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Potential in Creativity: Individual, Social, Material Perspectives, and a Dynamic Integrative Framework[1]

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Abstract

In this article, the notion of potential as discussed within creativity research is examined. It is noted that there are multiple, sometimes competing, understandings of potential within the literature with the biggest gaps existing between individual perspectives, on the one hand, and sociocultural perspectives on the other. Affirming that a comprehensive understanding of potential needs to consider what individual, social, and material perspectives have to offer and, above all, pay attention to both person and context, the focus is turned towards the dynamic definition of creativity in order to construct a multi-fold classification of creative potential. Fifteen types of potential are abstracted and offered as an open framework for a more complex discussion and understanding of this key topic in creativity research. These include the potential of an Individual/Person/Actor (mini-c potential, little-c potential, Pro-c potential, Big-C potential, embedded individual potential), of a Process/Action (systemic process potential, embedded process potential, universal process potential), of a Product/Artefact (instantaneous potential, experiential potential, condensation potential, cultural evolution potential), and of the Press/Audience/Affordance (sociocultural context potential, action potential, virtual world potential). A summary of these is offered in the conclusion.

Keywords: potential, creativity, individual approach, sociocultural approach, material approach, dynamic definition of creativity

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Introduction: Re-examining Potential

The notion of potential plays an important role in creativity studies, but its meaning is not devoid of diverse interpretations which depend on the specific epistemological commitments taken by the observer. Misunderstandings and contrapositions can follow when we fail to clarify the terms and notice the limitations in one's own discourse on creative potential. Considering the etymology of this word, potential comes from the Latin adjective *potis*, which has two different meanings: capable or possible. While the first refers to an individual entity, the second meaning can imply much wider associations, from socio-cultural to cosmological. A first dichotomy can thus be traced to the origin of this word. Interestingly, the noun form of potential came into life only in the 18th century, likely in association with the scientific study of electricity. Today, in the Merriam-Webster dictionary, potential is defined both as an adjective, meaning "existing in possibility: capable of development into actuality", and as a noun, meaning "something that can develop or become actual". In general, the use of this term induces a mental projection of a present reality onto a possible future, hence a form of forecast, foresight, or anticipation, as defined in future studies (Corazza, 2017a, Poli, 2011).

When the concept of potential is specifically mapped onto the creativity realm, the discussion can develop along quite different trajectories depending on a number of assumptions and decisions: the posited definition for creativity and its way of accounting for the dynamic development of the entities involved in the process; the fact that an individual perspective or a sociocultural perspective is being adopted; the consideration of the fact that the sociocultural perspective can be further defined by a focus on social relations and material affordances; the possible adoption of a 4P's (Rhodes, 1961), 4C's (Kaufman & Beghetto, 2009), or 5A's (Glăveanu, 2013) conceptual classification of

perspectives on creativity; the ambition to measure the potential quantitatively or document it from a qualitative perspective; the adoption of a positivistic versus constructivist epistemological position, and so on.

The aim of this article is to address the concept of potential through four main lenses – individual, social, material, and dynamic – and discuss the possibility of reaching an integrated view based on the latter that can serve as a general theoretical framework or, at least, as the beginning of one. As it will be seen, in the course of this development we will encounter fifteen different variations of *potential* associated to creativity, some of which can be considered 'classical', while others are introduced here for the first time. The diversified notions of potential depend on the focus being placed on the Individual/Person/Actor (yielding mini-c potential, little-c potential, Pro-c potential, Big-C potential, embedded individual potential), the Process/Action (yielding systemic process potential, embedded process potential, universal process potential), the Product/Artefact (yielding instantaneous potential, experiential potential, condensation potential, cultural evolution potential), or the Press/Audience/Affordance (yielding sociocultural context potential, action potential, virtual world potential) elements of the creativity eco-system. Given this perhaps surprising conceptual complexity, the need for systematization should become apparent to the reader.

Individual and sociocultural approaches: Opposite or complementary?

While the history of creativity studies goes much further back in time (Glăveanu, 2019b), there is general agreement that Guilford's presidential address to the American Psychological Association (APA) in 1950 drew a significant starting line for modern approaches to this construct. In that address, Guilford (1950, p. 446) observes that

employers: "are asking how to recognize the individuals who have inventive potentialities." This is a clear indication of the pragmatic value of the objective of measuring creative potential under an individual perspective, a value that led, in time, to the development of several psychometric test batteries (e.g., Agnoli, Corazza, & Runco, 2016; Lubart, Zenasni, & Barbot, 2013; Torrance, 1988). Specific forms of these batteries can be used with students, for example as a tool supporting the introduction of creativity in education, others with adults in organizations, to support personnel selection, training, or management. Whenever possible, longitudinal studies and meta-analyses should be carried out to interconnect the outcomes of these test batteries on large populations and subsequent creative achievements in real life (e.g., Gajda, Karwowski, & Beghetto, 2017). We observe that the underlying rationale of this approach draws on three *positivistic* propositions: i) creative potential exists within the individual, ii) the measurement process is able to determine its magnitude with sufficient precision, and iii) the ensuing results hold predictive validity for the individual's future creative achievement, albeit in statistical terms. Of course, these predictions cannot be taken as a guarantee, since creative potential is typically latent: it may be awakened through favourable experiences, training, environments, or stifled by negative versions of these same elements. It should be noted that, in this case, favourable does not necessarily mean pleasant, because creativity may actually be stirred by negative life experiences or heavy constraints (e.g., see Reynolds, 2003, providing evidence that a negative event such as illness may have life-enhancing effects through textile artwork).

On the other hand, a sociocultural perspective on creativity would follow a different approach, one based on *constructionist* premises. Within it, one's potential for creativity

is fundamentally related to the social and material elements that constitute the environment in which individuals are necessarily embedded; indeed, no individual can exist in isolation. In other words, potential is a *relational* construct that should not be measured only by focusing on a single person. Potential is closely related to human action and what can effectively be "done", and this is why it fundamentally depends on both social and material entities and, most of all, on the way they relate to each other (i.e., a person's capabilities at any moment "connect" with environmental affordances). It requires an appreciation of the evolving inter-connection between person and world. This also means that potential is *relative* to the "match" between person and situation and cannot be judged in absolute or abstract terms (or, at least, that absolute or universal assessments of potential need to be treated with caution). Moreover, if we consider that the person–environment system is always changing, then potential is also *dynamic* within the sociocultural approach. In other words, dynamic measures of potential need to take into account both the nature of the socio-material system the person is immersed in, and the evolution of this system over time.

While it might be impossible to fully reconcile these dual approaches (as, indeed, they are grounded in very different epistemologies), both have a clear contribution to make towards our understanding of the creativity construct, as well as carry distinct practical applications. In order to illustrate this, let's consider for a moment two thought experiments: a) same person in different environments, and b) different persons in the same environment. Let us assume (in contradiction to the sociocultural view of person–context interdependence), that we could ever separate the individual with his/her abilities and psychological makeup on the one hand, and the environment with its affordances and constraints on the other. Would the creative potential of this "self-

contained" individual be different if placed in different – including radically different – situations? It is not hard to assume that, indeed, this would be the case. The person's knowledge and abilities will most probably serve him or her better in one context rather than another. As such, his or her embedded potential to act creatively will be greater or lower, depending on situation. This calls for the development of the socio-cultural approach. Let's now consider the reverse thought experiment. What if two people with very different psychological attributes would be placed in one and the same situation, with identical social and material affordances. We would expect, once more, to have a clear variation in those people's potential to act creatively, depending on their individual characteristics. This calls for a thorough characterization of the individual's creative potential. What these simple thought experiments help us show is the fact that both person and context have something fundamental to offer to our understanding of potential, and no treatise on this subject can be considered complete if it only considers one of the two in isolation.

The hope to place in this article person and context into an integrative theoretical framework is based on the dynamic definition of creativity (Corazza, 2016), according to which the concept of potential is an intrinsic element of the creativity phenomenon. More specifically, the dynamic approach to potential is here shown as a reinterpretation of existing frameworks of analysis such as the 4P's (Rhodes, 1961), the 4C's (Kaufman & Beghetto, 2009), as well as the 5A's (Glăveanu, 2013). Before discussing the dynamic approach, however, we start by outlining the specific contributions to this discussion made by individual, social, and material perspectives on potential. In this way, multiple points of connection and continuity between these perspectives and the dynamic approach can be highlighted. As a result, novel indications can be drawn from

this first systematization effort, leading to the identification of fifteen types of creative potential; their multi-dimensional significance and organization can be considered to be a fundamental topic for future creativity studies.

Individual Perspective: Measuring Potential

Under the individual perspective, prominently in line with the aforementioned Guildford's APA presidential address, the goal in the study of creative potential is *to identify and measure the evident or latent factors and characteristics of a person that may predict future creative behaviour when the person will be faced by a real challenge in a real environment with sufficient resources, possibly leading to a creative achievement*. Clearly, this goal is quite ambitious and largely dependent on age; therefore, the definition of creative potential, and the relative methods of measurement, should be quite different between children and adults, also because the forms of possible achievement will differ considerably. There are at least two realms whereby a *methodological approach* to the definition and measurement of individual characteristics are well justified and of interest for society: i) creative potential for children in educational contexts, and ii) creative potential for adults in professional environments. Interestingly, this is perfectly in line with the approach proposed by Lubart, Zenasni, and Barbot (2013), who discuss a tool identified as EPoC (Evaluation of Potential Creativity), targeting the assessment of creative potential for children and adolescents, together with a "creative profiler" which is intended for the assessment of domain specific creative potential for adults, taking as references the so-called "optimal creative profiles", obtained by averaging the profiles of creative champions for the domains of interest. While EPoC is designed according to a production-based

philosophy (with tasks including divergent-exploratory and convergent-integrative exercises, in both visual and verbal domains), the creative profiler follows a complementary resource-based strategy, aiming at measuring five cognitive resources (divergent thinking, analytic thinking, mental flexibility, associative thinking, selective combination) and five conative resources (tolerance of ambiguity, risk taking, openness, intuitive thinking, motivation to create). The environment is considered as an additional context-centred factor, but clearly there is no attempt to insert that dimension into the profile. These tools are certainly well-designed, and the database of administrations is large, providing a good normative reference.

Recent research efforts are trying to insert neural correlates to creative behaviour inside this picture. Beaty et al. (2018) identify brain connectivity networks of highly creative individuals (default mode, executive control, and salience networks), and argue that cognitive creative potential can be reliably predicted from these networks. Jauk (2019) adds to this picture the dopaminergic system, which would modulate individual differences in creative performance, as well as openness to experience and intelligence. Lin and Vartanian (2018) introduce neuroeconomic mechanisms that determine subjective preferences and choices, which play a significant role in the creative process. These and other lines of research are very promising, yet not mature enough for application over large populations as the test batteries previously described.

Having established the general value of this work on the individual, one can ask whether the environment is simply an external variable in this discourse, or if rather it is an element of a complex systemic experience that can dynamically impact on the persons involved in an interaction, significantly affecting their profile. Indeed, as Johnson discusses (2000), functional brain development in infants can be explained

through a probabilistic epigenesist framework, according to which interactions between genes, structural brain changes, and psychological experiences are bidirectional. In other words, our brains undergo bio-cultural development, and therefore even neural correlates of creative behaviour have a bio-socio-cultural basis.

Social Perspective: Potential in Dialogue

The social approach to creativity emphasizes the role of social interaction and communication within creative action (Lebuda & Glăveanu, 2019). More than this, it postulates that creativity is, at all times, *collaboration* (Barron, 1999), given the fact that we do not only collaborate with others while creating something with them, but also when building on the ideas and perspectives of other people as part of our own creative processes (including when alone). To study creativity according to this approach, therefore, requires an in-depth analysis of the visible and invisible networks of collaboration that foster creative ideas, products, and practices. As a consequence, the outcomes of creative work are considered, in fact, as *co-creations* (Ind & Coates, 2013), as they emerge out of exchanges between people rather than the activity of isolated minds.

There are a few social models of creativity available in the literature. The "classic" one was proposed by Csikszentmihalyi (1988) as a systemic model that considers, at once, the individual, the field, and the domain. The field in particular is made up of people who have the power to validate (or not) a certain product as creative. Gatekeepers are, thus, the first actors that come to mind when considering the social nature of creativity. There is also a growing literature on how groups create (see Reiter-Palmon, 2018), with a particular focus on the cognitive and social processes that impact

creativity in a group context. While these studies add to our knowledge of the facilitators and obstacles faced by those engaged in collaborative creativity, they tend to operate a sharp distinction between what happens inside the mind of each collaborator and what happens between collaborators, in interaction. Sociocultural models of creativity challenge this distinction by postulating the individual mind as essentially dialogical, relational, and distributed within the world (Glăveanu, 2014a; Hutchins, 1995). One of the latest additions to this line of scholarship is represented by the perspectival model which postulates that creativity involves acts of repositioning, perspective-taking, and placing perspectives in dialogue with each other.

The perspectival model of creative action (Glăveanu, 2015a) starts from the premise that we all occupy different physical, social, and symbolic positions in a shared socio-material world. These positions afford us the development of different perspectives or action orientations within this world (Gillespie, 2006; Martin, 2005). For example, having the perspective that a cup is meant to contain liquid facilitates our actions of drinking from it. The interesting aspect when it comes to creativity and creative potential, is that the cup can have many other uses, including as paperweight, weapon, or art object. Exploring these requires us to develop new perspectives and, thus, take new positions in relation to what a cup is (e.g., if we look at it from the standpoint of an artist, we might paint on it or add new, unique features). Creativity is thus the process of *putting different perspectives on any given issue in dialogue with each other, a dialogue that is reflective and emergent at the same time* (Ness & Glăveanu, 2019).

Where does this place the notion of potential? From a social / perspectival approach, potential is not embedded either in the person or in the object but in the dialogue of perspectives. It is relating two or more perspectives that we get to discover the world

anew and act on it in a much more flexible manner. To return to the example of the cup, the social approach doesn't consider our creative potential as confined to the individual mind's possibility to engage in divergent thinking or other ideational processes. What substantiates our potential to act creatively in relation to the cup is the number of perspectives we can bring to it and the way we relate them to each other. In turn, these perspectives depend on our social and material experience of the world: on how many interactions we have with cups and how many interactions we have with other people and cultural content about cups. Potential is thus placed within a relational space of social and cultural experience and depends on how our capacity to have this experience informs what we do in the present. Given that experience is not easily quantifiable, our evaluation of potential depends on understanding the context of the person (both immediate and life context) and in particular the kinds of positions and perspectives adopted by him or her in the past and in the present. We must also pay attention to broader cultural norms that invite the person to take certain positions instead of others, that facilitate certain perspectives while obscuring others (Glăveanu & Clapp, 2018).

In terms of the two thought experiments we introduced earlier, the social approach encourages us to consider the person not as a contained mind that travels from one context to the next, but as a dynamic accumulation of social experience that is constantly transformed in ongoing actions and interactions. Equally, the new environment the person is "transported" to is made up of a series of physical, social, and symbolic positions that the newcomer would have to adapt to, and change based on his/her previous positions. Potential will be thus defined by how much and how quickly the person's social and cultural experience can be brought to bear within a new life context.

Material Perspective: Affording Potential

The material approach is a relative newcomer within creativity research, traditionally focused on individual minds and, more and more, on social interactions. And yet, it is undeniable that we tangibly create within a material world and as embodied beings. We also have a clear sense, when being creative, of what is possible and impossible for our actions from a material perspective. Our imagination might be able to change something into anything, but even imagination is constrained by how objects are and what we know they are for (Vygotsky, 2004). A material focus in creativity studies means recognizing the fact that ideas are *co-constituted* in interaction with the physical environment. This is not a reductionist, materialistic point of view, however. Materiality, at least in the sociocultural tradition, is considered as deeply connected to sociality in the sense that the material world is introduced to us by others, interacted with in relation to others, and changed with the help of others (Glăveanu, 2014a).

There aren't many theories developed yet to account for the material dimension of creativity. The ones that do exist typically come from outside psychology such as actor – network theory (Latour, 2005) and material engagement theory (Malafouris, 2013). In each case, they tend to make problematic claims regarding "object agency" which lead to accusations of anthropomorphism. In fact, according to the socio-material standpoint, we should be talking about co-agency (Glăveanu, 2015b) or the bi-directional relation between people and their environment. This idea is well captured by the notion of *affordance*, initially used by Gibson (1986) to designate what material objects afford (or not) our action. In essence, affordances denote action potential when it comes to interacting with our physical environment. A chair affords sitting but also standing on it

and being moved around. But a regular chair, in and of itself, doesn't afford swimming on it or flying into space. If we are to build a material theory of creativity starting from the concept of affordance, we can define the creative process as that of *perceiving new affordances in our environment, inventing objects that have desired affordances, and exploiting those affordances that might go against existing cultural norms* (Glăveanu, 2012, 2016). This formulation underlines the fact that affordances don't simply exist in the object or in the mind of the person. They are actively discovered within the situation by the "meeting" between certain action potentials and action orientations (see the previous section on perspectives and the social approach). Creativity involves finding new matches between affordances and perspectives that lead to novel, surprising and useful actions and outcomes.

What does a material approach tell us about creative potential? As briefly described above, the notion of affordance speaks directly to that of potential as it illustrates what can and/or could be done within a given situation. To perceive an affordance, whether it is used or not, is to discover what is *possible*. Importantly, though, affordances and, thus, potential, equally depend on the person's capabilities and the properties of the socio-material world. Chairs are for sitting, but they don't afford this to babies who are too small to climb on them on their own. Equally, young children will probably perceive other affordances in a chair – for example the possibility of turning it into a small house or a shelter within episodes of play – that escape most adults in their daily interactions. Creative potential, in this approach, is relational and evolving together with the moment to moment changes in the interplay between perspectives and affordances (Glăveanu, 2018). When an artist discovers, all of the sudden, a new affordance of the material and

acts on it, a series of new possibilities are opened to him or her; at the same time, certain other action possibilities are closed due to the route that was chosen.

In terms our two thought experiments, it is interesting to notice that some basic physical properties of the person and the environment will remain constant even when "transported" within new contexts (presuming that these belong to the world as we know it). As such, there are some aspects of potential that can be more easily predicted or at least predicated. However, the person's history of using objects in a certain manner will certainly play a role in shaping creative potential, and so will the sociocultural norms specific to the old and new contexts when it comes to object use. Potential becomes, thus, the *dynamic space* created between old action orientations and new material arrangements, in which changes in either one redefine the entire space. This emphasis on the dynamic aspect is fully elaborated in one of the newest approaches to the definition of creativity.

Potential within the Dynamic Definition of Creativity

The dynamic definition of creativity (Corazza, 2016) posits that creativity requires a *potential* for originality and effectiveness. The distinction between this definition and others that can be found in the literature, among them the so-called standard definition of creativity (Runco & Jaeger, 2012), is prominently the introduction of the concept of potential *inside* the definition itself. This is a critical theoretical change, because it introduces dynamics into the framework by recognizing that the potential might be realized, yielding a *creative achievement* (i.e. an outcome which is recognized by a group of people, at a certain time, within a certain cultural milieu, as both original and effective), but also that, due to various circumstances, the process might not be met with

any form of success, leading to a state of *creative inconclusiveness*. The latter, far from being a mere failure, turns out to be a crucial part of the process (Corazza, 2016): high potential in a creative inconclusiveness state entails for example resistance to frustration, strong determination, self-belief. In addition, the extraction of value from the process outcomes, which determines dynamically whether one is met with achievement or inconclusiveness, should be thought of as the activity not of a judge but rather of an *estimator*, because no one has the ability and the possibility to measure the entire potential of an original idea. If we understand that creative achievement is a possible result of an act of estimation (and not of judgment), it follows immediately that this is the result of a dynamic interaction between all the entities involved in the process.

Now, if creativity requires the existence of a potential, the question is where this potential is actually found, in what form, and how this relates to the previous discussions on individual, social, and material perspectives. The answer is that, under the dynamic framework, potential is pervasive, or more precisely it resides in different form in *all* of the elements that exist and interact within the creativity phenomenon. In order to clarify this point, it is useful to take as a reference the classic 4P's classification (Rhodes, 1961): Person, Process, Product, and Press, and then extend it through the more recent 5A's classification (Glăveanu, 2013): Actor, Action, Artefact, Audience, Affordance. Each of these strands, which also correspond to distinguishable research areas in creativity studies, can be shown to be the home of a different form of potential, as we will discuss in the following.

Starting from the consideration of the Person, we are led immediately to the concept of *creative potential of an individual*, i.e. the classic individual perspective on potential,

as we have discussed in the previous section. From a dynamic perspective, the individual creative potential can also be seen under the 4C's model by Kaufman & Beghetto (2009), encompassing mini-c, little-c, Pro-c, and Big-C, levels, and it includes both production-based and resource-based approaches and corresponding measurement methodologies (Lubart, Zenasni, & Barbot, 2013). This form of potential can be latent, not necessarily activated, and can grow or be stifled through the education system, everyday experiences and work duties, and, in general, by the environments in which the person lives. Neuroscientific aspects, cognition, emotional intelligence, and personality, all contribute to the determination of this form of potential (Mastria, Agnoli, Zanon, Lubart, & Corazza, 2018). The expression in actuality of this latent individual potential requires the initiation of a Process.

When attention is turned to the Process, a new form of potential emerges, which we identify as *systemic potential* as it attains to the overall complex system of resources (time, information, expertise, materials, social factors, etc.) available to carry out the process itself, the adopted strategies, the thinking and acting style of those involved in the process, their background knowledge and experiences, the specific domain of application, and the challenges to be faced (Corazza & Agnoli, 2015). Considering as an example the last element, it should be evident that the potential for originality and effectiveness is totally different if the challenge is finding a focused solution for a (possibly ill-defined) problem, as opposed to exploring a vast area of possible advancements beyond the state-of-the-art in a specific domain of human activity. In other words, systemic potential is heavily impacted by intrinsic and extrinsic constraints. Other important distinctions could be made regarding the relationship between potential in a creative process and the resources available in the environment,

which justify, for example, why we expect the next innovations to come from certain parts of the world and not others. Finally, if the Process does not relate to a single creativity episode, but is extended to the notion of the Dynamic Universal Creativity Process (Corazza, 2019a), encompassing material, biological, socio-cultural, and artificial layers, and justifying the evolution of our cosmos in all of its complexity, one can introduce the notion of *universal process potential*, indicating that our universe is far from static but continues to evolve along trajectories that are intrinsically unpredictable. This view is in line with Whitehead's philosophical cosmology, whereby creativity is considered to be the ultimate metaphysical principle (Whitehead, 1978/1929). Overall, the potential of a creative process is a topic which deserves a significantly larger space than what we will devote here; the full development of this part is left for future work.

Considering the Product, the outcome of a creative process, the discussion of its potential can start by making a fundamental discrimination between those outcomes which are consumed in real-time, such, as for example, a ballet, a live music improvisation, or a theatre performance, and those whose impact will be mainly observed in the future as, for example, could be the case for a disruptive innovation in an industrial product line, but also a work of art such as the frescos in the Sistine Chapel, the value of which has been and continues to be re-interpreted for centuries. The potential for originality and effectiveness of a product with real-time fruition appears to be consumed in the moment, and yet the experience might remain in the episodic memory of those who were present and influence their future actions. Therefore, for real-time Products, there exists both an *instantaneous-potential* in the experience of the originality and effectiveness of a Product, as well as an *experiential-*

potential, a sort of long-tail effect. Regarding Products with non-instantaneous fruition, it may be useful to retrieve an element from past literature that appears to have almost been forgotten today. Jackson & Messick (1964) introduced the concept of *condensation* for those Products that show an endurance, that we seek to re-examine and re-experience, that do not reveal their meaning completely on first viewing. Following these lines of thought, we introduce here the notion of *condensation potential*, which expresses the fact that for future-oriented and time-enduring Products, the real potential is related to experiences that will occur in the future, that will presumably transcend the Person and specific creativity episodes, and that will entail repeated estimation cycles, possibly across different cultures. It is certainly possible that a Product that is not considered creative in a time epoch, through its condensation potential can be estimated as a very important achievement at a subsequent time.

Considering the discussion of potential in the Press, the environment within which the Process is carried out by the Persons involved, and the Products are estimated, this is clearly a notion that is much more precisely described by the 5A's framework, so we now turn our attention to the latter. As discussed in (Glăveanu, 2013), the 4P's framework has served its classification purposes very well, but, as with all categorizations the danger is that of creating barriers, separations between topics which initially create order but when internalized can become forms of intellectual segregation. The 5A's framework has been purposely conceived to give the proper evidence to the irreducible relationships between the elements in the phenomenon. Let's begin again from the start of the classification.

According to Glăveanu (2013), the Actor is a Person embedded in a field of social relations, a socialized self, shaped by a sociocultural context in coordination with others.

As a consequence, the potential for originality and effectiveness of the Actor is also embedded within the same sociocultural context, and as such it can and should be observed. We identify this as *embedded individual potential*. This argument does not deny the value of controlled experiences in controlled environments, such as a test in a laboratory, but it points to the necessity of qualifying these elements. The importance of this derives from the fact that the creative potential of a person, measured in a controlled environment, might change significantly when that person becomes an Actor embedded in natural, everyday life environments.

As a second element, Action refers to a two-fold analysis of the creative process: an internal, psychological dimension and an external, behavioural one. Therefore, the potential of a creative Action depends on the integration of these elements into an experience, which involves a dialogue between several Actors, each adding richness to the embedding sociocultural framework of the Action itself. We identify this as *embedded process potential*, with a shift of the emphasis on dynamic collaboration and co-creation. Indeed, supposing a collaboration between two persons in a co-creation exercise, the potential of the ensuing Action will be very different from the simple sum of the potential of the two Actors, given the complex interaction between them that can allow the emergence of unforeseeable resources. Clearly, this can work both in a positive and in a negative direction, i.e. the Action potential can be increased, decreased or even nulled in the interaction.

Third, referring to Products as Artefacts, places a focus on their "cultured" nature and the cumulative character of creation in human civilization. As such, the instantaneous-potential, experience-potential, and condensation-potential of an Artefact should be examined in view of the contribution that this specific Artefact can give to the evolution

of culture of the human species, giving life to a fourth form identified as *cultural evolution potential* of an Artefact. Just to give an example, a wonderful invention, which taken in isolation could be considered a major advancement, could still lose its potential due to the emergence of a competing, and better, technology. Vice versa, a standard technology for producing glass could become overnight a cutting edge technology on the day optical fibres are invented (Cattani, 2006). The estimation of the potential for originality and effectiveness of an Artefact must therefore draw elements from the discipline of cultural evolution.

The consideration of the potential for originality and effectiveness which descends from the notions of Audience and Affordances leads to the introduction of three additional forms of potential: *sociocultural context potential*, *action potential*, and *virtual world potential*. In line with the thought experiments that we described in the Introduction, we intend to show how the consideration of situational elements can at times completely change the picture that is obtained in "neutral", or controlled environments. It has been shown repeatedly that, when measuring individual creative potential in males and females, hardly any significant differences are found (Baer & Kaufman, 2008). However, as shown by Kemmelmeier and Walton (2016), the result can change radically when experimental instructions included the notion of creativity for the benefit of others, and the fact that the process could be conducted under threat. In particular, women outperformed men in originality when the effort was said to be beneficial to others, but this effect disappeared under threat. This is a good example of how the sociocultural context potential of a situation interacts with the individual's creative potential, personality and gender, to provide a very different picture. As we discussed previously, action potential is a characteristic of the affordances in the surrounding environment that

points to all the possibilities of use and interaction with material entities. Of course, this is an open ended exercise as no one is able to see and foresee all possible functions, uses, interactions with one or more surrounding objects: again, it is an exercise in estimation.

It is here useful to connect this discussion to the 4C's model of creativity by Kaufman & Beghetto (2009), who distinguish between mini-c (personal discovery of new things, ideas, heuristics), little-c (non-professional or everyday creative achievements), Pro-c (professional creative achievements and innovations), and Big-C (eminent creativity) levels and achievements. As discussed by Kaufman and Beghetto, it is possible to use these categories to draw hypothetical developmental trajectories in the creative endeavours over a person's life, that might typically start from mini-c, then go on parallel paths to little-c on one side and Pro-c on the other, the latter possibly leading to Big-C, but only in a few rare cases. Since the concept of potential points to future creative achievement, this classification can help to clarify different situations.

Considering the creative potential for mini-c achievements, and disregarding in this discussion any form of psychological pathology, this can be thought of as the most widespread form of potential, in the sense that anyone should be able to engage and find satisfaction at this level, provided that sufficient stimuli are provided by the environment. The design of education systems that stimulate students and increase their *mini-c creative potential* is certainly in order here (Beghetto & Karwowski, 2019), and this points to the relevance of methodologies for the definition and assessment of mini-c creative potential in populations of students. A different perspective is that of *little-c creative potential*, still quite accessible to large numbers of individuals (if not entire populations), but requiring a form of intrinsic motivation to spend one's own resources in a form of everyday/non-professional activity that has a potential for creative

achievement. It is interesting to analyse the impact of this kind of creative achievements, both from an individual and a socio-political perspective. In general, it would appear that little-c creative achievements are optional and not really necessary in one's life. On the other hand, this sort of activity may be related to the individual well-being (Corazza, 2017b, 2019b; Csikszentmihalyi, 1997), and this can indirectly provide benefits also beyond the activity itself, including professional aspects. From a socio-political perspective, it is important to reflect on the policies and institutions that a society might adopt and provide in order to allow its members to live a life in which there is room for creative endeavours, at least at the little-c level. This is becoming more and more of an issue in those societies with reduced work-week load and/or aging populations. Therefore, the specific form of individual little-c creative potential might be seen on a scale that runs continuously from ancillary to socially relevant, but the value and necessity of developing measurement methodologies for this kind of potential could be reasonably argued against. Undoubtedly, it was *Pro-c creative potential* that Guildford (1950) had in mind in 1949 when speaking of adults in the work environment. In fact, it would be too ambitious and unrealistic to propose any form of prediction tools towards Big-C creativity, so that *Big-C creative potential* is an entity that is typically studied in retrospective (e.g., what conditions led that person and his/her collaborators to be in the right place at the right time? see Albert, 1983; Eysenck, 1995), while it appears to be reasonable to try to devise models, experiments, measurement methods, and training approaches that are oriented towards the identification and development of creative individuals and teams in professional environments.

To complete this discussion, it is interesting to note that new information and communication technologies (Corazza, Pedone, & Vanelli-Coralli, 2010; Feather, 2013)

have relatively recently introduced different ways of producing virtual realities, including visual immersive experiences but also simpler forms such as social networks and even chat applications. The net result of all these transformations of our way of living and interacting with others is that "artificial" controlled conditions can actually become an environment that we live in for several hours a day. In-vitro can become in-vivo. The question, which is still quite open for investigation, is how do these virtual environments affect the creative process? As a minimum, it is possible to introduce the notion of *virtual world potential*, which includes new forms of social interactions and the digital affordances of virtual objects. The impact of these artificial elements on the creative process is starting to be studied (e.g., Guegan, Nelson, & Lubart, 2017). It is interesting to note that a trend which is emerging today is that many people enter these virtual worlds through a change of their personal characteristics, such as sex, age, looks, dressing style, and so on. How this affects their creative potential requires much more research, but early evidence points to a large impact (Bourgeois-Bougrine et al., 2018).

Conclusion: Multi-fold Creative Potential

It is hoped that the reader will by now be convinced of the multi-fold nature of the notion of potential introduced by the dynamic definition of creativity, which posits the essence of the creativity construct on the requirement for potential originality and effectiveness, a requirement that can then be specified in multiple alternative and complementary ways. This establishes a theoretical framework, within which the individual, sociocultural, and material perspectives find all a useful collocation. Table 1 collects the static/dynamic definitions of creativity and the fifteen different forms of

potential identified in our discussion. Clearly, when one approaches the study, definition, or measurement of creative potential, it is natural that a single perspective is taken, in order to bring the scientific discourse to considerable depth. However, we feel it is very important to be able to place any specialised perspective into a larger theoretical framework, so that all efforts end up contributing to a larger picture. This problem is not new. As Henri Poincaré stated back at turn of the twentieth century (Corazza & Lubart, 2019): "In proportion as the science develops, it becomes more difficult to take it in in its entirety. Then an attempt is made to cut it in pieces and to be satisfied with one of these pieces—in a word, to specialize. Too great a movement in this direction would constitute a serious obstacle to the progress of the science. […] it is by unexpected concurrences between its different parts that it can make progress."

The hope is that this work can be a contribution towards finding those "unexpected concurrences" that will emerge when the concept of creative potential is considered critically in its various forms and dimensions.

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	Definition	Observations
Creativity nature		
Static	Creativity requires originality and effectiveness (O&E)	This only defines a creative *achievement*
Dynamic	Creativity requires *potential* originality and effectiveness	This definition includes both *achievement* and *inconclusiveness*
Individual/Person/Actor		
mini-c potential	Potential for personal discovery, learning, creative behaviour	Psychometric measurement existing (e.g. EPoC)
little-c potential	Potential for non-professional creative achievement	Psychometric measurement possible. Might gain centrality in future societies
Pro-c potential	Potential for professional creative achievement	Psychometric measurement existing (e.g. creative profiler)
Big-C potential	Potential for eminent creativity	Not easily predictable, typically posthumous recognition
Embedded individual potential	Creative potential of an Actor embedded in a cultural milieu	In-vivo observation necessary
Process/Action		
Systemic process potential	Potential for O&E of a creative process	Depends on system of resources, style, constraints, challenges
Embedded process potential	Potential for O&E of a creative process embedded in a cultural milieu	Emphasis on relations and co-creation in a creative process
Universal process potential	Potential for O&E of the Dynamic Universal Creativity Process	Relevant to cosmic evolution, involving material, biological, socio-cultural, artificial layers
Product/Artefact		
Instantaneous potential	Potential for real-time impression of O&E	Most relevant for live performance
Experiential potential	Potential for episodic memory impression of O&E	Impact in memory of experiencing a creative product
Condensation potential	Potential for continuous re-examination of O&E	Time-enduring creative achievement transcending epochs
Cultural evolution potential	Potential for O&E of an Artefact embedded in a cultural milieu	Impact on cultural evolution of the human species
Press/Audience/Affordance		
Sociocultural context potential	Potential of the dialogue of perspectives	A strictly relational construct referring to co-creation
Action potential	Potential for O&E in the affordances of a socio-material entity	Emphasis on discovering possibilities afforded by material entities
Virtual world potential	Potential for O&E of a virtual world entity	Emphasis on discovering/inventing possibilities afforded by virtual entities

Table 1 – Creativity definition and forms of potential

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