Creativity and Function

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The Advent of Creative AI

While Artificial Intelligence and its various applications have been the focus of research and public debate for a while now, Artificial Creativity (the use of AI for creative and artistic ends) has only recently moved into the spotlight. Suddenly, however, it seems ubiquitous. Within mere months, several new iterations of text-to-image generators, as well as particularly the release of ChatGPT and GPT4, have raised public interest and awareness of the topic – already at an all-time high – to a whole new level and shifted attention to the narrower field of text and image generators. Newspapers overflow with daily articles telling the public how to use ChatGPT to increase creative output, or explaining why its arrival marks an important, even worrying threshold in language-focussed creative AI.

All of these assessments of ChatGPT and similar AIs are based on a loosely understood everyday notion of creativity, or on the ideas of those who identify as creatives, complicating issues, as these very people are in some way or another heavily invested in the importance and uniqueness of the creative process. In critically assessing the creative capabilities of ChatGPT and related AI applications, we are still lacking a clear definition of creativity, especially one that works across disciplines. This paper is meant to alleviate this problem by providing a cross-disciplinary working definition of creativity in the context of current AI research and development, and to shine a light on what the exact purpose of such a definition might be in the first place.

A Multitude of Questions

So, what is creativity? Given the ubiquity of creativity in modern western societies, it is easy to forget that its boom is a relatively recent phenomenon and that from the very beginning, any definition of creativity has struggled, not least due to the fact that individuals and disciplines have approached the phenomenon with a range of pre-existing expectations and convictions.

Furthermore, in contrast to some related or adjacent terms like consciousness and intelligence, creativity does not come with the kind of philosophical tradition that would give us a panoply of competing, contextualised and critically vetted definitions to choose from. Instead, it has made an astounding journey from religious creation myths to a core skill within a globalised capitalist workforce within a mere 200 years, and from obscure mark of artistic genius to subject of scientific enquiry in a fraction of that. Over that period of time, the question 'What is creativity?', has expressed a number of related and interwoven, yet distinct questions, so that there are competing questions when it comes to a basis for defining creativity. Historically (that is, diachronically), these questions have touched upon the relationship between human and divine creation; between mind, soul, or spirit, and a creative touch of genius; or a transcendental quality of the creator. The competition here is about which general domain creativity even belongs to. It is a tradition that is still alive in dogmatic assertions that creativity cannot be fully explained.

From a contemporary perspective, the questions more usually concern issues such as: How do we attribute creativity? How do we produce ideas and objects that are deemed creative? What is the role of creativity in society and discourse? Why do we want to be creative? And, in discussing artificial creativity, why on earth would we want machines to be creative, as well? This clear shift in focus is indicative not only of the secularisation of especially Western society, but even more of capitalist free-market economies and the resulting shifts in societal norms.[1] While the historical genesis of AI imaginaries and notions of creativity is without doubt fascinating, this paper will focus on a synchronic perspective. In order to do this, we must first sample definitions and approaches currently on offer and evaluate in how far they succeed in answering (all) the questions raised above.

Functional Definitions

Before it makes sense to have a look at different attempts to define creativity, however, it is crucial to consider not only criteria for a good definition, but also remind ourselves what the ultimate end of the act of defining is. Given the success of data-driven approaches in pattern-recognition and prediction, it might even seem that the task of defining has become somewhat redundant and outdated. Indeed, a shift from domain-specific, concept- and definition-based theory towards a kind of 'post-theory' relying on correlations and machine-generated classification has been noted by some. (Hansen 2022) Whatever works, goes. Consequently, there seems to be a

1 In fact, it seems that this connection between shifting notions of creativity and the economic climate in which they have taken place explains the 'whiff of reactionism or conservatism' attached to discussions around authorship.

confusion and conflation of research and development, which have for a long time been merged in businesses. While development may be justified by success only, research is fundamentally theory- and knowledge-directed, and the task of defining is a crucial step in the theorising of any phenomenon, a cognitive exercise directed at understanding rather than merely replicating or predicting. A definition comes with certain epistemic implications and advantages that 'merely' solving a problem cannot.

Its etymology and practical everyday usage suggest that a definition is "[a] precise statement of the essential nature of a thing; a statement or form of words by which anything is defined" (*OED Online "definition, n"*.) and thus an authoritative paradigm. As this very passage shows, definitions are used as a starting point, due to this authoritative, agreed-upon, and seemingly fixed nature. Yet, on the other hand, there are further definitions of what a definition is that speak a different truth. Definition, we learn, is also "[t]he setting of bounds or limits; limitation, restriction" (ibid.), as well as "[t]he action of determining a controversy or question at issue; determination, decision" (ibid.). Furthermore, in the field of logic, definition refers to "[t]he action of defining, or stating exactly what a thing is, or what a word means" (ibid.). Structurally, a definition brings together the explanandum (that which is to be explained) with the explanans (that which explains it).

In his *Tractato Logico-Philosophicus*, Wittgenstein wrote that "[t]he object of philosophy is the logical clarification of thoughts. Philosophy is not a theory but an activity" (1922: 4.112) The very same holds true for definition as one of philosophy's main endeavours. The takeaway is not only that definition is a process rather than a definitive and fixed statement, but also that it has itself undergone several shifts in meaning, thus inherently exemplifying this dynamic nature of definitions. This tension between the assumedly fixed nature of definitions in most everyday situations and the dynamic process of definition as part of academic inquiry has to be taken into account when developing criteria for a 'good', i.e. successful, definition.

Coming Up with Criteria

As naïve, essentialist notions of what creativity is lead nowhere, there must be criteria for the definition other than capturing what creativity 'really is'. Instead, we have to judge the definition by the *options it affords* us, and the *practical advantages* it provides over other definitions, prioritising *clarity over certainty*. In fact, we can reframe definitions as epistemic affordances in that they offer us ways of knowing and learning about the world. If, "[a]ffordances are functional meanings" (Windsor 2004: 180), it makes sense to understand definitions in the very same way. Furthermore, a definition ought to be precise in the sense of offering *maximum effective distinction*. In

other words, a definition should be focused on information in the sense of Bateson, meaning "a difference which makes a difference" (Bateson 1987: 460).

Additionally, the definition should be able to ideally accommodate all, but definitely as many cases as possible, while at the same time being as narrow as possible as well. It ought to tread the fine line between too broad (which would limit its usefulness and complicate the study of the phenomena involved), and too narrow (which would exclude too many perspectives and in doing so reduce its broad, cross-disciplinary appeal). It should especially not exclude on principle certain academic disciplines or indeed common-sense usage. This give and take between broadness and narrowness can be expressed in more technical terms as an approximation towards an equilibrium between maximum intensionality (defining in terms of properties, characteristics, and membership of higher-order groups) and maximum extensionality (the sum of lower-order objects / concepts that belong to this group; examples of the explanandum). As these are generally negatively correlated, the task of finding this equilibrium is difficult and relies on the elimination of contradictions rather than the complete overlap of the two. What this means is that the different methodologies and subject matters of disciplines should not pose a fundamental problem, as they result in non-alignments rather than contradictions.

Another fundamental tension in a definition is between what Locke calls nominal and real definitions. A nominal definition specifies cases of correct usage of a term by providing linguistic-contextual criteria or examples. A real definition, by contrast, gives criteria for correctly applying the term to a referent by identifying characteristics and properties of that referent. In short and somewhat simplified words, a nominal definition explains the word, while a real definition explains the denoted referent of the word. While the distinction may be clear and obvious for physical objects, it is less so for culturally complex phenomena such as creativity and others, due to the fact that there is no clearly identifiable referent. In fact, one of the most contested points is whether in these cases the nominal definition is a subset of the real definition, or vice versa.

One crucial caveat in assessing the extensional definition in a field such as AI is that we need to distinguish clearly between metaphorical and literal uses. New cases tend to sneak into extensional definitions through a metaphorical back-door, due to our tendency to explain the new in terms of the familiar. Therefore, talking about machines 'thinking' does not imply that the activation of their circuitry constitutes an example of thought in the same way that talking about what a machine 'knows' does not mean that there is knowledge, but rather that data storage is employed to achieve availability of task-relevant information broadly reminiscent of the ways in which humans draw on knowledge in similar situations. As a result of this abundance of mentalistic metaphors in the field, AI discourse is ripe with such examples of mis-extended extensional definitions that render the task of providing intensional definitions all but impossible. There is, of course, a wider (posthuman-

ist) argument behind the questioning of traditional extensional definitions and the resulting intensional definitions that is valuable and valid. A principled counter-argument that embraces the underlying posthumanist agenda can, however, easily be constructed by pointing to the fact that extensional definitions are necessarily constructed and therefore neither wrong nor right, but rather useful or problematic according to their consequences and applications.

Given the hugely different approaches and perspectives across disciplines, the definition should lend itself to functioning as an explanans in those cases where this is required, but it should also be able to work as an explanandum for these same cases. In other words, definitions should not be designed as the starting or end point of an explanatory chain or system, but work in relation to the other elements within the same explanatory system. Just as with signifier and signified in signs, the explanans of one definition is the explanandum of another, and every answer necessarily opens up new questions. In that sense, definitions are relational in a strong, Saussurean sense, being marked by the differences to other elements within the same system and relying on Derrida's 'différance' as the refutation of the "notion of there being a fully present and self-present term that would be a terminus of any chain of signification" (Baugh 1997: 128)

While each discipline will at any point treat it as either explanans or explanandum, but not both, it is important to guarantee the translatability, that is to make sure that the explanans can be substituted for the explanandum and vice versa with minimal loss of coherence or information. It makes sense for a truly interdisciplinary definition to render the phenomenon necessarily a subset of the concept, and the real definition part of the nominal definition.

Finally, and this may be an overly obvious point, a definition of any kind needs to assume that something is explainable in principle. This is especially true in a research context and the aim of research is to provide those explanations. So, before returning to the issue of creativity, this leaves us with the following criteria:

A successful definition

1. affords (conceptual) operations not afforded by competing definitions
2. focuses on differences that make a difference
3. is neither too broad nor too narrow (equilibrium between intensional and extensional definition)
4. provides linked and interchangeable explanans and explanandum (are part of the same explanatory system rather than beginning or end point of an explanatory chain)
5. avoids dogmatic declarations of non-explicability

A Multitude of Answers

The difficulties in defining creativity are widely acknowledged. In their paper on 'AI-aesthetics and the Anthropocentric Myth of Creativity', Arielli and Manovich state that "when we try to give a working and operational definition of these notions [of creativity], we see how elusive they are" (4–5) and Margaret Boden, one of the foremost authorities on creativity, agrees that "[c]reativity is mysterious […] the very concept is seemingly paradoxical". (1996: 75) Nonetheless, however, they and others have repeatedly tried to capture creativity.

A Cognitive Perspective

Margaret Boden takes as a starting point the so-called 'standard definition', which Runco and Jaeger formulate in a very concise way as: "Creativity requires both originality and effectiveness". (2012: 92) This definition works in terms of necessary and sufficient criteria. If something is not original, it cannot be creative. Similarly, if something is not effective, it cannot be creative. Only when something is both original and effective at the same time can we say that it is. Now, effectiveness in this case should not be misinterpreted as a kind of problem-solving effectiveness only, but more broadly as effective at achieving some kind of end, be it practical, or sensual-aesthetic in nature. Surprise is sometimes used as a stand-in for originality, and a distinction can be made between cases of varying degrees of originality. Boden writes that "Many creative ideas, however, are surprising in a deeper way. They concern novel ideas that not only did not happen before, but that […] could not have happened before". (1996: 76)

Consequently, "[w]e can now distinguish first-time novelty from radical originality. A merely novel idea is one that can be described and / or produced by the same set of generative rules as are other, familiar, ideas. A genuinely original or radically creative idea is one that cannot. It follows that the ascription of creativity always involves tacit or explicit reference to some specific generative system" (ibid. 78)

This is interesting and illuminating in several ways. For one thing, it seems to acknowledge that creativity is a matter of degrees; there are stronger and weaker cases, and it is possible that it would make sense to define creativity along prototypical cases. Furthermore, creativity, or rather the ascription thereof, is relative to context, more precisely to specific generative systems. This also implies that creativity requires rules to be broken. You can only be creative in a domain if there are conventions or constraints to violate in the first place.

Constructivist Approaches

Manovich, on the other hand, points out that "[t]he association of the arts and creativity that we take for granted today, and the privileging of creativity over other considerations, are relatively recent inventions" (Manovich 2022: 65), drawing attention to a kind of bias that leads us to perceive of the primacy of the connection between creativity and art as something given, even natural, rather than constructed.

Instead, he draws our attention to the fact that attribution of creativity is determined by an observer, or a group of observers, and depends on their knowledge of the 'creative' process. He writes: "'being creative' is a label that an observer ascribes to phenomena whose underlying processes he is unaware of". (Arielli & Manovich 2022: 5) But how exactly do we attribute creativity, especially when dealing with machines? In his book on the *Creativity Code*, Marcus Du Sautoy proposes what he calls the 'Lovelace Test' for creative AI according to which

> an algorithm has to produce something that is truly creative. The process has to be repeatable (not the result of a hardware error) and the programmer has to be unable to explain how the algorithm produced its output. We are challenging the machines to come up with things that are new, surprising, and of value. For a machine to be deemed truly creative, its contribution has to be more than an expression of the creativity of its coder or the person who built its data set. (2019: 6)

The final sentence is interesting in that it gives more detailed conditions for what it means for the output to be beyond explanation. This, however, is a matter of nuance. Arguably, for most of the applications around, it is reasonable to assume that an understanding of the underlying algorithms as well as the datasets on which they were trained, in combination with knowledge about a prompt that went into the creation of a particular text or image, would be sufficient to explain the output in principle, but not in detail. The issue of attributing creativity is also hugely affected by a choice between two competing perspectives that highlight indistinguishability as in Du Sautoy's Lovelace Test, or Turing's 'Imitation Game' (1950: 433), or the functional approach according to which it is sufficient for a machine to achieve something that would require creativity if done by a human (analogous to Marvin Minsky's pragmatic view on AI).

The Creativity Dispositif and Creativity as an Economic Resource

A somewhat different point is made by Andreas Reckwitz, who mentions two basic meanings of creativity. The distinction he makes can be summarised as: there is "the

potential and the act of producing something dynamically new" (Reckwitz 2017: 2), but there is also the "topos of creativity" (ibid.), the idea of creativity as a culturally significant concept, which informs his work on the creativity dispositif. The distinction is a crucial one and probably the single most persistent problem in finding ways of addressing creativity across disciplines. These problems in defining creativity also have real-world consequences, as in cases of copyright law, which is not yet properly equipped to deal with these newly emerging technologies, even though new legislation, such as the EU's AI Act (2022) is imminent. Cases brought to courts in the US and elsewhere show the lines along which copyright is granted or denied according to attributed creativity.

In 1978, the final report of the National Commission on New Technological Uses of Copyrighted Works attested that "the eligibility of any work for protection by copyright depends not upon the device or devices used in its creation, but rather upon the presence of at least minimal human creative effort at the time the work is produced". (111) Two things are noteworthy here. First, the categorical commitment to "human creative effort", which is understandable from a practical standpoint in legal advice, but problematic in other contexts. And second, the stress on this effort happening '"at the time the work is produced", which seems to imply that programming does not constitute a basis for claiming copyright on any output generated by an algorithm later. So while agreement on some aspects of creativity emerges, many theoretical and practical problems remain unresolved, and looking back at our initial questions, we find several of them only partially answered. We tend to have a reasonable grasp on the role of attributing creativity, while a range of disciplines work to provide more detailed accounts of how creative behaviour comes about and is realised cognitively, as well as socially. Through his examination of the creativity dispositive, Reckwitz in particular gives us a clear idea of the role creativity plays in society and on an individual level. In short, synthesizing a definition is a matter of prioritising some aspects and approaches over others while making sure that all are respected in non-reductive ways.

Creativities?

One distinction that I would like to draw some more attention to is that between 'potential or act' and 'topos' as Reckwitz called them, which can also be understood as phenomenon and concept, the implication being that the main distinction is in the degree to which they are implicitly socially constructed, as well as in the way they tend to relate to certain disciplines and methodologies of inquiry. We could also call this a distinction between ontological and epistemological creativity, ontological creativity being a matter of what 'constitutes' creativity, or how we come to

be creative, while epistemological creativity would be concerned with how we know about creativity, or how we come to think of something as creative.

They also, crucially, have opposing explanatory functions. This is evident in the ways in which creativity, like intelligence and other related terms, often serves in discourse to demarcate a dividing line between the human and non-human where this would otherwise be difficult to justify. Put bluntly, we often call something creative when we have no better explanation for how it was created by a human in ways that we think non-human entities would not be able to. The concept or topos fulfils a discursive function to fill in certain gaps that we, justifiably or not, feel need to be filled. This function is challenged by concepts of co-creativity, actor-networks or even autonomous machine creativity.

Another approach that focuses on this reception and discourse-side perspective of the concept is the 'Lovelace effect', proposed by Natale and Henrickson, which "mediates actual software functionality with how individuals conceptualize and interpret that software, reminding us that all outcomes of interactions between humans and machines represent constant implicit and indirect negotiation between programmer intention and user experience". (2022: 13), the idea being that in the absence of a clear understanding of how the algorithms work, users are likely to apply the same theory of mind that they do to understand other humans.

A Synthetic Definition of Creativity – Creativity On The Go

In current, usually domain-specific definitions of creativity, overlap of concept and phenomenon is limited and contested. Instead, a truly interdisciplinary definition should render the phenomenon necessarily a subset of the concept. As a result, creativity as an 'inexplicable' explanans, will have to be excluded, for the sake of enabling research. The aim of empirical creativity research in this framework would be to increase the share of the explainable phenomenon subset within the concept set. So let me now come to the proposed working definition, which has four parts

1. Creativity is a socially and culturally relevant attribution of novelty and effectiveness to a created idea, practice, or object.
2. Creativity is consequently attributed to any (co-)creators as well as to the processes and practices involved in the creation of said idea, practice, or object. (Similarly, it is without doubt often attributed for having done so in the past. For processes and practices in particular it therefore likely makes sense to introduce some kind of distinction between those labelled creative in the sense of 1. and those mentioned here. There is certainly also a kind of bias, which will lead an audience to label creative anything produced by someone who has regularly been labelled creative in the past.)

3. The attribution is based on the transformation of conceptual and / or aesthetic spaces upon audience contact with the idea or object (3rd-person creativity), where the audience explicitly includes any creators or co-creators during and after the process of creation (i.e. in attributing creativity, creators are a privileged subset of the audience). (One with diachronic access, first access, and agency for further change; 1st-person creativity)
4. Any such transformation of conceptual and aesthetic spaces, as well as their genesis and recognition is explainable in principle, but not predictable (and thus remains non-deterministic).

It seems clear that this definition is designed to be open to (but not to confirm by design) the idea of machines being creative in relevant ways. By focussing on the reception- and ascription-side of creativity, as well as the processes involved in creative behaviour, there is no fundamental distinction between human authors and potential non-human authors or sources, other than any distinctions enforced by the respective community of judgement.

Also, it does not require machines to possess or have access to, conceptual or aesthetic spaces themselves, thus avoiding dependence on certain ontological commitments to AI concepts and interpretations, which offers conceptual flexibility.

Thus, many of the most controversial issues in artificial or machine creativity can be treated as distinct from creativity in general, while also offering clear pathways to resolving some issues around the role of AI in creative processes by pointing out the crucial role of the community of judgement. Even more crucially, however, the proposed definition also disentangles questions of creativity from the related, but fundamentally distinct question of art. Even in the field of creative AI, dominated by critical reflections on the relationship between human and machine, as well as the hidden human labour involved in most AI, there is a tendency to take the fixed relationship between creativity and art for granted. This leads to confusing claims about creativity, such as that it "is reduced [in discussions of generative AI] to repetition of the same" (Zylinska 2022: 50). This holds mostly true in artistic terms, but not in a stricter sense. Generative AI produces an output that is based on, but crucially not identical to, its input data. It would thus be more precise to say that generative AI reduces creativity to the re-combination of existing data to produce novel output with a high degree of similarity to its respective input, i.e. existing works and styles. Rather than conceiving of creativity as the vehicle and only pathway towards art and consequently devaluing creativity that does not result in art, the proposed definition allows us to judge creativity on its own merit, while some types of creativity remain the principal mode of producing art. This seems fitting, given that creative behaviour arguably precedes the culturally and socially relevant production of art in evolutionary terms.

Complexity and Complications

How does this definition live up to the criteria specified in the beginning? The first criterion is the most difficult to evaluate, but the interdisciplinary and dynamic nature of the developed definition promises advantages over other, discipline-specific definitions, so it stands to reason that there is an 'added value' attached to this definition. The focus on not merely distinguishing creativity from related phenomena, but also between specific subsets of creativity with respect to usage and methodologies of inquiry arguably fulfils the second criterion (focus on differences that make a difference). The definition is broad in the sense of accommodating a variety of approaches from a range of disciplines yet at the same time narrow in providing a layering of levels and pronouncing the centrality of the community of judgement and audience reception. It also works as an explanation as well as something that requires further explanation, and furthermore explicitly outlines ways in which these explanatory functions can be fulfilled across disciplinary boundaries. And lastly, it even more explicitly addresses the issue of explicability, providing a way of dealing with blackbox-scenarios, both in cases of AI applications, as well as in attempting to explain creative processes in humans. For after all, explanation still beats prediction.

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