

## Collaborative Creativity



Wendy Ross<sup>1</sup>, Sam Smith<sup>2</sup> and J. E. Vistic<sup>3</sup>

<sup>1</sup>Department of Psychology, Kingston University, Kingston upon Thames, UK

<sup>2</sup>Department of Social Sciences, Oxford Brookes University, Oxford, UK

<sup>3</sup>BIMM Institute, Brighton, UK

### Abstract

In this entry we suggest that a shared view of the possible has accompanied the development of successful creative collaboration both in modern time, in the historic past, and from the viewpoint of deep history. The concept of the possible in collaborative creativity is distributed, in rather than predicated on an individual, at times this possible is unknown by all until the moment it becomes actualized. The possible, when considered in this way, becomes a relational phenomenon existing in a shared future both inspiring collaboration and also inspired by it. This entry will start by drawing a distinction between creativity in groups and collaborative creativity before moving to examine how a distributed sense of the possible drives commonly collaborative ventures such as in music or science and how collaboration unfolds across multiple time

scales. Finally, we will move to an aspect of creativity more rarely considered from a psychological perspective – that is how creativity appears in the archaeological record. The study of creativity should have great appeal to pre-historians: The remarkable creativity of our species appears to be one of the defining features that separates humans from the rest of the animal world, but an individualist view of creativity has stymied previous study. Our review of the current evidence suggests that the fundamental building blocks of the development of human creativity lie in demographic and neural changes relating to social engagement. This points to the tantalizing suggestion that all creativity should be considered as collaborative.

### Keywords

Collaboration · Deep History · Distributed Creativity · Demography · Social intelligence · Extended Mind · Entanglement

What is indisputable [...] is the fact that humans live not only in the here and now but are capable of enriching and expanding their experience of the world by remembering the past, imagining the future, considering alternatives, anticipating problems and continuously engaging in ‘as if’; what if’ and ‘if only’ thinking processes. The common denominator between these experiences is the

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capacity to go beyond the actual or the real and to explore the possible. (Glăveanu 2018, p. 1)

In this entry we suggest that a shared view of the possible has accompanied the development of successful creative collaboration both in modern time, in the historic past, and from the viewpoint of deep history. Conversely, collaborative creativity also expands and surpasses the boundaries of what is possible for an individual to conceive and to achieve. So for example, the improvisatory genius of a single individual such as, say, John Coltrane, can be best understood as emerging from several entangled factors: the material and collaborative conditions of the jazz music of his day, for example, the saxophone, bass and drums; the US economy; the changing language of jazz; the ethnic and social aspects of his time; and the social demographics and the possibilities of collaboration in his musical scene. Beyond these material necessities, his band's ability to follow his innovative approaches to the language of jazz was also integral to his musical talent. Thus, while his individual qualities arguably drove the resultant product, a true understanding of creativity needs to also settle on a level of analysis which takes into account these factors.

Additionally, because the concept of the possible is distributed, in our view, rather than predicated on an individual, at times this possible is unknown by all until the moment it becomes actualized. The possible, when considered in this way, becomes a relational phenomenon existing in a shared future both inspiring collaboration and also inspired by it.

This entry will start by drawing a distinction between creativity in groups and collaborative creativity before moving to examine how a distributed sense of the possible drives commonly collaborative ventures such as in music or science and how collaboration unfolds across multiple time scales. Finally, we will move to an aspect of creativity more rarely considered from a psychological perspective – that is how creativity appears in the archaeological record. The study of creativity should have great appeal to prehistorians; the remarkable creativity of our species appears to be one of the defining features that separates humans

from the rest of the animal world. Our review of the current evidence suggests that the fundamental building blocks of the development of human creativity lie in demographic and neural changes relating to social engagement possibly pointing to the tantalizing suggestion that all creativity should be considered as collaborative.

## Collaborative Creativity

There are two distinct strands when it comes to psychological research examining how we are creative in groups, which are perhaps more complementary than their supporters care to admit. However, each posits diametrically opposed views of the ontological locus of creativity and, importantly, the level of analysis necessary to unpick it. One views creativity as an essentially individual process and has as a research focus individual attributes which are reduced even so far as the firing of neurons associated with creativity (see Sawyer 2011 for a review). Others reject the idea such a closed system is reflective of true creativity, rather they suggest that creative processes and products arise from a combination of people, products, and moments (Glăveanu 2015; Montuori and Purser 1995; Ross and Vallée-Tourangeau 2018).

An understanding of these two viewpoints can elucidate the difference between collaborative creativity and group creativity. This latter sees creativity as a linear, additive process preserving the boundaries of the individual as she works in a group. This research focus necessarily privileges both the individual as a unit of analysis and a quantitative methodology which often employs tasks such as the Alternative Uses Task to quantify creativity. Such an epistemological position pins the locus of creativity on the individual and casts group creativity as something that occurs when a measurable outcome is formed by the interaction of these individual creative units (Glăveanu 2011). The individual is the focus of attention rather than the group.

However, this research program, while elucidating some aspects of the creative process, does not reflect collaboration as documented across

other naturally occurring domains. Those who assert collaborative creativity is distinct from group creativity suggest that some creative processes and products cannot be fully understood at the individual level of analysis and that group level analysis is necessary (Glăveanu 2011; Sawyer 2010). The level of analysis is not trivial here in understanding how we can unpick the creative process when it unfolds collaboratively. Collaboration is necessarily a group activity and, if we study collaborative creativity, then a model which reduces beyond the group level will lose much explanatory power.

Moran and John-Steiner (2004, p. 11) refer to collaboration as “an intricate blending of skills, temperaments, efforts and sometimes personalities to realise as shared vision of something new and useful.” Regarding collaboration as a naturally occurring relationship between two or more people often leads to changes in methodology with a focus on a qualitative, idiographic approach exploring how non-substitutable components interact. These components will almost certainly have different qualities to each other and thus products of collaboration as a complex system are perhaps best considered as truly emergent – that is irreducible to their constituent parts (Sawyer 2004).

Research into collaborative creativity approaches creativity as an in-between process with a final creative product that emerges from the combination and interaction of different, complex actants. As a result, the product and process cannot be reduced to individual units of analysis. The focus of this entry will be on how such collaborations involve a creative product that is only possible as an emergent product of that collaboration. In this way, we fundamentally reject the idea that collaboration consists of a group of interchangeable actants, rather our notion of collaboration is that it is unique, occurs on multiple timelines, and is irreducible.

## **Collaborative Creativity and an Emergent and Distributed Possible**

### **Improvisational Jazz**

When the possible is distributed across different members of a group, then what is actualized is a

shared vision which is often not available to the members of the group until the moment it comes into being. This is true for rehearsed and iterative group composition, but it finds its apex in improvisation where the product is ephemeral and explicitly interactional. For example, group jazz improvisation is an art form which simply cannot be understood in terms of individual, conscious cognitive processes and where what is possible is predicated on what occurs at the group level rather than individual contributions. Indeed, this form of group creativity is so explicitly collaborative that Seddon (2004) suggests it generates an “empathetic creativity,” that is, a creativity that is necessarily dependent on the presence of others.

In the domain of psychological research this art form is often used as a fundamental challenge to a reductionist notion of creativity (Kenny 2014; Sawyer 1992). This is not only because an analysis of the individual’s creative output would not capture the final product in a satisfactory manner, but also because it is impossible for the individuals in the group to know, let alone shape the creative process in its entirety (Sawyer 2010). In improvisational performance the social group is not only conceived of as influence but as co-creators. Again, the appropriate level of analysis is fundamentally important.

In addition, it is impossible to assess the creativity of such groups without an awareness of their positioning in a temporal space where the collaboration is not only with the current members of the band but also with the musical tradition. For free form jazz is not as uncontrolled as might be first assumed, rather its novelty arises from the recombination of learned set pieces and is contingent on a shared thought and moment as well as a deep shared history. Thus when we are assessing the creativity of such a group, the traditional methods of assessing the product cannot work because it is necessarily ephemeral, so we must take into account the process, and the practice of music making; the “creative process and the resulting product are co-occurring” (Sawyer 1992, p. 253). For this type of collaborative creativity, there is no individual ownership of the final product and so the moment at which the possible is conceived is at the moment of actualization.

## Scientific Collaboration

The distribution of the possible also arises in more concrete forms of creativity. Scientific innovation has always been collaborative – the first coauthored paper appeared in 1665 (Beaver and Rosen 1978) – but there has, however, been a significant increase in scientific collaborations with ambitious projects such as the Large Hadron Collider pooling resources in order to further scientific discovery and creativity in way that a single team cannot afford to do in terms of either financial or human resources. Coauthorship of scientific papers has been rising steadily both in terms of the numbers of authors and the number of countries from which those authors are drawn (Gazni et al. 2012). Technological changes have both facilitated this deeper level of collaboration and meant it is necessary as the technical skills needed to operate equipment require levels of expertise that cannot be found in a single individual. Thus, the shared possible here becomes a fractured product if only considered at the individual level. The possible here is greater than the sum of its parts.

Increased collaboration has a positive impact on productivity and the citation level of individual researchers, but it also has a wider impact than this; it effectively increases the range of what is possible in scientific research. Beyond the pooling of financial resources, scientific collaboration allows creativity to develop in a nonlinear, iterative, and reciprocal manner. The benefits of scientific collaboration are not just realized by a brute force increase in numbers but also by encouraging and exploiting disciplinary diversity. Here what is possible is not determined by what is similar between collaborators but what is different and the possible arises in these complementary tensions. As we have seen above, what emerges is more than a linear, additive formula treating collaborators as interchangeable units. This transdisciplinarity is essential to capitalize on serendipitous discoveries (Rocca et al. 2019).

As collaboration occurs across disciplines, it encourages diverse groups of researchers to pool different areas of expertise to create something that would not be possible for one individual.

This, in turn, allows individuals to become increasingly specialized within a team of other specialized individuals which they would not be able to do without offloading some skills to others (Ness and Riese 2015). This creates an iterative relationship between the individual and the group extending beyond an analysis of the scientist as an individual. Again, the possible cannot be understood at an individual level but emerges from the process of multiple, different individuals. Moreover, just as with a jazz ensemble this collaboration extends back in time as well: any discoveries are made through collaboration not only with those researchers currently on the project but also those who have already made the necessary advances.

## Trust and Tension

Modern scientific collaborations require a high level of trust (Andersen 2016) and its increasing complexity supports specialist knowledge rather than a polymath. This requires relinquishing individual control. Trust is not a given and therefore, it also needs to be assessed in the context of the temporal developments of the relationship. Such trust can only develop over time and grows as the relationship develops allowing for a steady widening of the boundaries of the possible.

This is also true for artistic collaboration. In a jazz ensemble, for example, band members cannot be simply exchanged for other equally talented members with the same outcome because music making in such groups is a dynamic and shifting mix of formal and informal approaches. While jazz players can be substituted the dynamic mix will result in a different final product. As is the case with the types of close creative collaborations outlined above, creative processes in this environment are informed by social processes as much as the act of creativity itself (Kenny 2014). Importantly, satisfactory improvisation in such groups does not happen spontaneously but rather arises from social interactions that act as backdrop to supply the level of trust necessary to work collaboratively (Kenny 2014; Seddon 2004). The creativity is enacted in the moment, but the

collaborative ties are formed over time. In her ethnographic study of creative collaboration in a jazz ensemble, Kenny writes of a “sense of camaraderie” (p. 4) and a “shared history” (p. 5) and Seddon tells of two members of the band he studied who had attained a higher level of “sympathetic attunement” (p. 73) through spending time playing and travelling together. The piece of music then emerges from this mix of current work and shared history and cannot be understood simply as the addition of talents from interchangeable components in an easily generalizable model (Sawyer 2006).

## Material Collaboration

The creative product is often constrained by the things around it. Just as the initial flurries of artistic creativity in our prehistoric ancestors were often constrained and used the surrounding natural features to shape their artistic output (Froese 2019), so materials can be considered key collaborators in the creative process to this day. In the same way as human collaborators serve to shape the final creative product, so materials exert an influence over the process.

That the materials used in artistic creativity influence the creative act and shape and constrain what can be done is a commonly reported phenomenon. Take, for example, the experience of working with clay. Paul March’s (2019) writings on this process reveal how the actual physical materials with which he works shapes the creative process with the delicate nature of porcelain contrasting with the more robust nature of stoneware:

The physicality of sculptural experience can be felt by comparing two different clays: stoneware and porcelain. Metaphorically speaking, stoneware is dynamic, generous and forgiving—confident in its plastic potential. Porcelain is intransigent and full of inertia. With porcelain, the act of creation and the outcome of the engagement with my hands take place within boundaries set by the clay’s limited elasticity and excessive friability. Sculpting with porcelain is a tense negotiation. (March 2019, p. 137)

The subtly different affordances of the material used intervene in the final artistic work similar to the way in which a human collaborator would. Again, the possibilities arise in the difference, in the “negotiation” and tension between the human and nonhuman collaborator (see also Glăveanu et al. 2013). Moreover, there is a relationship of trust and tension which mimics the intensity of the human/human relationships described above. Other artists discuss being aware of how material reacts and how they respond to a question posed by the material rather than imposing their imagination on that object (Botella et al. 2013).

## Collaboration Across Different Time Scales: The Development of a Shared Possible

When we consider collaboration, it is important to consider it as a process unfolding across multiple time scales. Not only do collaborative creative processes occur against the backdrop of a particular sociocultural field which structures, constrains, and extends possibilities, they also take place within the different life histories of those collaborating. Thus, collaboration and the possible take place on different time scales from the micro to the macro. On the one hand, the possible is created at the moment of production, on the other it comes into being as relationships develop between the collaborators. These can almost be conceived as two versions of the possible: an emergent, immediate possible which is grounded in material action and an ever present shadow of an “envisioned” possible which captures the cumulative possibilities for thought and action that come out of experience and that we can more easily reflect on. There is also an explicit tension in considering the relationship between the sociocultural background and the role of the individual in creativity: the novelty inherent in creative acts requires the transgression of the sociocultural norms and yet the evidence suggests that the creative act is at the same time dependent on sociocultural changes.

Collaborations take place against a rich tapestry of ideas, language, and materials and even an

individual who doesn't name direct collaborators cannot be fully understood without reference to this. We would extend the concept of collaboration beyond direct collaboration with people and things to describe the dialogue between past and present ideas (see also Ross et al. 2020) where one of us has expanded this idea further). There are fertile moments in history that generate cultural moments from which new creative products emerge (Simonton 2019). Alongside an inspirational social milieu, the material conditions are hugely influential on the levels of creativity and this appears to hold throughout history. Again, what is possible arises from a tension between the individual and the surrounding creative energy which at once extends and constrains the individual. An understanding of the possible as it relates to creativity must take into account the indirect collaborations which arise from a situated individual.

Even those people characterized in the collective imagination as an individual genius are perhaps best understood as arising from this complex and dialogic network of indirect collaborations and sociocultural forces (Ross and Vallée-Tourangeau 2018). Take, for example, the work of Shakespeare: The modern desire to attribute authorship to one sole individual and grant him ownership of the text is anachronistic when applied to his plays which were generated when ideas of text ownership were not understood as they are today. It is notable that the entire field of authorship studies has now arisen to disentangle the phraseology and words that can be attributed to different single authors from this period. Thus, collaborations are woven into the very fabric of the texts we have inherited (Dahl 2016) and these texts reflect speech patterns and thoughts that cannot be easily attributed to any one person. For example, Marlowe's and Shakespeare's influence on each other until the former's dramatic death was substantive to the extent that there are still many who are convinced that Marlowe is a better candidate for authorship of the plays commonly attributed to Shakespeare. Indeed, Muthukrishna and Henrich (2016) review the history of many modern innovations, such as the light bulb or the theory of natural selection, and

show that these are best explained as the result of collaboration and cultural recombination, with little credit given to their supposed inventors (see also Lamb and Easton's theory of multiple discoveries 1984).

### **Collaboration and Cognitive Modernity: The Possible in Deep Time**

Evidence from primatology suggest that wild apes are neophobic, extremely conservative, and avoid innovation where possible (Forss et al. 2016), a situation which stands in stark contrast to the creative nature of modern human societies. However, the exceptional creativity that characterizes our contemporary situation is not evident for much of our deep history. Instead, the archaeological record suggests that for long periods, sometimes spanning millions of years (Finkel and Barkai 2018), we seem to have been little more creative, at least in ways that are evident in the archaeological record, than chimpanzees or other ape species. Perhaps, seen in this light, creativity is not likely to be a particularly fruitful field of study for those concerned with our species' long-term development. This situation is exacerbated by the fact that archaeology is concerned with long-term patterns and behavioral trends, rather than individual action, and in this context it is extremely unlikely that archaeology will identify creative, or innovative, behavior unless and until that innovation has become widespread among a population and persistent over long-time spans (Hovers and Belfer-Cohen 2006).

Given this, it is clear that the data sets available to prehistorians are not suited to the study of individual creativity and so the recent focus has been not on individual moments of creativity, but more on the social and ecological contexts that encourage creativity (Kuhn 2012). This has been a far more fruitful avenue and seen from this standpoint, creativity becomes an essentially collaborative process. In this section, we will briefly review a selection of archaeological evidence demonstrating that collaboration is a powerful explanatory tool not only for the transmission of creative products but also for the development of

creativity itself and finally suggest that creativity in all its forms may be best viewed as an expression of collaborative intent.

## Deep History

For vast swathes of our deep history, hominin evolution suggests that our ancestors were not particularly creative, especially in the realm of material culture. For example, the Acheulean handaxe – a bifacially flaked large cutting tool that first appears in the archaeological record around 1.8 million years ago in Africa – remained, essentially unchanged, the tool of choice for over a million years (Finkel and Barkai 2018); a remarkable period of stasis and conservatism. Indeed, many archaeologists (e.g., Mithen 1998) have argued that we do not see real human creativity until the Upper Paleolithic period (around 40,000 years ago) in Western Europe. This period has been characterized as a creative explosion and is marked by rapid diversification in stone tool styles, flexibility in hunting strategies, and, perhaps most dramatically, a flourishing of both parietal and mobiliary art. Traditionally, many archaeologists have explained this pattern, that is a long term stasis followed by a sudden fluorescence in creativity, as being a result of a neurological “tweak” in the human mind that created “modern” or creative cognition at around 40,000 years ago (Klein 2000; Mithen 1998).

However, a growing corpus of data now shows that this explanation is untenable (d’Errico and Stringer 2011; McBrearty and Brooks 2000). As we collect more data on the behavior of our Paleolithic ancestors, the evidence indicates that creativity did not emerge in a “big bang” 40,000 years ago. Rather the data now show that creativity (at least durable material creativity) appears and disappears from the archaeological record over a period of several hundred thousand years. For example, Henshilwood et al. (2011) have shown that during the Still Bay period human groups in Southern Africa were making art, jewelry, and bows and arrows around 80,000 years ago, indicating that humans could be exceptionally

creative well before the 40,000-year neurological tweak proposed by Mithen and Klein.

Additionally, it is now also recognized that such periods of exceptional creativity, such as the Upper Paleolithic or the Still Bay, did not lead to sustained creativity among our species, rather these periods were followed by long periods of creative stasis. A final nail in the neurological explanation for Upper Paleolithic creativity is provided by the fact that we now have good evidence that Neanderthals were also capable of remarkable creativity including the manufacture of art and jewelry (Finlayson 2019). Taken together, these lines of evidence have led many archaeologists to propose that periods of exceptional creativity are not caused by modifications to the brains of individuals, but rather reflect demographic factors, including population size and the closeness of social networks (Powell et al. 2009).

Demographic models of this type generally assert that large groups of social learners (equipped with the biological and material equipment to transmit and maintain culture) are more creative than small disconnected groups. Based on model data, Powell et al. (2009) show that not only are large connected populations needed for the transition and maintenance of culture, but also that large populations of closely collaborating individuals are also key for the creative process itself. This model implicitly flags collaborative creative as a key mechanism not only in the transmission and acceptance of innovation but in its actual occurrence. Larger populations are not just more likely to sustain creativity, they are more likely to generate it. Joseph Heinrich and colleague elaborate these ideas and argue that human creativity is essentially an emergent phenomenon of large well-connected populations of social learners (e.g., Muthukrishna and Henrich 2016). Muthukrishna and Henrich argue that innovations mainly occur through serendipity or through cultural recombination which leaves little, if any, role for the individual genius. Demographic models of this ilk provide a far better fit with the archaeological and biological evidence and suggest that throughout our evolutionary past almost all creativity was essentially collaborative in nature.

While these models may explain how large, collaborative human social networks foster creativity, they do raise the question of why we saw so little creativity until the last half a million years of our evolution – as demonstrated by the Acheulean “stasis” discussed above. Here the answer may lie in the not in a neurological “creative” tweak but rather in the development of a suite of cognitive mechanisms that foster close collaboration between groups that may not have been in place until around 500,000 years. Elsewhere, one of us has argued that by around 500,000 years our ancestors possessed the socio cognitive skills and biological capacities (e.g., language, shared intentionality, full theory of mind, and the ability to share plans for the future and reflections on the past) to undertake close collaboration (Underdown and Smith 2019). Additionally, from this time onwards there is good evidence that hominin groups engaged in collaborative hunting; a major creative development that allowed our ancestors to become the planet’s apex predator (Conard et al. 2015). It may also be significant that 500,000 years ago also marks the period where the Acheulean handaxe is replaced by a more varied a flexible stone tool technology. We argue that, from this point onwards, humans possessed the biological kit needed to collaborate, and that collaborative creativity was now possible whenever demographic and social factors were in place. Collaboration, rather than the development of individual cognitive capacities, may well be what made creativity possible.

## Conclusion

Collaborative creativity moves beyond the understanding of creativity as an accumulation of individual units, rather this view takes a broader view of creativity seeing it as emerging from the interaction of people and things. In this way, collaboration is intimately bound up in the possible. Like the possible, it exists across multiple time scales and in the differences between people and things. Furthermore, such collaboration is predicated on a shared sense of the possible and that possible becomes extended through collaboration. Thus,

while in collaborative creativity, the possible only becomes visible when it is actualized collapsing the divide between the actual and the possible, it is this shared vision of the possible which motivates collaboration.

Extending back into our deep history, our brief review shows that most (if not all) human creativity appears to have been collaborative in nature and that focus on the links between the individual cognitive process that underlie collaboration coupled with analysis of the social networks and demographic settings of our prehistoric ancestors may provide a powerful means to explain the sporadic appearance of creativity in the past rather than a focus on creativity *per se*. This is in line with much recent thinking that focusses upon the collaborative nature of human cognition in general (e.g., Wilson 2005). According to this hypothesis, stunning creative achievements are able to be interpreted as visible manifestations of human collaboration.

## Cross-References

- ▶ Creativity
- ▶ Perspective Taking
- ▶ Possible in Anthropology
- ▶ Possible in History
- ▶ Possible in Music
- ▶ Possible in Performance Art

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