

Aims of the Series

Both creativity and culture are areas that have experienced a rapid growth in interest in recent years. Moreover, there is a growing interest today in understanding creativity as a socio-cultural phenomenon and culture as a transformative, dynamic process. Creativity has traditionally been considered an exceptional quality that only a few people (truly) possess, a cognitive or personality trait 'residing' inside the mind of the creative individual. Conversely, culture has often been seen as 'outside' the person and described as a set of 'things' such as norms, beliefs, values, objects, and so on. The current literature shows a trend towards a different understanding, which recognises the psycho-socio-cultural nature of creative expression and the creative quality of appropriating and participating in culture. Our new, interdisciplinary series Palgrave Studies in Creativity and Culture intends to advance our knowledge of both creativity and cultural studies from the forefront of theory and research within the emerging cultural psychology of creativity, and the intersection between psychology, anthropology, sociology, education, business, and cultural studies. Palgrave Studies in Creativity and Culture is accepting proposals for monographs, Palgrave Pivots and edited collections that bring together creativity and culture. The series has a broader focus than simply the cultural approach to creativity, and is unified by a basic set of premises about creativity and cultural phenomena.

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The Palgrave Handbook of Creativity and Culture Research

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- Lebel, R. (1959). *Marcel Duchamp*. New York: Grove Press.
- Lévi-Strauss, C. (1966). *Savage Mind*. Chicago: University of Chicago Press (First published 1962 in French as *La Pensée sauvage*. Paris: Librairie Plon).
- Lévi-Strauss, C. (1971). *L'Homme nu: Mythologiques*. vol. IV. Paris: Édition Librairie Plon.
- Lévi-Strauss, C. (1981). *The Naked Man: Mythologiques*. vol. IV. Chicago: University of Chicago Press.
- Lévi-Strauss, C. (1982). *The Way of the Masks*. Chicago: University of Washington Press (First published 1975 in French as *La Voie des masques Part I*. Geneva: Editions d'Art Albert Skira, and Part II 1979. Paris: Librairie Plon).
- Liddell H.G. & R. Scott. (1968). *Greek-English Lexicon*. Oxford: Clarendon Press.
- Lock, C. (1994). Petroglyphs in and out of perspective. *Semiotica. Journal of the International Association for Semiotic Studies*, 100(2-4), 405-420.
- Miller, S. (1995). *Constantin Brancusi: A survey of his work*. Oxford: Clarendon Studies in the History of Art.
- Pearson, R. (2004). *Mallarmé and circumstance: The translation of silence*. Oxford: Clarendon Press.
- Pellizzi, F. (2005). On the margins of recorded history: Anthropology and primitivism. In M. Westermann (Ed.), *Anthropologies of art. Clark studies in the visual arts* (pp. 26-40). New Haven/London: Yale University Press.
- Plato. (1929). *Timaeus. Critias. Cleitophon. Menexenus. Epistles*. (Vol. IX, trans: Bury, R. G.). Loeb Classical Library. Cambridge, MA: Harvard University Press.
- Rubin, W. (Ed.) (1984). *"Primitivism" in 20th century art: Affinity of the tribal and the modern*. New York: The Museum of Modern Art.
- Sansi, R. (2015). *Art. Anthropology and the gift*. London/New York: Bloomsbury Academic.
- Serres, M. (1995). *Genesis*. Michigan: The University of Michigan Press. (First published 1982 as *Genèse* by Paris: Grasset).
- Steefel Jr., L. D. (1984). Marcel Duchamp and the machine. In A. d'Harnoncourt & K. L. McShine (Eds.), *Marcel Duchamp* (pp. 69-80). New York: Museum of Modern Art.
- Stiegler, B. (1998). *Technics and time: The fault of Epimetheus 1*. Stanford: Stanford University Press. (First published 1994 as *La Technique et le temps, I. La Faute d'Épiméthée*. Paris: Galilée/Cité des Sciences et de l'Industrie).
- Velescu, C. R. (1993). *Brancusi initiatul (Brancusi the Initiate)*. Bucharest: Editis.
- Wiseman, B. (2007). *Levi-Strauss, anthropology and aesthetics*. Cambridge: Cambridge University Press.

Macro, Meso, and Micro Creativity: The Role of Cultural Carriers

Fathali M. Moghaddam and Lauren Covalucci

In the film *The Third Man* (1947), the complicated and dark character Harry Lime puts his finger on part of the mystery of *creativity*: the ability to 'think outside the box' and generate valuable novel ideas, methods, interpretations, and ways of problem solving generally. Creativity does not always arise out of conditions of peace, tranquility, and affluence. The extraordinary creativity of the Renaissance took place in the context of the violent conflicts that engulfed the Italian city states. In more recent times, the creativity involving Irish artists such as William Butler Yeats, James Joyce, and the Irish National Theater emerged in the context of violence of early twentieth-century Irish society. The computer innovations of Alan Turing took place during World War II. The relationship between creativity and freedom is also complex. For example, in nineteenth century England women were deprived of important

Harry Lime: Don't be so gloomy. After all it's not that awful. Like the fella says, in Italy for 30 years under the Borgias they had warfare, terror, murder, and bloodshed, but they produced Michelangelo, Leonardo da Vinci, and the Renaissance. In Switzerland they had brotherly love—they had 500 years of democracy and peace, and what did that produce? The cuckoo clock. So long Holly. <http://www.imdb.com/title/tt0041959/> quotes

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political, educational, and economic rights—yet this era produced arguably the finest female novelists to ever write in English (Jane Austen, Charlotte and Emily Bronte, and George Elliot). Great art, drama, and literature have been produced in the context of repressive political systems, as in the case of nineteenth-century Russian novels produced by the Tolstoy, Dostoyevsky, and others. A key factor during these eras was support for the products of creativity from powerful elites, who helped shape the dominant ideology and value system in society. Perhaps because of the enormous complexity of creativity in the context of the larger society, psychologists have in general tackled this topic by focusing on the ‘creative individual’ rather than taking into consideration the society in which the creative individual lives. We believe it is essential to adopt a broader perspective.

This chapter explores creativity by examining two main issues, before proposing a new way to consider the links between different levels of creativity. Our first focus is on the distinction between processes at three levels: macro, involving large-scale societal transformations; meso, involving the organizational and small group level; and micro, involving the intra-personal level. The second issue explored is the puzzle of how influence is achieved across the macro, meso, and micro levels. We assume that influence is bi-directional, both top-down from macro to meso and micro, and bottom-up from micro to meso and macro. But irrespective of the source and direction, the puzzle is: how does this influence come about?

A major innovation we propose is that creative processes at macro, meso, and micro levels are nurtured and connected by *creativity carriers*, which are specialized forms of ‘cultural carriers’—means through which values and normative systems are propagated (Moghaddam 2002). Examples of cultural carriers are the American flag and the Islamic veil, which from one perspective are both ‘just pieces of cloth.’ However, these pieces of cloth ‘carry’ values that are enormously important in American and Islamic cultures respectively. We propose that by giving importance to certain values propagated through cultural carriers, societies influence creativity at meso and micro levels. Examples of creativity carriers are the Internet and the computer, both of which have been used to create and propagate new ideas and ways of doing things.

We argue that processes at macro, meso, and micro levels are involved, to some degree, in all creativity, even when the unit generating creativity is *primarily* macro, meso, or micro. Until recently, most creativity research has focused on micro-level creativity and cognitive processes within individuals (see readings in Kaufman and Sternberg 2010). Some attention has lately been given to meso-level creativity (e.g., Nijstad et al. 2006), and to work groups and organizations, such as Apple and Microsoft, as ‘creative units.’

A great deal of attention has been given to how such units are influenced by particular leaders like as Steve Jobs and Bill Gates. However, far less attention has been given to the influence of societal processes, such societal values associated with the entrepreneurial spirit in the USA (for an exception, see Leung and Lo 2014).

There are at least two major kinds of macro-level creativity. First, ‘creativity carriers’ involve features of societies that enhance creativity at meso and micro levels. This results in waves and surges in creativity such as Elizabethan theater, renaissance art, nineteenth-century English novels, twentieth-century American films, and twenty-first-century computing software in California. Second, ‘movement creativity’ involves large-scale innovations that transform the normative system and bring about major changes, as has happened through the women’s liberation movement and the Black Power movement, as well as through major revolutions.

Our discussion of creativity gives importance to the dynamic nature of creative processes. We argue that activities at macro, meso, and micro levels are interdependent. This dynamism means that when creative force is not aligned at all three levels, its impact is muted. For example, Gregor Mendel (1822–1884) was an isolated researcher who discovered in the late nineteenth century that inheritance takes place through the transmittance of discrete units, genes, rather than the ‘blending’ of different characteristics of the parents in the offspring. However, Mendel did not work in a group, so at the meso level there were no others to continue and spread the news of his findings when he died. Nor was the larger scientific community and society—the macro level—thinking along the lines of his discoveries. As a consequence, it was only in the early twentieth century that the rest of the world caught up, and that Mendel’s discoveries found a wider audience.

Micro Creativity

The idea of a lone creative genius is nothing new: it is so ingrained into our cultural consciousness that research on group creativity has only (relatively) recently started picking up steam. Moreover, the relationship between the individual, group, and the larger society has received scant attention. We argue that ‘surges’ and ‘waves’ of creativity, such as the creativity in computer technologies in twenty-first-century America and the creativity in Elizabethan theater in England, are achieved when individual, group, and societal-level creative processes are linked by creativity carriers. Such links have not been a focus on psychological research, because the focus of discussion has almost exclusively been individual creativity, the micro level.

A main reason for this focus on the micro level of creativity is the narrative of the lone genius, the long-held idea that innovation and creativity flows through an individual vessel. In the classical tradition, the Greeks and Romans thought of creativity as a divine energy that was channeled through artists, often poets, who went on to author great works. This is why Greek and Roman epic poetry begins with an invocation to the Muses on behalf of a singular, humble creator. Virgil's *Aeneid* is an excellent example of this: the poem opens '*Arma virumque cano*,' 'I sing of arms and a man,' regardless of the fact that Virgil is actually just codifying a folk tale passed down for generations. He then calls on the muse to help *him* recount Juno's anger and all that followed. To the ancient (and modern) imagination, he is a human conduit of divine creative energy, chosen specially by the gods. Homer before him was seen the same way—so was Socrates. The books of the New Testament share a similar origin story: the four Gospels are seen as written by four divinely inspired individuals, in isolation rather than as a group. Through the ages, divine influence began dropping out of this narrative, but the focus on individual literary genius remains. Dante, though he begins the *Divine Comedy* with an invocation that mirrors Virgil's, was seen less as a conduit and more as a creator in his own right. By the time we arrive at literary greats like Hemingway and Salinger, the myth of the isolated genius is well intact sans divinity. In all these cases, the creative leaps and bounds are seen as the product of individuals rather than of their culture or their immediate surroundings. Virgil *was* amazing and is timeless, but the *Aeneid* is more Rome's creation than his.

The archetype of the lone genius has moved through the sciences as well. We use Mendel as an example of what happens when new ideas, through no fault of the creator's, do not come to fruition because of a lack of creative receptivity at the meso and macro levels. Newton and Leibniz are two other enormously important academics—again, true geniuses in their own right—whose developments were seen as the result of their own individual work. (We're all familiar with the twist, here. Their story provides support to our assertion: if these two truly did work independently, which is fairly agreed upon, how did they both come to invent calculus if their community had not so perfectly set the stage for it?) Philosophy has its examples, as well: Descartes begins his most famous work with a narrator who has shut himself away from the world, full of external stimuli that do nothing but confuse and hinder his talent. This narrative has been repeated to us through every discipline. When psychologists began to seriously examine creativity, and with American individualism making them only too receptive to the do-it-yourself lone wolf creators, it is no small wonder that they focused on the individual to the exclusion of creative groups and societies.

If our cultural history so often points to individuals as the most foundational sources of creativity, what reason is there to question the narrative? Change is often spearheaded by one remarkable person, and it seems only natural that they be recognized for their accomplishments. In this paper, we are not seeking to minimize the contributions of individuals, but to reexamine the idea that creative change happens *only* from the bottom-up, like an organism that spreads and reproduces outward. Rather, we point to the fact that humans have continually worked in groups to achieve our current place in the biological pecking order. Virtually no one shuts herself in her room with a notebook and candle and successfully creates change beyond her front door. Modern writers, for instance, may go out into the wilderness to 'live deliberately'—before returning to their offices to have their diaries proofread by their editors. Workshop settings are now seen as crucial for poets, playwrights, biographers, and memoirists, and are a seminal part of the education process for creative writing. Group work is not limited to writing, and group input and feedback are now rightly seen as imperative exercises for anyone in the arts, both to give and receive feedback as well as to generate ideas that can be taken back to the individual drawing table. The lone genius has an important part in the creative process, but she is not the only part, and we do not think she is the most foundational. Individual luminaries only pave the way for amazing creative leaps and bounds as part of a greater whole.

Creativity research is still relatively young to psychology and was not brought to wide attention until the well-known 1950 address by J.P. Guilford to the American Psychological Association (discussed in Simonton 2000). The little research that has emerged since then focuses on the individual in part because micro creativity is easier to observe and study than creativity in groups. In some sense, a group is an intangible thing—you can ask a group what the *group* thinks (and get an answer!), but that will tend to come through the voice of individuals who then have the chance to give their own spin on the verdict. Even research that *does* look at group or cultural creativity tends to do so through this lens of the individual. Much research on group creativity is purposed toward increasing it by increasing the creative effectiveness of its individual members. Social loafing solutions often focus on personal accountability, for instance, rather than group structure. Some exceptions are the research on how diversity and group incentives relate to creativity (e.g., Eckel and Grossman 2005; McLeod et al. 1996).

After Guilford's 1950 address, psychologists particularly explored intrapersonal properties of creativity. Guilford himself focused on the measurement and development of creativity on the individual level, enjoining other scientists to help him pursue the line further (1967). Social creativity did

not take the spotlight, though he recognized its potential in studying group work. Research on creativity in education came closer to a more meso (but not macro)-level view: for instance, several essays in Gowan's 1967 anthology examine the effect teachers can have on their students' creative potential. Effects were measured by the individual development of each child, though, rather than by the classroom's joint ability to problem-solve or create.

A large and more modern body of research exists on the link between individual characteristics and creativity. The cultural fascination with genius personalities sparked much curiosity about whether the introverted/misunderstood-artist personality somehow contributed to creative excellence, or if it was the other way around, with great talent weighing on individuals to shape them into the lonely genius trope. Psychologists studied artists themselves (Drevdahl and Cattell 1958) as well as many traits that could impact a person's creativity. This research led to interesting findings, such as the case of gifted children who had lost a parent, showing that certain parent-child relationships *do* produce more creative children (Albert 1971); and that, despite the stereotype, madness is a hindrance rather than a help to creativity (Rothenberg 1990). The relationship between intelligence and creativity received a lot of attention from the 1950s (Getzels and Jackson 1962; Schubert 1973; Barron and Harrington 1981; Sternberg and O'Hara 1999; Nusbaum and Silvia 2011), whereas that between sexual orientation and creativity received less attention (Ellis 1959; Demb 1992).

Thus, the individualistic, reductionist tendencies of traditional psychology have pervaded creativity studies. In the next section, we turn to meso creativity, which is vitally important but has received less attention.

Meso Creativity

Humans spend most of their lives in small groups: from the family, to a school classroom, to friendship group, to work group, and so on. Despite the centrality of small groups in human life, creativity in groups was not adequately studied until recently,¹ and the now-extant research on groups and creativity is usually ambivalent and sometimes highly negative toward the idea of group creativity. To support our overarching theory—that the three levels of creativity interact deeply and are all crucial to a creative act—it will help to show that work in groups is worthwhile, despite its complications.

¹ Even in 2001, after the brainstorming boom, Kurtzberg and Amabile shared our complaint (2000–2001).

The discussion of the pitfalls of group creativity began early in the twentieth century and stretched to an explosion of research in the '70s and '80s. Many of these studies aimed to debunk the idea that two heads (or three, or three dozen) will always be better than one. Several main problems with group creativity have received very wide attention, an example being social loafing. The concept was introduced by French engineer Maximilien Ringelmann in 1913, who observed a group of people pulling a rope. Ringelmann noted that the individuals would pull harder when they worked alone than when they worked as a group. The sum of the whole, rather than being greater than the sum of the parts through mutual encouragement and camaraderie, as many would have thought, was *less* than the sum of the parts. The observation was taken back up in the mid-1970s, termed 'social loafing', and has been written about continuously since (Simms and Nichols 2014). As the phenomenon was further explored by greater evidence, the focus turned not to proving the existence of social loafing but toward research on what causes it and how to mitigate it.

We therefore have a well-established literature on why social loafing occurs: interest level, morale, group dynamics, stress, perception of other group members' competence, leadership, and comfort level all contribute. One meta-analysis of social loafing studies observes the following: 'Social loafing appears to be moderate in magnitude and generalizable across tasks and subject populations. The integrated model of individual effort on collective tasks suggests that social loafing occurs because individuals expect their effort to be less likely to lead to valued outcomes when working collectively than when working coactively' (Karau and Williams 1993, p. 700). (The same researchers found that social loafing *decreases* when group participants see each other as incompetent.)

Several explanatory models for social loafing have been put forward for the purpose of identifying and correcting inefficiency in group work. Karau and Williams (1993) list factors such as evaluation potential, dispensability of effort, matching of effort, and self attention that appear in many social loafing models as explanations for unproductive behavior. Many of the models they discuss isolate one of these factors as the main cause of social loafing, excluding others. In addition, most imply that the individual is the locus of creativity. They propose ways to boost the *individual's* creative potential as a way of adding to the productivity of the group. This is not an invalid way to affect group creativity, of course—for instance, Tziner and Eden (2006) show that a high-achieving member of a group can have a noticeably positive effect on group performance, and that effect is greater if the group consists of other high achievers. Though these measures can be helpful, we think that an

understanding of small groups as creativity generators themselves will enrich solutions to social loafing (and other such phenomena). The optimization of group work should focus on the group's total output, rather than the sum of individual contributions. As we will see later, well-established and highly successful groups like Apple or Ideo tend to focus on improving group creativity from a structural perspective: from the top down rather than the bottom up.

There is also some evidence that social loafing can be a net positive. Bluhm (2009) explores the idea that social loafing is an adaptive quality to lessen individual stress. If a group of social loafers produces completely satisfactory results when working less hard than they would individually, the group as a whole benefits: individuals can come together to solve a complex problem with relatively little stress, helping to prevent burnout when the group breaks up and the members go back to individual tasks. The group task may go *as* well as it would have were there not social loafing, but the tasks done by individuals will receive greater effort, thus producing more creativity overall.

The ways in which groups work together have also come under scrutiny, particularly the now ubiquitous practice of brainstorming. One can brainstorm alone, but the technique is more commonly done in a small group, where the group identifies a problem to be solved and works together to identify possible solutions. A seminal 1958 paper identifies four core rules that define the process:

1. Criticism is ruled out. Adverse judgment of ideas must be withheld until later.
2. 'Free-wheeling' is welcomed. The wilder the idea, the better; it is easier to tame down than to think up.
3. Quantity is wanted. The greater the number of ideas, the more the likelihood of winners.
4. Combination and improvement are sought. In addition to contributing ideas of their own, participants should suggest how ideas of others can be turned into *better* ideas; or how two or more ideas can be joined not still another idea. (Taylor et al. 1958, pp. 24–25)

In theory, by collectively throwing ideas together, the group will be more productive and more original than a person coming up with solutions alone. Listening to the ideas of others is supposed to spark ideas throughout the group so that elements can be combined in new and interesting ways.² Criticism is supposed to be withheld so that members feel as free as possible to

² In theory, brainstorming is a compacted, artificial form of creative Darwinism. Rather than pitting only one person's ideas together, a group can set that many more ideas up against each other. More competi-

say whatever comes to mind—no idea is too wild for a brainstorming session, and a ridiculous idea might very well cause another member to come up with something more practical. Paulus (2000) argues that the diversity of a group can expose its members to a multitude of unfamiliar viewpoints, allowing them to make new associations and connections. This group-wide, interpersonal stimulation of associations facilitates lateral thinking that bridges fields and, supposedly, spawns innovation.

By the time researchers began testing the efficacy of brainstorming, it had already been adopted across a wide variety of industries. To examine whether brainstorming was as productive as it seemed, Taylor et al. (1958) conducted a study where discussion groups of four men were compared against individuals, and against nominal groups of these individuals who did not actually interact. He found that the groups, far from producing more creative ideas than the nominal groupings of individuals, did more poorly than the individuals. They hypothesized that the deficit could be due to a fear of criticism (either unvoiced or voiced, if the group is breaking Taylor et al.'s rules) to some variation of what we know as groupthink. The study has some glaring limitations: the uniformly small group sizes; the uniformity of the sample (all groups were composed of men); the limited set of problems the group was asked to discuss; and, most notably, groups were only given 12 minutes to discuss each problem, which hardly facilitates an involved discussion. A review of many similar studies comes to similar conclusions—given that the groups examined were small, the problems given to them were simplistic, and the only function of creativity measured was the generation of raw ideas (Lamm and Trommsdorff 1973).

Nonetheless, productivity loss is a well-documented effect of brainstorming. By the 1980s, researchers began examining productivity loss more closely to determine its causes. Taylor was right that brainstorming sessions were less useful when the members feared criticism, and others have found that external pressure can squash a brainstorming session as well (Amabile 1998). Diehl and Stroebe's 1987 study examines a few more problems with brainstorming, namely free riding, when some group members contribute less energy because they expect others to pick up the slack; and production blocking, the fact that members must wait their turn share their ideas in a group. In theory, a group of ten would only produce one idea in the time it would take for them to produce ten distinct ideas, were they working individually. Diehl and Stroebe's studies concluded that production blocking constituted most of the

tion means that the end product will ultimately be better and stronger. Simonton touches the relationship between cultural factors and individual creativity through a Darwinistic lens in his 1999 paper (317).

production loss in brainstorming groups. The solution seems obvious: give groups more time to work through their ideas. If group work really does produce better and more original ideas than individual work, the extra time spent should be worth it. Other researchers have found that anonymous electronic brainstorming improves the process considerably (Cooper et al. 1998). Not only does electronic brainstorming mitigate production blocking by removing the spoken aspect, it makes it easier both to mask the participants' identities and hold them accountable. (Anonymity has been shown to help prevent self-censorship in brainstorming, and personal accountability helps mitigate social loafing.)

But do brainstorming groups actually produce *better* ideas than the same group of individuals? As of Diehl and Stroebe's (1987) study, the jury was out on whether the quality of brainstormed ideas was higher. More recent studies have not been much more optimistic (Rietzschel et al. 2006). Why keep trying, then? And do groups and companies persist in brainstorming just because they are misinformed? It's always possible that the general public is mistaken—it's happened before—but yet prevalence of brainstorming as a tactic for creativity remains. Some, like Paulus, are believers in the potential of meso-level creativity; his 2004 paper describes opportunities for improving creativity in groups and creative benefits that only come from working in teams.

If there is an overarching theme of group work literature regarding the optimization of team creativity, it is this: the most creative and productive groups control for group work pitfalls by carefully and deliberately structuring group discussion. It is somewhat paradoxical to think that imposing a rigid and unchanging structure over a wide variety of groups allows for *more* creativity—however, we see this often paralleled in the arts, where creators can be most productive when left to their almost ritualistic habits, and most prolific when restraints are imposed on them. To take a broader perspective, this is one of the more interesting ways that the levels of creativity interact. As much as it can be stifled by an oppressive culture, mid-level creativity can also blossom under a certain level of adversity. While one cannot artificially impose certain cultural conditions on a society in order to make it more creative, perhaps the most effective creative groups are able to do that for themselves.

For explanation, we may want to turn to the industries that are dependent on creativity to stay relevant. Some models of industrial innovation not only use creative teams and brainstorming processes to survive: they thrive off of these sessions.³ In looking for positive role models of excellent group

³Bennis and Biederman examined 'Great Groups' like Apple and the scientists behind the Human Genome Project in their 1997 book *Organizing Genius: The Secret of Creative Collaboration*.

creativity, psychologists often stumble over a firm called IDEO. Famous for their 'human-centered' focus, the company is a (very lucrative) legend in the world of design and is contracted by a wide number of industries for problem-solving help. Part of their success lies in their practice of hiring exemplary people; they claim the lion's share, though, is due to their method. The company guards itself carefully against the common pitfalls of group work by leaning on what amounts to a formula for innovation. The ways their focus groups interact discourage groupthink and social loafing while creating an environment of creative safety and freedom.

The company is open about their process and has shared much of their method with the public. They have published many of their tips for generating ideas and facilitating discussion, including a document called the Human-Centered Design Toolkit. The toolkit focuses on using design to empower developing countries and problem-solve with the help of the local community, but it has other applications as well, and it gives us a good glance into the company's philosophy. In this toolkit, you see that their choices streamline the creative process and minimize distraction so that the focus is on innovation. A leading passage early in the text illustrates this:

The challenges you face are very complex and are likely to have been explored by predecessors. You will have a higher likelihood of success at solving such complex, difficult, and already-examined problems by intentionally assembling the right team of people. This team will work best if it consists of a core group of 3–8 individuals, one of whom is the facilitator. By mixing different disciplinary and educational backgrounds, you will have a better chance of coming up with unexpected solutions when these people approach problems from different points of view. (Idea Human-Centered Design Toolkit, 2nd edition, P. X)

We learn several things in this paragraph. First, they value diversity. This can pose its own challenges—in a group with mixed educational backgrounds, a blue-collar worker unused to research may feel intimidated by someone else in the room with a PhD and therefore contribute less than her potential. It will fall to the structure of the group, and the participants' commitment, to remedy this. Second, we see that IDEO means to encourage vastly different lines of thinking, again a difficult task. A group of individuals with different focuses and areas of expertise can easily devolve into a roomful of people talking past each other, another outcome that must be avoided. Last, Ideo encourages a facilitator. A too-strict leader may encourage groupthink as individual members suppress the urge to rock the boat and deviate too far from the leader's opinion. A leader who is not respected by the group, though,

will lose the ability to keep the discussion on track and enforce a beneficial structure, among other benefits a good leader can provide to a creative group (Reiter-Palmon and Illies 2004).

There are counterpoints to Paulus, IDEO, and other optimists about group work. Pirola-Merlo and Mann (2004) take a deflationary stance toward group creativity, claiming that 'failure to account for aggregation across time as well as across individuals can result in misleading empirical results, and can result in the erroneous conclusion that team climate influences team creativity directly rather than indirectly via individuals' (p. X). Their study supports the proposal that teams, as such, have no creative generative power—the $n + 1$ factor we assume makes two heads to be better than one. If true, this could pose challenges for our three-tiered model of creativity; however, our model would not be invalidated. It could be the case that the meso level of creativity serves more as a gatekeeper than an amplifier, allowing talented individuals to reach a larger audience and keeping the relatively mediocre ideas at bay.

The link between meso creativity and the micro and macro levels, we argue, are carriers that are particularly effective at the group level. These carriers work to enhance group culture and guide individual members to higher creativity performance. For example, consider the title 'impressionists' adopted by the avant-garde French artists, including Cézanne, Degas, Monet, Renoir, Pissarro, and Sisley, after their highly controversial exhibition of 1874. This title came from a satirical and highly critical article written about the exhibition. But the rebellious stand of the impressionists (who had declared they would not participate in the traditional *Salon de Paris* art show put on by the French *Académie*) included adopting the 'label' of 'impressionists' given to them by their mocking critics. The title 'impressionists' came to serve as a powerful carrier, helping to define them, and propagating their ideas. Groups develop a wider variety of names, behavioral styles, norms, traditions, and habits, that can serve as creativity carriers, connecting the group both to the individual members and to the wider society.

Macro Creativity

In this part of the discussion, we explore the meaning of macro creativity, arguing that it is often the most crucial level of creativity. Our argument might seem counterintuitive, since Western cultural tradition tells us that the source of creativity is the individual. This tradition has bled into creativity research. For instance: the major tests of creativity, such as the Torrance Tests of Creative Thinking (TTCT), measure individual performance (this is akin

to IQ tests such as the Stanford–Binet that test the intelligence of individuals). These tests are necessary and important, but their prevalence assumes that the individual level of creativity is the only level that matters—we do not, for example, have any well-established metrics to measure the creative potential of a group or society. Florida (2007, 2014) has written provocatively about the role of what he calls the 'creative class' in national and global economies, and some of his discussions (such as on 'creative class centers' and a 'super-creative core' in the creative class) do touch on collective processes. Through the '3Ts' of economic development, Technology, Tolerance, and Talent, he explores the context in which the creative class gathers and thrives. However, he neglects the social psychological collective processes that enable creativity to thrive.

There are also possible misconceptions concerning group creativity, which calls to mind the (negative) phenomena of 'collective thinking' and 'group mind.' It seems impossible that a collective could think, or that a group could have a mind. The difficulty comes not because groups are *not* creative, but because it does not make sense to expect groups to 'think' as though they were individuals. Instead of supposing that a culture comes together as a larger version of a single mind, we see macro-level creativity as a certain directional force influenced by social factors—which in turn acts on smaller groups, and on individuals.⁴

There is already some published discussion of the relationship between culture and creativity, typically focusing on explicit, formal processes. For example, in summing up research on creativity and culture in greater China, Leung and Lo (2014) argue that, '...the development of creative industries in Greater China follows three major models: (1) the minimal role of the Hong Kong government regarding creative potential explored and realized by both individuals and groups; (2) partnerships between the government, groups, individuals, and the market in the case of Taiwan; and (3) the dominant role of the state in the People's Republic of China (PRC), where the creativity of groups and individuals has to conform with the principles of economic modernization, social harmony, and political correctness' (p. 369). There is no doubt that government intervention in the 'creative industries' is quite direct in the PRC as opposed to a nation like Taiwan, constituting a legislative and explicit cultural influence on individual creativity. However, the *informal, implicit* influence of the government on creative industries is quite considerable in all societies. For example, 'political correctness'—which reflects values made dominant by government agencies and political elites—

⁴C.f. Vygotsky 1978.

has a very strong influence even in the USA and other Western societies. This is evident in the widespread influence of 'politically correct' multiculturalism and relativism, strongly endorsed in a top-down manner in the education system (Moghaddam 2012).

Woodman's work provides an interactionist perspective on creativity. He posits, like we do, that creativity is the combination of factors at several different individual and group levels, and gives a model for organizational creativity: 'The gestalt of creative output (new products, services, ideas, procedures, and processes) for [an] entire system stems from the complex mosaic of individual, group, and organizational characteristics and behaviors occurring within the salient situational influences (both creativity constraining and enhancing) existing at each level of social organization' (Woodman et al. 1993, p. 296). These influences combine on the individual *and* small group levels and are influenced by organizational attitudes, policy, and leadership to produce aggregate organizational creativity. Beyond this, the concept of creativity carriers can also provide some more concrete explanation of the interaction between levels of creativity.

Creativity Carriers

In each era, the normative system of society encourages (and pushes) creativity in certain direction (see Simonton 2004, on creativity and *zeitgeist*). Directional shifts become particularly apparent in times of revolution, when revolutionaries forcibly change the directions of creativity. This change is most clearly apparent in the arts and humanities—take the turn away from 'frivolous' Rococo style toward neoclassicism after the French Revolution—but it also takes place in scientific research. For example, in the Soviet Union, Stalin shunned the advanced genetics pioneered by Nikolai Vavilov (1887–1943) and other legitimate scientists, forcing researchers to invest time and effort in bogus 'indigenous' breeding ideas (see Moghaddam 2013, pp. 173–177). In Iran after the 1979 revolution, Khomeini's followers attacked and emptied the universities, preventing 'Western style' research and encouraging so-called 'Islamic research.' These political disruptions provide clear evidence of how macro-level shifts in a society can change the direction of creativity, particularly through severe punishments against those who attempt to be creative in ways unacceptable to the new regime.

The same top-down processes are apparent in the USA and other Western societies, often driven by market forces rather than direct government intervention. For example, consider the role of the computer as cultural carrier. In

the era of the 'computer revolution,' it is almost inevitable that young people invest their creative energies in the realm of computing. Mark Zuckerberg and his collaborators launched Facebook in 2004, and within a decade the social networking service became a California-based company with a market value of over \$200 billion. Twitter, Snapchat, Yik Yak, and numerous other novel social networking platforms have been launched, and millions of young people from around the world dream of joining the new Californian 'gold rush' riding on computer technologies. In other historical eras, these young people would have been developing their creative talents in other domains, such as writing sonnets, or finding ways to breed faster and stronger horses, or identifying shorter routes to travel across newly discovered oceans and continents. But in the twenty-first century, it is the computer that gives direction to creativity for many young people. Their dreams, imaginations, and aspirations are moved and shaped by computer as cultural carrier.

Collective Movement Creativity

Certain, cultural, social, and political movements involve collective creativity that is both top-down and bottom-up in influence. There is top-down influence in fashion when leading fashion magazines such as Vogue 'set a trend' by celebrating certain styles and colors of clothing. For example, here is a tip from Vogue about new designers to follow: 'It's a big year for Erdem Moralioglu. He is the reigning British Womenswear Designer of the Year, a trophy won after he showed his swoon-inducing Victoriana-hothouse spring collection—a thing of verdant beauty based on a fantasy about an intrepid lady explorer and illustrator of exotic flora' (Vogue 2015, p. 418). Morelioglu will see quite a bit of imitation as consumers flock to his style. But the influence of Vogue is not deterministic, because by the time the designs and colors propagated by Vogue and other 'top' sources filter to the masses, they have been altered along the way by those who wear them. Fashion for and by the masses involves creativity by the many, often in ways not predicted by the 'top' sources. Examples like this are interesting because a few elite individuals are making creative decisions that effect change in the community at large, whereas our previous examples move from one member of the community up through the elites to then trickle back down. (See our previous example of Mendel.) Large-scale creative change or innovation does not always follow the pattern of one obscure genius, to influential friends, to mass adoption, and societal revolution: it can also be a new idea from one elite member of society that filters down to the masses.

Movements such as Black Power and women's liberation also involve this bi-directional creativity, though they originate from a position without power rather than from the powerful. In large-scale social movements, macro-level changes in attitude and opinion trickle down (or up) to the people in power, thus changing policy and cultural norms on the way. The voices of individuals play an important role in such movements, but the 'creativity of the crowd' is vital, with recent electronic technologies, 'E-swarmling,' and other Internet-based communication giving a voice to those who may not have otherwise had one. These are the instances where two (thousand, hundred thousand) heads are better than one, and where the 'mob' can be a source of great innovation. Crowd wisdom and creativity is a focus of 'swarm intelligence' research, which proposes that collective human life results in solutions that individuals alone could not have created (Krause et al. 2009). Diversity of background, ability, and especially opinion can be useful, as empirical research has shown how novel ideas arise from collective decision-making processes when critical debate, rather than 'getting along,' is given priority in groups (Nemeth and Ormiston 2007). Group decision making by animals also takes place and can have superior results (Conradt and Roper 2007). For example, Seeley (2010) studied how honeybees make collective decisions to overcome sometimes life-and-death challenges through 'novel' solutions (novel in the sense that the bees are in a new environment and having to deal with unknown topographies and hazards).

Conclusion

Our focus has been on the narrative of creativity as originating from the individual alone is not as well-founded as psychological literature and Western tradition may lead us to believe. Creativity is multi-layered. Small groups and also societies can be creative, each in different ways, in addition to 'traditional' individual creatives. More important than isolating any one source of creativity is acknowledging the role of all three levels, in communication with one another, in a particular creative process and creative movement as a whole. An individual's good idea seldom (if ever) has any impact without being discussed and improved upon by a group; and individuals isolated from creative and intellectual stimulation—both of which are provided by groups—seldom have world-changing ideas. As Barron (1999) argued, all creativity is collaboration.

We are not simply (and uselessly) saying that ideas spread because groups adopt them. We cannot evaluate how many ideas were stifled by unreceptive,

poorly trained, or malicious groups of people, and thus never made it out of an individual's imagination. Conversely, it would be impossible to determine the number of ideas that started as fairly good, but were made excellent once they were taken up by a group; or, how many individuals had their best ideas after being inspired by associations sparked by group work. Historical evidence indicates that these numbers would be significant, were we able to measure them. Likewise, it is seldom the case that creative ideas emerge solely from an individual, or solely from a group, without significant input from one another and from the cultural environment. As such, it makes little sense to focus so granularly on studying just *one* tier of creativity. We look forward to seeing more research on the integration of the three tiers—on the effect of oppressive government regimes on personal creativity, or on innovation in countries at war, or more research into how the traits of individuals impact the creative success of the groups to which they belong.

Concluding Comment

To sum up, as Nijstad (2009) has outlined in his excellent book on *Group Performance*, there are conditions in which groups are more creative than individuals working alone. This is what we would expect from an evolutionary perspective, with humans having evolved to be functional in small groups over millions of years. Small groups, such as family and friends, serve to socialize individuals in relation to the creativity carriers of their cultures. For example, family interactions in the twenty-first-century middle-class context have the computer and the Internet at the center.

Creativity carriers in the twenty-first century, such as the computer and the Internet, point to how the young are most likely to channel their creative energies. It could be argued that such creativity carriers are 'individualistic' and involve individuals working in isolation, demonstrating different degrees of creativity. This would endorse the 'bowling alone' thesis (Putnam 2001), arguing that there is a decline in social capital associated with increasing individualism and weakened traditional group life and communities. However, our alternative interpretation is that the creativity carriers of the twenty-first century are resulting in new electronic communities, crossing traditional borders such as nation states.

Central to our analysis are two striking features of creativity: first, that creativity varies considerably across time and culture, including in the level of creativity; second, that creativity can take place through processes that are at macro, meso, and micro levels. We have proposed that creativity carriers link

these three levels, as well as provide links across culture and time. Creativity carriers do not fit neatly into the analytic framework of any one discipline; a multi-disciplinary approach is needed to better explore and understand them. For example, a research study on creativity in the computer industry could involve personality psychologists who examine the dispositional characteristics of highly creative individuals, social researchers who explore the characteristics of group creativity in the computer industry, as well as anthropologists, sociologists, economists, and others who research the role of the larger society in creative developments in the computer industry. Historians, political scientists, and others will be needed to contextualize the place of such objects in history; philosophers and cultural psychologists will be needed to dissect their symbolism; and neuroscientists and others would explore the interaction of newly created computer technologies and software with our cognitive and neural processes. A collaborative approach will be the best way forward to keep expanding the once-narrow view of creativity and gain a better and more dynamic understanding of the creative process.

References

- Albert, R. S. (1971). Cognitive development and parental loss among the gifted, the exceptionally gifted and the creative. *Psychological Reports*, 29(1), 19–26.
- Amabile, T. M. (1998). How to kill creativity. *Harvard Business Review* 87, 77–87.
- Barron, F. (1999). All creation is a collaboration. In A. Montouri & R. Purser (Eds.), *Social creativity* (pp. 49–59). Cresskill: Hampton Press.
- Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual review of psychology*, 32(1), 439–476.
- Bassett-Jones, N. (2005). The paradox of diversity management, creativity and innovation. *Creativity and innovation management*, 14(2), 169–175.
- Bennis, W., & Biederman, P. W. (2007). *Organizing genius*. Basic Books, New York.
- Bluhm, D. J. (2009, August). ADAPTIVE CONSEQUENCES OF SOCIAL LOAFING. In *Academy of Management Proceedings* (Vol. 2009, No. 1, pp. 1–6). Academy of Management.
- Conradt, L., & Roper, T. J. (2007). Democracy in animals: The evolution of shared group decisions. *Proceedings of the Royal Society. B*, 274, 2317–2326.
- Cooper, W. H., Gallupe, R. B., Pollard, S., & Cadsby, J. (1998). Some liberating effects of anonymous electronic brainstorming. *Small Group Research*, 29(2), 147–178.
- Demb, J. (1992). Are gay men artistic? A review of the literature. *Journal of homosexuality*, 23(4), 83–92.
- Diehl, M., & Stroebe, W. (1987). Productivity loss in brainstorming groups: Toward the solution of a riddle. *Journal of personality and social psychology*, 53(3), 497.
- Drevdahl, J. E., & Cattell, R. B. (1958). Personality and creativity in artists and writers. *Journal of Clinical Psychology*, 14, 107–111.
- Eckel, C. C., & Grossman, P. J. (2005). Managing diversity by creating team identity. *Journal of Economic Behavior & Organizations*, 58, 371–392.
- Ellis, A. (1959). Homosexuality and creativity. *Journal of clinical psychology*, 15(4), 376–379.
- Florida, R. (2007). *The flight of the creative class: The new global competition for talent*. New York: HarperBusiness.
- Florida, R. (2014). *The rise of the creative class—Revisited* (2nd ed.). New York: Basic Books.
- Getzels, J. W., & Jackson, P. W. (1962). *Creativity and intelligence: Explorations with gifted students*. London/New York: Wiley.
- Gowan, J. C. (1967). *Creativity: Its educational implications*. New York: Wiley.
- Guilford, J. P. (1967). Creativity: Yesterday, today and tomorrow. *The Journal of Creative Behavior*, 1(1), 3–14.
- Guilford, J. P. (1968). *Intelligence, creativity, and their educational implications*. San Diego: RR Knapp.
- Ideo. *Human centered design toolkit* (2nd ed.). Retrieved from http://www.ideo.com/images/uploads/hcd_toolkit/IDEO_HCD_ToolKit.pdf
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of personality and social psychology*, 65(4), 681.
- Kaufman, J. C., & Sternberg, R. J. (Eds.) (2010). *The Cambridge handbook of creativity*. New York: Cambridge University Press.
- Krause, J., Ruxton, G. D., & Krause, S. (2009). Swarm intelligence in animals and humans. *Trends in Ecology and Evolution*, 25, 28–34.
- Kurtzberg, T. R., & Amabile, T. M. (2001). From Guilford to creative synergy: Opening the black box of team-level creativity. *Creativity Research Journal*, 13(3–4), 285–294.
- Lamm, H., & Trommsdorff, G. (1973). Group versus individual performance on tasks requiring ideational proficiency (brainstorming): A review. *European journal of social psychology*, 3(4), 361–388.
- Leung, C. C., & Lo, S. S. H. (Eds.) (2014). *Creativity and culture in greater China: The role of government, individuals and groups*. Los Angeles: Bridge21 Publications.
- McLeod, P. L., Lobel, S. A., & Cox, T. H. (1996). Ethnic diversity and creativity in small groups. *Small group research*, 27(2), 248–264.
- Moghaddam, F. M. (2002). *The individual and society: A cultural integration*. New York: Worth.
- Moghaddam, F. M. (2012). The omnicultural imperative. *Culture & Psychology*, 18, 304–330.
- Moghaddam, F. M. (2013). *The psychology of dictatorship*. Washington, DC: American Psychological Association Press.
- Nemeth, C. J., & Ormiston, M. (2007). Creative idea generation: Harmony versus stimulation. *European Journal of Social Psychology*, 37, 524–535.

- Nijstad, B. A. (2009). *Group performance*. Hove/New York: Psychology Press.
- Nijstad, B. A., Stroebe, W., & Lodewijckx, H. F. M. (2006). Production blocking and idea generation: A reduction of failures explanation. *European Journal of Social Psychology, 36*, 31–48.
- Nusbaum, E. C., & Silvia, P. J. (2011). Are intelligence and creativity really so different?: Fluid intelligence, executive processes, and strategy use in divergent thinking. *Intelligence, 39*(1), 36–45.
- Paulus, P. (2000). Groups, teams, and creativity: The creative potential of idea-generating groups. *Applied psychology, 49*(2), 237–262.
- Paulus, P. B., & Nijstad, B. A. (Eds.) (2003). *Group creativity: Innovation through collaboration*. New York: Oxford University Press.
- Pirola-Merlo, A., & Mann, L. (2004). The relationship between individual creativity and team creativity: Aggregating across people and time. *Journal of Organizational Behavior, 25*(2), 235–257.
- Putnam, R. D. (2001). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.
- Reiter-Palmon, R., & Illies, J. J. (2004). Leadership and creativity: Understanding leadership from a creative problem-solving perspective. *The Leadership Quarterly, 15*(1), 55–77.
- Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Social Psychology, 42*(2), 244–251.
- Rothenberg, A. (1990). *Creativity and madness: New findings and old stereotypes*. Baltimore: Johns Hopkins University Press.
- Schubert, D. S. (1973). Intelligence as necessary but not sufficient for creativity. *The Journal of genetic psychology, 122*(1), 45–47.
- Seeley, T. D. (2010). *Honeybee democracy*. Princeton: Princeton University Press.
- Simms, A., & Nichols, T. (2014). Social loafing: A review of the literature. *Journal of Management Policy and Practice, 15*(1), 59.
- Simonton, D. K. (1999). Creativity as blind variation and selective retention: Is the creative process darwinian? *Psychological Inquiry, 10*(4), 309.
- Simonton, D. K. (2000). Creativity: Cognitive, personal, developmental, and social aspects. *American Psychologist, 55*(1), 151.
- Simonton, D. K. (2004). *Creativity in science: Chance, logic, genius, and zeitgeist*. New York: Cambridge University Press.
- Sternberg, R. J., & O'Hara, L. A. (1999). Creativity and intelligence. In *Handbook of creativity* (Vol. 13, p. 251) Cambridge: Cambridge University Press.
- Taylor, D. W., Berry, P. C., & Block, C. H. (1958). Does group participation when using brainstorming facilitate or inhibit creative thinking? *Administrative Science Quarterly, 3*(1), 23–47.
- Tziner, A., & Eden, D. (2006). Effects of crew composition on crew performance: Does the whole equal the sum of its parts. In *Small groups: Key readings* (pp. 55–64) New York: Psychology Press.

- Vogue (2015, March). View. P. 418, 430, 432, 434, 436, 438, 442, 444.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA.: Harvard University Press.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review, 18*(2), 293–321.