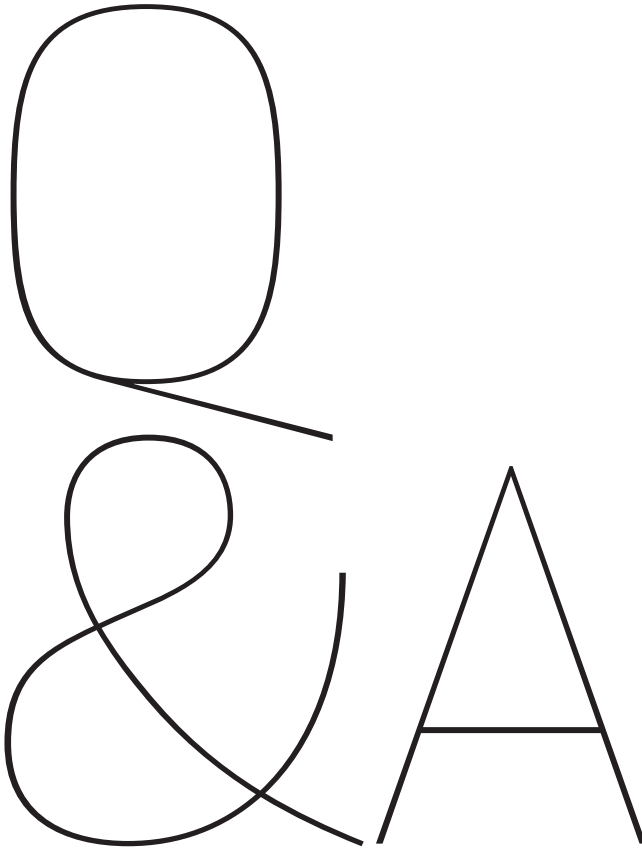




Questions for: **Jonah Lehrer**



The neuroscientist and author says **creativity is a plural**, not a singular entity, and that we must adjust our approach to it accordingly.

Interview by Karen Christensen

Most people assume that creativity is separate from other kinds of cognition. What is the more complex truth?

The reality is that creativity consists of many different types of cognition. Even though we often refer to it in the singular, it really deserves the plural. The more practical side of this relatively new idea is that we have to do a better job of fine-tuning our thought processes to make sure we're thinking in the right way, depending on the problem we have in front of us. Some kinds of creative problems require us to increase our attention – to chug a triple espresso and focus on the task – while others demand that we take a long, warm shower or find some other way to relax, in order to increase what neuroscientists refer to as 'alpha waves' in the brain.

Too often, we think of creators as somehow being above the fray of ordinary life; but that is an illusion. In reality, creativity is an act of deep immersion, an emergent property of a mind amid the world. At any given moment, our brain is automatically forming new associations, as it continually connects an everyday *X* to an unexpected *Y*. Seventeenth-century philosopher **David Hume** described this talent as the essence of the imagination:

“All the creative power of the mind amounts to no more than the faculty of compounding, transposing, augmenting, or diminishing the materials afforded to us by the senses and experience. When we think of a golden mountain, we only join two consistent ideas, gold, and mountain, with which we were formerly acquainted.”

Hume is pointing out that the act of invention is really an act of *recombination* – a drawing together of the once disconnected.

You write that to understand how the imagination works, “we need to blend Psychology with Sociology – to blur together the outside world and the inside of the mind.” Please explain.

This touches on an outdated romantic myth – that of the lonely poet taking a walk in the countryside – a kind of solitary, lonely model of creativity. When you look at real-world creativity, it is rarely that way at all. We are often inspired by other people, and sometimes our best ideas come to us when we bump into a stranger. This comes from what economists call 'knowledge spillovers' – whereby peoples' ideas can 'leak out' anywhere and everywhere. Part of the reason we are such a creative species is exactly because we are such a social species. In my new book, I start by talking about the brain and the particular circuits that lead to moments of insight, but I end by talking about cultures and societies, and

why some cultures have produced so many more geniuses than others. We can't just look at creativity or the imagination as emanating from a single individual in a vacuum; that is a very false perspective.

Why is interrupting our focus - with a stroll outside or a game of ping pong - often so helpful for encouraging moments of insight?

This is the perfect example of why Neuroscience can be such a practical tool, and why self-knowledge is useful knowledge. We now know that moments of insight come from a particular circuit in the back of the right hemisphere of the brain called the *superior anterior temporal gyrus*. It turns out that often, this part of the brain may have an answer to the problem we're working on and may be trying to give us the insight; but if we are completely focused on the outside world and paying attention only to the problem itself, that quiet voice in the back of our head gets drowned out. It's not until you are a bit more relaxed that you turn the spotlight of attention *inwards* that finally, you can eavesdrop on that quiet voice. The slightly unsettling idea here is that the insight may have been there all along; you just weren't taking the time to listen to it. This is pretty counter-intuitive, because most people assume that if you give them a hard problem, the way to solve it is to focus, focus, focus; but that can be the exact wrong thing to do.

Artists often accelerate the insight process by forcing themselves to work within constraints. How do they go about this?

One of the mysteries of artistic forms such as poetry is, why do people choose to rely on such traditional formats? Why would anyone want to use the sonnet format, when it just traps you in this old form? And why do poems often rely on rhymes? I believe moments of insight help explain this. One of the main challenges of the creative process is finding ways to avoid the *obvious next thing* - finding ways to stretch our mind so that we consider things and possibilities that we might never have considered at first. And that is where things like poetic forms become so essential: because you *have* to put ten syllables in that line, or because that line *has* to rhyme with the line two lines before it, these seemingly-artificial constraints actually propel the imagination forward. In a very real way, we can break out of the box by stepping into shackles.

You write that the act of unconcealing is an essential element of the creative process; please describe it.

There is this romantic notion of the 'radical breakthrough', where all of a sudden, an answer appears to us out of the blue, and we immediately know that it's right. These wonderful occasions seem even more impressive when they happen while we're shampooing our hair. It would be great if I could tell you that the way to become more creative is to 'always find a way

to relax'; but, of course, in the real world that's not how it works. We also sometimes have to buckle down and pay attention. We have to sit at our desks and chisel away at the problem. And sure enough, when you look at the real world, you see that in many instances, that's how our creative problems are solved - through a slow and ongoing *unconcealing* process, whereby we slowly whittle away at a problem over days, weeks or months.

The question becomes, how do we know when we should take a long walk and when we should settle in and focus?

This is where 'feelings of knowing' become essential. This is an eloquent term for the fact that we can do a pretty good job of diagnosing which problems we can solve. If you give people a variety of creative problems and one hour to solve them, they will have intuitions, hunches about whether or not they can actually solve the problems, and these hunches are remarkably accurate. One of my favourite examples of a feeling of knowing is when a word is 'on the tip of your tongue': how do you know that you know that word if you can't quite remember it? That's an example of a feeling of knowing; this is your brain telling you, 'if you keep searching for this word for 20 minutes or half an hour, you will eventually remember it'.

When it comes to creativity, such feelings of knowing allow you to look at a problem and say, I think I can solve this, and then you can get to work. If you experience a sense of progress, that's a really important signal that you should keep on paying attention, keep on focusing and drinking coffee. However, once you hit a wall and that sense of progress disappears - once that feeling of knowing is gone - that's when you need to get up from your desk and have a nice cold beer or go for a long walk. If you don't, the wrong answer will just keep looping in your head; you've got to try something different. Unfortunately, most people don't do this. We just assume that we should be stuck at our desks, because we have to look productive, even if we're stuck on the wrong answer.

Recently ranked as the world's third most-innovative company (after Apple and Google), 3M has been pioneering new products for more than 75 years. What lessons can we learn from its approach?

Perhaps 3M's greatest achievement is its 'Flexible Attention Policy'. This goes back to their invention of 'the 15 Per Cent Rule' (which many people assume Google invented, but 3M has been doing it for 50-plus years), which is the idea that they allow their workers to devote 15 per cent of the work week to a side project or hobby - to their own personal obsession. This is part of a larger idea within the company that it's not a good idea to micro manage the attention of creative people. Instead, what you should do is, give them a hard problem to work on, then trust them to go off and solve it. Also, trust

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you almost treat the solution as an analogy.

them to know that sometimes they need to focus and other times they need to leave their desk and take a walk.

If you spend any time on the 3M Campus outside of St. Paul, you will see people taking a nap on the couch in a sunny corner or out walking across the fields. 3M has been very influential in propagating this model of, ‘You know what you have to do’. They provide people with the freedom to use their attention in the right way, because sometimes the answer will only come to them when they’re playing ping pong.

The second thing 3M has done, which has also become very influential in creative companies, is to emphasize a model of ‘horizontal sharing’. A couple of times a year, they hold a big science fair, where all the engineers come and present their research and talk about what they’re working on. The idea is that people mingle and share solutions across the company. This approach has really paid off: when you look at the history of 3M products, what you find again and again is that they’ve taken a solution from one domain and transplanted it into another. For instance, the original model for masking tape, which 3M invented, led to the idea for Scotch tape; they simply added-in this **DuPont** product. Then the same basic concept was used to weld-together golf clubs, and it’s now being used on sound-dampening panels for **Boeing** aircraft. They’ve come up with adhesives that are so strong that they actually ‘stick’ to sound waves.

The basic idea is that you can solve lots of problems by taking one good idea and seeing how it works in other domains; you almost treat the solution as an analogy. As **Larry Wendling** of 3M’s research lab told me, “The lesson is that the tape business isn’t just about tape. You might think an idea is finished, that there’s nothing else to do with it. But then you talk to somebody else in some other field, and your little idea inspires them, so they come up with a brand new invention that inspires someone else. That, in a nutshell, is our model.”

What lessons can we learn from the societies that produced Shakespeare, Plato and Michelangelo?

Sociologists refer to these as ‘ages of excess genius’. We have no idea why Elizabethan England produced not just **William**

Shakespeare, but **Francis Bacon** and **John Donne** and **Christopher Marlowe** – the list goes on. So many great writers all came from London in the late 16th century – a city about the size of Wichita, Kansas. I end my book by trying to understand where such excess genius comes from. One of the key possibilities is what **Paul Romer** refers to as ‘meta ideas’, which are ideas that basically make it easier for everyone to have ideas – things like getting the patent system correct, or the expansion of educational opportunity. In Elizabethan England, there was all of a sudden this vast expansion in the education of people with illiterate parents. So, for the first time you had people like William Shakespeare – whose father signed his name with a mark – being given a free education by an Oxford-educated teacher. Another meta idea in Elizabethan England was the incredible flourishing of the press and the publishing industry. The area around St. Paul’s had more than 100 independent publishers; people complained because the streets smelled like ink. This allowed Shakespeare to borrow books and build a library. These are the kinds of meta ideas that enable creativity at an individual level.

The larger point is that it’s not enough to think about creativity in terms of bits of your brain turning on and off; we also have to think about it at a more collective level. We have to pay attention to the meta ideas that our culture embodies right now. How can we get those meta ideas right? Whenever we create institutions and laws and norms, we have to realize that these concepts filter down and impact individuals in a big way. **R**

Jonah Lehrer is a contributing editor at *Wired* and the author of the forthcoming *Imagine: How Creativity Works* (Houghton-Mifflin Harcourt, March 2012), *How We Decide* (Mariner Books, 2010) and *Proust Was a Neuroscientist* (Mariner, 2008). A Rhodes Scholar, he also writes for *The New Yorker*, *The New York Times*, *The Wall Street Journal* and contributes to *Radiolab*.