

## the prelude



Editorial

# Activate Creative Thinking

By Benjamin Bolden

I find I do my best work while riding my bicycle.

I plan lessons, meals, and phone conversations; compose emails, articles, and music; tackle administrative, financial, and personal predicaments... I engage with all sorts of thinking tasks, and negotiate problems with lightning speed. There is some magical freeing of the creative mind that occurs when I am outside, peripherally engaged in riding the bike, physically active pumping pedals.

I turn onto a long, straight section of road about five minutes into my commute. Uninterrupted by stop lights or signs, I am able to bear down, find my stride, and settle back for the ride. Invariably, it is this precise moment that my thoughts take flight. The feeling reminds me a little of an airplane at takeoff: the plane gathers power (collecting energy like a weightlifter before the lift), hurtles groaning and protesting down the runway, struggles to clear the tarmac, finally breaks free, then suddenly becomes beautiful—a soaring, logic and gravity-defying miracle, slipping the surly bonds of Earth.

When I am cycling fast and steady it feels as though a fog lifts from my mind. At home, in sharp contrast, half-baked plans and ideas circle fruitlessly around my mind, in a foggy funk, restrained by a mesh of quotidian concerns. A few moments of rapid, concentrated pedaling, however, and my thoughts invariably clear the earth and fly free, break the cloud cover and split the sky like fireworks.

I am not alone in noticing, and benefitting from this phenomenon.

My wife Jen used to work as a summer camp director. She spent a lot of time canoeing, and recalls recognizing a similar occurrence; once she cleared preliminary obstacles and settled in to a consistent, rhythmic stroke, her mind became clear of distraction. All the “daily nitty-gritty things,” and even what was immediately around her, disappeared, and she found herself able to think clearly about one idea at a time. Her mind was freed to reflect, strategize, and problem-solve: to work on interpersonal problems, or to plan activities for the campers in her charge.

Mia, a colleague down the hall in art education, informed me that when walking, gardening, cleaning, and vacuuming, she often also mentally engages in creative work. She brainstorms ideas for new paintings and addresses practical considerations—what kind of paint to use (water colour or acrylic), or the scale

and size of the new work. If the piece is already underway, she schemes how to continue it, mentally exploring possibilities. Mia describes consciously working to visualize multiple potential versions of the painting, varying the way she plays with colour, or balance, in her imagination: creating mental thumbnails of how the painting might possibly turn out: “working through potential solutions in my head until I find the one I really want to try.”

Composer Gustav Mahler seems to have made similar use of physical activity to facilitate creative work. In 1907 he wrote, in a letter to his protégé, Bruno Walter:

**I cannot work at my desk. My mental activity must be complemented by physical activity...For many years I have been used to constant and vigorous exercise, roaming about in the mountains and woods, and then, like a kind of jaunty bandit, bearing home my drafts. I used to go to my desk only as a peasant goes into his barn, to work up my sketches.**

Strenuous walks were integral to Mahler's composition process. And apparently he cycled, too.

So what is going on, here, exactly? Why is it that for Jen, Mia, Mahler and me, these physical activities seem to facilitate creative thinking? I have encountered a few possible explanations.

## Brainwave Entrainment

Neurons are electrically active cells responsible for carrying out brain functions. They connect to each other with electrical signals. The frequency or rate of neuronal ‘firings’ synchronizes over a network of neurons, and scientists have identified characteristic frequency ranges of electrical activity associated with different states of brain functioning (e.g. waking and various stages of sleeping). As one might expect, neurons firing at a high frequency (over 40 per second—gamma brainwaves) are associated with higher mental activity, such as perception, problem solving, and the emotional state of fear; delta brainwaves represent a frequency of three or less firings per second, and are associated with the loss of body awareness and deep dreamless sleep.

Entrainment is a fascinating physical phenomenon. In 1666 physicist Christian Huygens noticed that two pendulum clocks, when put in the same room, moved into the same swinging rhythm. Subsequent experiments duplicated this finding.

Accordingly, Huygens coined the term ‘entrainment,’ to indicate the process whereby two interacting oscillating systems, which have different frequencies of oscillation when they are apart, assume the same frequency of oscillation when put into close proximity with one another. Apparently, small amounts of energy transfer between the two systems until they assume a more stable phase relationship.

Brainwave entrainment is the practice of *intentionally* causing brainwave frequency to synchronize with an external stimulus with the same frequency as the intended brain-state (for example, inducing a state of hypnosis by showing a swinging object). Given the right circumstances, the human brain will change its dominant rate of electrical activity to match the frequency of an external pulse. The pulse may be introduced a variety of ways—aurally, the pulse may be embedded in white noise, or, of course music, and visually, the pulse may be presented through flashing or flickering lights or images. The pulse stimulus can also be introduced through our sense of touch—we might pick it up when sitting in a vibrating chair, maybe, or when engaging in rhythmic movement, such as walking, swinging a canoe paddle, or pedaling a bicycle. Might it be possible, then, to self-entrain a ‘creative’ brain state through physical activity?

I put this notion to brainwave entrainment expert Dr. Lee Bartel. He responded:

*Creativity and moments of insight are associated with a theta brain-state. Theta is around 4 - 7 pulses per second. So it is pretty easy to get that clicking in your brain if you are a musician who feels the rhythm of your pedaling feet independently “playing” a beat. That within a few minutes of regularity can entrain the brain and make that state more dominant. So if you are pedaling at that rate you would enter a theta state and be likely to have moments of real insight.*

Perhaps, then, my creativity is enhanced while cycling to work as a result of brainwave entrainment; once I hit the straightaway and my pedaling becomes fast and steady I self-induce a ‘theta state’, the brain-state associated with creativity and insight. The same could be happening when Jen canoes, or when Mahler walks, or when Mia scrubs the floor. Even though we may not maintain the steady pedaling or paddling or stepping or scrubbing for very long, two minutes is all it takes to entrain the neurons to fire at a given rate; afterwards they can continue firing at that rate on their own (the same way another entrainment frequency can send you to sleep, and even when the stimulus is removed you continue sleeping on your own).

### Lateralization of Brain Function

This ‘activate-free-thinking’ phenomenon might also have something to do with the lateralization of brain function—the notion that the left hemisphere of the brain tends to look after thinking that is analytical and logical, while the right hemisphere deals with holistic and intuitive thinking.

In working with language, for example, the left brain deals with grammar, vocabulary, and literal meanings, while the right engages with intonation, accentuation, and rhythm. The left works on direct fact retrieval while the right contextualizes the data and finds pragmatic ways to apply it. The right brain functions are those more traditionally associated with creativity.

It has been suggested that certain basic, routine, and repetitive actions (taking a shower, shaving, jogging, swimming, cycling) may serve to ‘suspend’ the left brain and ‘release’ the right brain to engage in intuitive dimensions of brain processing. If the left brain is occupied with an uncomplicated, routine activity (on autopilot), it may make fewer demands on the right brain—disengaging to some extent—thereby freeing up the right brain to do something else. So the right brain takes advantage of the opportunity to do what it does best: visualizing, imagining, and problem solving. The routine activity (say...walking to work) makes just enough demands on the left brain to keep it busy (so that it doesn’t pester the right brain with critical, creativity-inhibiting cross-talk), and virtually no demands on the right brain, thereby freeing the right hemisphere to engage in enhanced creative thinking.

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Whether a result of brainwave entrainment, freeing the right brain, a combination of the two, or something else entirely (increased blood flow sending more oxygen to the brain? repetitive movements simply calming the mind, like a cat kneading with its paws to put itself to sleep? healthy exercise, like prayer or meditation, a means of metaphysically opening ourselves to divine intervention?), the correlation between sustained rhythmic physical activity and enhanced creative thinking is, for me, very real and very valuable. It provides a brilliant opportunity to richly engage in any kind of creative work—composing, painting, relationship-building...and, of course, teaching.

My art education colleague, Mia, takes advantage of the enhanced creative thinking facilitated by walking or cleaning or gardening to carry out pragmatic, structural planning. She also analyzes past teaching episodes—reflecting on what worked, what didn’t, and how she might implement changes for next time. Similarly, I find my mind addressing countless aspects of my teaching as I cycle, or walk, or jog: from designing instrument distribution systems to choreographing song movements to minimizing classroom performance anxiety.

There are limits, of course, to the work I can do on my bike. It doesn’t take very long for me to run out of RAM, as it were; I can only plan so much of the lesson, or compose so many bars of music before I simply find myself going over the same ground—before thinking becomes circular. My brain is full. This is where getting things down—whether with pen and paper, computer, or some other thought-capturing technology—becomes necessary. I must disgorge the ideas. Because then I can see the work I have done and build on it. Correspondingly, when Mia finds herself thinking the same thing over and over, ‘just bouncing’, as she

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describes it, she knows she cannot productively go any further without producing some kind of draft, or sketch. These sketches enable her to refine her ideas more than when she works on them in her head alone. Gustav Mahler used very similar language when he described returning from his mountain walks 'bearing home my drafts'. He would return to his desk, 'to work up my sketches'.

It is clear to me that my work benefits from the 'activate-free-thinking' phenomenon, and so I deliberately and consciously maximize its potential to assist me in my creative endeavours. I have learned to resist the urge to immediately turn on my computer and check my email when I arrive at work, but instead take time to jot down the ideas I have explored during my commute. If I am sitting and working on a piece of music, or writing, or a lesson, I make a point of periodically leaving my seat to carry on the mental work as I walk, cycle, or run.

The next step, for me, is to figure out how to help my students access and take advantage of the activation of enhanced creative thinking through physical activity. Although the phenomenon works well for Jen, Mia, Mahler, and me...I have no idea if this is something that all people can experience. I am not sure how best to help and encourage my students to structure the right physical and mental circumstances for themselves, tune in to their free-flying thoughts, then capture them and reap the rewards—to facilitate the generation of insights and their application to the manufacture of creative product. But I know I owe it to my students to try, and I know just what to do to maximize my chances of figuring it out.

I'm going cycling. CME

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### President's Message

# Gardening 101

By Mary Dinn

Spring is that time of year avid gardeners long for, as evidenced in the perennial transformation of a friend of mine. This yearning having already manifested itself months earlier in the dead of winter as she poured over seed catalogues, identifying what new hybrids to plant alongside the old tried and true favorites. As soon as mother earth exposes herself this keen gardener will be out there getting hands dirty removing rocks, and tilling and fertilizing the soil so that it will be a nurturing environment promoting new growth. All demonstrative signs that spring is synonymous with renewal and growth.

As with the gardener, CMEA/ACME too, over the past two years, has been intent on tending its garden - tilling its mission statement, identifying new directions to sow and projects to maintain - under the umbrella of its strategic vision action plan. The inevitable challenges of sandy soil and pH balance were aptly met to produce fertile topsoil for maximum yield. Some budding developments from the CMEA garden:

#### COLLABORATIONS

##### Canadian New Music Network (CNMN)

During the CNMN forum in Montreal this past February, I was fortunate enough to re-experience the synergy felt during the ISME NA regional Planning Seminar April 08. In addition to

participating in the formal aspects of the event, I was able to make connections with other delegates and presenters - Canadian composer R. Murray Schafer was the captivating keynote - and organizations - Fameq and the Canada Council for the Arts - for future dialogue and collaborations. Currently, CNMN president Tim Brady and I have been entertaining shared projects and proposals for musicians and music educators.

##### NAXOS

Allan Anderson, CMEA/ACME Immediate Past President, continues to work with Raymond Bisha, Sales Manager with Naxos Radio Promotions Manager, in developing a basic music 'curriculum', with built in listening links c/o Naxos Music Library. When completed, this resource will be available to music educators across the country to use as a basic reference tool at their own discretion.

##### Music Industries Association of Canada (MIAC)

Building on the past successes of the 2007 and 2008 MIAC/CMEA workshops for music educators, Kevin Merkley, CMEA/ACME member at large, has been busily working with Al Kowalenko, MIAC/PAL, executive director, in developing the 2009 model. As preliminary sketches of the session promise