Leonardo: Math, creativity align

By JASON BROWN
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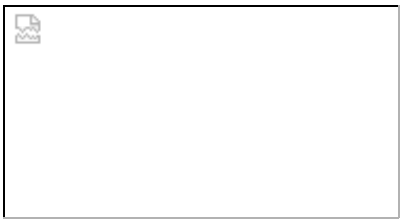

Leonardo da Vinci's Mona Lisa follows the golden ratio. (Amel Pain / AP)

Leonardo da Vinci's Mona Lisa follows the golden ratio. (Amel Pain / AP)

In July, I was invited to the Netherlands to do mathematical research and to give three lectures. So off I went, overseas.

It was my first trip to mainland Europe, and the Netherlands was a perfect place to visit. The weather was fairly good, and the people wonderful.

I know the pitfalls of generalizing national characteristics from a sample of social interactions, but like most people, I can't avoid making statistical inferences from my observations.

The Dutch people I met were almost uniformly helpful and kind. While there, I gave a public lecture on mathematics and music. Even in the pouring rain, the lecture drew a large audience. I am still amazed at the command of English that most Dutch people have, understanding the nuances even of the jokes I peppered throughout my talk (and, of course, this shows what a great sense of humour the Dutch have).

What also impressed and delighted me was the ubiquity of artwork, not only in museums, but also on buildings and street corners. There is art almost everywhere, with much of it centuries old.

Strolling through the museums with the works of Rembrandt, Van Gogh, Vermeer and others, I could see the mathematics inherent in their work. Proportions for figures and buildings often followed the golden ratio, an irrational number of about 1.6, that seems to define the perfect dimensions of an aesthetically pleasing rectangle. The face of Mona Lisa, that followed me in the Louvre Museum in Paris, is a golden ratio visage, when you compare its height with its width.

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I found the deepest connections between art and math in the Escher Museum in The Hague. Maurits Cornelis (M.C.) Escher is a famous 20th-century Dutch artist whose artwork seamlessly but fascinatingly combined art and mathematics.

Room after room in the Escher museum held mind-boggling pictures that twisted and defied reality. If you haven't experienced M.C. Escher's work, treat yourself and either buy a book of his artwork, or at the very least, Google the National Gallery of Canada and Escher to view some of his work that was donated by his eldest son, George.

In fact, even though M.C. Escher had little mathematical training, he was a research mathematician at heart. He undertook the study of whatever mathematics he found appealing, and drew inspiration from symmetry, tilings, alternate geometries and the concept of infinity.

He spent years studying and investigating, loving the process as much as the product. And like most mathematicians, he savoured a good paradox, and created artwork that cajoled the onlooker with such intellectual "jokes." Fun, esthetics and mathematics were all rolled into one.

As a mathematician, I can't help but notice connections, and it is M.C. Escher's outlook that I find in the minds of the most brilliant people in the arts, whether it be Leonardo da Vinci, M.C. Escher, Van Gogh, Rembrandt or Vermeer. All of their work brings together both halves of the brain — the right (creativity) and the left (analysis). And the work is strikingly interdisciplinary — between their influences and their muse, between their art and their life, between the esthetics and the underlying patterns, between the abstract and real life.

The creativity inherent in mathematical research is evident in all of their works. Touring through some of these artists' workshops allowed me to learn how many of them physically measured their paintings and prints to achieve the effects they wanted to achieve. No matter what your profession — be it lawyer, engineer, scientist, programmer, teacher or artist — these outliers of the arts have a lesson for you.

Jason I. Brown is a professor of Mathematics at Dalhousie University in Halifax. His research that used mathematics to uncover how the Beatles played the opening chord of A Hard Day's Night has garnered worldwide attention. He is also the author Our Days Are Numbered: How Mathematics Orders Our Lives.

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