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### Book Review

#### We Are Unique When We Cry

A Review of Michael Trimble, *Why humans like to cry: Tragedy, evolution, and the brain*. Oxford University Press: Oxford, United Kingdom, 2012, 236 pp., US\$29.95, ISBN 978-0-19-969318-4.

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Crying is an important human behavior, and we are all aware of the impact that our tears can have on others, and theirs on us. From an ethological perspective, the survival value of crying is clear, particularly in the case of infants and small children. However, much less is known about the evolutionary meaning of crying, in particular its relationship with other abilities developed over millions of years such as Theory of Mind, empathy, consciousness, morality, altruism, and love. These relationships are explored in a new book by Michael Trimble: *Why humans like to cry: Tragedy, evolution and the brain*.

Trimble is a neuroscientist with a passion for music and Greek Tragedy. In this insightful book he connects these disparate areas by adopting an evolutionary perspective. His major aims are to understand how crying emotionally has evolved over the past several million years, why it is a uniquely human attribute, and why, paradoxically, it is often a pleasurable experience for us—for example, when listening to the *Molto Adagio* from Beethoven's String Quartet Op. 132 or witnessing Shakespeare's *Othello* on stage. What most fascinated us in this book was the broad perspective the author takes to understand why we cry when we experience intense emotions. On the one hand, Trimble shows us that the association of tears and art has a long past by taking us back to the origins of tragedy in Greek drama and the dichotomy between the Dionysian and Apollonian—the aesthetics of crying. On the other, Trimble analyzes this behavior from the more recent perspective of neuroscience and evolution to understand its mechanism and function. He explores the neurobiology and neuroanatomy of tears, including their chemical composition and description of the relevant brain structures and neural circuits. The evolutionary approach suggests the importance of the tears as a way to communicate with others, and that it is easier for us to express emotions and feelings by crying rather than words because crying

evolved before propositional language.

One may wonder when seeing this book for the first time: What is crying? Because a definition of crying is sometimes assumed without much elaboration (e.g., Bard, 2004), confusion may arise. Although crying can be understood as a vocalization of pain—and in this sense, most animals do cry—here crying is considered to be an external manifestation of an inner feeling by means of shedding tears, also known as emotional crying. Only humans seem to cry in this way, but why? Trimble attempts to answer this question with evidence from various disciplines, and returns to it in various chapters throughout the book. First, he reviews evidence that nonhuman animals do not cry for emotional reasons (Chapter 1, pp. 2-3), referring to behavioral observation studies with primates, especially those of Jane Goodall and Dian Fossey. Then, in Chapter 3, Trimble discusses the neurobiology of crying, and explains how an understanding of neuroanatomy can provide insights into this behavior. For readers who are not expert in neuroscience, Trimble provides an appendix with a description of the brain, so that the relevant structures for crying can be more easily understood and remembered. Although this is a helpful touch, the extensive use of specialized language in this chapter might present a challenge for many readers. In Chapter 4, the author offers an evolutionary account of crying. In particular, he shows that crying may have increased survival and reproductive fitness because it enhanced communication with others.

As the title of the book makes us wonder, why do humans like to cry? Although crying may be thought as a negative reaction with negative consequences for our well-being, research has shown that emotional crying often brings pleasure. The explanation is not always clear throughout the book, as the reader may be distracted by many other questions and issues raised by the author. Although it is very interesting to consider the evolutionary, neurobiological, social, aesthetic, and artistic aspects of crying, it may be difficult for the reader to see clearly the author's conceptual path. In a section about the epidemiology of crying (p. 20), some important information is given: Crying is generally viewed positively, and while people who cry refer often to feelings of loss as the trigger, they do feel better psychologically and physically after crying. Here, Trimble also reports some studies that show that shedding tears brings pleasure. For example, William Frey (1985) did an extensive study about emotional crying with 331 adults, and showed that 85% of female and 73% of men reported feeling better after crying. Later, the author introduces the concept of tragic joy (p. 129), considering that unlike real-life tragedies, this feeling relates to conflict resolution: Tensions that are eventually relieved by the closure of the plot. This contributes to answering the main question: We like to cry when seeing art because although our bodies and minds respond to the suffering we are witnessing, when the film or play ends, we are reminded that even though tragedy exists in the world, what we have seen is just make-believe.

Crying has communicative, social, and developmental aspects. To elaborate these ideas, Trimble refers to MacLean's (1990) views of animals' behavior as evolutionary adaptations of the brain, and to the importance of the limbic system. The change from a reptilian-like to a mammalian-like limbic system is considered to have enabled us to feel empathically, and together with the development of symbolism and language, we have learned not only to create an organized symbolic system but also to acknowledge the

existence of a mind not unlike our own in others. This opened the evolutionary path towards empathy, understanding others' emotions as symbolic representations and gateways to their own minds, which facilitated sharing of resources and providing protection. Eventually, crying emerged as a cipher for emotions, thoughts, and socialization. Interestingly, this notion can lead us to assume that, because emotions are so hard to define and aptly name, tears, as well as laughter, can serve as a substitute for language, creating an immediate reaction in our collocutor and avoiding misunderstandings. In fact, crying is one of the first ways in which a baby communicates with the world—though not yet with tears.

In chapter 4 Trimble discusses two important concepts: Theory of Mind and mental time travel. The acknowledgment of mental states in others—Theory of Mind—allows us to wonder about what other people think, if they think like or unlike us, if they feel the same feelings we do, and to predict behavior based on such states (Leslie, 1987). This ability is related to the capacity to be aware of one's past or future—mental time travel (Suddendorf and Corballis, 1997). Both Theory of Mind and mental time travel help to solidify empathy, eventually for its consequences on our future and on our own survival and reproduction. These components of emotional understanding, together with mirror neurons—capable of responding both when an animal acts and when it observes the action performed by another animal (Gallese and Goldman, 1998)—, are the grounds for a differentiated emotional system that enables crying for emotional reasons. The author also notes that the importance given to the eyes has changed: Primates are gaze-avoiders, while humans are gaze-followers. This characteristic is considered to be connected to the relative salience of the pupil: Whereas in humans there is a difference in color between the pupil and the sclera, in non-humans the pupil and sclera share the same color and are thus difficult to distinguish at first sight. Because emotions and attraction can lead to changes in pupil dilation (Tombs and Silverman, 2004), this further solidifies the eyes as windows of emotion (p. 146), possibly aiding the establishment of empathy.

All of this serves as a theoretical preparation for a discourse on how we come to be able to cry (pp. 147-151). Several ideas emerge: Emotions are part of survival mechanisms, since they lead to bonding and bonding may lead to cooperation which increases the probability of survival; though crying was already useful for moistening the eye, somewhere in our evolution it acquired a new meaning, becoming a social sign; and that crying as a way of expressing emotion would be impossible without adequate development and evolution of the lachrymal system. As such, one can conclude that somewhere in our evolutionary path an ancestor evolved a connection between the emotion-related brain systems and the lachrymal ducts (Walter, 2006). Presumably this connection, possibly due to increased efficiency in communicating and bonding, potentiated the reproduction and/or survival of that ancestor. Thus eventually all humans acquired the ability to shed tears for emotional reasons. This could only have happened if humans had a highly developed crying system, not only capable of moistening the eye, but also of producing an excess of tears that could overflow and drop. With this mechanism fully developed and with mirror neurons capable of firing when we see emotions in others, Theory of Mind allowing us to take the perspective of others, mental time travel affording us the capacity to think ahead, and empathy upon seeing suffering in others, both cranial nerves associated with emotion

and lachrymal glands would fire, resulting in tears.

Trimble's book provides a novel and fascinating approach to a particular human behavior, and the author draws not only on his scholarly expertise but also his personal interests, for example by showing how much the arts play a role in his life, especially music—which he claims to be not only the loveliest form of art, but also the one that makes us cry most easily. Due to the author's background as a neuroscientist, it also serves as a reminder of how the brain's intricate mechanisms and structures work together to help producing complex behavior. This is an interesting read for a broad audience, from the educated lay public interested in neuroscience and evolution, to students and scholars in psychology and biology.

The book is a blend of aesthetics, neuroscience and evolution with the goal of explaining emotional crying. However, we believe that some of the transitions from one topic to another may be too abrupt for some readers. This may be a price we need to pay for having very distinct approaches to explain the same phenomenon, but it might be off-putting for some readers who are hoping for a simple answer to the question implied by the book's title.

The earliest record we have of crying is from Canaanite clay tablets, 14th century BC. Because of its survival and reproductive value, we have inherited it from our evolutionary ancestors, and we respond with tears to arts, to suffering, to beauty, to pain, to death and even to the tears of others. We like to cry when seeing art because though the situation is dramatic and tragic, it is not real. As such, the final sensation is not that of grief but of joy. Overall, *Why humans like to cry* is a very interesting read. Not only does it explore a fascinating topic but does so in a broad and intellectually engaging way.

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