

INTRODUCTORY NOTE: Daniel J. Levitin is a professor of psychology and neuroscience at McGill University, where he directs the Laboratory for Musical Perception, Cognition, and Expertise. The following passage is adapted from his 2006 book *This Is Your Brain on Music*.

## EXPERTISE DISSECTED

How do people become expert musicians? And why is it that of the millions of people who take music lessons as children, relatively few continue to play music as adults? When they find out what I do for a living, many people tell me that they love music, but that their music lessons “didn’t take.” I think they’re being too hard on themselves. Although many people say that music lessons didn’t take, cognitive neuroscientists have found otherwise in their laboratories. Even a small exposure to music lessons as a child creates neural circuits for music processing that are more efficient than those of people who lack training. Music lessons teach us to listen better, and they accelerate our ability to discern structure and form in music, making it easier for us to tell what music we like and what we don’t like.

But what about those classes of people that we all acknowledge are true musical experts--the Alfred Brendels, Sarah Changs, Wynton Marsalises, and Tori Amoses? How did they get what most of us don’t have, an extraordinary facility to play and perform?

The scientific study of expertise has been a major topic within cognitive science for the past thirty years, and musical expertise has tended to be studied within the context of general expertise. In almost all cases, musical expertise has been defined as technical achievement--mastery of an instrument or of compositional skills. The late Michael Howe, and his collaborators Jane Davidson and John Sloboda, launched an international debate when they asked whether the popular notion of “talent” is scientifically defensible. They assumed the following alternatives: either high levels of musical achievement are based on innate brain structures (what people refer to as talent) or they are simply the result of training and practice. They define talent as something (1) that originates in genetic structures and (2) that is identifiable at an early stage by trained people who can recognize it even before exceptional levels of performance have been acquired.

It is evident that some children acquire skills more rapidly than others: the ages of onset for walking, talking, and toilet training vary widely from one child to another, even within the same household. There may be genetic factors at work, but it is difficult to separate genetic factors from factors with a presumably environmental component, such as motivation, personality, and family dynamics. Similar factors can influence musical development and can mask the contributions of genetics to musical ability. Brain studies, so far, haven’t been of much use in sorting out the issue because it has been difficult to separate cause from effect. For example, studies of violin players by Thomas Elbert have shown that the region of the brain responsible for moving the left hand--the hand that requires the most precision in violin playing-- increases in size as a result of practice. We do not know yet if the propensity for increase preexists in the genetics of some people and not others.

The strongest evidence for the talent position is that some people simply acquire musical skills more rapidly than others. The evidence against the talent position—or, rather, in favor of the view that practice makes perfect—comes from research on how much training the experts or high achievement people actually do. Like experts in mathematics, chess, or sports, experts in music require lengthy periods of instruction and practice the most, sometimes twice as much as those who weren't judged as good.

In one study, students were secretly divided into two groups (not revealed to the students so as not to bias them) based on teachers' perceptions of their talent. Several years later, the students who achieved the highest performance ratings were those who had practiced the most, irrespective of which "talent" group they had been assigned to previously. This suggests that practice is the cause of achievement, not merely something correlated with it. It further suggests that talent is a label that we're using in a circular fashion: when we say that someone is talented, we think we mean that they have some innate predisposition to excel, but in the end, we only apply the term retrospectively, after they have made significant achievements.

Anders Ericsson at Florida State University and his colleagues approach the topic of musical expertise as a general problem in cognitive psychology involving how humans become experts in general. In other words, he takes as a starting assumption that there are certain issues involved in becoming an expert at anything, that we can learn about musical expertise by studying expert writers, chess players, athletes, artists, mathematicians, in addition to musicians.

The emerging picture from studies of high achievers in many fields is that ten thousand hours of practice are required to achieve the level of mastery associated with being a world-class expert—in anything. In study after study—of composers, basketball players, fiction writers, ice skaters, concert pianists, chess players, master criminals, and what have you—this number comes up again and again. Ten thousand hours is equivalent to roughly three hours a day, or twenty hours a week, of practice over ten years. Of course, this doesn't address why some people don't seem to get anywhere when they practice, and why some people get more out of their practice sessions than others. But no one has yet found a case in which true world-class expertise was accomplished in less time. It seems that it takes the brain this long to assimilate all that it needs to know to achieve true mastery.

## **ESSAY TOPIC**

According to Levitin, what roles do talent and practice play in enabling people to reach outstanding achievements in any field? What do you think of his views? Write an essay responding to these two questions. To develop your own position, be sure to discuss your own specific examples; those examples can be drawn from anything you've read, as well as from your own observation and experience.

