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Talent vs. Practice: Why Are We Still Debating This?

By *Scott Barry Kaufman* July 15, 2014

When I was a little kid, my mom and grandmom were having a heated argument in the front of the car. At one point I interrupted them, and with exasperation said: "You know, Mom, Grandmom is really right." Then I turned to my grandmom and said, "I think my Mom is right too." They were shocked, because I had rarely talked much until that moment. Thankfully, there was silence for the rest of the car ride.

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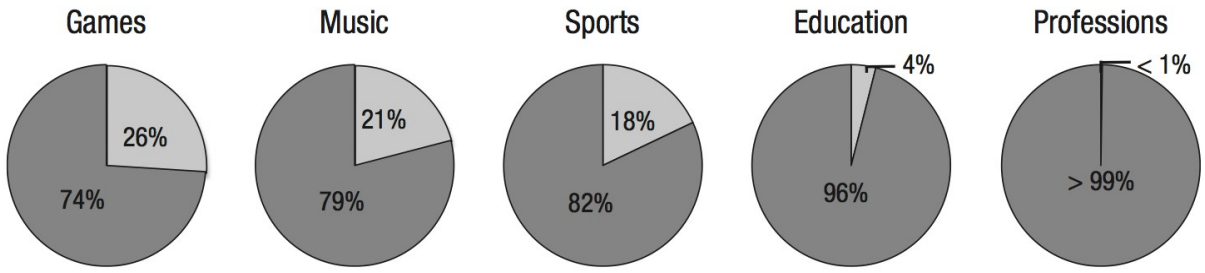
In 1993, K. Anders Ericsson and colleagues asked musicians to estimate the amount of deliberate practice– full engagement in structured training activities designed to improve a particular aspect of performance– every week for each year of their careers. They found that *on average*, the most accomplished musicians estimated much higher amounts of deliberate practice than the less accomplished musicians. At age 20, the average estimated hours for the most accomplished violinists was more than 10,000 hours, whereas the average estimated hours for the least accomplished violinists was about 4,600 hours. They concluded that "individual differences in ultimate performance can largely be accounted for by differential amounts of past and current levels of practice." This paper, which has been cited more than 4,200 times, set off a flurry of research on the development of expert performance, and has been featured in best-selling books such as Malcolm Gladwell's "Outliers and David Shenk's "The Genius in All of Us". Gladwell drew on Ericsson's findings to coin the phrase "10,000 Hour Rule" and referred to 10,000 hours as the "magic number for true expertise".

In the first ever actual test of Ericsson's initial claim, Brooke Macnamara, David Hambrick, and Frederick Oswald recently reviewed a large number of studies conducted since that 1993 paper. They found that sheer amount of deliberate practice does not, in fact, explain most of the differences in expert performance. Additionally, there were huge differences between fields, with effects for education and professions much smaller than for games, music and sports:



Further analysis revealed that the effects of deliberate practice were stronger for highly predictable activities (e.g., running) compared to less predictable activities (e.g., handling an aviation emergency). Deliberate practice also had a larger effect for for studies that relied on *retrospective reports* (in which people estimated their hours of deliberate practice) than *logging methods* (in which people logged their hours on an ongoing basis). In fact, for studies using the logging method (presumably a more valid estimate of hours of deliberate practice), deliberate practice only accounted for 5% of the differences in expert performance.

The researchers conclude:

> "Regardless of domain, a large amount of variance in performance is not explained by deliberate practice and is potentially explainable by other factors. Amount of deliberate practice–although unquestionably important as a predictor of individual differences in performance from both a statistical and a practice perspective–is not as important as Ericsson and his colleagues have

argued."

While this study makes an important contribution to the scientific literature, it's easy to misrepresent the findings. For instance, a recent article in the New York Times did a nice summary of the analysis, but titled the piece "How Do You Get to Carnegie Hall? Talent". But the study had nothing to do with talent!

See those pie charts above? The lighter grey regions represent amount of differences in each domain accounted for by deliberate practice, whereas the darker grey regions represent amount of differences in each domain accounted for by other factors. This could include a million other things, such as physical features, personality, cognitive ability, imagination, creativity, motivation, passion, inspiration, opportunities, encouragement, support, and just plain luck. The missing piece of the pie also undoubtedly includes other forms of engagement that don't feel as effortful as deliberate practice, such as play and flow.

Note I said *other factors*, not talent. This is not a pie chart of talent vs. practice. All traits, including the ability to deliberately practice, involve a mix of nature and nurture. In fact, there is no such thing as innate talent. That's a myth that is constantly perpetuated, despite the fact that most psychologists recognize that all skills require practice and support for their development—even though there are certainly genetic influences (which influence our attention and even our passions).

This consensus was evident in a recent book I edited entitled "The Complexity of Greatness: Beyond Talent or Practice". A variety of perspectives were represented in the volume, including behavioral genetics, individual differences, and expert performance. The clearest conclusion from the volume was that the development of high achievement involves a complex interaction of many personal and environmental variables that feed off each other in non-linear, mutually reinforcing, and nuanced ways, and that the most complete understanding of the development of elite performance can only be arrived through an integration of perspectives.

The pie chart above also has nothing to say about the importance of practice for *you* as an individual attempting to reach greatness. The study is about explaining differences *between* people, not explaining the development of expertise *within* a single person. The person who has dreams of reaching expertise in a particular domain would be well-advised to find a supportive mentor, and should be willing to put in many years of deliberate practice and engagement in the domain to develop their skills. At the end of the day, what people really want to know is how they can capitalize on *who they currently are* to become *who they want to be*. That information is not provided in those pie charts.

To be honest, I'm not even sure what the debate is anymore.

Even Ericsson has changed his views over the years. In a recent paper, Ericsson acknowledged both that "there is nothing magical about exactly 10,000 hours" of deliberate practice, and that "we can at most realize a significant correlation between our measures of training history and final adult performance". Not even Ericsson still argues that deliberate practice explains all of the differences in expert performance!

Where psychologists differ is in their emphasis on those "other factors". What explains the variance in performance that deliberate practice does *not* explain? Ericsson focuses on age of onset of deliberate practice, whereas researchers such as Zach Hambrick have investigated cognitive factors, such as working memory.

They are both right.

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There are so many ways people differ from each other (including age and personality), and there are various stages on the road to excellence when these differences matter. While Ericsson is correct that individual differences at any single moment of time don't necessarily *constrain* ultimate levels of performance (as he frequently points out in his articles), individual differences may still *influence* the development of expertise.

One way that individual differences can matter is by influencing the *efficiency* of expertise acquisition, therefore speeding up the rate of acquisition. In his recent paper, Ericsson acknowledges that the 10,000 hours of practice he found among elite violinists at age 20 was just an *average*, with substantial variation around the mean. People differ drastically in how long it takes them to reach the same level of expertise. For instance, triathlete Chrissie Wellington didn't compete professionally until the age of 30, but won her first world championship less than a year later. In fact, Simonton found across the arts, sciences, and leadership, that those with the greatest lifetime productivity and highest levels of eminence required the *least* amount of time to acquire the requisite

expertise (Simonton, 1991a,b, 1992, 1997, 1999).

What sort of factors can help speed up the development of expertise? Well, there are a bunch of possibilities, including prior knowledge, IQ, working memory, intellectual curiosity, and physical stamina. Note that none of these factors are "inborn"– like all other traits, they develop through a complex interaction of nature and nurture.

Another way individual differences matter is by sustaining the motivation to practice over an extended period of time. While deliberate practice is important (no one denies that), it's no easy feat to sustain that practice over the long haul and just *keep showing up*. In their 1993 paper, Ericsson and colleagues acknowledged that:

> "It is quite plausible, however, that heritable individual differences might influence processes related to motivation and the original enjoyment of the activities in the domain and, even more important, affect the inevitable differences in the capacity to engage in hard work (deliberate practice)."

I believe an overlooked characteristic that influences the motivation to engage in deliberate practice is inspiration. When people become inspired, they usually are inspired to realize some future image of themselves. It is the clarity of this vision, and the belief that the vision is attainable, that can propel a person from apathy to engagement, and sustain the energy to engage in deliberate practice over the long haul, despite obstacles and setbacks. As the legendary creativity researcher E. Paul Torrance once noted,

> "One of the most powerful wellsprings of creative energy, outstanding accomplishment, and self-fulfillment seems to be falling in love with something— your dream, your image of the future."

Indeed, Todd Thrash, Andrew Elliot, and colleagues have conducted multiple studies showing that inspiration (measured both as a trait and a motivational state) is associated with an approach motivation, positive emotions, and an increase in creative productivity. In fact, in one of their studies, inspiration not only predicted the creativity of writing samples in science and poetry, but also increased the efficiency of the writing samples (e.g., a larger number of typed words that were retained in the final product, and less time pausing and more time writing). This raises the intriguing idea that *motivational characteristics may cause an increase in cognitive efficiency*, which would ultimately increase the rate of expertise acquisition. I believe this is a promising area for future research.

These are just two ways in which individual differences can influence the development of expertise. Nevertheless, these are the sorts of questions I believe are scientifically tractable, and are much more productive than continuing to debate the relative importance of talent vs. practice.

For more, see my recent article "A proposed integration of the expert performance and individual differences approach to the study of elite performance".