The Art of Possibility

Part Two

Making Sense Of Talent In Music Teaching And Learning

By Steven Brundage

Editor's Note: This is the second of a two-part series examining the talent versus expert skill debate.

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Unique Genetics Or Unique Upbringings?

Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select – doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors.[1]

—John B. Watson, behavioral psychologist

In the late 1960s, Hungarian educational psychologist László Polgár devised one of the most audacious experiments ever conducted on talent and expert skill development. Polgár believed that a common thread connected geniuses from throughout history—early and focused specialization in a particular area—and like behavioral psychologist John B. Watson, Polgár believed he could develop expert skill in any healthy child. Polgár said, "Children have extraordinary potential, and it is up to society to unlock it."

So, in 1969, Polgár sought and found a wife, explicitly stating his intentions to test his theory of talent development, and began teaching his first-born daughter, Susan, the game of chess. Polgár considered the game of chess a suitable activity to test his theory as it was completely objective in its scoring, did not

favor qualities of either gender and did not require exceptional physical attributes. Chess provided a perfectly level playing field for his experiment.

In 1973, when Susan was just 4 years old, they began their experiment, and within the next three years, her two sisters, Sophia and Judit, were born. Polgár devoted many hours to teach each of his daughters to love and play the game of chess. In fact, by Susan's 5th birthday, she had already accumulated hundreds of hours of deliberate practice. Polgár continued methodical training with Susan's two other sisters. Susan's first competition came at age 5.

She competed against girls twice her age, winning every single game—10 in all—eventually seizing the championship undefeated. By age 12, Susan became the world chess champion for girls younger than age 16. Two years later, she was rated as the top female chess player in the world. She eventually reached the status of grandmaster, the first female player in history to do so and has won the women's world championship four times.

Polgár's second daughter, Sofia, was no less accomplished as a chess player. Just like her older sister, Sofia learned the game of chess from an early age, growing to love and master it. At age 5, she won the Hungarian championship for girls younger than 11. As an 11-year-old, she won the world championship for girls younger than 14. Most astonishingly, she played in the Magistrale di Roma as a 15-year-old, winning eight straight games against the very best male players from around the world and receiving the fifth highest performance rating of any chess player, male or female, in history.

Judit, Polgár's youngest daughter, also experienced remarkable success as a chess player. She won the under-12 world championship in 1988, the first time in history a girl had won. As a 15-year-old, Judit became the youngest-ever grandmaster and later was the number-one ranked female chess player in the world for more than a decade. Presently, she is considered the greatest female chess player of all time.

The apparently natural gifts of the Polgár sisters demonstrate what K. Anders Ericsson calls the "iceberg effect" of expert performance, a sort of talent delusion. Ericsson says, "Expert performance is similar to an iceberg, where only one-tenth of the iceberg is visible above the surface of the water and the other nine-tenths are hidden below it. When fans observe an elite athlete perform at a competition lasting a few hours they may not be aware of the over 10,000 hours of practice that preceded this display.[2]

When asked about Susan's precocity, Polgár simply replied, "If they had seen the painfully slow progress, the inch-by-inch improvements, they would not have been so quick to call Susan a prodigy." In the end, Polgár's experiment proved, at least to him, that geniuses are made, not born, which raises the question: Why do we often equate expert skill with precocity?

Precocity Or Meritocracy?

Genius, in the popular conception, is inextricably tied up with precocity—doing something truly creative, we're inclined to think, requires the freshness and exuberance and energy of youth.[3]

—Malcolm Gladwell

There exists a prevailing, societal notion that expert skill, especially among athletes and musicians, belongs, for the most part, to the precocious. It's a sort of romantic idealization that giftedness is divinely imbued. But perhaps we are viewing this issue from the wrong perspective. Perhaps child prodigies appear so extraordinarily gifted because they are compared to average children of the same age.

Most children, and adults for that matter, never dedicate themselves to skill development with the same deliberateness, methodology and guidance of child prodigies because, in most cases, they lack the opportunity, guidance or motivation. Perhaps, children, for sheer lack of familial and vocational responsibilities, possess greater potential for expert skill development than adults.

There are those whose lives depict an inverted picture of prodigious success, illustrating an important principle of expert skill development—success is sometimes more a result of meritocracy than precocity. These late bloomers exist throughout history in every discipline, from literature to sports, from music to science, and from art to mathematics.

Vincent Van Gogh attended art school in his late 20s, exhibiting his works for the first time by age 32. One of his most famous works, *Starry Night*, was completed in his mid-30s. Similarly, French impressionist Claude Monet did not achieve world renown until his 30s with the iconic work, *Impressions, Sunrise.* Another French impressionist, Paul Cézanne, followed a similar path as Monet, finally achieving success at age 33, after having failed the entrance exam to the École des Beaux-Arts of France.

The Finnish composer Leoš Janáček was 62 when the premier of his opera *Jenůfa* first garnered him world

The Art Of Possibility

renown. Austrian composer Anton Bruckner upon hearing Richard Wagner's opera, *Tannhäuser*, began writing his world famous symphonies at age 39. Giuseppe Verdi composed his iconic *Aida* at age 58 and later in his 60s, he composed his masterpiece *Requiem.* Verdi's well-known Shakespearean operas, *Othello* and *Falstaff*, were composed when he was 80.

The famous Italian tenor, Andrea Bocelli, received his big "break" during his mid-30s and it was not until age 41 that his critically acclaimed album, *Sacred Arias,* became one of the most successful classical albums of all time, selling more than 5 million copies.

In literature, Mark Twain, the iconic American writer, penned *Tom Sawyer* at age 41 and *Huckleberry Finn* at the ripe age of 49. After selling his first poem at age 20, Robert Frost did not publish again until his 39th birthday and Laura Ingalls Wilder, probably best known for her *Little House* series, was not published until in her mid-60s.

These late bloomers, and surely many others, demonstrate a single principle, crucial to an understanding of talent and expert skill development—that elite skill does not always take the form of precocity. Often when expert skill does take prodigious form, we conveniently overlook other influential factors such as practice, guidance and opportunity.

Intelligence And Innate Physical Qualities

None of this is to deny the power of practice. Nor is it to say that it's impossible for a person with an average I.Q. to, say, earn a Ph.D. in physics. It's just unlikely, relatively speaking. Sometimes the story that science tells us isn't the story we want to hear.[4]

—Zach Hambrick, Michigan State University psychologist

It is also important to consider the roles of intelligence and innate physical qualities in the development of expert skill. A number of studies testing the memory capacities of individuals with expert skill reveal greater than normal activity in the brain's memory bank, the cerebral cortex and natural physical characteristics like height, arm and finger length, as well as general health, may impact an individual's capability to acquire expert skill with a particular musical instrument.[5]

In 2011, psychologists Zach Hambrick and Elizabeth Meinz published an article with the *New York Times* detailing their research into the relationship between expert skill development and intelligence. They were interested in understanding what, if any, role "working memory capacity" played in predicting success in complex activities such as playing the piano. They studied the practice habits of pianists, their sight-reading skills and their working memory capacity while performing other tasks.

Their research found a strong correlation between hours practiced and sight-reading abilities, but it also determined that working memory capacity accounted for variance in aptitude. They said, "If you took two pianists with the same amount of practice, but different levels of working memory capacity, it's likely that the one higher in working memory capacity would have performed considerably better on the sight-reading task."

The same can be applied to memorization in music. A musician with below average working memory capacity will struggle to successfully complete a memorized performance, an often-necessary component to professional musicianship. It seems that a certain level of intelligence, perhaps even above average intelligence, is necessary to developing expert-level skill; however, Malcolm Gladwell notes the diminishing marginal returns of intelligence in terms of achieving success, saying, "Once someone has reached an IQ of somewhere around 120, having additional IQ points doesn't seem to translate into any measureable real-world advantage."[6]

Certain innate physical qualities are also necessary to achieve expert skill in certain fields. Most professional basketball players, for example, are not short and typically, professional football players are not thin. Stereotypes like these are mostly consistent among sports, demonstrating the necessity of certain innate physical qualities to achieve expert-level skill, but the same is not always true for musicians.

While typically a concert pianist must capably reach an octave and a violinist must have nimble finger dexterity to perform most works in the standard repertoire, many professional musicians have achieved expert skill despite being underweight or overweight, below average height or above average height. This is a matter of degrees or dosages and in many cases there are exceptions.

Innate physical qualities then, in terms of expert skill development, are generally less important for musical success than for athletic success, for example. But intelligence, that is working memory capacity, appears to play an active and significant role in expert skill development among musicians.

The Art Of Possibility

Can anyone be a great musician? No—there are all sorts of limitations. Some are severely physically disabled, others intellectually disabled. Others don't have the childhood

resources of encouragement and training. Others never develop the intense desire, for whatever reason. There are lots of obstacles out there. The point that I think shines through in all this research is that we need to sweep aside this old notion that most people simply don't have IT. The IT—the greatness—is something you acquire, not something you are given or are not given. Some may face too many obstacles to acquire IT but few are born with limitations so severe that the acquisition is inherently impossible.[7]

—*David Shenk,* The Genius in All of Us

Dan McLaughlin believes talent has little to do with success, and according to Florida State psychologist K. Anders Ericsson and others, he may be correct. László Polgár certainly demonstrated that expert skill, even world-class greatness, could be developed, provided the proper training, guidance and opportunity.

Many biographers note equal significance in terms of the nurturing of expert skill among child prodigies like Wolfgang Amadeus Mozart, Pablo Picasso, Tiger Woods, Roger Federer, Bobby Fischer, and Serena and Venus Williams. They demonstrate the same principle—precocious children are more the result of unique upbringings than unique genetics.

Daniel Coyle, author of *The Talent Code,* claims that elite performance is the result of deep practice, which produces within the brain a microscopic neural substance called *myelin*, adding speed and accuracy to thoughts and movement, the very essence of skill development. Ericsson asserts that roughly 10 years or 10,000 hours of deliberate practice will produce expert skill. Malcolm Gladwell says greatness is the result of 10,000 hours of practice plus innate giftedness, Matthew Syed asserts the importance of extraordinary opportunity and guidance in achieving greatness, and Michigan State University psychologist Zach Hambrick alleges that all the opportunity and training in the world will not develop expert skill without an above-average level of intelligence.

But surely the matter of expert skill development is more complex than any equation of "this plus that equals success." Indeed, the proper training without some degree of innate giftedness, intelligence and physical readiness may not always yield expert skill. Equally, talent without some degree of deliberate practice, extraordinary opportunity and master coaching may not develop expert skill either. So, what causes a person to develop expert skill?

Stanford University psychologist Carol Dweck suggests there is more to expert skill development than talent, opportunity and the proper training. She says the key to success is a "growth mindset." In her book *Mindset: The New Psychology of Success*, Dweck proposes that people with a growth mindset "thrive on challenge and see failure not as evidence of unintelligence but as a heartening springboard for growth and for stretching our existing abilities."[8] Dweck also notes that individuals with a "fixed mindset" believe skill to be an innate quality, static and inherent. She says that in some cases, the talent theory has caused a prevailing "fixed mindset" among individuals, stifling the fulfillment of their potential.

Perhaps musicians should be most concerned with instilling in students and themselves a "growth mindset," placing greater emphasis on the importance of learning from failures rather than fearing them, striving for continual improvement and viewing challenges as opportunities not obstacles.

Indeed, there are those who possess talent but will never achieve expert skill because they lack the self-belief and motivation to pursue it. And there are those lacking talent who will achieve greatness because they possess more than the proper training and opportunity. They possess the burning fire of motivation and the determination to spend time and energy pursuing skill development without short cuts. They endure failures, yet persevere. Perhaps, then, all that separates ordinary from extraordinary is openness to the possibility.

Notes

1. John B. Watson. *Behaviorism.* W. W. Norton and Company, Inc., 1930.

2. K. Anders Ericsson. "Optimizing Performance in Golf," Australian Academic Press, 2001.

3. Malcolm Gladwell. "Late Bloomers: Why do we equate genius with precocity?" *The New Yorker*, 2008.

4. David Z Hambrick. Sorry, "Strivers: Talent Matters," *New York Times*, November 2011.

5. Brian Butterworth. "What makes a prodigy?" *Nature Neuroscience*, volume 4 no 1, January 2001.

6. Malcolm Gladwell. *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants,* Little, Brown, and Company, 2013.

7. David Shenk. *The Genius in All of Us*, Anchor Publishing, 2011.

8. Carol Dweck. *Mindset: The New Psychology of Success*, Ballentine Books, 2007.

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