



CELLO

Nature, Nurture, and Our Students

by David Holmes

Last weekend, I taught at an out-of-state Suzuki workshop. One of the teachers there has a son who is an incredible cellist, attended Curtis at age 16, and subsequently participated in the Tchaikovsky Competition. Along with several other teachers, I heard a recording of his playing and indeed, he is a world-class player. Afterwards, I asked, “Was he a real natural on the cello?” and his parent replied, “No; he worked his butt off.” A silence hung in the air after this brief interaction, which, though unexpressed, highlighted the complex issue of nature (genetics) versus nurture (environment).

Over the years, the pendulum of the nature vs. nurture debate has swung from one side to the other. In the United States back in the “old days,” calling someone “musically talented” was a label given to the blessed few (i.e., emphasizing “nature”). Most people were assumed to be untalented, therefore not meriting the time and money required for musical instruction. Shinichi Suzuki, Phyllis Young and many others, knew this was an erroneous assumption. They realized that all humans have musical talent, and that hard work and a supportive environment are keys to anyone’s success (i.e., the “nurture” viewpoint). They also believed that learning to play a musical instrument has benefits and value for anyone. In more recent years, however, scientists have discovered that rather than genetic and environmental influences being mutually exclusive, they are inextricably linked and profoundly affect one another.

While I am no expert on this subject, I live with someone who is—my lovely and brilliant wife, Irene. She has worked at the University of Minnesota’s Center for Twin and Family Research for 25 years now, and among other topics, has published two papers on how genetic and environmental influences on parent-child relationships change from childhood through adolescence. I have engaged in many interesting conversations with her on these topics over the years, from which I have gleaned insights that have informed my perspective

on teaching the cello. For a number of reasons, I think this is a timely subject.

Researchers have learned much about environmental and genetic influences by studying genetically identical twins, comparing them to fraternal twins, who like other siblings, share 50% of their genes, on average. These studies have shown that identical twins have more similar interests and abilities than average siblings, consistent with genetic influence. Adoption studies provide a way to focus more on the impact of rearing environment since an adopted child has no genetic relationship to their parents; thus, familial resemblances must be due to the common environment.

Sandra Scarr was a pioneering twin and adoption researcher who, in the 1980s, delved into the complex field of behavioral genetics. She described 3 ways that a genotype (a person’s DNA) may influence the environment (referred to as gene-environment correlations) that are still considered relevant today. These 3 types of gene-environment correlation were labeled 1) passive, 2) evocative, and 3) active.

For example, “passive” gene-environment correlation, which is most important during early childhood, is often present when a child is raised by a biological parent who reads to him or her. More often than not, a parent who chooses to read more to a child particularly enjoys reading as well. The child may then learn to enjoy reading, both because of genetic resemblance to the parent, and because the parent is also providing an environment that reinforces reading—a “double whammy” as it were, of genetics and environment. The same likely applies to musically-trained parents, who are more likely to pass on some genetically-influenced musical potential to their children, and are also more likely to have their children take music lessons than non-musically trained parents.

By contrast, “evocative” gene-environment correlation describes how the child affects the environment through the expression of his or her “genotype,” or DNA. Parents may tend to react to a young child

who seems interested in books by reading more stories, and fewer, if the child seems bored. In this way, the child’s interest helps shape the parent’s behavior. Parents who aren’t musically trained might notice one of their children singing or otherwise expressing more natural interest in music, leading them to seek to enroll that child in music lessons.

Musical examples of “active” gene-environment correlation may occur when a more musically-inclined child requests to take lessons on an instrument or eventually, asks to join a youth orchestra or other group. A child taking ownership of practice time, either to a parent’s delight—or dismay—may represent another “active” gene-environment example. Active gene-environment correlations tend to increase during adolescence, a time when children’s musical interests typically become less influenced by their parents, and more motivated from within. In addition to external pressures, such as increasing academic demands or competition from sports activities, changes in musical motivation may be due in part to genes that are “expressed” during this time, as gene expression occurs on sort of a “timed-release” schedule throughout development.

Returning to the incredible cellist described in the first paragraph, at age 12, he became passionate about the cello, though he had not previously seemed that way, when taking lessons at earlier ages. This increased interest on the cusp of adolescence happened to me as well; I started the cello in 6th grade, and within a year or two, I became quite smitten with it. However, I wasn’t practicing many hours a day until college. No one started lessons at age 4 in my youth, since the Suzuki method had not yet caught on in America. That amazing cellist may have practiced his butt off, but eventually, so did I. However, we initiated the intense practice at different ages. I don’t play as well as he does, which is probably attributable in part to the experiences we were exposed to and when, but also to genetics. Not everyone has the potential to

be a Yo-Yo Ma. That said, while genetics plays a role in personality traits and in our potential abilities, it is not destiny. Rather, it is in continuous interplay with our early experiences, later choices, and hours and hours of effort to be the best that we can be.

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