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From The Sunday Times

September 2, 2007

Born to play?

A record producer turned neuroscientist asks whether musical talent is all in the genes



Daniel Levitin

On Songs for Swingin' Lovers, Frank Sinatra is awesomely in control of his emotional expression, rhythm and pitch. Every note he sings is perfectly placed in time and pitch. I don't mean "perfectly" in the strict, as-notated sense; his rhythms and timing are completely wrong in terms of how the music is written on paper, but they are perfect for expressing emotions that go beyond description. His phrasing contains impossible details and subtle nuances. Try to sing along with any song on Swingin' Lovers. I've never found anyone who could match his phrasing precisely.

How do people become expert musicians? And why is it that, of the millions who take lessons as children, relatively few continue to play music as adults? Many people tell me they love listening to music, but their music lessons "didn't take". I think they are being too hard on themselves. The chasm between musical experts and everyday musicians that has grown so wide in our culture makes people feel discouraged, and for some reason this is uniquely so with music.

But, although many people say their music lessons didn't take, cognitive neuroscientists have found otherwise. Even just a small exposure to music lessons as a child creates neural circuits for music-processing that are enhanced and more efficient than in those who lack training. Lessons teach us to listen better and 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 that class of people we all acknowledge are true musical experts – the Alfred Brendels, Sarah Changs, Wynton Marsalises and Tori Amoses? Do they have a set of abilities – or neural structures – that are a totally different sort from those the rest of us have (a difference of kind), or do they just have more of the same basic stuff all of us are endowed with (a difference of degree)? And do composers and songwriters have a

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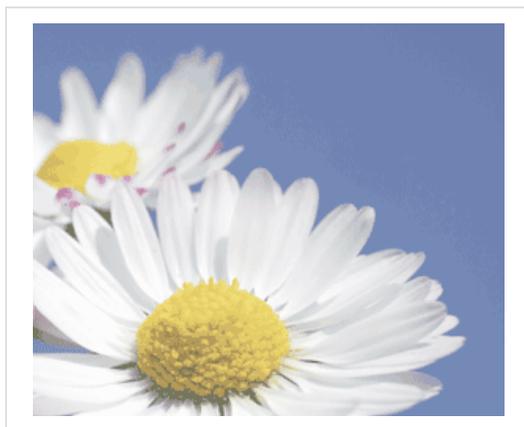
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fundamentally different set of skills from players?

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The science of music

It is evident that some children acquire skills more rapidly than others. There may be genetic factors at work, but it is difficult to separate out ancillary factors – with a presumably environmental

component – such as motivation, personality and family dynamics. Similar factors can influence musical development and can mask the contribution of genetics to musical ability. Studies of violin players 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. But we do not yet know if the propensity for increase preexists in some people and not others.

The best guess scientists currently have about the role of genes and the environment in complex cognitive behaviours is that each is responsible for about 50% of the story. Genes may transmit a propensity to be patient, to have good eye-hand coordination or to be passionate, but certain life events – in the broadest sense, meaning not just your conscious experiences and memories, but the food you ate and the food your mother ate while you were in her womb – can influence whether a genetic propensity will be realised or not. So we can only make predictions about human behaviour at the level of the population, not of an individual. In other words, if you know that someone has a genetic predisposition toward criminal behaviour, you can't predict whether he will end up in jail in the next five years. On the other hand, knowing 100 people have this predisposition, we can predict that a percentage of them will probably wind up in jail: we simply don't know which ones.

The same applies to musical genes we may find someday. All we can say is that a group of people with those genes is more likely to produce expert musicians, but we cannot know which individuals will become the experts.

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