

The Musical Brain Conference 2014

Mozart and the Power of Music: Memory, Myth & Magic

Friday 24 October 2014, Senate House

TRANSCRIPT

The “Mozart Effect” - Prof. Jessica Grahn

JESSICA GRAHN: So we've just got a little bit of light science before you all get to go to lunch. I'm going to talk about the Mozart Effect, because honestly, what day on Mozart wouldn't be complete without a little bit of talking about the Mozart Effect. It's one of the most popular associations that people have currently with Mozart - how to make your children brainy, how to get your babies' brain capacity up.

Okay, so the Mozart Effect. There are quite a lot of claims about what Mozart can do, not only what Mozart can do in his own lifetime, very impressive musical feats, but about what he can do for us now. This is a small sampling of the products available for you to purchase at your nearest Amazon website. Sometimes other composers get a look in, Bach for the brain, but Mozart is really the one that has struck home. As you can see, most of these are for accelerating learning, Mozart for the mind, but a lot of them are targeted at children and babies, so we have: *Brainy Baby Music*, *Music for the Mozart Effect*. Here's the pregnant woman over here with her unborn child and her child, sharing the joys of Mozart together. Music can help every child's development, music makes your child smarter – these are just right out there as claims. Some of the claims are quite impressive, things like: based on up-to-date medical and psychological research - very important, you don't want to just be buying snake oil - the pieces on each recording have been carefully chosen by the author so that tempos, key signatures and textures of the music change with each selection to provide a rich listening and learning experience for children of all ages. One even claims you can stimulate bonding, communication and learning before birth, you can invigorate brain growth and development in the womb, and positively affect emotional perceptions and attitudes from pre-birth onward. What a shame if you found out about this stuff maybe on the day your baby was born and you missed out on the months of development that could have happened.

What I find particularly fascinating about the Mozart Effect is these claims are very strong and very targeted at children, but if we go look at the science, it tells a slightly different story. The original Mozart Effect study is now over 20 years old. Yes, that is right, and was conducted by a researcher, not looking to sell brainy baby books, but interested in the effect that music might have on what she called spatiotemporal reasoning. I will give you some examples. In the original study, it was undergraduates, not foetuses or babies, who were divided into three groups and heard either ten minutes of Mozart, ten minutes of a relaxation tape or ten minutes of silence. We'll hear the Mozart piece later tonight but I'll give you a tiny preview.

[Music played.]

Just call out any words that came to mind, in describing that piece, or the reactions you might have had to that piece.

FLOOR: Happiness.

JESSICA GRAHN: Any others?

FLOOR: Energy.

JESSICA GRAHN: For sure.

FLOOR: Strength. Conversation. Cheekiness. Charm.

JESSICA GRAHN: Charm, very good. Flourish, lots of that. I think you've hit the nail on the head. So this is a happy, upbeat, energetic, cheeky, charming, all very positive connotations type piece. That's going to be important in some of the future studies on this. So after students were exposed to this for ten minutes, either this or relaxation tape or silence, they had to complete a series of tasks and this is just an example of one of those tasks, it's called the paper folding and cutting task. Your job is to imagine if we had a piece of paper such as that shape on the left, and we folded it forward on that little dotted line seam there, and then folded it forward again on that same dotted line seam, and then folded it forward, and then folded it across, then mirror reversed it along the axis shown by M, rotated it at 180 degrees, then made little snippets off the corner in the middle, so you ended up with the folded piece of paper like that, what kind of snowflake are you going to end up with? This is a really difficult task, one of the tasks that they had to do, and interestingly, their performance, if they listened to music, on the left there, compared to relaxation or silence, was a bit higher. If you transformed this into an equivalent on the IQ scale, it was about 4 or 5 points higher than if you listened to a relaxation tape or sat in silence. So you had more correct answers, and this effect seemed to last about 15 minutes after the exposure. For exactly the reasons you all just said, the Mozart condition strongly differs from these other two conditions, and it may be that the Mozart was having a positive effect or it could be that it was listening to something that was happy and energetic and upbeat and in general quite positive. In fact, there was recently a study showing that people would rather give themselves mild shocks than sit in silence alone with their thoughts for 15 minutes, so it could actually be that Mozart didn't enhance performance but in fact sitting in silence or listening to a relaxation tape was mildly unpleasant, and suppressed performance.

I'm going to talk now about a few studies that tried to take these ideas a little further and see what it was contributing to the Mozart Effect. So the first study I'm going to talk about was taking it down to children, at least where some of these products are aimed, and this was a study conducted here. Many schools and many different classrooms tuned into different BBC channels at a particular time and heard either rock music, or this Mozart piece used in the original study, or instead of silence they heard a researcher describing the Mozart Effect, so slightly more active control condition than just sitting in silence. They then completed a simplified version of that paper folding and cutting task and interestingly, what the researchers found was in this case, there was a Blur effect, so most of the rock music was by the group Blur, and the students did better after listening to pop music in this paper folding and cutting task than they had after Mozart or listening to the researcher. So too bad, Mozart isn't super special in this particular way, it seems that any kind of music can do it. In fact, does it even have to be music at all? Another study that was conducted was where they had people listen to a story, it was an engaging story by Stephen King, or listen to that same Mozart piece. Then they asked people, which condition they had preferred, and lo and behold, you did better on the paper folding and cutting task after listening to the condition that you

preferred. On the left, we have the people who preferred the story, and they got more points after listening to a story than after listening to Mozart Effect, and on the right, we have people who preferred listening to the Mozart and they did better after listening to the Mozart, compared to listening to the story.

So does it have to be Mozart? It doesn't have to be music, and it turns out it is very highly related to arousal or energy level and mood, which fits this description that you gave of the Mozart in advance. They did another study and scaled the scores here on paper folding and cutting, those are the black bars, after listening to Mozart or an Albinoni piece often used at funerals, which had the opposite mood or association. This was not happy, this was sad. This was not energetic, it was very slow and staid. They found that people's ratings at the arousal were slow and staid, the energy, and ratings of the mood and enjoyment were all higher for the Mozart piece than they were for the Albinoni piece, and the score they achieved was highly correlated with the mood arousal and enjoyment. That suggests really that it is not about Mozart being special, it is about listening to something you enjoy, that makes you happy and puts your energy level up and makes you do better on cognitive tests. However, as I said, the Mozart Effect is generally for products sold to parents. Maybe the effects on children or babies, very young children, are different than on 1-year-olds or undergraduates.

This was a study conducted with five-year-olds. Instead of paper cutting they decided to have the children draw after one of four conditions: they either heard the Mozart piece, the Albinoni funeral song or listened to simple but familiar children's songs. They had two other conditions: they could listen or sing along. Then they had an adult, who didn't know the conditions the children had been exposed to, rate the questions on things like technical proficiency and creativity. We can see that creativity and technical proficiency were all highest after singing the familiar children's songs, they were least for the Albinoni and somewhat middling for the Mozart. It is not something special about Mozart and the children were very much more likely to be engaged with the songs that were familiar to them. That had the biggest impact on their development. This still hasn't stopped people from selling amazing products so you can still get the Mozart into your womb. Those white dots are a set of speakers, in case it wasn't enough for what is coming, you really want to get there, into there directly you can buy the flattering tummy belt to play the music.

When we look at the literature on babies and the effect music has on babies and even foetuses, we find it doesn't exist. No study has ever shown that music for babies or foetuses has any effect on brain function or cognitive ability. So you don't have to feel guilty if you accidentally did not buy *Baby Einstein Prenatal* and expose your womb to it earlier on. In summary, listening to enjoyable music, stories, anything, participating by singing along to music you enjoy, boosts your mood and arousal. This is not specific to Mozart or music. Boosting of mood and arousal leads to temporary increases in performance on some tests. Mood is very important to cognitive function. When people come in to be tested in our lab, we often administer a depression inventory. That is because somebody who is depressed can look almost as if they have dementia on a cognitive test, but still be perfectly fine in the points where their mood is boosted. I don't want to dismiss how important mood and arousal are, but that is what is driving the effects here. The level of improvement we get we should also keep in mind here. It is about the same level of performance boost you would get from having a cup of coffee and it lasts about as long. Enjoy your Mozart, but don't worry too much about the effects on the cognitive function or the IQ. Thank you.