

Music, Development, Aging and the Brain *It's Never Too Late for Music*

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"By approximately age 11, the neuron circuits that permit all kinds of perceptual and sensory discrimination, such as identifying pitch and rhythm, become closed off. Not using them dooms the child to be forever tone deaf and offbeat." (1)

This dire statement from a popular magazine is provided within the context of an article that urges teachers who are untrained in music to promote musical activities in their classrooms. Of course, this is a laudable and proper goal. But the misinformation contained in the quote could have disastrous consequences. Therefore, the misconceptions it engenders require correction.

In short, the article is dead wrong. Children lacking musical training before about the age of eleven are not "doomed" to anything, much less tone-deafness, etc. This fact, and the far more hopeful and optimistic message that it brings, is true irrespective of naive and hopelessly oversimplified beliefs about brain development. In brief, the "neuron circuits" are most definitely *not closed off*.

Before continuing, let's be clear about some basic points.

First, all things considered, is it better to initiate musical activities, including education and play, well before the age of eleven? Yes, certainly. As reviewed previously in this newsletter, infants have considerable musical capabilities (2). Moreover, we, as others, have suggested that delayed encouragement of musical activities (not necessarily only formal lessons) fails to capitalize on the stage of musical competence that is present at a particular developmental stage (2). Furthermore, preschool children exhibit a natural interest in music and in the many cognitive processes that underlie music comprehension and behavior (3). It certainly makes sense to take advantage of their interests and abilities.

Second, do children benefit musically when taught by their regular teachers rather than by specialists in music education? Yes, without doubt. The vast majority of students who study music were introduced to musical activities, such as group singing and the use of percussive "rhythm instruments" in preschool, kindergarten or early grades, without instruction by a formally trained music teacher. It is true that musically trained teachers do help students reach a higher level of accomplishment (4). But this fact doesn't mitigate the essential influence of "regular" teachers. A recent study showed that preschool students learn a good deal about music and increase their attentiveness in class when their "non-musical" teachers are given some musical training (5). Therefore, teachers should be encouraged to bring or increase music in the classroom.

So, the article is well-intentioned. But it goes way overboard in dooming and glooming. If it were really true that we can't comprehend, appreciate, or perform music unless we learn music before the relevant "neuron circuits" close down, then how can the nameless

author of the "dire dooming" account for the fact that all of these activities do occur after that age, including aging adults who have never had musical training?

Yes, it is common for professional musicians to have started at a young age and it is almost a certainty that major creative musical artists and composers have done so. But that leaves the other 99% of the population out in the nono-musical cold. Here's a challenge to the "doomers". Select anyone over the age of, let's say twenty-one, who wants to gain musical understanding and even some instrumental competence. Within six months, that person will have success on some instrument, provided she or he is motivated and has weekly professional instruction. Pygmalion redux, but why not?

Think of the terrible consequences of believing that the pre-teen years are the only period for music training. At the very least ...

Children would be discouraged from starting lessons just at the time when most show a real interest in singing or playing an instrument.

Those who start would have a "built in" excuse for lack of achievement and then dropping music. We can virtually hear their pleas -- "Ma, why should I keep practicing? ... you started me too late... I'll never be any good... etc., etc."

Teachers would be loathe to "waste their time" on teaching music to teenagers. They would also have lower expectations, leading to students having lower expectations of success.

Adults would not be tempted, as so many fortunately are, to take up music.

Is it too late to gain musical understanding and the enjoyment of performance at an advanced age, much less between the ages of e.g., 18-60? There is no evidence of such a limitation, with the caveat that one has to match physical abilities to demands of the selected instrument. On the contrary, music experience and music lessons have repeatedly been shown to be successful and have many psychological and social benefits.

A well known case in point (but apparently not well enough known to many article writers) is the New Horizons Band started by Dr. Roy Ernst, Chairman of the Department of Music Education at the renowned Eastman School of Music in Rochester, New York. Dr. Ernst has formed a band comprised largely of adults between the ages of about 60 to 85, the majority of whom never had previous music lessons. With instruction and encouragement, the New Horizons Band has achieved excellence in performance, not to mention the great pleasure and happiness afforded both its members and audiences.

Sometimes, special curricula are needed, as in the case of the institutionalized aged (6). But whether healthy or slightly infirm, there is no question of adequate musical capability and equally no question of benefit (7). The interested reader, whether a skeptic or a supporter of music "after sixty", should find it well worth the time to review the extensive

bibliography of resource materials on music and arts in the aged, compiled by Marie DiGiammarino and colleagues (8).

So, from a behavioral standpoint, it is "never to late" for music. But if the "neuron circuits" are "closed down" in the pre-teen years, how is this possible? Well, to put it in a nutshell, the circuits are not closed down... they are operating just fine. What could possess someone to make such a claim? Probably a misunderstanding of technical findings on the brain. For example, string players have an enlarged representation for the digits of their left hand, and this enlargement is greater the earlier the age at which instruction began (see *Briefly Noted*, this issue) (9). But such findings don't preclude great violin playing when instruction is started after puberty.

As many scientists wrongly believe that sensory cortical systems can't change after some critical stage of development, it is hardly surprising that non-scientists might be similarly misled. Actually, it has been known for at least a decade that experience in adulthood, including learning-induced "retuning" in the auditory cortex (the highest level of the brain's auditory system), modifies sensory and perceptual processing (10). So, since it is never too late for the brain to change, it is hardly astounding that it is never to late to learn music.

Footnotes

(1) Music: Exercise for the Brain (March/April, 1996)*Learning*, pgs. 62-64. This article, appearing without author attribution, "was adapted from material developed by John Langstaff and Elizabeth Lloyd Mayer." My criticism of the quoted statement is restricted to the article in *Learning*, as the material on which it is said to be based is currently unavailable and therefore has not been reviewed.

(2) "The Musical Infant" (1994)*MRN*, vol. 1 Spring

(3) "The First Music Lessons" (1995) *MRN*, vol. 2, Spring.

(4) Lamar, H.B., Jr. (1989) An examination of congruency of musical aptitude scores and mathematics and reading achievement scores of elementary children. Unpublished doctoral dissertation, University of Southern Mississippi.

(5) Nichols, B. L. and Honig, A.S. (1995) The influence of an inservice music education program on young children's responses to music. *Early Child Develop.*, 113, pgs 19-29.

(6) Bell, J.C. (1987), Music and the elderly. *Educational Gerontology*, Mar-Apr, 13, pgs. 147-155.

(7) Osgood, N.J. (1993) Creative activity and the arts: Possibilities and programs. IN: *Activity and aging: Staying involved in later life*. Kelly, J. R., Ed. Sage Publications, Inc, Newbury Park, CA, US. pgs. 174-186.

(8) DiGiammarino, Marie; Hanlon, Heather; Kassing, Gayle; Libman, Karen. (1992) Arts and aging: An annotated bibliography of selected resource materials in art, dance, drama and music. *Activities, Adaptation & Aging*, , 17, pgs. :39-51.

(9) Elbert, T., Pantev, C., Wienbruch, C., Rockstroh, B. and Taub, E. (1995) Increased cortical representation of the fingers of the left hand in string players. *Science*, 270, pgs. 305-307.

(10) For example, see Weinberger, N. M., (1995), Dynamic regulation of receptive fields and maps in the adult sensory cortex, *Ann. Rev. Neurosci.*, 18, pgs. 129-158.

After completion of the issue of MRN, I learned of the book *Piano Lessons: Music, Love & True Adventures*, recently published by Delacorte Press. The author is Noah Adams, host of NPR's All Things Considered. At the age of fifty-two, Noah decided to begin taking piano lessons, for reasons that readers of his book are likely to find fascinating. Within a relatively brief period, Mr. Adams had achieved a good level of performance competence.

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<http://www.musica.uci.edu/mrn/V3I1S96.html#never%20too%20late>