

[Previous post](#)

[Next post](#)

Tweet

9

6

Share

No, Really: Teach Your Toddler Perfect Pitch

By Garth Sundem

[Email Author](#)

February 1, 2012 |

6:00 am |

Categories: Science and Education

Follow @garthsundem

Send

74
people



Pairing meaning with pitch may allow your progeny to be prodigy. Photo: kubotake/Flickr
Conventional wisdom holds you're born with perfect pitch or you're not. The conventional wisdom is wrong. Here's how to train perfect pitch.

For my book *Brain Trust*, I interviewed Diana Deutsch, University of California San Diego professor and president of the Society for Music Perception and Cognition, and she said the trick is pairing pitch with meaning — early!

First, if you had perfect pitch, you'd know it, if for no other reason than people whistling in the airport would sound physically, painfully, out of tune. (This, according to my friend Ariel, who was an orchestral recorder prodigy before switching to heavy-metal guitar in college and environmental architecture after.)

And until recently, experts thought that that was it — at birth, you can hold a note in your mind's ear or you can't. If you're born without the gift, the theory went, your only hope is the consolation prize of painstakingly training *relative* pitch. For example, learning that the “way up high” leap in “Somewhere Over the Rainbow” is the interval of a major sixth, as is the iconic leap in the Miles Davis tune “All Blues.” Likewise, the first interval in “Twinkle, Twinkle, Little Star” is a perfect fifth. And based on learning these leaps, you can learn to deduce any note on the keyboard given a starting point. In university music programs around the world, a teacher plunks a note, names it, then plunks another note, and students who have successfully trained their relative pitch can name the second note.

But what about naming the first note? What about perfect pitch? What about that shortcut that may allow your progeny to be prodigy?

Diana Deutsch thinks you may be able to train perfect pitch — but only if you start early. In part, she bases this opinion on an illusion. In music, a *tritone* describes the interval that splits an octave exactly in half. For example, C and F# form the interval of a tritone, and so do the notes D and G# (music majors will flame me for mislabeling these tones — if you get that reference, count yourself in the know). The interval was banned during the Inquisition as the *diabolus in musica* (the devil in music). Today it starts *The Simpsons* and makes Danny Elfman scores of Tim Burton movies immediately recognizable.

Now imagine alternating C and F#, like the siren on a British ambulance. Really, you wouldn't know if the pattern is ascending (C-F#, repeat) or descending (F#-C, repeat). But here's the thing: You do know.

Every note has a companion that's exactly half an octave away, and depending on which tritone is played, you perceive the interval as either descending or ascending. And you don't ever switch. It's fixed. Deutsch discovered this tritone paradox and calls it “an implicit form of perfect pitch.”

Somehow, some way, we all fix these notes and hold them in our minds. So why doesn't this proven, universal ability to hold abstract pitches allow us all to know note names when we hear them? Why — dammit — can't we all be prodigies!

Deutsch found that fixed pitch does, in fact, allow perfect pitch . . . but only in certain cultures.

Sure, an individual American's perception of the tritone paradox is fixed — maybe you hear C-F#-C-F# as an ascending pattern — but as a *culture*, Americans may each hear tritones differently. Your friend Barb may hear C-F#-C-F# as a descending pattern. But here's the interesting bit: In Vietnam, the vast majority of the population hears tritone paradoxes in the same way — they're fixed not only on an individual, but on a cultural level.

Blame it on language, says Deutsch. In Vietnamese and other tonal languages, a high “ma” can mean something very different than a low “ma,” and so infants learn very early to pair fixed tones with fixed meanings. Later, it's easy to use this same brain mechanism to pair tones with note names like A, B, and C. Deutsch explored data from the Singapore Conservatory and other Asian music schools, and found that — sure enough — the incidence of perfect pitch is much higher in speakers of tonal

languages.

Deutsch thinks it might be possible to create a similar mechanism in English speakers. “If your son or daughter has a keyboard at home, use stickers to label the notes with whatever symbols they understand first,” she says.

If your child recognizes barnyard animals or pictures of family members or colors before he or she recognizes letters, label the keyboard with animal, family, or color stickers. (All Gs get a cow, all Fs get a pig, etc.) This encourages your budding Beethoven to pair tone with meaning — any meaning works! — which you can then switch to note names once you child knows his or her letters.

It’s too late for you — “It seems as if the window for creating this pairing is closed by about age four,” says Deutsch — but by forcing meaning on pitches, your child can learn to fix and hold these tones. (You can hear examples of the tritone paradox and more cool auditory illusions at Diana Deutsch’s faculty homepage.)

[You Might Like](#)

[Previously](#)

[Related Links by Contextly](#)



[The Avengers: Hawkeye, World's Worst Archer?](#)



[The Avengers: The Hulk - Biggest, Greenest, Meanest Hero Ever?](#)



[67 Books Every Geek Should Read to Their Kids Before Age 10](#)



[iPad 3 Makes Images Sparkle and Reading Easy](#)



[The New iPad's Hidden Downside -- For All iOS Users](#)



[GeekDad](#)



Author of *Brain Trust: 93 Top Scientists Dish the Lab-Tested Secrets of Surfing, Dating, Dieting, Gambling, Growing Man-Eating Plants and More*

Follow [@garthsundem](#) on Twitter.

Tags: deutsch, Education, [Music](#), [Perfect pitch](#), sundem

[Post Comment](#) | 12 Comments and 25 Reactions | [Permalink](#)

[Back to top](#)

Like

74

Follow

9

Share

6

Like

Comments for this page are closed.

Sort by popular now

Showing 12 comments



Guest

Some great discussion here and sorry I'm late.

It's debatable whether or not perfect pitch is a blessing or a curse. The Western tuning system (I can't speak for other tuning systems found in different cultures) is not perfect and in fact requires unconscious ear training before the music "makes sense." Ever listen to traditional Chinese music? It can sound pretty alien because our ears are not accustomed to their different method of slicing up an octave.

I read a great book in high school (given to me by my music teacher) called, "Temperament" and it detailed the history of how the piano came to its current form. It's quite interesting to see the weird pianos that were invented before its current incarnation was finalized (along with our tuning system).

Fascinatingly enough, early musicians had big problems while tuning pianos (or precursors to the piano, such as the harpsichord). They initially started with an absolute note (such as C) and tuned subsequent notes perfectly in harmony to this starting note. The result was that any piece in C sounded wonderful, but if the musician were to try to modulate or transpose the piece to an alternate key, the tones did not resonate very well and sounded like "howling wolves." After much struggle and experimentation, the final system that was decided upon (and is still in use in Western tuning today) is a system where an octave is equidistantly sliced into twelve parts. Because of this slight compromise in pitch (that is, the fifths, fourths, and octaves are no longer "perfect"), world-class singers and classical instrument players can purportedly have difficulty staying in tune with a piano.

My whole digression is to make the point that individuals with perfect pitch might notice all the little tuning inconsistencies that most people automatically and unconsciously adjust to the nearest expected pitch. I can't imagine being bothered by every little out of tune pitch I ever heard... not to mention I would probably get speeding tickets -- "Officer, I know I was doing 80 in a 65 zone, but my fifth gear RPM is exactly A 440 at 80 MPH and, well, I can't stand it when my transmission is flat."

1 month ago

Like



Relativo

Historically and culturally, there's no such thing as perfect pitch. Pitch frequencies have changed throughout the centuries and continue to do so. In medieval times A could sometimes be as high as 460Hz. In 18th century France, A could be 390Hz. Today, even within one country, various orchestras will tune anything between A=440Hz to A=444Hz. Historically, there have been a range of tuning systems, relative to the type of music being played. We should get rid of the word "perfect" in relation to pitch and substitute it with "memory" or "memorised." If I am working with baroque players where A=415Hz, it is a shock to hear a modern oboist give the "A" to tune an orchestra: it sounds like a Bflat. But if I'm working with modern players, after a short time I adjust to their pitch, and a baroque group at 414Hz, sounds a semitone "low."

1 month ago

Like



Stephane

I like your idea of memorized pitch because most people who claim they have perfect pitch will sing using equal temperament and have a hard time singing true/pure intervals. They have memorized the piano pitches.

1 month ago in reply to Relativo

Like



ImpureScience

My feeling is that we are born with differing abilities to discriminate, i.e. wiring, but that "perfect pitch" is learned or programmed. I cannot imagine that there is a Platonic archetype somewhere in the aether that represents a perfect middle C. There have been variations in standard pitch for at least several hundred years, and if there were a true perfect standard I would expect that many, many people would have been driven mad during the periods in which the norm wasn't "perfect". There is probably a period in childhood where the imprinting is easier.

My wife and I are both musicians with good relative but not perfect pitch. Our son does have perfect pitch and a professional's understanding of theory, and it's possible he was imprinted early on, since we always played and sang with him for fun and included theory tidbits as well: identifying notes, etc. But then the missus grew up in a house with two incredible classical musicians and she's in the same boat as I am (relative pitch only) and neither of my parents

were musicians, and neither pushed any sort of musical education.

1 month ago

Like



VonK

Complete BS.

You already admit you're not a music scholar, go on to deny the fact music is a universal language, and then extoll mediocrity.

1 month ago

Like



Stephane

Music is not a universal language.

1 month ago in reply to VonK

Like



Patricia Vollmer

Fascinating! Makes me regret not working with my sons earlier on about this. My oldest is understanding music and intervals pretty well (for a 9 year old) but I wish I had thought to start teaching him on notes the same way we might teach our children on letters, numbers or colors.

1 month ago

Like



Charlie Austin

wish i learned perfect pitch as a baby :(

1 month ago

Like



Jonathan H. Liu, GeekDad senior editor, Etch-a-Sketch artist, book lover, board game fanatic, Christian, st...

I remember actually getting perfect pitch training when I started playing piano—but that was at age 5 or 6. However, my siblings and I all speak Mandarin Chinese, which is a tonal language, and has that built-in advantage to tying meaning to pitch. So my siblings and I all have perfect pitch, but I'm somebody who grew up thinking it was a learned skill, not innate.

Oh, and I actually disagree with your friend Ariel's assessment of why somebody whistling out

of tune would be painful. That has less to do with perfect pitch as it has to do with relative pitch. If the whistler's relative pitch is fine, then it doesn't really matter what their absolute pitch is because it's just like transposing to a different key. But if their relative pitch is bad, then anyone halfway musical (perfect pitch or not) can tell it's not in tune. Out of tune means the pitches aren't right relative to each other, but has nothing to do with an absolute value.

Now, here's where perfect pitch can mess you up: trying to sing along with sheet music (for example, a hymnal) when the pianist/accompanist has transposed it to a different key. I have an inability to look at music and transpose it in my head — but somebody without perfect pitch can do that without any problem, because for them they're just looking at relative pitches anyway.

1 month ago

Like



Heidi

I also have perfect pitch. I'm not bi-lingual so I have no idea where mine came from. I can see why you'd think it was a learned skill and it just might be. I believe our brains are capable of anything if we just put in the hard work. I was never trained to hear pitch, just exposed to music at an early age. I don't know if that would be enough, though, to have taught me to memorize the pitches.

And yes, I TOTALLY agree with you about the whistler statement. Nothing to do with perfect pitch, really.

As for transposing on sight, I have always wanted to get better at it, but I'm just too lazy. My high school choir teacher (the one who told me I had perfect pitch) would purposely have us sight read music in a different key just to throw me off. It was frustrating to say the least. It helped me understand why sight reading vocal lines can be difficult, though!

I appreciate this article, though. I have always wanted to spend more time researching perfect pitch. This article and your comments remind me why!

1 month ago in reply to Jonathan H. Liu

Like



Garth Sundem

Thanks Jonathan and Heidi on the catch with the whistler! Next time I see him, I'll beat my musically gifted friend Ariel within an inch of his life for suggesting such. I guess a better example might be from the time (era at this point?) I used

to play jazz -- I played tenor in a college quintet and one thing that's commonly done in jazz is calling a tune's key. For example, a decent jazz musician should be able to play Straight No Chaser from any starting note (you both already know this...permit me this background rambling in case others read...).

That is, good musicians WITHOUT perfect pitch. When people with PP would sit in, we were pretty much confined to playing tunes in their original key, lest we upset the aural universe of these perfect pitchers.

Overall, I'd love to hear musicians chime in on whether they think perfect pitch, in the long run, is a blessing or a curse? Is knowing any note (perfect pitch) worth trading the ability to move them around (relative pitch)?

1 month ago in reply to Heidi

Like



Heidi

I'm musical, but not what most would label a musician. I don't do anything musically professionally, didn't train in college. I just love music, love my kids, and love watching them develop their talents and working with them. I participate in church choirs and play the piano and organ in church often, lead a small ensemble for church, direct childrens choirs, etc.

So, with that background, in my opinion perfect pitch is a tossup in the blessing/curse debate. I love the way my brain works and I can see so many personal advantages with having that tool available for use. But like you pointed out above, and with personal experience, perfect pitch can be limiting if the individual doesn't learn to transpose quickly (I have no idea if everyone else is much faster than I am and if I am the only one who finds this limiting) and can be annoying to others.

Really, what are the advantages of perfect pitch? For me, all the wonders of it bless the individual possessing it and not the group. Perfect pitch helps me sight read, helps me find a starting note instantaneously, eliminates the need for a pitch pipe or tuning fork (do people still use those?!) and freaks people out when I can tell them what pitch their doorbell is, their vacuum hums a D# (or whatever pitch it does), and the horn on my car is a quarter tone which is really irritating. But perfect pitch seems to hinder the group, at least in my experience. The choir now

has to listen to the perfect pitch-er complain that they were went sharp a half pitch and she had to stop singing. Or the band can't play in the key a vocalist wants without having it written in that key. And the ignorant feel intimidated by the perfect pitch-er because they just don't understand what it means (99% of people I meet that find out I have perfect pitch).

Proof-reading that comment (rant?) made me feel like perhaps the problem (if one exists) is with the perfect pitch-ers and the way they (me) handle themselves in musical situations and not perfect pitch itself. Like I divulged in the beginning, I am not a professional musician. So perhaps my vision is too narrow to intelligently comment. And I can accept that position. However, I should also mention that I rarely divulge to anyone that I have perfect pitch. I just don't feel the need and don't know how it benefits those around me to know that tidbit. If I were to tell someone I had perfect pitch, it would only be to help them understand (and only if they asked) why I was incapable of doing something (ie: singing when the organist has hit the transpose button) not to make myself seem more "perfect" in any way shape or form.

So, in summary, I guess I'd take the position that from my experience, perfect pitch is an individual blessing in most situations, but a curse in most music group situations.

1 month ago in reply to Garth Sundem

Like

 [Subscribe by email](#)  [RSS](#)

Reactions



[Show more reactions](#)