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A Scientific Approach to Relative Pitch

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June 2, 2016

Wikipedia defines relative pitch as follows: “Relative pitch is the ability of a person to identify or re-create a given musical note by comparing it to a reference note and identifying the interval between those two notes.” Relative pitch can be developed through ear training. But, how does the ability get measured?

So far, no general test exists that gives a quantitated measure of the ability. This is no surprise, if you consider the numerous possibilities in which this could be measured. For example, someone might recognize a major third if the major third falls in the range between C3 and C6, but not for higher or lower tones. Some other person might recognize perfect intervals, but not major or minor intervals. And you could go on listing limits of combinations that some person may or may not be able to recognize.

This variety makes it indeed difficult to give a general assessment. Especially, considering that there are other musical systems than the equal tempered system.

Another challenge is: How do you test non-musicians that are non-aware of the musical interval terms?

To overcome this I propose to evaluate the pitch-distance discrimination ability.

An aural specialist can measure your hearing range with a frequency and loudness response test. The result is an audiogram that shows your minimum discernable sound level at various frequencies. To eliminate side effects as much as possible, sinus waves are used during the tests.

In a similar way, I propose measuring your pitch-distance hearing ability. Instead of using volume to determine your level of frequency hearing, this test measures your ability to discriminate pitch distances—that is, the presented pitch distances become smaller and smaller. To become a usable means of measurement, the test will be conducted in a specified, reproducible environment.

Since the primary goal of the test is to determine your pitch-distance hearing ability, volume is not part of the test or used in the pitch-distance determination. You can do the test at any volume you like.

The following restrictions should be applied for reproducibility:

1. Use sinus waves.
2. Use defined octaves.
3. Use only distances that are on equal-tempered frequencies or that deviate a specified fraction from the equal-tempered frequencies.
4. Allow only a predefined number of errors before stopping the test and calculating the pitch-distance hearing ability.
5. The time elapsed between the reference tone and the tested tone has a predefined duration.
6. Take the time to get a better grasp of the capability.

The Pitch-Grid-Test measures your pitch-distance discrimination ability over a range of 4 octaves. Because of this wide range tested, this general measurement method will often produce results that are disappointing. Therefore, the program PitchBlitz was created that allows you to train within boundaries and thus observe faster progress.

Since the test quantifies your pitch-distance recognition ability - independent of any musical interval knowledge, the test is especially suited to express the ability as a scientific means.

About AlgorithmsAndDatastructures, F. Rudin

AlgorithmsAndDatastructures, F. Rudin is a small company located in Ramlinsburg, Switzerland.

F. Rudin, also known under the Nickname "PitchFeedback" develops software to help individuals to understand music better. The newest program called "PitchBlitz" is about a more scientific approach to understand and how to develop relative pitch.

Contact

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