

DIFFERENCES IN MUSIC PERCEPTION OF
INDIVIDUALS CAUSED BY CULTURE

A Research Paper

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DIFFERENCES IN MUSIC PERCEPTION

CAUSED BY CULTURE

Introduction

Why are some songs popular in particular countries/regions, but not others? Why are Eastern and Western music scales very different? Can we assume that a certain melody will be liked more by a specific group of people? If so, is it because of the familiarity of the group members with the scale in which the melody is composed? Or, is it because the instrument, which plays the melody, is similar to the most prevalent instrument within that society? Maybe it is the time signature. Can dynamic range play a role? How about spatial properties, or polyphony? The list goes on. We are all aware that people from the same cultural group share similar tastes in many different areas such as art, cuisine and entertainment. Even though much research has been done regarding how cultures differ from each other, just a few of them focused on the relationship between culture and music perception. This paper will focus on the effects of culture on a person's perception of music and how it relates to the listening concept.

Endeavors Regarding Understanding Music Perception

All societies have music, and as far as we know, they have always had (Peretz 2000, 519). Unlike other widespread human systems such as writing, music was not invented by some groups and then spread to others. Music apparently emerged as early as 40,000 to 80,000 years ago, as suggested by the discovery of a bone flute attributed to Neanderthals (Peretz).

Adorno (1969, 155) states that “*pop melodies and lyrics must stick to an unmercifully rigid pattern while the composer of a serious song is permitted free, autonomous creation*”. Thereby, one may assume that we can examine any popular musical piece and/or genre as a product of the social evolution of music to understand those *unmercifully rigid patterns* that make some songs more pleasant than others for the majority, as they represent easy and enjoyable listening for the masses. Moreover, Adorno remarks that “*despite its universal character -which it owes to the absence of firm concepts, the very lack that distinguishes it from the spoken language- music does show national characteristics*” (155). Accordingly, we can assume that we understand the reasons that make some social groups find specific types of music pleasant, by investigating how individuals from diverse cultures perceive music.

Historical and Contemporary References

Related to Music Perception

Many theories have discussed the capacity of human brain for music. One of the most innovative ones, the generative theory of tonal music by Lerdahl and Jackendoff, renewed the approach to musical analysis and has contributed to a more general movement in psychology; returning to the ideas of gestalt theory (Imberty 2000, 449), which emphasizes that the whole of anything is greater than its parts (“Gestalt Psychology”). Even though Lerdahl and Jackendoff (1983, 332) stated that their approach to music theory has not been concerned with questions of memory capacity, real-time processing, brain localization, and the like, their work has helped cognitive scientists in their efforts to characterize the cognitive capacities of humans.

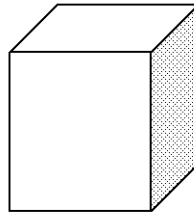
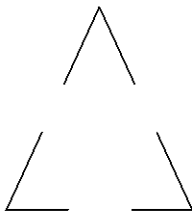


Figure 1. It is quite difficult for the mind to disassociate the three parts of figure on the left, and similarly it is difficult for the mind to see the figure on the right as a square adjoined by two rhombi. Both figures are seen as a whole, or a ‘gestalt’, the mind recognizes a pattern and then fulfills its own expectations of this pattern (Ben-Tzur and Colloms).

“Little research has been done on how music is represented and organized in memory. A related question is the nature of perceptual cues that will be effective in activating the appropriate stored musical representation. Knowledge of such factors should clarify both the nature of processing that must precede access to the repertoire and the internal structure of the repertoire itself. Melodic line and rhythmic pattern are conceived as two relatively independent structural cues for access to the

repertoire.” ... “In songs, music and speech are intrinsically related. Yet, there is now substantial evidence that, in songs, melody and text are perceptually separable.” (Peretz 2000, 532-535).

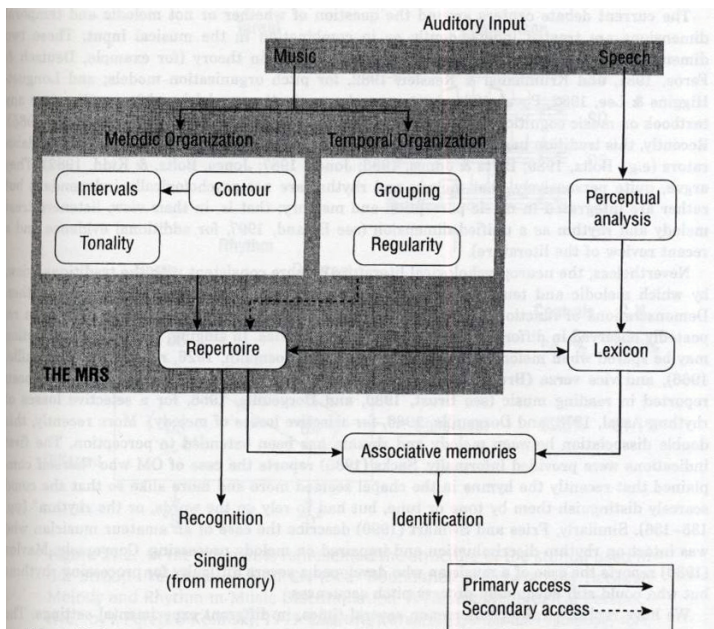


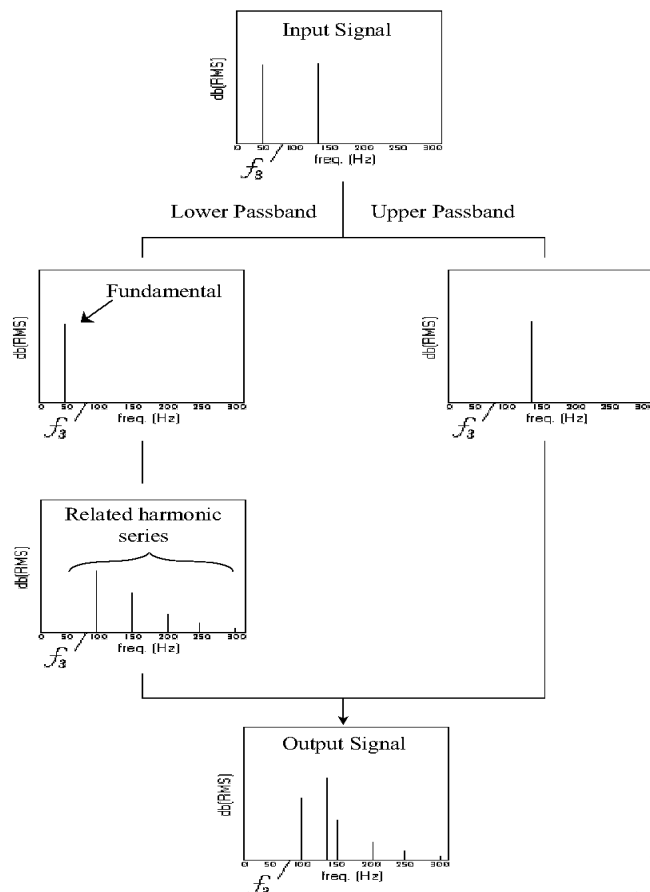
Figure 2. Schema of the Music Recognition System (Peretz 2000,523).

Scientists have been trying to understand sound perception as well as music cognition for many decades. Practical applications such as MP3s, active noise cancellation systems, and low frequency simulations *via missing fundamental phenomenon* emerge from those studies. One may assume that linking the findings of the studies in question and cultural music perception research may help us to understand the role of the cultural differences in music perception better. Thereby, analyzing previous work may help to build a foundation for future research in cultural music perception.

Linking Previous Studies with Cultural Music Perception Analysis

Even after Harvey Fletcher and many other scholars put a lot of work into understanding the missing fundamental concept, the phenomenon is still under investigation. However, there is much evidence to demonstrate the phenomenon. A professional audio signal processing technology developer, *Waves Ltd.*, uses the missing fundamental mechanism to solve real-world problems, recreating the sensation of low frequency sound without the need to cover the whole

Figure 3. Diagram of the MaxxBass algorithm



low frequency range by creating just the upper harmonics of the “missing fundamental”, as seen in MaxxBass plug-in, which is widely used by many sound engineers all around the world (Ben-Tzur and Colloms). Since we know that a combination of specific sounds makes us perceive a sound which is not there, one may assume the opposite; that another combination of sounds may make us not perceive what is actually there.

In view of the gestalt theory, one may assume that the relationships that an individual develops between the perceived qualities of music, such as scale, under the influence of a specific culture, can cause him or her to exclude, manipulate, or ignore some of the components of the whole. The components of a musical piece may not be registered as candidates to create the intended whole in the lexicon of the individual as a result of the effect of the culture in question on *expected perception*. Therefore, an individual from a cultural group may perceive a melody differently because he/ she is not able to register qualities such as melody and rhythm as they lay in the original version. This may be due to the lack of information and expectation regarding qualities provided by the culture in question.

Gestalt theory, the predisposition to see the whole before the parts, has been largely studied by many scholars from many disciplines, including acoustics and audio. Even though there is enough theoretical evidence to argue that a set of musical qualities such as rhythmic values or perceived pitches may make an individual misperceive the consequent ones, there is still not ample research regarding the effects of cultures on sound and/or music perception.

Pitch Perception Relationships

Scale is a prominent distinction between songs from different parts of the world. One may assume that a song is from somewhere around Asia even without any revealing evidence that blows a whistle on it (such as lyrics in Chinese, hearing Sanxian, or recognition of the artist by his/her voice etc.). He/ she may do that just because it is in a diverse scale, which *sounds like* Asia. Furthermore, a Turkish ud (oud) virtuoso would most probably find it hard to memorize the melody of a Puerto Rican song, as an American blues guitar master may not be able to play an old Ottoman classical music partition. When they try to do so, they may realize that it is a little harder than usual, arguably not because of the lack of the skills to perform, but the lack of the ability to perceive it as it is. Moreover, it is common to see that many musicians who live or work abroad for long periods of time start to perform the music of that culture better, which supports the previous proposition.

Diana Deutsch (1974) has proved in one study, that playing a scale simultaneously in both ascending and descending form, (tone from the ascending scale is in the right ear, tone from descending scale is in the left ear, and vice versa) can cause a listener with headphones to hear the higher tones coming from one earphone (in right-handers, it is generally the right ear) and the melody corresponding to the lower tones coming from the other one. She also remarked that some listeners do not hear all the tones. Her research proves that a person can perceive a melody differently under specific circumstances. Consequently, one may suggest that differences between cultures may cause perception circumstances to be unique for each culture, which may cause the members of the same cultural group to have similar perception expectancies.

It is crucial to understand pitch perception in order to comprehend how scale is perceived by individuals. Rasch and Reiner use gestalt Theory to explore why the components (harmonics)

of a complex tone are heard as one perceptual unit (or why all partials fuse into one percept) (1999, 95). They explain that we become familiar with the complex tones of speech signals (both of our own speech and of other speakers) from an early age. Rasch and Reiner claim that we learn that all components point to a single source and start to perceive complex tones as one unit as a result of a perceptual learning process, since it would not be efficient to perceive them all separately. They also remark that the harmonics of a complex tone exhibit common-fate, which supposes that elements with the same moving direction are perceived as a collective or unit as one of the laws of gestalt psychology. The work of Rasch and Reiner supports the idea of a *shared perception expectancies* seen in the members of a socially related group. The aforementioned provides a foundation to develop a theory that explains the reason that members of different cultures have diverse musical tastes and listening habits, with the help of perceptual learning process phenomenon.

Ottoman vs. Western Classical Music

Based on historical precedence, both Ottoman and Western classical music disciplines can be accepted as the reflection of the musical understanding and evolution of each specific culture. Dowling and Harwood (1986, 100) suggest that the precision in using octaves and other logarithmic intervals seems almost universal to all the cultures of the world, even to the extent of agreement on particular kinds of deviation from an exact 2:1 frequency ratio for the octave, which may be accepted as an aspect of music perception, similar in every region of the world. Although, it is very well known that there are still many different musical temperaments being used for different disciplines. Similarity between frequencies of colors and notes in different

music disciplines from various regions may also be an example of the common sense shared by the majority of mankind. Knowing these similarities and differences may provide a good stepping-stone for comparative research regarding cultural perception characteristics. As a starting point, this section will analyze some of the aspects between Ottoman classical Music and Western classical music, as they once have been very popular (and therefore represent musical taste and expectations of the majority of their societies), to gain a better understanding regarding the differences in music perception between two societies: Europeans and Turks.

The music disciplines of European and Turkish cultures have major differences in their composition, instrumentation, and arrangement. Polyphonic melodies are one of the most significant characteristics of Western classical music. On the other hand, Ottoman classical music focuses on a monophonic melody. Thereby, Ottomans specialize in the resolution of the melody itself, while Westerners work mostly on the harmony between different melodies. Ottoman classical music uses different sets of pitch intervals for different scales (makams). The resolution of the pitch is so important that they use numerous notation systems by which the composer is able to represent various special intervals (koma) between two notes, which divide a whole tone into nine. Just four of nine increments are used to generate 57 notes in two octaves (Martinelli, 2001). Fretless instruments played by masters are widely used to perform the exact pitch resolution in addition to the fretted ones. Hence, not only the Turkish musicians, but also the Turkish listeners, become very sensitive to the monophonic melody, and therefore, to the pitch.

The perception of the distinction between instruments may be accepted as not very important in monophonic music. The fact that every instrument plays the same melody leads to

relatively small orchestras automatically. For this reason, one may assume that an Ottoman classical music listener focuses less on the distinction of different frequency bands than Western classical music listener.

Western composers use polyphonic melodies, which create a need for distinction in frequency response for different parts of the same melody. That need leads to larger orchestras and more complex instrumentation. On the other hand, since semitones are used as intervals, the Western classical music listener does not expect to hear more than one interval between two notes, while he or she perceives more than one melody played by different sets of instruments. Therefore, the Western listener tends to focus more on the relationship of the melodies than the relationship of the pitches that create them.

A European listener may perceive (therefore hear) the Ottoman classical music piece quite differently than is intended, since he/ she listens for (or expects to hear) some pleasant polyphonic harmony combinations while disregarding the very subtle monophonic melody variations. On the other hand, a Turkish listener may listen for a main melody and expect detailed pitch change combinations in higher resolution, while ignoring the complex polyphonic melodic structure subconsciously.

In Europe, the need for different instruments for a better polyphonic expression with an improved dynamic range gave birth to instruments such as the harpsichord and the piano, which are not only used as instruments in orchestras but also as tools by which to compose. The lack of these instruments within Ottoman music has caused its listeners, musicians and composers to be ill-acquainted with the European instruments and musical array. At the same time, a Turkish

listener would immediately recognize a fretless instrument, since he or she is familiar with it from Turkish music. On the contrary, in western countries, fretless instruments have never been as popular, which makes the Western listener unfamiliar with their unique sound. In fact, it was a Turkish guitar virtuoso, Erkan Ogur, who built the very first fretless classical guitar, in 1976, as he could not play the fretted one in the Turkish system (Martinelli, 2001).

“Even the Turkish system is not perfect, although it is better adjusted to the real frequencies produced by a string if you divide it in parts and pluck or bow it. The Turkish system is better because the tones move, unlike the so-called the circle of fifths in Western harmony. With natural tuning it does not close, it's not a circle at all. In Turkish music it looks more like an ellipsis, but it still does close, so it's not perfect. It's in the nature of the harmony: on a well-tempered piano, if you play an improvisation on A-minor and you concentrate on the note B, you'll hear it lower than its tempered value of around 485 Hz. Then, if you play an improvisation on C-major you'll hear this B higher. It is your brain, your imagination: you tune your brain differently. Composition and harmony in the well-tempered system cannot reach that. In fact, harmony has a big problem,

and on that point all the musics all over the world have a big problem. We hear what we like, actually!” Erkan Ogur (Martinelli, 2001).



Figure 4. Erkan Ogur

Both Ottoman and Western classical music disciplines use various rhythms in more than one time signature. Even so, simple time signatures dominate in Western music whilst it is not necessarily the fact for Ottoman music. Turks use very complex meters called usuls, which correspond the time signatures of Western music such as 9/8, 11/8 and 13/8. Additionally, there are many conjunct time signatures (birlesik usul) which are formed by combinations of other usuls (Odtu Klasik Turk Muzigi Toplulugu). Thus, Ottoman classical music followers tend to pay presumably more attention to the rhythmical content than Westerners subconsciously.

Generally, classical music has a very large dynamic range in which the audience may find themselves listening to a very soft piece just after a very loud one. Ottoman music has a smaller dynamic range where the listeners rarely hear dramatic changes in loudness. As a consequence, Western listeners would probably be more trained to perceive dramatic changes in dynamics whereas Turkish music lovers may not fully focus on the very first seconds of a very soft partition, which is played immediately following a fortissimo one.

Thereby, a Western listener may find it hard to understand and listen to the Ottoman classical music, as a Turkish listener may find Western classical music difficult to enjoy. The reason would be cultural, personal or both. However, the differing “perception habits” of these two listeners may play a big role in not fully understanding the opposing culture’s music.

Discussion

If we make a diverse group of subjects from various cultures listen to a song from another culture which does not have any representative in the group in question and then ask them to whistle it, odds are they will whistle the same song in very different ways. Not only the scale and

the rhythm, but also the intonation, dynamic range structure, accents and even the time signature may not even be close to the original. Moreover, since we know that performance does not always correspond to what is perceived perfectly, their differences in cognition may be greater than the differences in performances.

Blessner and Salter explain (2007) auditory awareness with three simple concepts: sensation, perception and meaning. They denote that perception is the stage that transforms raw sensation to meaning, which is widely dependent on personal and cultural experiences. As a matter of fact, perceptions are inherently subjective, evanescent, subject to various non-auditory influences within and surrounding the human organism, as Dr. Toole states (2008). Even though many scholars have been doing various research regarding sound perception, there are not enough studies done on the physiological and psychological impacts of music perception in general, most probably because the facts regarding perception are still difficult to observe, measure and evaluate. On the other hand, general opinion about auditory issues tend to be directly related not only to objective measurements and but also to subjective evaluations. According to Dr. Toole (2010), subjective tests play a large role in developments in audio engineering, acoustics, psychoacoustics and therefore, music production.

Despite the advances in neuroscience and psychoacoustics, the factors that may cause differing cultural perceptions of the same program material remain ambiguous. As learning another language from books may not be enough to understand a joke or slang expression, one may need to spend years immersed in that culture to understand it to do so. Even though we have an idea about the psychological and physiological processes of the brain while perceiving music, we also need to understand cultural impact, to form and explore a theory that may exert whether

there is a global effect of shared social values on the perception of music. Further research must be done in music perception and its relationship with cultural diversity in order to achieve a better understanding regarding the subject.

“It is your brain, your imagination: you tune your brain differently.”

Erkan Ogur (Martinelli, 2001)

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