The Psychology of Music:  
An Overview

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by

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Abstract

Relative to other areas of psychology, not a great deal of literature is available on research pertaining or even relating to music. A history of the subfield known as the psychology of music (or music psychology), in particular, does not to my knowledge exist in the form of a single source. Here, I provide an overview of events and concepts that define the study of music psychology.
The Psychology of Music: An Overview

Introduction

Edgard Varèse, an influential French composer of the early 20th century, is quoted as having described music as “organized sound” (Levitin, 2006). Igor Stravinsky was of similar opinion, saying, “tonal elements become music only by virtue of their being organized, and that such organization presupposes a conscious human act” (Storr, 1992). This organization Varèse and Stravinsky tell of takes into account very specific rules (hence the existence of music theory and, in part, musicology)—but even these are not set in stone across time, cultures, or musical styles (Levitin; Révész, 2001; Storr). It follows that we must ask what brings us to see certain arrangements of sounds as “musical,” while others are deemed “noisy,” “atonal” or otherwise unpleasant. In other words, why do we tend to find great beauty and emotion in the operas of Gustav Mahler or in the surf-centric vocal harmonies of the Beach Boys, but not in the Great Dane barking two houses down or in the sounds of a crowded restaurant on a Saturday evening?

Is experimental or avant-garde music such as French musique concrete or that of Yoko Ono “real” music then? I own a vinyl reissue of composer Tony Conrad’s 1969 release Fantastic Glissando, an album nearly an hour in length consisting of little more than static and harsh, incessant electronic ringing. Surely, the average music listener would not like to play the five pieces contained on this album before bed or on the drive to work. Still, there are a great many such as myself who greatly enjoy Tony Conrad and other artists most listeners would find irritating and offensive to their ears. On the other side of the coin, I personally cannot stand Lil Wayne, a rap artist whose popularity allowed him to receive eight Grammy nominations last year, more than any other artist in 2008 (Moody, 2008). The sound of his voice is as grating to me as I presume Tony Conrad would be to most others. Is Lil Wayne any more or less valid an
artist than Tony Conrad? I should think not, but part of the beauty of music lies in the fact that our perception of it is subjective. Still, it remains that the average person is inclined to prefer certain arrangements of sound—those that best follow the aforementioned rules to which I have previously alluded (Levitin, 2006; Storr, 1992). Why is this so?

Furthermore, why is it music—particularly that which is entirely instrumental, as there are no words with which one may make emotional associations—has the ability to make us feel as sad as though a loved one has died one minute and as happy as we would be if all in our lives were perfect only a few songs later? Why does early 1990s hip-hop nearly always move me to dance? How is it the 1965 hit “Get Off of My Cloud” by the Rolling Stones is (much to my chagrin, I should add) so often stuck in my roommate Adam’s head? Hundreds, even thousands of similar questions could easily follow, but the matter of uncovering their answers is something altogether more complicated. Where the aforementioned areas of musicology and music theory intersect with concepts of neurology, various psychologies (particularly cognition), and psychoacoustics, we find what has developed into the present day psychology of music (or, alternately, music psychology). It is thus in music psychology where we begin our hunt for those difficult answers.

In part, the interdisciplinary nature of the psychology of music is what makes the search so arduous. Such a field is inherently broad, often resulting in disagreements regarding various concepts and phenomena—argument over what is known as the “consonance problem,” a topic that will be discussed later, being a prime example (Levitin, 2006; Meyer, 1956; Révész, 2001). At the same time, however, bringing together various approaches and schools of thought to systematic research lends us a greater understanding of how we hear, play (both in terms of
practice and performance), and think about music by providing wealth of varied opinions and a
greater pool of resources from which to work.

Unfortunately, relatively few texts dedicated solely (or at least directly) to music
psychology are in print today. A large percentage of those I have encountered have made their
way in to my personal collection and, thus, have served as invaluable resources in the
formulation of the words found here. Also, it is worth noting that research in the area seems to be
gaining popularity of late, as I have seen relatively accessible texts such as Daniel J. Levitin’s
This is Your Brain on Music and Oliver Sacks’ Musicophilia—both of which come as highly
recommended further reading—find their way into the bestseller sections of bookstores. Neither
of these books, nor any other I have come across has approached the psychology of music from a
historical standpoint. Each treats work in the field on a phenomenological basis, often utilizing
research in this area to explain varying processes or concepts in related fields. This causes one
difficulty in trying to truly get a sense of the psychology of music as a whole, especially in terms
of directional changes and prevailing ideas.

My original intention, then, was to commit myself to a literature review and develop a
brief, accessible introduction to and history of music psychology. I quickly found myself
overwhelmed due to the previously discussed broadness of the topic at hand. Findings regarding
one area of study or another are often decades apart as a result of new research, technological
advances (particularly in terms of brain imaging techniques), and changes in the zeitgeist of not
only psychology, but also of other areas of research related to the psychology of music in
particular. Despite these barriers, I have done my best to provide an overview of important
events and popular concepts in the psychology of music in a manner reasonably accessible to a
lay audience, but thorough enough to be informative for both musicians and those working or studying in the field of psychology.

The Importance and Origins of Music

In the introduction to his *Music and the Mind*, Anthony Storr (1992) writes that people today listen to music more than at any other point in world history. The availability of recordings as well as the prevalence of radio and television (and, I might add, the internet, in the years passed since his authoring the text) have put music in the ears of most in the Western world and a great number of people elsewhere. Also, as Storr notes, past warnings that the advent of recorded music would result in a dramatic decrease in demand for live musical performance were unwarranted, as concerts have remained a major draw for the public. Even with current economic woes unlike those seen since the Great Depression, worldwide concert ticket sales in 2008 were higher than ever before, coming to a total of just under $4 billion (Associated Press, 2008).

Along similar lines, Levitin (2006) writes that Americans spend more of their hard-earned money on music than they do on both prescriptions and sex.

It is also well known that no human culture in historical record has ever been found to lack music in some form or another (Levitin, 2006; Sacks, 2007; Storr, 1992). Furthermore, bone flutes, animal skin drums, and cave paintings depicting what appears to be dance are among the oldest human artifacts thus far unearthed (Levitin). Music was and is, then, an undeniably major part of human life. For the better part of human history, in fact, music performers and listeners have been one and the same. Even for the ancient Greeks, who thought great skill and finesse in the performance of music to be the exclusive domain of professional musicians, instruction in lyre playing as well as singing were educational standards for all citizens (Storr). Only in the last half millennium or so has the divide between performer and listener become so great in the West
With the advent of recordings came opportunities for further commercialization of music, itself leading to greater emphasis on skill and adding in the factor of fame and notoriety for some professional musicians, further setting them apart from everyone else. In other parts of the world, this is simply not the case, as musical performance (as well as dancing, which is, in many languages, defined by the same word as singing) remains as much a part of everyday life as speaking (Levitin).

The average person may not be an expert musical performer, but he or she is most definitely an expert musical listener, even despite a lack of technical, textbook knowledge (Levitin, 2006; Meyer, 1956; Sacks, 2007). In 1996, Daniel Levitin and Perry Cook published a study in which they asked people to sing their favorite songs from memory. Remarkably, the majority of subjects were able to sing within 4% of the songs' respective original tempos (Levitin). Similarly, imagining of music in most people appears to be quite faithful to the original songs, not just in terms of tempo, but also pitch and feeling (Sacks).

Why are we so well tuned then to music listening? Storr (1992) writes that many scholars view the arts as luxuries, not necessities for human existence (hence the fact that music programs are unfortunately among the first to go in American schools when faced with financial troubles). Furthermore, it is thought that they evolved from adaptively useful practices. The visual arts, for example, may have evolved from the wall paintings of our ancestors, which were used for recording purposes and in ritual. Literature is similarly believed to have developed from oral story telling traditions, which was a means of passing on both important information and tradition. Music, on the other hand, is more of an enigma, as it does not appear to serve any necessary purpose. Despite this, there are many (myself included) who cannot imagine existence without music. Like sex and food, music is one of man's great passions, something beloved to
such a degree that famed neurologist and author Oliver Sacks (2007) goes so far as to deem our thirst for it *musicophilia* (hence the title of his book). Sacks also writes that we are no less a musical species than a linguistic one. That theorists often link the origins of music to those of speech is not a surprise then. In fact, arguments regarding just this have been going on for over two hundred years (Sacks; Storr).

Jean-Jacques Rosseau was of the belief that speech and song emerged in tandem, as a sort of singsong speech. William James, on the other hand, thought music nothing more than a coincidence, an accident resulting from the fact that humans can hear (Sacks, 2007). In our own time, the evolutionary psychologist Steven Pinker has expressed similar views, even going so far as to call music “useless” in terms of biological cause and effect (Levitin, 2006; Sacks). Others, past and present, have related the origins of music to bird song (Storr, 1992). According to Storr, Charles Hartshorne, an ornithologist and philosopher, is noted in particular for his claims that birdsong contains such variation in pitch in tempo akin to human music. Hartshorne has also suggested that, because birds often sing far more than is necessary from a biological standpoint, birdsong has evolved from practical use to something done entirely for its own sake. Such has, however, been dismissed for several reasons, namely because birdsong is extremely demanding (and thus is not likely to be produced without serving some purpose) and is so complicated as to be difficult to reproduce (Alcock, 2005; Révész, 2001; Storr). Furthermore, music resembling birdsong has not been found in any past culture, nor has it been discovered in any isolated pre-literate group (Révész; Storr).

The music humans make bears such little resemblance to the sounds of other animals that it is likely entirely unrelated, though interesting parallels to music have been found in gelada monkeys. In particular, geladas utilize varying rhythms, pitches, and accents in unison
vocalization in what appears to be an attempt to resolve emotional tensions between individuals (Storr, 1992).

In disagreement with fellow evolution theorist Herbert Spencer (the man best known for contributing the phrase “survival of the fittest” to the scientific lexicon), who believed song arose from the modulations present in emotional speech, Charles Darwin theorized singing was initially developed as a form of sexual invitation in our nearest predecessors (Levitin, 2006; Sacks, 2007). In response to Spencer, he wrote the following:

Musical tones and rhythms were used by our half-human ancestors, during the season of courtship, when animals of all kinds are excited not only by love, but by strong passions of jealousy, rivalry, and triumph. . . . As we have every reason to suppose that articulate speech is one of the latest, as it is certainly the highest, of the arts acquired by man, and as the instinctive power of producing musical notes and rhythms is developed low down in the animal series, it would be altogether opposed to the principle of evolution, if we were to admit that man’s musical capacity has been developed from the tones used in impassioned speech (Budd, 1992).

Storr (1992) writes of another theory for the origins of music: that it developed from infant babbling. At around one and a half years of age, it has been found that children can intentionally produce specific pitches. After another year, children begin to recognize and learn songs sung by others. It has also been argued, however, that the babbling melodies produced by infants this age have already been conditioned by other music they have heard, thus negating the idea that music actually developed from the act of making these sounds (Storr; Rêvesz, 2001).

Along similar lines, the anthropologist Ellen Dissanayake, theorizes music is born of the verbal exchanges between mothers and their children taking place during the first year of life (Storr).
Here, the most important components of communication are those concerned with expressing emotion, thus incorporating the prosodic elements of speech: stress, pitch, volume, tone of voice, and rhythm, among other things.

Unfortunately, arguments regarding how music came to be must continue, as no theory thus far proposed has provided enough compelling evidence for scholars to comfortably let the issue rest (Levitin, 2006; Storr, 1992; Sacks 2007).

The Birth of Music Psychology

As a subfield of psychology, one might say the psychology of music is still very much in its infancy. At the same time, however, one should recognize that such a notion only applies when we look at music psychology as an organized or official area of psychological study. It is common knowledge even among those not working and studying within the realm of psychology that man had long theorized about the nature of the mind before said field’s “official” birth in 1879 when Wilhelm Wundt founded the first psychology-dedicated laboratory in Leipzig, Germany (Schultz & Schultz, 2008). It would be foolish for one to assume thought and discussion regarding music-related behavior and experience did not occur as well before the actual phrases “music psychology” and “psychology of music” came to be uttered for the first time (Levitin, 2006; Sacks, 2007).

Those familiar with music theory, the history of music, or the work of ancient Greek philosophers have likely encountered much proof of this assertion that the intersection of music and our minds has long been a subject of contemplation. The earliest versions of the diatonic musical scales known as the modes were developed by the ancient Greeks and both Plato and his student Aristotle would come to write of the fact that each of the seven modes tended to evoke
varying emotions in listeners (Aristotle, 2000; Hamilton & Cairns, 2005). Specifically, Aristotle wrote the following in his *Politics*:

The musical modes differ essentially from one another, and those who hear them are differently affected by each. Some of them make men sad and grave like the so-called Mixolydian; others enfeeble the mind, like the relaxed modes; another, again, produces a moderate and settled temper, which appears to be the peculiar effect of the Dorian; the Phrygian inspires enthusiasm (Aristotle, 2000).

Speculation of music, philosophy, and the human mind amongst the great thinkers of ancient Greece was not limited solely to ideas of the effects of what we hear on our mood. An earlier philosopher and mathematician, Pythagoras (who is most famous for the geometric theorem that bears his name) too forwarded the discussion of the nature of music and how we perceive it. He noted the mathematical qualities inherent in musical sounds and attempted to improve the music of his time by proposing that it would be made more pleasing to human ears if ratios and mathematical equations were properly and consistently applied by musicians and composers to their works (Rèvèsz, 2001; Riedwig, 2005).

Later, as truly scientific research was building steam across the world and what had been an offshoot of philosophy was coming nearer to Wundt’s groundbreaking work in Germany, scientists such as the prolific physician, physicist and physiologist Hermann von Helmholtz came to take further steps in the direction of modern auditory science, thus making major contributions to what would become music psychology as well (Levitin, 2006). In 1863, he published his own research (as well as a full literature review) on the physiology of sound and how it is perceived, among other things, in the form of *On the Sensations of Tone* (Schultz & Schultz, 2008). Prior to this, little legitimately scientific work had been done in terms of music
and the mind. It was he who first noted that, when we hear multiple sounds at once (which we
inevitably do in virtually all situations, whether sitting alone in a quiet room or listening to an
orchestra at a concert in a performance hall) unconscious processes are utilized for the grouping
and separation of sounds that, respectively, do and do not go together within whatever context
they may be found (Levitin; Rêvész, 2001). This, of course, is an important concept in terms of
how we hear music, one having to do with recognition of separate instruments and whether or
not we can separate the music we are hearing or listening to from other sounds found in the
environment (Levitin; Rêvész; Schultz & Schultz).

What one might consider the earliest “official” roots of music psychology were formed
not long after Wundt began work at his laboratory in Leipzig. In 1890, the Austrian philosopher
and psychologist Christian von Ehrenfels found himself puzzled by the concept of musical
transposition (Levitin, 2006). Why is it, he wondered, the brain still recognizes a familiar song
for what it is, even if the relative pitch (key), pace (tempo), or timbre (instruments, in terms of
their individual sounds) are changed? For example, the songs on a vinyl record intended to be
played at 33 1/3 RPMs will remain recognizable if played at 45 RPMs. Similarly, I can perform
Beethoven’s Turkish March (Marcia alla turca) on my electric guitar and the average, untrained
listener will still recognize it as the same piece as the one my roommate Billy enjoys practicing
on piano (Levitin). Von Ehrenfels sought to explain these phenomena through the formulation of
Gestalt theory, that is, the idea that the whole is greater than the sum of its parts. Along with Max
Wertheimer (who is often credited with founding the Gestalt movement even though von
Ehrenfels actually introduced the concept itself), Kurt Koffka, and Wolfgang Köhler, among
others, von Ehrenfels worked to find out just why it is that wholes are so different from the sum
of their parts (Levitin; Schultz & Schultz, 2008). As for the initial question of why we
recognized transpositions of familiar songs, such provided for the Gestaltists a perfect example of their theory: although the pieces of such a song (meaning its notes or the nature of those notes) have been changed, the whole they form when put together is still recognizable as the original whole that was made from an entirely different set of pieces. Regarding this, it should be noted that, although the Gestalt school was essentially founded as a result of trying to answer just why this whole and others are greater than the sums of their respective parts, no conclusive answer ever materialized. It is for this reason Gestalt psychology all but died out after its first generation of adherents (Levitin).

Following the work of Gestalt theorists at the turn of the twentieth century, the course of what would become the psychology of music becomes more difficult to track, what with music-related psychological research coming from a variety of sources. For the most part, it seems continued study has largely been focused in the area of cognition and, since technology has become available, neuropsychology (Levitin, 2006; Sacks, 2007).

How We Hear Music

Pitch is measured in cycles of vibration per second. One cycle, that is one movement back and forth of an object before returning to its original position, is deemed one Hertz (Hz). Vibrations constituting these units create sound waves, which increase in pitch with the number of cycles in a second (Rèvèsz, 2001). Humans not afflicted with any sort of hearing loss have a range of hearing from about 20 Hz to 20,000 Hz. Though we can hear sounds across this entire spectrum, the range of our perception of these sounds is not equal. In particular, sounds at both extremes of this continuum are usually heard as less distinct in nature, leading to difficulties telling one tone from another just above or below it (Levitin, 2006). Exposure to high
volume sounds and the process of aging further diminish our ability to hear sounds across the entire range of normal human hearing (Levitin; Révész; Sacks, 2007)

With regards to how we hear music, much research has been directed toward solving what has been deemed the “consonance problem” (Levitin, 2006; Meyer, 1956; Révész, 2001). It is assumed that, in the development of the scales that make up the basis of Western music, intervallic divisions of the octave were chosen to produce the most pleasant sounds possible. When multiple notes are sounded simultaneously, their combination yields varying results, some deemed consonant (pleasant and musical) and others dissonant (harsh and unpleasant) (Révész). As far back as the ancient Greeks, Révész writes that arguments have been fought as to what explains this phenomenon. Prominent figures such as the aforementioned Plato and Pythagoras each offered their own explanations, based mostly in mathematical ratios, but none were adequate in the end. Later, the philosopher Leibniz, Helmholtz, and others developed their own theories, but again to no avail. Even now, a conclusion has yet to be reached (Levitin).

Music and the Brain

As previously mentioned, modern technology has allowed the study of music psychology to move in a heavily neurological direction. Levitin (2006) writes that we have already learned a great deal with regards to what happens in our brain as we listen to, play, read, and compose music. Nearly every area of the brain thus far identified has been implicated in one manner or another as being activated during these processes. The motor cortex and cerebellum, for example, are activated when we tap our feet along with music, as we dance, and when we play an instrument. Listening to music, of course, begins with processing in the auditory cortex, where perception and analysis of tones take place. The nucleus accumbens and amygdala make up the seat of our emotional reactions to the music, which is eventually stored in the memory.
bank of the hippocampus. The creation, violation, and satisfaction of expectations—each of which being crucial for keeping music from getting stale—are determined by the prefrontal cortex (Levitin).

In *Musicophilia*, Oliver Sacks (2007) outlines a number of cases in which music is related to various neurological maladies and anomalies, particularly cases of synesthesia, music-induced seizures, amusia (inabilities to understand, recognize, appreciate, or reproduce musical sounds), and musical savantism. Here as in the work described by Levitin, further breakthroughs in understanding how the music affects the brain are put forward and analyzed. Even so, much more remains to learn than has already been discovered (Levitin, 2006; Sacks).

Music and Culture

As music in the world's various cultures developed for the most part independently, conceptions of musical form and sound are obviously quite different from one place to another, though there are a few constants. For example, the music of every known culture has chosen the octave (an interval created when the frequency ratio between two notes is 2:1 or 1:2) as the basis for its musical system (Levitin, 2006). Similarly, virtually all cultures utilize intervals no smaller than the semitone (or halftone), which is the distance between one key and the next on a piano or one fret and the next on standard fretted instruments such as the guitar or the mandolin, in their music. Middle Eastern music and Indian music, however, are said to use quartertones (a semitone divided in two) (Herriges, 2006). As Western music is most frequently based upon the 12-tone scale, in which the smallest subdivision is the halftone, the quartertone is uncommon. Some instruments, however, such as the orchestral strings (the violin, viola, cello, and double bass), slide brass instruments, some woodwinds, and saxophones allow for the use of
quartertones. Use of these so-called “microtones” is, in most cases, only for the purpose of moving from one note to another, between notes no smaller than the semitone (Levitin).

Scales are simply subsets of note series upon which music is built collected in ascending and descending order (Levitin, 2006; Révész, 2001). For the most part, each culture has developed its scales somewhat arbitrarily or based upon some sort of tradition (Levitin). Herriges (2006), however, explains that Middle Eastern music utilizes not scales, but a more complex system known as the *maqām* to determine melodic structure in music. The *maqām* generates music inherently more melodic than harmonic and which is usually accompanied by a droning tone (which itself may be consistent or modulated, as in Western music).

In traditional Chinese music, the scale we commonly recognize as major pentatonic—which is found regularly in both rock and blues music styles—is used quite frequently, but sounds different due to phrasing and the timbre of the instruments commonly used (Butzen, 2006). An example of such an instrument is the *pipa*, a four-string, teardrop-shaped and fretted lute played by fanning the strings with the backs of one’s fingers (Herriges, 2006). Even on a single instrument, playing methods differ from genre to genre and region to region, resulting in distinct temporal, timbral, melodic, and harmonic differences. For an example, I return to the electric guitar as I have played the instrument personally for nearly a decade now. I grew up playing mostly punk rock and extreme heavy metal on my guitars—two types of rock music defined by high speed, distortion (in this case meaning alteration of the original waveform via amplification to produce a “thick,” sustaining sound rich in overtones), simplicity, and the use of chords commonly made up of only two or three notes. Modern African stylings, commonly referred to collectively as Afro Pop, on the other hand, most often utilize a much more complicated playing style on the same instrument, one incorporating buzzing or rattling, use of
the thumb and index finger to sound notes (as opposed to a plectrum, which is a device used to
sound notes in most modern guitar playing) and extensive use of *legato* techniques (in this case,
sounding notes using the fretting hand via what are known as hammer-ons and pull-offs)
(Herriges, 2006). As opposed to the more abrasive and dissonant sounds of punk and metal, this
music is intensely melodic and upbeat.

Cultural differences in terms of tempo and rhythm are significant as well. Japanese music
often utilizes what is known in Western music as *tempo rubato*, a free time slowing and speeding
of tempo at the discretion of the performer (Herriges, 2006).

The concepts outlined here are important to music psychology in that one must recognize
differences in perception and understanding of just how “organized sound” is to be arranged.
What is “right” to me in the musical sense may not be to a Balinese *gamelan* orchestra performer
or an Indian sitarist.

Conclusion

Presently, few universities offer programs of study in the psychology of music and,
according to Daniel Levitin (2006) there are only about 250 people in the world who pursue what
he describes as “music perception and cognition” as their primary focus in research. In terms of
scholarly journals, I have only been able to find about 10 offering a significant amount of
published research relevant to music psychology. However, given the recent popularity of
Levitin’s *This is Your Brain on Music* (as well as his newest work, 2008’s *The World in Six
Songs: How the Musical Brain Created Human Nature*, which I have personally yet to get my
hands on) and Oliver Sacks’ books (particularly the aforementioned *Musicophilia*), it appears the
systematic study of music and the mind is only now beginning to make noticeable contributions
beyond the realm of academia. With each day that passes, our knowledge of the complex relationships between music and our brains become a bit clearer.

Throughout this expanse of work encompassing not only the psychologies and the study of music, but also neurology and acoustics, among other things is a common thread. That is, the search for answers to our species' biggest questions about music, something we have yet to understand even in terms of its origins and which appears to serve no truly necessary purpose. Why are we so deeply affected by this "useless" creation of ours? Why is it so important to us? In the end, we may never know, or it may even not be important that we discover just why we love music so much. For the time being, however, the psychology of music will allow us to sleep a bit easier knowing we are getting closer each day to understanding one of mankind's greatest love affairs. The "organized sound" of Varèse and Stravinsky, the Beach Boys, Mahler, Lil Wayne, Tony Conrad, and countless others remains a mystery, but oh, what an alluring mystery it truly is we have before us.
References


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