Music, Psychology of

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The psychology of music is a field of scientific inquiry studying the mental operations underlying music listening, music-making, dancing (moving to music), and composing. The field draws from the core disciplines of psychology, cognitive science, and music, and music-related work in the natural, life, and social sciences. The most prominent subdiscipline is music cognition, in which controlled experiments examine how listeners and performers perceive, interpret, and remember various aspects of music.

The field traces its origins to experimentation with musical instruments in ancient Greece and China. Aristoxenus (364–304 BCE) argued that one should study the *mind* of the listener, not merely the collection of sounds impinging on the ear. Descartes, Galileo, and the eighteenth-century French composer Jean-Philippe Rameau, among others, were interested in musical scales and questions of consonance and dissonance (i.e., pleasant/unpleasant sound combinations). In the late 1800s, the German physicists Hermann VON Helmholtz and Gustav Fechner, and the German psychologist Wilhelm Wundt, applied modern scientific methods to study musical experience. The Gestalt psychologists (e.g., Christian von Ehrenfels and Max Wertheimer) asked how a melody retains its identity under transposition, that is, with all component pitch or duration values changed but their relations preserved. In the early twenty-first century, music psychology is experiencing a renaissance, with an exponential increase in scholarly activity over the preceding century (seven hundred papers were published in 2006). This surge of interest follows increasing communication across scholarly disciplines, the emergence of cognitive psychology in the 1960s, and new technologies that facilitate the preservation, presentation, and manipulation of sound (e.g., magnetic tape, hard disks, computers, digital signal processing).

Prominent lines of research include: (1) perception and cognition (e.g., perceptual thresholds—the smallest perceptible differences in pitch, loudness, etc.; memory for musical attributes such as melody, rhythm, timbre, etc; attention and perceptual organization including fusion/separation of voices and instruments); (2) development (how music behaviors change across the life-span), (3) performance, motor planning, and the attainment of expertise, (4) assessment and predictors of musical ability; (5) the role of music in everyday life, (6) disorders of music processing, (7) crosscultural similarities and differences, (8) the impact of music training on nonmusical domains, (9) education (how best to teach music), and (10) the biological and evolutionary basis of music. Scholars in the field have taken increased interest in musical emotion, music-language comparisons, and neural substrates of musical behaviors, the assessment of the latter in particular having been made possible by advances in neuroimaging.

The media-promoted notion that passive exposure to classical music (especially Mozart) enhances intelligence is exaggerated. The original research suffered from inadequate controls, with the effect being attributed to arousal; and equal short-term benefits have been seen from listening to books on tape or performing any mentally stimulating task prior to taking cognitive tests. Modest long-term benefits on academic performance have been linked to systematic or formal music training, perhaps because such training incorporates components of school-based learning. Some studies—and some anesthesiologists—have noted that listening to music reduces pain and stress (probably by distraction effects or by increasing endorphins and dopamine) and increases feelings of well-being and social relatedness.

A central controversy is music's historical and neuroanatomical relationship to language. Some crosscultural similarities in the structure of music (e.g., octaves, scales) and in music processing likely arise from cognitive constraints; these remain to be identified, but cross-species studies are revealing innate constraints.

A long-standing problem affecting public policy (and the distribution of educational opportunities) is how to identify musical aptitude, or the potential to acquire musical expertise.

Some scholars contend that genetic variations primarily underlie musical ability or talent, whereas others dispute this, arguing instead that high levels of music achievement are primarily attributable to the combined effects of motivation and effort. Impediments to progress on this issue include difficulties defining musical talent, quantifying performance for component skills (rhythm, pitch, melody, harmony), and their manifestations in complex domains such as performance, interpretation, and composition.

Much of the neural basis for music perception and cognition remains obscure, particularly at the level of the cerebral cortex. The stability of pitch over large dynamic ranges, how multiple instruments and voices are separated, the creation and violation of musical expectancies, and how melodies are recognized under transposition, remain unsolved.

Comparatively little work has been conducted outside of Western musical contexts. The relation between music and culture, and the evolutionary origins of music, remain relatively understudied. Prominent ongoing inquiries concern the social psychology of music—the influence of peer groups, music and ritual, trance states, and automatic (machine) recognition of music and style; and identifying the neural substrates of musical behaviors.

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