Musical invariants and cognitive invariants in music processing

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Across musical systems, it is possible to search for invariant musical features, such as the use of a limited set of tones and their combination in structured relations. These features might inform us about more general perceptual and cognitive constraints that have led to the construction of these systems. Furthermore, we can take the perspective of the listener being confronted with the system of his/her culture and focus on the cognitive processes that apply to music processing (i.e., the perception of structural relations, the construction of a mental representation). Thanks to the cognitive capacity of implicit learning, listeners acquire knowledge about the musical system of their culture just by mere exposure to musical pieces obeying this system. This implicit knowledge influences the perception of musical structures and allows developing musical expectations for future events. Even if current research in music cognition and neuroscience has a bias to study the processing of Western-tonal music, some studies provide converging evidence for the processing of other musical systems by native listeners. The cognitive processes involved in acquisition and perception of music are reflecting more general cognitive processes that also apply to the processing of other structured systems, such as language. Here, the discussion of musical invariants and of cognitive invariants in musical processing can thus lead to more general questions about brain functioning, notably about domain-specific or domain-general processes (e.g., is music/language special?).

References

Stevens, C. & Byron, T., *Universals in music processing*, in *Oxford Handbook of Music Psychology*, C.T. Hallmam, Editor. 2008, Oxford University Press.

Patel, A. D. (2003). Language, music, syntax and the brain. *Nature Neuroscience, 6*(7), 674-681.

Tillmann, B., Bharucha, J.J. & Bigand, E. (2000). Implicit learning of tonality: a self-organizing approach. Psycholical Review, 107, 885-913.

Special Issue of *Cognition* on Music processing, 2005,vol. *100* (1), in particular:

Trehub, S. E. & Hannon, E. E.: Infant music perception: Domain-general or domain-specific mechanisms?

Jackendoff, R. & Lerdahl, F. The capacity for music: What is it and what is special about?

Bigand, E. & Poulin-Charronnat, B. Are we "experienced listeners"? A review of the musical capacities that do not depend on formal musical training.