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## Book Review

HURON, DAVID. *Sweet Anticipation: Music and the Psychology of Expectation*. The MIT Press 2006, 480 pp., \$24.00 paperback.

Reviewed by Andrea Nolen

Music affects people. But can we measure the effect? Is there a scientific way of analyzing what music does to us? David Huron, of The Ohio State University, offers an empirically-based explanation of how music may impact the listener through the psychology of expectation. His theory marries the study of music, cognitive science, and biological evolution in a way that — potentially — takes some of the subjectivity out of answering: “Why does this music make me feel . . . ?”

Huron’s theory takes off from the fact that eons of natural selection have shaped the way our brains process auditory information. In order to process sound efficiently, our brains respond to sound in ways that can be manipulated by musicians for emotional impact. Huron identifies five expectation-related responses involved in processing music: imagination response, tension response, prediction response, reaction response, and appraisal response (ITPRA).

Each of these responses has an emotional valence. Our anticipation of an event, our preparedness for the event itself, and our subsequent analysis of the event — all of which usually happen unconsciously — are emotionally charged. Nature has predetermined these emotions as incentives for survival: good guesses release endorphins, bad guesses induce stress. But enjoyment isn’t as simple as ‘good’ or ‘bad’; the interplay between our ITPRA responses and their various emotional nuances can result in a range of aggregated responses, from surprise and awe to goose-bumps (*frisson*).

*Sweet Anticipation* is written from a music theorist’s perspective. The first several chapters are an introduction to the aspects of psychology and cognitive science that are relevant from the standpoint of ITPRA theory. The following sections explain how musical structure, tonality, periodicity, and genre relate to what is currently known about emotion, learning, and memory — the tools that our brains use to process information from the outside world. Huron then looks at how musicians employ, e.g., structure and scale degree for emotional effect, with emphasis on how these tools are used in music from different cultures (particularly Balinese music compared

to Western music). He also explores aspects of music that are common across cultures, such as the frequency of interval-occurrence in music from a range of countries.

In presenting his ITPRA theory, Huron provides an excellent overview of scientific literature on music, cognitive science, and psychology, as well as a wealth of statistical analysis of world music. Huron identifies a number of interesting patterns: for example, his statistical analysis of German folk songs composed in major keys shows that the most likely melodic event is a pitch transition from the mediant to the supertonic. Such analyses are intended to support his argument that statistical learning (e.g., expectations that the musical events we have experienced in the past will probably be repeated), along with our attendant emotional responses to uncertainty, guessing, and surprises, can account for much of how music makes us feel.

*Sweet Anticipation* is an excellent book for exposing seasoned music scholars to interdisciplinary ideas relating psychology to music and the arts in general. It is also a good introduction for music students interested in using statistical analysis, or the findings of the brain and cognitive sciences, to enrich their own research. Understanding the ‘how’ of emotional impact is arguably vital to all artists who want to develop their craft.

As Huron is careful to explain in the introduction, ITPRA theory is still a work-in-progress. Cognitive science has the potential to explain a great deal, but scientists’ understanding of the brain is limited, so there are still many unanswered questions. In addition, while expectations are important to understanding how music and emotions are related, expectations are not the only relevant area of study. Two forthcoming books by Huron focus on non-expectation-related emotional experiences of music: one on voice leading (how sounds are perceived when they interact) and another on the question of how sounds are perceived as sad or happy.

Perhaps the most interesting chapter in *Sweet Anticipation* looks at music which is designed to frustrate expectation. Chapter 16, “Expecting the Unexpected,” looks at the ‘modernist turn’ in Western art (very roughly 1910-20), when celebrated composers wrote works that flew in the face of long-established conventions, and whose music is often under-appreciated because of it. Huron provides a statistical analysis of Wagner, Schoenberg, and Stravinsky, focusing on cadence, tonality, and meter, respectively:

“Especially in his later works, Wagner did everything in his power to avoid, disguise, elide, suspend, or delay cadential closure. One might say that he wrote ‘contra-cadential’ music. ... In the case of Schoenberg, this contrarian aesthetic is most evident in his avowed avoidance of tonality. ... Finally, in the case of Stravinsky, the contrarian aesthetic is most evident in his periodic unraveling of meter” (333).

According to Huron, this explains how these three composers’ music can frustrate the typical listener’s culturally- and biologically-conditioned expectations and why their work is more appreciated by professional musicians and musicologists than the general listening public. Huron even make this cheeky suggestion:

“Experienced listeners know what they are getting into, and so are less prone to a sense of disappointment or betrayal when attending a concert of modern music. A cynic might say their expectations are lowered” (349).

The book’s concluding chapter, “A Sense of Future,” provides a point-by-point summary of the information provided earlier, as well as repercussions of ITPRA theory (should it be true) for musicians, musicology, ethnomusicology, music theory and musical aesthetics. Music theory and biology share a similar challenge: form doesn’t necessarily imply function. Because of this, most music scholars stick to analyzing form, rather than speculating about how form affects listeners.

But Huron believes that empirical research methods provide good ways to investigate musical function, as long as researchers bear in mind that the phenomenal experience of music may be different from the notes written on a page or recorded. For instance, one study showed that listeners were better able to detect a single tone among noise if that tone was nearly the same frequency as the tone they were expecting.<sup>1</sup>

Musical aesthetics finds a foundation in natural selection. ITPRA theory challenges the idea that pleasure is something crude, or non-intellectual. Pleasure is how Nature motivates cognitive processes like learning and reflection. Therefore, separating pleasure from ‘intellectual’ enjoyment is as inappropriate as claiming that the canopy of a tree is less vital than its roots. In Huron’s words: “If aesthetic philosophers are genuinely interested in understanding the phenomenon of beauty, they cannot achieve this goal without taking into account the operation of the human brain and its predilection for pleasure” (374).

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<sup>1</sup> G. Z. Greenberg and W. Larkin, “Frequency-response characteristic of auditory observers detecting signals of a single frequency in noise,” *Journal of the Acoustical Society of America* 44 (1968): 1513–1523.