

Book review

Musical thrills and chills

Sweet Anticipation: Music and the Psychology of Expectation by David Huron, MIT Press, 2006. £25.95/US\$40.00 (hbk) (512 pp. ISBN 0-262-08345-0)

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Of all the performing arts, music is the most mysterious. Theatre and dance move us, but mostly through narrative devices. By contrast, music uses only abstract sounds, which are inert in isolation but can, in certain combinations, evoke complex human emotions. Why and how music works its magic on us is the main theme in David Huron's book *Sweet Anticipation*. Huron argues that the emotions we experience when listening to music emerge from the expectancies that are created. He claims that forming expectations is what humans and other animals do to survive; only by predicting the future can we be ready for it. And because the brain ensures that accurate prediction is rewarded, we feel good when we are proved right. The link between prediction and reward causes us to constantly seek out structure and predict how events will unfold. As a temporally evolving texture, music is a super-stimulus for such predictions. The idea that we form expectancies when we listen to music is not new, but only recently have musical expectations been submitted to intense empirical study.

Reactiontime methods show that individuals react to a musical event such as a tone more quickly when the tone is preceded by certain musical events [1]. The generation of expectancies depends on statistical learning. Over the course of our listening history, we internalize the contingencies and relationships that occur most frequently and we build up a library of implicit rules which are brought to bear whenever we hear a piece of music. Modern classical music (e.g. Schoenberg and Stravinsky) might be challenging for Western listeners, more familiar with the music of the classical or romantic periods, because the framework of rules from which it is created are new to them. However, with repeated exposure to this kind of music, listeners can add to their listening library and start to form expectancies from music that was previously alien to them.

Although statistical learning is the generic mechanism by which we form expectations and ultimately from which we derive pleasure from the listening experience, there is much we have still to learn about how this process occurs. For instance, what unit of musical structure does this statistical learning operate on? Does the brain keep track of how often absolute pitches, intervals or higher-order contingencies occur across a lifetime of musical listening? Huron shows that, with careful experimentation, it is possible to determine which features are most relevant to the representation of music in the brain. He also explains that statistical learning is constrained by 'cognitive firewalls': if the implicit rules that are applied to musical listening were an average of all the regularities that have been internalized throughout an individual's listening history, expectations formed when listening to Beethoven would be similar to those formed when listening to Britney Spears – but they are not. Huron

argues that instead we build up parallel families of rules, specific to different musical genres.

Huron's book highlights the extent to which music exists, not in the vibrations of air molecules, but in the patterns we discern from the chaos that reaches our eardrums. And although we might all hear the same music, the structure that each of us perceives is affected considerably by our personal listening histories. A piece of music that is intensely thrilling to one person might leave another cold. Such subjectivity would ring alarm bells for many researchers, but Huron recognizes that any account of how the brain represents music in all its complexity must be able to explain how individual differences arise. Combining his backgrounds in cognitive psychology, musicology and ethnomusicology, Huron shows that the question of how and why music works its magic on us can now be addressed, not only at an abstract or theoretical level, but also with a level of scientific rigour that could not have been anticipated just a few years ago.

Reference

1 Janata, P. and Reisberg, D. (1988) Response-time measures as a means of exploring tonal hierarchies. *Music Percept.* 6, 161–172