

EDITORIAL

SPECIAL ISSUE—MUSIC AND LANGUAGE: 25 YEARS AFTER LERDAHL & JACKENDOFF'S GTTM

“The title of this paper ‘*Cognition and real music: The psychology of music comes of age*’ commits me . . . to identify a precise historical moment which signified the coming of age of our discipline. I have no doubt at all about what this moment was. It was the publication in 1983 of Lerdahl and Jackendoff’s Generative Theory of Tonal Music.”

(Sloboda, 1986, as cited in Sloboda, 2005, p. 102).

The publication of Lerdahl and Jackendoff’s *Generative Theory of Tonal Music* (GTTM) in 1983 represents a landmark in the history of music cognition. Its contribution was to provide a quasi-formal description of the different musical structures that underlie the perception of Western music. It provides an analytical account of four perceptual components concerning grouping structure, metrical structure, time-span reduction, and prolongational reduction. The first two components correspond to perceptual patterns that any listener may experience explicitly. The latter two components describe perceptual phenomena of which it is more difficult to be fully conscious but that stand at the core of Western music cognition and emotion. The plausibility of the rules of the model presented considerable prospects for experimental testing in the discipline. The perception of stylistically relevant musical structures could be approached, thus breaking with a long tradition in experimental psychology of the restricted study of artificial, pseudo-musical sound structures.

As noted by Sloboda (1986, as cited in Sloboda, 2005), the book marked the coming of age of the discipline for at least eight reasons. It was one of the most widely reviewed books in music psychology. It posed the problem of the structure of musical knowledge as its main theme, and was explicit and detailed in offering rules for understanding the perceived importance of each note in an extended piece of music. Although developed for Western music, the book was “universal” in the sense that the rules for Western music were understood as special cases of culture-free rules meant to apply to all music. The book was ambitious in offering a complete theory that could cover most “real” music. It was specific in the sense that it applied structures borrowed from other domains (notably linguistics) specifically to music. The book also was empirically oriented in being based on the musical intuitions of highly trained working musicians.

Because of the considerable impact this book had on the discipline, we were drawn to consider its importance in the domain 25 years after its publication. One of the current issues the book has strongly contributed to developing is the link between music and language. As stated by Sloboda (1986), the book interestingly applied concepts of linguistics to music, but in a *specific way*. This nicely summarizes the intense debate concerning a possible overlap of cognitive and neuronal resources in music and language that has received considerable interest in the cognitive neuroscience of music during the last two decades (see Patel, 2008). The importance of this debate has been marked by several events, notably a special issue of the prestigious journal *Nature Neuroscience*, as well as the financial support from the Human Frontier Science Program to an “interdisciplinary approach to the problem of language and music specificity” (with Mireille Besson, Régine Kolinsky, Isabelle Peretz and Kai Alter as the main investigators).

Thanks to a happy convergence of circumstances, several researchers involved in this line of research were present in France in January, 2008, including Fred Lerdahl, Ray Jackendoff, and Isabelle Peretz. This offered the possibility of organizing in Dijon—Rameau’s native town—an interdisciplinary workshop about the music and language comparison, 25 years after Lerdahl and Jackendoff’s GTTM. The purpose of the workshop was to highlight some of the main issues that had developed on the theme since 1983, and to point out some of the most promising prospective developments that were likely to influence future comparisons between music and language. The workshop was interdisciplinary, with contributors from cognitive psychology, neuroscience, musicology, psycholinguistics, and ethnomusicology. It was unrealistic to address exhaustively all the advances made since 1983 that were directly linked either to the GTTM theory or to the

comparison between music and language. We chose to focus on some challenging past and prospective issues revolving around these issues.

The present special issue of *Music Perception* was derived from this workshop, expressing the main questions that were addressed. Papers were selected and submitted to rigorous review. Lerdahl retraces the genesis of the GTTM project, its link to Chomsky's and Schenker's theories, and its further elaboration in Lerdahl's (2001) *Tonal Pitch Space*. Jackendoff explores parallels between language and music, focusing on the differences between them as well as on those parallels that are shared with other cognitive capacities. Three empirical studies that address the processing of tonal and nontonal structures are then presented. They deal more or less directly with the GTTM and TTPS frameworks. Firmino and colleagues investigate the impact of travel through Tonal Pitch Space on time estimation. Marmel and colleagues report new findings concerning the syntactic-like processing of Western pitch structures, and Lalitte and colleagues compare the perception of tonal and atonal versions of Beethoven sonatas. The direct comparison between music and language is addressed by the next articles. Kolinsky and colleagues analyze the influence of musical expertise on lexical stress processing, and Frey and colleagues study the neurophysiological markers of conceptual priming triggered by short, meaningful musical excerpts. The next article shows that in some cultures one and the same melody can express strongly contrasting emotions, depending on context (Bonini-Baraldi), illustrating the contribution of ethnomusicology to the

comparison of music and language. The next paper by Leman points out the importance music-embodied cognition is likely to have in future research, notably for the music and language comparison. As suggested by Luciano Fadiga during the workshop, music and language may share common resources because both rest on the same motor abilities. Finally, Habib and colleagues develop the implication of the overlap of music and language for reeducation.

The organization of the workshop roughly coincided with the publication of two important books that were directly related to the workshop theme, Patel's (2008) *Music, Language and the Brain*, and Leman's (2007) *Embodied Music Cognition and Mediation Technology*. The reviews of these books by Schön and by Keller and Janata nicely complete this special issue.

We would like to thank all the reviewers who provided very constructive comments to the authors. In addition, we wish to express our appreciation to *Music Perception* and editor Lola L. Cuddy for publishing this special issue commemorating the publication of GTTM.

EMMANUEL BIGAND
Institut Universitaire de France
& Université de Bourgogne

PHILIPPE LALITTE
Université de Bourgogne

W. JAY DOWLING
University of Texas at Dallas

References

- LEMAN, M. (2007). *Embodied music cognition and mediation technology*. Cambridge, MA: MIT Press.
- LERDAHL, F. (2001). *Tonal pitch space*. New York: Oxford University Press.
- LERDAHL, F., & JACKENDOFF, R. (1983). *A generative theory of tonal music*. Cambridge, MA: MIT Press.
- PATEL, A. (2008). *Music, language and the brain*. Oxford: Oxford University Press.
- SLOBODA, J. A. (1986). Cognitive psychology and real music: The psychology of music comes of age. *Psychological Belgica*, 26, 199-219.
- SLOBODA, J. A. (2005). *Exploring the musical mind*. New York: Oxford University Press.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.