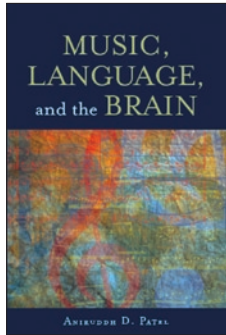


## Exploring music's links to language

**Music, Language, and the Brain**

by Aniruddh D Patel

Oxford University Press, 2008

528 pp, hardcover, \$59.95

ISBN 0195123751

Reviewed by Josh H McDermott

Nearly everyone who has written about music from a scientific perspective has alluded to its possible relationship with language. The superficial resemblance is clear: music and language both combine discrete elements (notes or phonemes) according to rules to yield complex structures. Both faculties are also unique to humans, and both have generated longstanding interest in their origins and brain basis. Many have speculated that language circuitry might have been co-opted for music, whereas others have proposed that music was the evolutionary precursor to language. Demonstrations of links between music and language, or the lack thereof, thus seem likely to clarify fundamental questions surrounding both domains.

Although many make mention of the possible relationship of music and language, Ani Patel is perhaps the foremost proponent of its rigorous empirical investigation. *Music, Language and the Brain* represents the fruit of his labors, surveying the current state of knowledge of the two domains and what they have to do with each other. This book was clearly years in the making, and it is refreshingly careful and thorough. It would have been easy for Patel to simply focus on his own research, as there is plenty of it, but instead he has delved into a wide array of specialist literature, including neuropsychology and neuroimaging, psycholinguistics, psychoacoustics and ethnomusicology. He goes far beyond the usual hit parade of high-profile papers, and even veterans of the field will find much to learn.

The book is organized into chapters that focus on analogous aspects of music and language. The chapter on melody, for instance, considers musical melodies alongside speech intonation. Each chapter contains a survey of the relevant literature, followed by a proposed point of contact between the two domains. Patel is clearly interested in highlighting the similarities between music and language, but also provides clear discussions of the many places where they differ. Here and elsewhere, it is obvious that he has been thinking about these issues for a long time. He acknowledges the stock ideas that one

commonly encounters on these topics, but generally rejects them in favor of his own, more sophisticated perspectives.

Some of the proposed links between music and language concern similarities between the sound patterns in the two domains. It is often said that composers are influenced by the sound of their native language, but Patel's own research is the first to document this empirically. He shows that sound statistics in music and speech (of rhythmic patterns and pitch intervals) covary across countries, suggesting that composers are unconsciously influenced by the sound of their language when creating music. Although this sort of crosstalk is fun and interesting, I am inclined to think that the most significant of the proposed links lie in syntax—the principles governing how musical or linguistic elements are combined. These principles obviously differ in their specifics between the two domains and seem likely to apply to domain-specific representations (words versus chords or notes), but Patel argues that these differences belie common integrative computations. He provides intriguing support for this notion via work showing interference between the processing of linguistic syntactic anomalies and musically inappropriate chords or notes. Such interference does not occur for semantic anomalies in sentences or for other attention-grabbing changes in music, suggesting it is specific to syntax. This sort of work has exciting potential to take music and language analogies past the point of surface resemblance by providing insight into their mechanistic overlap.

One virtue of the book is its acknowledgment of music outside the Western tradition. Most music researchers live in the West and tend to be classically trained musicians; perhaps as a result, music research often deals with the structures of Western music. The book surveys existing research and is thus inevitably slanted somewhat in this direction, but Patel makes efforts to describe other musical traditions wherever possible and notes when Western concepts such as key membership have counterparts elsewhere. Patel also opted to focus on instrumental music, arguing that musical similarities with language are more telling if they occur in the absence of sung speech. Although this choice shifts attention away from vocal genres prevalent in indigenous music, many chapters are complemented by interludes devoted to song. The book also has an associated website with useful sound examples of many of the stimuli mentioned in the text.

Although the obvious contribution of the book lies in focusing attention on the relationships between music and language, it is equally valuable simply as a compendium of the scientific literature on music. Many papers on music appear in dedicated journals that are not widely read outside the field, and this book is a fabulous guide to what can sometimes be an inaccessible body of literature. Although popular books on this subject abound, Patel has provided an up-to-date and authoritative academic treatment; the reference list alone will be a useful resource for students and researchers. If you want to read up on the science of music, look no further. *Music, Language, and the Brain* is an impressive feat of scholarship and comes highly recommended. ■

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