

**Aniruddh D. Patel. *Music, Language, and the Brain*. New York: Oxford UP, 2008. xi - 513 pages. \$89.50 cloth; \$31.00 paper.**

Aniruddh D. Patel's *Music, Language, and the Brain* speculates on the similarities in the cognitive processing of music and language. When appropriate, the book details historical discussion of music-language similarity by historical figures ranging from linguistic representatives such as Rousseau and Wittgenstein to music representatives such as Hugo Riemann and Leonard Bernstein. However, the book is empirical in its methodology and goals and seeks to "advance [music-language studies] from suggestions and analogies to empirical research" (4). Patel does not stray far from the project's major interest, the relationship of ordinary, spoken language to instrumental music, and still the book is too vast to be adequately summarized in this review. *Music, Language, and the Brain* is likely of greatest interest to linguists working in ESL, educational psychology, cognitive empiricism, and sociolinguistics. However, Patel's book is potentially of interest to those working in aural poetics, multimedial rhetoric and semiotics, comparative literature, ethno poetics, cognitive poetics, and empirical reading/writing research in both literary and non-literary discourses.

According to Patel, past neuropsychological evidence has focused on brain-damaged patients and their ability to retain either their music or language function regardless of an impairment to the opposed function. These studies led to theories focused on locality and separation of music-language processes. Thus, the overlap of the cognitive processing has been underdiscussed. Patel "emphasizes commonalities over differences" (4) and orders his chapters in a music-centric progression paralleling the phonetics-to-pragmatics ordering of the linguistic subfields. To his credit, Patel does not overreach when making claims for the cognitive overlap of music and language, and the book creates a practical foundation of existing research and questions to guide continuing research.

Chapter two, "Sound Elements," begins as all chapters do, with an explanation of musical research followed by a comparative analysis with language study. The primary goal of the chapter is to compare music and speech "in terms of the way they organize pitch and timbre" (9). The primary focus is on musical scales and pitch intervals as learned categories, not innate categories. The similarities of music and language are similarly discussed in terms of the cognitive processes that create sound categorization. Readers without a background in music may find some explanations of musical sound categories challenging, although Patel takes practical strides to accommodate these readers. The discussions of music theory in later chapters are more challenging still. Language theorists, however, are not the sole audience. Chapter two's focus foregoes major discussions of syntax and semantics. Of note

is the human need for not a musical scale, but a tonal center, for pitch perception. Also of note are the general hemispheric asymmetries in music (right hemisphere) and language (left hemisphere) whose mapping is much less hemispheric when comparing studies in the melodic contour of music and speech. The chapter includes a convincing recap of musical ability's prediction of L2 variables.

Chapter three, "Rhythm," begins with Patel stating that "although all periodic patterns are rhythmic, not all rhythmic patterns are periodic. . . . Both speech and music are characterized by systematic temporal, accentual, and phrasal patterning. How do these patterns compare? What is their relationship in the mind?" (96). The following discussion of rhythm in music offers evidence from non-Western music to reinforce the idea that rhythm needn't contain periodicity (a beat), with research suggesting that listeners often rely upon the rhythmic values of their own culture when listening to novel, foreign musics. Thus, periodicity as a component of musical rhythm is culture-bound, context-bound, and pragmatically useful for researchers, but the need to account for or search for periodicity may hamper rhythm study in music and language.

Patel opens the discussion of rhythm in speech by defining three approaches: the typological, with interests in the rhythmic similarities of human language ("stress-timed," "syllable-timed," "mora-timed"); the theoretical, which attempts to identify the principles of rhythmic shape (i.e., metrical phonology) and provide formal rules for rhythm in and across languages; the perceptual, which attempts to understand the role that rhythm and rhythmic predictability plays in speech perception. Patel's goal is to add to each of these conversations through comparison with musical rhythm. In language study, the typological approach (Pike, Abercrombie, etc.) has been largely influential in providing a testable hypothesis; however, empirical study has failed to demonstrate that such isochrony exists in speech. A focus on rhythm as a product of language, not on rhythm as an organizational principle, can better explain speech rhythm.

Rhythm in music, however, is an organizing principle. Patel provides a detailed review of the theoretical approaches of linguistic metrical grids. These grids' patterns of prominence do not denote temporal periodicity, and the research is more intuitional than empirical. In linguistic perceptual studies, empirical evidence does not fully support the hypothesis that rhythm and rhythmic expectancy guide attention to semantically important parts of communication. In music, however, rhythm and expectancy provide temporal expectancy. Thus, the history of speech rhythm studies' focus on periodicity and isochrony is not supported by the evidence. Patel offers a host of reasons why periodicity and isochrony are so ubiquitous in

language rhythm study. In this reviewer's opinion, this chapter and later chapters, despite a focus on spoken language, raise issues pertinent to textual studies and methodologies in stylistics, poetics, and related fields, especially those researching motion, emotion, texture, and structure, whether in cognitive or non-cognitive methodologies.

The chapter also offers an interlude, "Rhythm in Poetry and Song." Patel reminds a reader that musical meter involves temporal periodicity, and poetic meter is based upon configurational periodicity. Patel includes empirical research into temporal patterns in poetry, strengthening the temporal profiles of poetic feet and their aesthetic effect in poetry and musical vocal performance. This chapter also empirically delineates truth from folk theory when comparing the similarities of and influence upon one another of language and music in a single culture. While linguistic rhythm appears to influence the rhythms of a culture's music, the connection is not obligatory, is dependent upon a composer's nationalist desires, and is dependant upon historical compositional trends.

Chapter four, "Melody," focuses upon linguistic intonation—"organized pitch patterns at the *postlexical* level" (182)—but discusses tone languages as well. Patel reports that, unlike musical melody, speech intonation is not predicated upon a set of pitch intervals, most likely because of ordinary speech's mix of affective and linguistic intonation. In music, melody is converted from two-dimensional pitch-time relationships into a "rich set of perceived relationships" (190). This chapter provides a list of nine relationships that create musical melodic richness. Discussion of these nine areas includes similarities to speech melody or speech phrasing and promising directions for research in grouping structures, tone intervals, motivic similarity, pitch hierarchies, event hierarchies (requirement vs. ornament), meta-relations, and other related phenomena. The chapter also covers perception of musical melody in the affective, syntactic, and pragmatic domains. An interlude focusing upon musical performance of song lyrics appears again, and Patel theorizes on the influence of speech melody and musical melody upon each other in a single culture, settling on a "direct route" (224) where patterns in one domain (speech) can influence the patterns in another domain (instrumental music), as opposed to indirect theories suggesting a speech-music blend may be required.

Chapter five, "Syntax," begins two consecutive chapters that those working in textual studies may find of interest. The chapter details attempts since the Chomskyan revolution to apply generative grammar to music. Patel notes that major research has overlooked the comparisons of linguistic and musical syntax for two reasons: the lack of musical equivalents to the parts of speech and differences in the structuring of music and linguistic syntactic trees. In absence of cognitive theory,

ethnomusicologists and linguists have been producing assessments of both fields through interdisciplinary methodologies. Patel's interest is again in the overlap of these two syntactic processing systems. The chapter details the history and problems of defining discrete elements and sequences for comparative study. The chapter covers performers' and composers' norms for musical sequences, as well as their options to subvert such sequences in composition for effect. Patel also notes the "lack of syntactic unity in human music" (242) because music is not constrained by information transmission, as language is. Patel argues that meaningful comparison rests upon focusing on a particular period and style of music. Patel chooses Western European tonal music.

Based upon this chosen canon, Patel discusses the reception of unornamented and ornamented familiar musical sequences and finds that longer, ornamented phrases require a familiar ending. Research on the perception of structurally important pitches in music is both hard to assess and lacking, but tonal hierarchies seem evident in musical reception studies. Tension and resolution are also central to a listener's musical perception. Analysis suggests that "the overlap in linguistic and musical syntax is not at the level of representation" (276). Rather, "overlap in the syntactic processing of language and music can thus be conceived of as overlap in the neural areas and operations that provide resources for difficult syntactic integrations" (283). This overlap "predicts that tasks that combine linguistic and musical syntactic integration will show interference between the two" (285). Patel elaborates upon this theory with or applies it to cases in aphasia and studies in linguistic semantics and musical syntax.

Chapter six, "Meaning," tackles semantics and pragmatics. The chapter discusses theories of "sonic logic" that makes musical meaning cross cultures more easily than linguistic communication. This is followed by a taxonomy with eleven types of musical meaning detailing perception of structural relations, motion, tone painting, imagery and narrative, social relations, and a variety of emotional phenomena such as cueing, theories of affective categories, and the evocation of emotion in listeners. Patel suggests that "the relationship of musical meaning to linguistic pragmatics is virtually unexplored," but is also "a promising area for future investigation" (327).

Patel's work in leitmotifs and other narrative devices should interest those in narratology. This section covers affect, activity, "character" development, and time-space relations. Of semantics in general, Patel concludes that music does not contain semantic compositionality, but "the semantic boundary between music and language is not categorical, but graded" (335). Addressing music and linguistic pragmatics, Patel focuses on context and coherence relations. Existing research

has focused on eight coherence relations whose perception is guided by cultural, not internal, relationships. This chapter also contains an interlude of linguistic and musical meaning in song that investigates relationships between lyrical meaning and musical meaning. Patel suggests that emotion is a key link between musical and vocal cues, and the chapter ends with a comparison of neural activity for sonic cues and emotion which are followed by calls for new, variable-dimension paradigms for charting emotional response in addition to an increase on research detailing music-language cross-domain difference.

The final chapter, “Evolution,” discusses a host of issues related to language and natural selection, music and natural selection, and beat-based rhythm processing that will be of interest to many, certainly those working in language acquisition. Patel concludes this dense chapter by claiming that music and evolution is “neither adaptation nor frill” (400). Instead, music is a technology that “as with other transformative technologies, once invented and experienced, . . . becomes virtually impossible to give up” (401). Music is part of “the fabric of our life” and “has the power to change the very structure of our brains” (401).

There is much research included in *Music, Language, and the Brain* that this review cannot contain—research and theory focusing on reading and speech performance, the music-language abilities of the deaf, and the cognitive benefits of music beyond the realm of music. Educators will find this research interesting. The book is most impressive to language and textual studies for two simple reasons. First, it sets a foundation for discussion and research of music-language studies. Second, in doing so, it vets or highlights much of the intuitive, folk psychology of music-language studies and therein offers alternative theories and methodologies for the study of language itself.

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**William Proctor Williams and Craig S. Abbott.** *An Introduction to Bibliographical & Textual Studies*. 4<sup>th</sup> ed. New York: Modern Language Association of America, 2009. 188 pp. \$37.50 cloth; \$17.77 paper.

The first edition of this work appeared in 1985 and ran to 105 pages. The fourth has 188, a fact that is in itself testimony to the willingness of the authors to look critically at their own exposition and the changing times. Although substantially

Fremund (with Anthony Bale) and is engaged in studies of the American manuscript collector Otto Ege and the English collector, John Meade Falkner.

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