Review

Twentieth-Century Music 21/1, 137–141 © The Author(s), 2024. Published by Cambridge University Press
doi: 10.1017/S1478572224000021

Elizabeth Hellmuth Margulis, Psyche Loui, and Deirdre Loughridge (eds.), *The Science-Music Borderlands: Reckoning with the Past and Imagining the Future* (Cambridge, MA: MIT Press, 2023), ISBN: 978-0-26204-764-7 (pb).

Since the late nineteenth century, many scholars have aspired to cross disciplinary borders in studying music. Hermann von Helmholtz's (1821–94) monumental *Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik* (1863) was written as an attempt 'to connect the boundaries of the two sciences, which, although drawn towards each other by many natural affinities, have hitherto remained practically distinct—I mean the boundaries of *physical and physiological acoustics* on the one side, and of *musicology and esthetics* on the other'.[1] Likewise, Carl Stumpf (1848–1936) described his book *Tonpsychologie* (*Tone Psychology*, 1898) as a 'monograph that cuts through the whole academic scholarship diagonally, so to speak'.[2] These pioneers' objectives of aspiring to interdisciplinary work are no longer novel. Today, the field of music studies is inherently diverse, with many publications engaging scholars and authors from diverse fields and disciplines, thus fostering interdisciplinary exchange. Most explicitly, the primary aim of the present journal, *Twentieth-Century Music*, is 'to transcend traditional boundaries within musicology that often keep scholars working in diverse fields apart'. Such multidisciplinary research endeavours to raise the question of whether adequate efforts have been made to foster a mutual understanding of the distinct epistemologies, assumptions, perspectives, and concepts in crossing disciplinary boundaries. *The Science-Music Borderlands* addresses this pressing issue.

Its subtitle, 'Reckoning the Past and Imagining the Future', best articulates the purpose of the book. With the premise that the new possibilities for future collaboration can be generated by a sensitive and critical consideration of the past, the editors identify four key issues, or 'myths', to go beyond in future interdisciplinary music studies. The entire book is organized into four such myths to be overcome, such as 'nature vs. nurture', 'music as a window into the mind', 'reductionism', 'and 'musicians and nonmusicians'. In between sections are three sets of 'interludes'.

1 Hermann von Helmholtz, *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (New York: Dover, 1954), 1.

2 'Eine solche Monographie, welche das Ganze der Wissenschaft gleichsam quer durchschneidet'. Carl Stumpf, *Tonpsychologie* (Leipzig: S. Hirzel, 1883), vol. I, vi.

Section 1 aims to go beyond the nature versus nurture debate that has persisted in various fields, including music research. The first two chapters discuss the emergence of culture including 'music' and its interaction with biological substrates from the complementary perspectives of neuroscience (Chapter 1) and humanity (Chapter 2). Patel's Chapter 1 begins by examining the notions of music and musicality and presents ten concepts to be explored in the interdisciplinary realm of studying the evolution of musicality, thereby presenting a conceptual guide for the entire volume. Chapter 2 presents Tomlinson's 'radical niche construction' model, a semiotic account of musical meaning in transspecies, highlighting the feedback loop between organisms and their environment. His notion of indexical commons among human musicking and other species' behaviours opens up the discussion in the following two chapters on animal musicality by Duengen, Sarfati, and Ravignani (Chapter 3), as well as Mundy (Chapter 4). Mundy's Chapter 4 particularly presents a unique case study in the borderlands, examining the ethical questions of animal research as 'historical artifacts' (107) and providing insights into notions of musicality.

Section 2 consists of studies that go beyond the traditional, narrow notion of the mind. Recognizing that the body plays a crucial role in shaping the mind and that cognitive processes are deeply interconnected with the environment has prompted new research directions in music cognition. The chapters in this section further their research by embracing embodied cognition (De Souza's and Witek's Chapters 6 and 7, respectively), investigating the way infant–environment interactions shape the development of musical behaviours (Kragness, Hannon, and Cirelli's Chapter 8), and reconceptualizing the science of music as the science of 'sound-as-relations', incorporating the author's own research in anthropology and ethnomusicology (Syke's Chapter 9). The section is bookended by a historical case study on nerves and vibration, demonstrating how the fields of history of science, musicology, and neuroscience converge (Raz's Chapter 5) and by research cases in the field of human–machine interfaces (Miranda's Chapter 10).

Section 3 arguably deals with the most conspicuous point of contention in humanistic and scientific approaches: reductionism. The chapters in this section evaluate both reductionist and naturalistic approaches and make suggestions for more experiential approaches to music neuroscience (Williams and Sachs's Chapter 11). Further, they propose complex systems as a framework for future studies, viewing the musical brain as a rich spatiotemporal structure to be considered across a life span (Faber and McIntosh's Chapter 12). The final chapter explores the parallels between artistic and scientific practice from a musician's perspective, presenting insight into alternatives to reductionism in the scientific studies of music (Leslie's Chapter 13).

This pursuit of a more comprehensive understanding of the complex musical experiences and behaviours leads to two interludes that delve into two different borderlands, providing a historical overview of the interplay between empirical and rationalist thinking (Deutsch's Chapter 14) and featuring an interview with the musician and sound artist Pamela Z (Chapter 15). The final section addresses yet another issue that lies at the forefront of the intersection between the sciences and humanities, which deserves critical engagement from diverse perspectives. Comparison between musicians and non-musicians is prevalent

in most scientific music studies. However, dividing people into these two categories may reflect cultural biases and may fail to capture the complexity of their musicality. Once again, this realization illuminates the need for interdisciplinary dialogue to better understand the full spectrum of the human experience. The chapters in this section address the issue from a historical perspective: focusing on the measurement of musicality in the context of the American eugenics movement (Cowan's Chapter 16); critically examining the concepts and problematizing the notions for future research directions (Ilari and Habibi's Chapter 17); and recommending best practices for cross-cultural research in music studies, emphasizing sustainable collaboration practices (Savage et al.'s Chapter 18). The final Chapter 19 comprises an interview with Steven Feld, which advocates for the reintegration of cognitive approaches with ethnography, encouraging research that transcends disciplinary and cultural boundaries.

While the subtitle serves to precisely describe the purpose of the book, which is wonderfully realized throughout the entire volume, the main title of the book, especially the 'science-music borderlands' spatial metaphor, invites further reflections from readers. The book is written with an aim to 'turn attention and energy away from rifts and towards the borderlands' (4), which are defined as the 'contact zone where the generative potential of interaction can be realized' (4). As interdisciplinary scholar Julie Thompson Klein explains, the spatial metaphors in interdisciplinary discourse implying territory, boundary, and domain tend to 'highlight formation and maintenance'.[3] However, despite their strong connotation of spatiality, the borderlands in this book also contain organic and procedural connotations of crossing and interrelating activities. The book originated from a workshop, and Margulis, Loui, and Loughridge, the three editors from different fields of psychology, neuroscience, and music history, skilfully edited the discussions into nineteen chapters written by forty-four contributors. The four sections are prefaced with the editors' introductory remarks, which distinguish the book from other edited collections with similar themes. These carefully prepared remarks set the tone for the subsequent section and establish the focus of the following chapters, situating them within the book as a whole. This can be particularly helpful in interdisciplinary collections, where chapters may vary not only in their methodology and terminology, but also in their style, spanning theoretical chapters, case studies, overviews, interviews, and personal journeys. Additionally, there are many cross-references linking ideas and discussions across different chapters that facilitate readers to navigate the edited collection in their own ways.

The term 'borderlands' in its plural form implies that the intersection of science and music in this book extends beyond that between C. P. Snow's 'two cultures', thus encompassing other dimensions.[4] Some chapters focus on dialogues between 'music-humanities and music-sciences' (e.g., Sykes's Chapter 9) and some explore the borderland between artistic and scientific practices (e.g., Leslie's Chapter 13). Other chapters deal with the interface

3 Julie Thompson Klein, 'A Conceptual Vocabulary of Interdisciplinary Science', in *Practising Interdisciplinarity,* ed. Nico Stehr and Peter Weingart (Toronto: University of Toronto Press, 2000), 9.

4 C. P. Snow, *The Two Cultures and the Scientific Revolution* (Cambridge: Cambridge University Press, 1960).

https://doi.org/10.1017/S1478572224000021 Published online by Cambridge University Press

between rationalistic and empirical thinking (e.g., Deutsch's Chapter 14) as well as the convergence between past and present (e.g., Raz's Chapter 15).

Various interdisciplinary activities take place at these intersections. As can be seen from the many cross-references linking ideas and discussions across different chapters, conversations among scholars with distinct perspectives can often complement each other, helping to situate one's own research in broader contexts. Such an encounter may have to go through the process of confrontation between disparate epistemological frameworks, but only through open communication, acknowledging the difference in conceptual structures, can the convergence be made. In Chapter 17, for example, Beatriz Ilari and Assal Habibi, two researchers specializing in music education and neuroscience, explore the conceptual dichotomy between 'musicians' and 'nonmusicians'. Beginning with an observation on the Westernized concept of musicians, the authors explore different viewpoints on the notions of musicians and nonmusicians from various academic fields, such as education, ethnomusicology, psychology, and neuroscience. From such an examination, converging aspects of musicianship emerge, including the idea of musical potential, continuous development, presentational and participatory music, and self-identification, which, in turn, are examined in developmental music studies. This chapter illuminates the aspects of 'musicians' and 'non-musicians' – the conceptual pair frequently assumed but not critically examined in several scientific investigations on music. The collaboration in this chapter wonderfully exemplifies how interdisciplinary encounters can generate crucial insights into the fundamental basis of music studies.

One concept that cuts across various chapters in the entire volume is the incorporation of more diversity in the research endeavours within the science-music borderlands. Several chapters mention the recent acknowledgement that too much data have been drawn from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies and that, more seriously, they have been taken as the normative reference point for research subjects.[5] While several pioneering cross-cultural studies have been conducted in the past, this more explicit and recent recognition has prompted researchers to engage in theoretical discussions on the challenges of cross-cultural works on music cognition.[6] Chapter 18 (by Savage et al.) proposes a set of best-practice suggestions for establishing sustainable collaborative research networks that go beyond the WEIRD-ness from the viewpoints of 'music studies and the social sciences'. However, the notion of WEIRD itself is a central theme that requires further in-depth consideration from different viewpoints. In fact, a few chapters in this volume contain perceptive and thought-provoking observations and reflections on this point. For example, Kragness et al. (Chapter 8) makes a keen observation on the fact that 'criticizing the weirdness of WEIRD runs the risk of overessentializing and exoticizing the non-WEIRD' (184). Instead of labelling a person's or group's musical culture, a developmental perspective might highlight 'the individual's unique life history of musical experiences and how those past

5 Joseph Henrich, Steven J. Heine, and Ara Norenzayan, 'The Weirdest People in the World?', *Behavioral and Brain Sciences* 33/2–3 (2010), 61–83.

6 See, for example, Nori Jacoby, Elizabeth Hellmuth Margulis, Martin Clayton, Erin Hannon, Henkjan Honing, John Iversen, et al., 'Cross-Cultural Work in Music Cognition: Challenges, Insights, and Recommendations', *Music Perception* 37/3 (2020), 185–95.

https://doi.org/10.1017/S1478572224000021 Published online by Cambridge University Press

experiences shape that listener's current and future musical experiences' (184). Also, as another alternative to WEIRD, Sykes (Chapter 9) introduces the notion of 'WIRED', which refers to societies that are 'white-dominated, [historically] imperialistic, rich, [former or current] empires [that] don't always export democracy' (209) and argues for additional consideration of capitalism. It would have been wonderful to read more about how such insights – from developmental, historical, and cultural perspectives – could be considered in the recent endeavours of global research networks.

Perhaps what we need to move beyond in our research endeavours in the science-music borderlands is not merely the 'overreliance on WEIRD music or musicians' (19). The incorporation of 'non-Western' music, musicians, and systems as the subjects of study constitutes only one of the steps to be taken. Rather, as Savage et al. state in Chapter 18, we need to reflect on how we move 'toward sustained collaborations that include members of diverse societies throughout the world as equal partners in shared research practices and as part of an ecology of knowledge' (348). After all, diverse voices should be allowed 'to affect the experimental designs and interpretative frameworks, or to respond to it interestingly'.[7] In Chapter 14, Diana Deutsch, a pioneering researcher in music cognition, noted the establishment of the International Conference on Music Perception and Cognition (ICMPC) and its first meeting in Kyoto in 1989.[8] The platform for the international collaboration for music cognition study was established in the 'non-Western' part of the globe and preceded the formation of regional societies such as the North American Society for Music Perception and Cognition (SMPC), the European Society for the Cognitive Sciences of Music (ESCOM), and the Asia-Pacific Society for the Cognitive Sciences of Music (APSCOM).

Approaches to the interaction between sciences and humanities are frequently framed and articulated from the viewpoint of the former. For instance, research questions in the sciences must be formulated in 'humanistically informed ways', and understanding in the humanities is foundational to 'good science' (3). However, the interaction at the junction between the humanities and the sciences, or in any 'borderlands', is reciprocal and multifaceted. Hence, the book is highly recommended for all scholars, in both the humanities and the sciences, who are ready to face, probe, and move beyond conceptual, methodological, and institutional rifts in pursuing earnest interdisciplinary collaborations in music studies. It invites researchers to engage in critical reflections on their own methodologies and problematize concepts that were previously accepted without scrutiny.

Youn Kim
younkim@hku.hk

7 Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 144.

8 See also www.icmpc.org/icmpc_history.html (accessed 2 January 2024).

https://doi.org/10.1017/S1478572224000021 Published online by Cambridge University Press