



MUSIC IN EVOLUTION AND EVOLUTION IN MUSIC

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Preface

Is evolution a theory, a system or a hypothesis? It is much more: it is a general condition to which all theories, all hypotheses, all systems must bow and which they must satisfy henceforward if they are to be thinkable and true. Evolution is a light illuminating all facts, a curve that all lines must follow. (Teilhard de Chardin, 2008, p. 219)

This book is not a sequel to my *The memetics of music* (Jan, 2007); if anything, it is a prequel. I wrote *The memetics of music* because I was interested in understanding how Darwinism might operate *within* music, both as process and as product. That is, I tried to consider how a Darwinian perspective might help us to see musical works as the products of myriad replicating particles that can be understood in terms of Richard Dawkins' concept of the meme (Dawkins, 1989); and I tried to frame the various processes attendant upon the generation of music and its cultural-evolutionary change as being motivated by the variation, replication and selection of memes. In this sense, I attempted to develop a model of music that understood it as governed by mechanisms equivalent to those that also operate, on larger scales, in other realms, most notably biology.

In the present book, my field of reference is somewhat wider – indeed, the book covers some topics I deemed outside the scope of *The memetics of music* – although a return visit is made unapologetically to memetics, most significantly in Chapter 3, in order to continue to advocate its merits, to consider recent developments in the field, and to integrate it into the broader context of this study. In a nutshell, I try to consider here all the various ways in which music might relate to, or be amenable to understanding in terms of, Darwin's theory of evolution, in order to see the wider connections between the natural and the cultural. Broadly speaking, this includes seeing music and musicality (human and non-human) in the context of evolutionary theory – *music in evolution* – as a counterpoint to seeing (in the way that memetics

does) evolutionary theory operating in the context of music – *evolution in music*.

The “Universal Darwinism” hypothesised by Dawkins (1983b) and Plotkin (1995) – that is, the extension of Darwinism to realms beyond the biological (§1.5) – is fortified by incorporating music because the reach of Darwinism can, this book argues, readily be demonstrated in a central realm of human culture. Similarly, our understanding of music is deepened by incorporating evolutionary theory because many questions concerning music’s nature can only be fully answered by considering how and why it arose in our species and why it is such a defining attribute of seemingly all human cultures. As the only truly “Universal Acid” (Dennett, 1995, p. 63), Darwinism has the disconcerting tendency to dissolve the boundaries between different phenomena and processes in the world, making music melt into the wider unity of a universe governed by the operation of evolutionary laws and processes.

It is tempting to use the term “evolutionary musicology” (Wallin et al., 2000) to encompass these concerns, provided the second word is not understood too restrictively, and provided that the balance of power between the scientific and the artistic dimensions implicit in the term – C. P. Snow’s “two cultures” (1964) – is broadly equitable. Nevertheless, the way this discipline developed in its initial phase has indeed often privileged the biological dimension over the socio-cultural, to the detriment of a fuller understanding of both.² By taking the synergistic perspective inherent in evolutionary musicology seriously, both domains may be enriched. Indeed, impelled by Wallin (1991) and significantly consolidated by Wallin et al. (2000), a number of recent books have appeared that to some extent balance the scientific and the artistic, including Patel (2008), Fitch (2010), Changizi (2011), Bannan (2012), Schulkin (2013), Honing (2018b) and Spitzer (2021), not to mention several dozen articles. This book attempts to continue this tradition, perhaps ranging more widely than some of its predecessors by covering certain less well explored areas where music and evolution intersect.

² Apropos Snow’s scientific-artistic dualism, it should be stressed that the socio-cultural dimension is not wholly analogous to the artistic, for it is itself amenable to understanding using the scientific method.

Building on ideas proposed by Darwin and others over a century ago, one factor in the growth of evolutionary musicology over the last twenty years has been its insistence that only an interdisciplinary perspective can unpick the complex relationships between music and human nature. Thus, it brings together a range of interlocking disciplines – evolutionary biology, genetics, neuroscience, psychology, archaeomusicology, memetics, zoomusicology and computational creativity – that, in conjunction, afford compelling evidence that music is not a frivolous diversion but something central to our nature and our existence. Indeed, one of the hard claims of evolutionary musicology, and one that I hope comes across strongly in this book, is that antecedents of what we now term “music” helped to drive the evolution of primate vocalisations in ways that underpinned the development of human sociality, language and complex thought: music shaped our societies (and thus our history), it nourished our languages and, most importantly, it structured our minds. Thus, music may be, as Cross (1999) asserts, “the most important thing we ever did”: we have survived and prospered on earth in large part because of the phenomenon of musicality.

From the foregoing it will be clear that the methodology of the book is broadly synoptic, taxonomic, integrative and comparative. This arguably represents the best approach for organising an account of the contributions to the evolutionary understanding of musicality and music afforded by the disciplines listed above, but also for highlighting their overlaps, common concerns and synergies. This is particularly important given that, in many cases, two or more disciplines may often consider the same issue from different standpoints, doing so by means of different vocabularies and methodologies. A synoptic approach also helps to highlight directions for future research, particularly interdisciplinary work. I try to be as scrupulous as possible in referencing the different disciplinary ingredients before mixing them together synergistically, not least in order to allow the reader to follow them up systematically. At times, however, the tone becomes more speculative and, because it is in the nature of many of the ideas considered here that concrete evidence is difficult to find, it follows that such speculations must remain open to future research to verify, or falsify, them. While the book is designed to be accessible to an intelligent general reader, its main constituencies are musicians interested in how scientific ideas can illuminate our understanding

of music; and, perhaps to a lesser extent, scientists interested in how music can exemplify, and help expand, their theories.

Structurally, the book reviews a sequence of interconnected topics in an ordering that is a mixture of the chronological and the conceptual. Chapter 1 outlines the key tenets of evolutionary theory needed to contextualise the rest of the book, focusing particularly on the extensions of Darwin's theory to other domains that have proved fruitful in recent decades, and on which understanding of the ideas presented in subsequent chapters depends. Chapter 2 considers the evolution of human musicality, attempting to understand the role music played in shaping our morphological and cognitive development. Chapter 3 turns to cultural evolution, considering the mechanisms by which the same basic human design plan can have given rise to the rich diversity and complexity of human musics and how cultural evolution and biological evolution interact. Chapter 4 serves in part as a corollary to Chapter 3 in taking a memetic view, not in relation to music itself, but in regard to the discourses surrounding it. Again, a coevolutionary perspective attempts to relate cultural evolution within music to cultural evolution in music-scholarly discourse. Chapter 5 moves the focus partly away from human music, attempting to understand certain animal vocalisations as proto-musical and proto-linguistic, and conceiving them as supporting evidence for the account of human musical/linguistic development offered in Chapter 2. Chapter 6, like Chapter 5, also turns away from human music to consider that generated by computers, this body of AI-generated music posing profound challenges to our understandings of musicality and music. Chapter 7 turns to the thorny question of consciousness, in an attempt to connect it to aspects of the foregoing discussion of music. This is not in order to offer any novel solutions to what is arguably the most intractable of all intellectual problems (spoiler alert: I do not solve the "hard problem" of consciousness). Rather, it attempts to relate the mechanism for the operation of consciousness hypothesised in certain theories (most notably that of Dennett) to the wider perspective on music developed here, in order to reinforce the book's overarching narrative of the power of Universal Darwinism.

Having previewed these chapters, it is important to stress that each one of them could have been expanded into a book-length study in its own

right – indeed, some other studies, including those cited in the paragraph above discussing evolutionary musicology, attempt this, wholly or in part – such is the breadth and depth of the topics covered and the vitality of the research associated with them. From this, it follows that the book – like most others tackling such weighty subjects – is necessarily constrained, and thus several interesting topics have not found their way into it, or have had their discussion curtailed. Examples of the former include formal mathematical models of replicator transmission and the learned song of animals other than the bird and cetacean species considered in Chapter 5; examples of the latter include the narrative of human evolution sketched in Chapter 2, the overviews of music-scholarly literature offered in Chapter 4, and the discussion of consciousness in Chapter 7, to name only a handful.

As will be evident from the foregoing, one important theme running, in various ways, throughout the book, is the relationship between music and language. As a “book within a book”, it is dealt with in each of Chapters 2–7 from various perspectives. Whenever it is discussed, I aim to make the point that the sound patterns of music and those of language are not so dissimilar as to warrant entirely separate consideration; and that the way they are implemented in the brain helps us, in conjunction with other evidence, to reconstruct their evolutionary history and to understand how patterning in both domains acquires syntactic structure and semantic content. In short, because the sounds of music and those of language are in many ways similar phonologically and so tightly connected physiologically and neurobiologically, it is highly likely that they are closely related evolutionarily, even though their subsequent bifurcation – in relation to their common “musilinguistic” ancestor (§2.7.2) – has to some extent obscured their commonalities.

Most of the music examples in this book are drawn from works of the European common-practice period. With this focus inevitably comes a concentration on male-composed musics. This is not in any way to imply that the ideas presented here relate only to this repertoire, or to this sex. Rather, this is simply the music with which I (and, I imagine, many of my readers) will be most familiar. Were I a proper ethnomusicologist, I would have drawn from a range of non-European musics, so there is nothing here that is intrinsically Eurocentric. Indeed, the ideas expressed in this book would be

very much diminished if they were only applicable to a narrow historical and geographical sample of music rather than, as is maintained here, the broad sweep of human cultures. I therefore attempt to stress throughout the universality of the processes underpinning human musicality and music, even though their products are richly diverse.

Steven Jan

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