



The Online Journal of the Society for Music Theory

[Contents](#)[MTO Home](#)[SMT Home](#)[MTO Talk](#)

Volume 3.3:

Anthony Pople*

Review of David Epstein, *Shaping Time: Music, the Brain, and Performance* (New York: Schirmer Books, 1995)

KEYWORDS: Epstein, tempo, motivic analysis, neurophysiology, performance, perception

[1] Most readers of *MTO* will already have encountered David Epstein's *Shaping Time*; many will have dipped into it; a far smaller number, I imagine, will have read it in its entirety. For it is a long book, by no means lacking in repetitiousness, and requiring of the reader several shifts of perspective along the way.

[2] What sort of book is it?--this was a question I found myself constantly trying to address. It has all the appearance of a grand statement, but clearly it is not a "tenure book," since Epstein is well past that stage of his career. It is to some extent a follow-up to Epstein's earlier book *Beyond Orpheus*, in that it pursues in greater depth the ramifications of proportionally related tempos in music. It frequently uses the language of music theory; it includes a cross-cultural study; it presents empirical analysis of performance timings; it draws in ideas from neuropsychology.

[3] All of these ways of working, ways of writing, are used to rationalise musical opinions. Perhaps that should be their true purpose for us all, one which is obscured by their more hermetic pursuit as academic disciplines. But the golden rule of interdisciplinary study--even inter-subdisciplinary study--is that it should satisfy the rigours of both (or all) disciplines involved, and this, so far as I can see, is not what Epstein sets out to do--though it may well be what some will assume he has tried to do.

[4] Essentially, I believe this is a book of advice about how to perform some pieces of music. It's a kind of musical memoir--the ordered reflections of a mature artist who has clear ideas about specific issues of performance and is well able to articulate them. Epstein wants us to know, for example, that when performed with certain proportional tempo relationships in mind, Tchaikovsky's Fourth Symphony achieves a strength of character that stems from the fusion of passion with

structure. In this it is not that distant from music of the German-Viennese heritage. Nor need its guiding pulse serve as a time prison. No one would suggest that this music, with its long romantic lines, its intense heights and depths, be confined in a temporal straightjacket. It needs at many moments and can easily live with an elastic pulse, swelling and contracting as the phrases may dictate. That is a matter of plasticity in tempo. By that fact it need not lose its central temporal unit, however--that basic pulse by which the entire work is held together (pp. 322-3).

[5] This view is not presented, however, as a description of common practice, as an end-product of theoretical distillation from the empirical observation of many performances in which an adherence to proportionally related tempos is found to be a common factor amid many obvious differences. On the contrary, Epstein begins his discussion of the piece by stating outright that "Tchaikovsky deserves better" than the "tradition of expressive excess [which] has dogged this symphony, driving its climaxes to Himalayan heights, its depths to depressive troughs, all the while pushing and pulling its tempos as a means for reaching these extremes" (pp. 308-9). He then goes on to describe in some detail what tempo relations he advocates, relying for the force of his argument on the fact that the rightness of these tempos is true to his experience.

[6] There are many other such examples in the book, covering a range of mainstream concert works, mostly from the nineteenth century. Setting conventional academic criteria aside, I have to say it is among these that I find the most rewarding pages in the book by far. When Epstein is describing what is true to his musical experience I feel I have something to learn. After all, what has any of us beyond our experience? I am happy to encounter performance advice of this caliber.

[7] But the book also attempts, quite sincerely I think, to be a number of other things in addition. There is an encounter with theories of rhythm and meter, which Epstein modestly but properly treats as an "ongoing dialogue" to which he merely contributes; there is an attempt on the basis of cross-cultural evidence to posit tempo proportionality as a musical universal in the Chomskyan sense; there is a continual attempt to account for tempo proportionality in terms of neurophysiology. The very language of the book constantly aligns it, more or less in alternation, with the academic subcultures of music theory and empirical musicology: there are lots of numbers and graphs. This allows him to be by turns elitist and more broadly empirical, but it is in the jostling of these narrative styles that the book becomes uncomfortable. Proportionally related tempo relationships "allow" motivic correspondences to be heard; motivic correspondences "confirm" that the tempos should be proportionally related in performance. (For example, in Mozart's Divertimento, K. 136 (pp. 172-4); his Symphony No. 29 (pp. 174-9)--and these are but the first two examples in a long chapter.)

[8] Epstein bravely steers his boat among the ice floes of composers' metronome markings. He does not attempt to discount the usual caveats about, for example, Beethoven's markings. But in looking for proportional tempos among metronome markings given by a gallery of composers, he seems to overlook the fact that the standard MM numbers in themselves, which were established by Maelzel in the 1820s, embody proportionality almost throughout, in Epstein's terms. Beginning with 40 bpm, the standard metronome compromises between, on the one hand, an "equal tempered" system of increases leading to 80 bpm, and, on the other hand, an orderly succession of integers. Maelzel's standard sequence: 40 42 44 46 48 50 52 54 56 58 60 63 66 69 72 76 80 [84 88 92] has 16 steps between tempo "octaves" related 2:1. If these steps were equally spaced, with adjacent tempos related by a factor of 2 raised to the power of 1/16, the succession would be as follows (to two decimal places): 40.00 41.77 43.62 45.55 47.57 49.67 51.87 54.17 56.57 59.07 61.69 64.42 67.27 70.25 73.36 76.61 80.00 (Compare the logarithmic scale of tempos in Stockhausen's Gruppen.) If simply rounded to integers in the normal way, however, rounding errors would render the resulting sequence irregularly graduated: that is to say, some integer successions a b c would be such that c-b is less than b-a (54 57 59; 62 65 67; 73 77 80). Maelzel's metronome scale, on the other hand, does have the property of being regularly graduated, whilst also remaining in close approximation to the logarithmic scale. One corollary of this approximation is that if a low-integer proportional relationship can be observed between any two "degrees" of the scale then that relationship will hold under "transposition" to other "degrees." For example, the tempo-steps 60 and 40 are related in this way (3:2, or 2:3 in terms of beat lengths). "Transposing" the relationship "up" by one "degree" yields tempos of 63 and 42 bpm--i.e., also in this proportional relationship. Even where precision breaks down--four steps

further along, at 76:50 bpm--the proportion is 3.04 to 2, which is well within the range of tolerance Epstein allows in such matters--accuracy to within 5%, or from time to time a little more. Closer study suggests that only one "interval class" between tempos on the standard scale does not fit this criterion--namely ic2 (e.g. 40:44, 42:46, etc., and its direction-inverse 40:72, etc.). Thus in any score that includes MM numbers taken from the standard scale, whether or not these stem from the composer, low-number proportional tempo relationships, in Epstein's sense, are statistically likely to predominate. (Interestingly, whereas ic1 on the Maelzel scale--on average 4.4%--was presumably heard by the inventor as a noticeable difference, for Epstein it lies within the limits of tempo equivalence.)

[9] The notation of tempo by composers, however, is not the be-all and end-all of Epstein's argument. Indeed, it seems possibly tangential, for in the main he is far more concerned with music as a re-creative than a creative art: with traditions of "commonly heard tempos," with the perception of tempo relationships by listeners and their conception by performers, and with his own ideas of how certain pieces should best go. It may be observed, however, that this is not a strict distinction: in his discussion of *La mer*, Epstein is happy to present Debussy's notated relationship between $q = 116$ at $1/1$ and $e = 116$ at $1/31$ as if it were unarguably a proportional relationship. On paper it certainly is, but as Simon Trezise has shown in his study of the work (Cambridge University Press, 1994), this is a relationship that is scarcely if ever followed, even approximately, in performance: the opening is taken significantly faster than Debussy's metronome marking in all the recorded performances Trezise describes (1994, pp. 29-31).

[10] But elsewhere across his book Epstein accumulates sufficient evidence to convince me, for one, that the study of tempo is essentially a study of performance traditions. If his neurophysiological arguments stand up, then it is in this context--that of the mental processing in time that underpins a performance as it proceeds. The creative act(s) of the composer, and the imaginary performances from which metronome markings are sometimes derived, are a qualitatively different matter, psychologically speaking. As Epstein points out more than once, performance traditions accumulate "right" tempos, together with ways of hearing music based on "right" tempos. I find it instructive that one of his most spectacular results concerns a controlled *ritardando* over the space of half an hour or so, observed in the apparently wholly aural tradition of Himou conducted among the Yanomami people of Venezuela (pp. 445-6). This is doubtless also a long aural tradition; and it is probably no coincidence that Epstein's studies of the concert repertory are centered on works which are sufficiently mainstream--I use this word to describe the constitution of an observable repertory, not to upset musicologists newer than I--for each to be carrying by the 1990s a well developed aural tradition of performance, albeit neither as long nor as wholly aural as that of the Yanomami.

[11] What, then, do composers' metronome markings represent? This is one of the enduring questions on which an encounter with Epstein's book renews perspectives. If the "rightness" of tempos in performance is essentially a matter of aural tradition, what does this imply for today's historically aware performance practices? It would seem that even when a composer is known to have arrived at metronome markings by timing actual performances (of a sort), such markings can aspire to no more than being a point of departure for traditions of performance. But it is a point from which departure is made not once but many times, through a kind of time warp: every performer who works from the score will see those markings, and there will be some kind of interaction between them and the developing aural tradition of "right" tempos. In this sense, the difference between historically aware performances and "normal" performances is one of degree rather than kind. But I imagine I am not alone in finding many historically aware performances exciting because, among other things, they bring what for me are "new" tempos, and perhaps new tempo relationships, to familiar pieces.

[12] The statistical analyses in Epstein's chapter on *rubato* demand careful scrutiny, since his method of determining integral proportions relies on the accuracy to the last decimal place of his timing data for individual beats. Similarly, I find the chapter on *ritardandos* and *accelerandos* interesting musically but in other respects less satisfying than it should be, because the cubic curves to which Epstein, and his co-author for this chapter, Jacob Feldman, claim to find a good fit for their timing data are so imprecisely described. Even their initial abstract presentation of cubic curves (p. 419, especially Ex. 12.1a, which claims to show a simple cubic curve but doesn't, with misleading consequences) is seriously flawed because it is not sufficiently detailed

mathematically. At the other end of the linguistic scale, the book's concluding chapter on "affect and musical motion" (pp. 453-83) is written in a highly flamboyant style, albeit idiosyncratically seasoned with words like "paradigm" and "structural." Reading Epstein's discussion of the opening movement of Mozart's Piano Concerto K. 466 simply forces one to dispense with any music-theoretic linguistic filters--since these overheat rapidly amidst appeals to "darkly colored" chords, to "a sense of the ineffable," and so forth (p. 470). Yet the chapter is musically instructive. Whether it is more instructive than a performance of the work along these lines would be, is a question it may not be fair to ask. Be that as it may, the value of the book lies, for me at least, in Epstein's willingness to invoke music theory and empirical performance studies at length and in detail--though without necessarily seeking to contribute directly to those disciplines or to satisfy professional scholars working within them--in order to convey insights about how music may be better played. I am not sure that this is such a bad thing to have attempted.

[Anthony Pople](#)

Music Department
Lancaster University
Lancaster LA1 4YW
United Kingdom
A.Pople@lancaster.ac.uk

 [Return to Beginning](#)

[Contents](#)

[MTO Home](#)

[SMT Home](#)

[MTO Talk](#)

Copyright Statement

Copyright ?1997 by the Society for Music Theory.

All rights reserved.

[1] Copyrights for individual items published in *Music Theory Online (MTO)* are held by their authors. Items appearing in MTO may be saved and stored in electronic or paper form, and may be shared among individuals for purposes of scholarly research or discussion, but may *not* be republished in any form, electronic or print, without prior, written permission from the author(s), and advance notification of the editors of *MTO*.

[2] Any redistributed form of items published in *MTO* must include the following information in a form appropriate to the medium in which the items are to appear:

This item appeared in *Music Theory Online* in [VOLUME #, ISSUE #] on [DAY/MONTH/YEAR]. It was authored by [FULL NAME, EMAIL ADDRESS], with whose written permission it is reprinted here.

[3] Libraries may archive issues of *MTO* in electronic or paper form for public access so long as each issue is stored in its entirety, and no access fee is charged. Exceptions to these requirements must be approved in writing by the editors of *MTO*, who will act in accordance with the decisions of the Society for Music Theory.

This document and all portions thereof are protected by U.S. and international copyright laws. Material contained herein may be copied and/or distributed for research purposes only.

prepared by
Lee A. Rothfarb, General Editor
5/8/97