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Running head: *HEARING IN TIME: PSYCHOLOGICAL ASPECTS OF METER*

*Hearing in Time: Psychological Aspects of Meter*

By Justin London

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Justin London's book *Hearing in Time* is as provocative as its title. It is articulate on a subject that, due to its temporal nature, we have considerable trouble imagining, and it will certainly help forward the discussion not only on questions of meter but likewise on musical rhythm.

It is still surprising to me that so few books have been written on the subject of musical rhythm in general. The conversations and studies have become much livelier in the last two decades, but most of these are confined to articles, conference presentations, and more informal means of communication. The book format, however, is most appropriate when a researcher wishes to describe an idea, concept, or view that is not well understood, or likely to be misunderstood, and needs considerable explanation. Meter fits this case perfectly, and London has thought sufficiently long and deep about it that a careful reading of the book is very rewarding.

The subtitle gives warning that psychology plays an important part in the book's grounding, and although this is inescapable, given the nature of his argument, it will make the book a bit more of a struggle for those graduate students and researchers in music theory who are not so accustomed to psychological terminology or viewpoints. Taken in isolation, the book may seem too focused on meter to the detriment of a full discussion of rhythm, but those who are aware of London's other work will realize that this is quite a conscious decision. As a result, the book is an excellent and concise, if dense, reference to the whole topic of meter, and if one wants to know more about London's thoughts on rhythm, a look at the New Grove and other articles will suffice (London, 2001, 2002). On the other hand, I do not agree with London that his views and Hasty's (1997) are so incompatible; certainly their styles and references are, but Hasty's insights into why we have tended to think about meter in certain ways, for example, can be helpful in grasping the implications of London's model. However, I am convinced that London's model of entrainment explains much of our experience of musical rhythm--and perhaps at the same time, why music with no beat leaves many 'cold' in the absence of that particular physically involving component. The central thesis of London's book is that meter is intimately connected with the performer's or listener's ability to synchronize with those elements that contribute to the nested hierarchies of meter, for which London uses the term 'entrainment,' a term much more familiar to psychology than to music theory. As he expresses it, entrainment is "the sympathetic resonance of our attention and motor behavior to temporal regularities in the environment," (p. 161) and metric entrainment, a particular sub-type, "allows listeners to synchronize their perception and cognition with musical rhythms as they occur in time" (p. 5).

The insistence on physiological bases as essential to our experience of meter may still be a foreign one to some who are less familiar with music psychology, but it is well-grounded in current research, and has long made intuitive sense to those of us who were skeptical of the association of musical pulse with heartbeat rather than with limb movement, and for whom the idea of music and dance being linked at origin conjures up images of drumming and dancing, reinforced throughout the ages in physical responses to music.

London's book tends to avoid such imagery, but does provide useful visual charts of tempo ranges and their effect on the perception of a metered passage, as well as diagrams to represent two levels of metric hierarchy. In fact, one of the more interesting aspects of Chapter 4 is the referral to several graphic representations of meter, including the evocative 'waves' of Zuckerkandl and the more practical dots representing accented points at different hierarchical levels. London's contribution to this array is a circle diagram representing the cyclic nature of a recurring period, with the sub-periods indicated as numbered dots. He has managed to work out a viable system whereby not only irregular subdivisions of such a circle can be notated--simple enough in itself--but they can be joined together according to a system of well-formedness rules, so that his concepts of meter can be applied to non-Western and 20<sup>th</sup> century music where the beats are not always grouped by constant duple or triple means. This is certainly one of the most appealing aspects of London's model, and is a healthy sign for the field in general, as far too many hypotheses presented in music theory and music psychology in the past decades are applicable only to mainstream Baroque, Classical, and Romantic works. It should be noted, however, that the graphic circles, while very clear for explaining the metric model, are not clearly transferable to an actual score notation, as the time axis is the circle itself, and cannot therefore be placed underneath a musical passage. In addition, although the model is supposed to be applicable to any combination of (adjacent) levels of beat and grouping, it is not completely evident how well the circle diagrams could represent what is normally referred to as hypermeter. (London insists that hypermeter is not a necessary term within his model, as his definition of 'meter' does not presuppose any particular set of levels.)

Another potential of the circle graphs is shown in Chapter 9, "The Many Meters Hypothesis." This chapter is not about polymeters, as I first hoped, but about the variation between different performances which is usually discussed under the term of 'expressive performance.' For these graphs, London uses dotted lines that curve away from and back to the circle to signify one or more expressive performances, while the circle represents the non-expressive, metronomically accurate notated meter. Although the meaning is quite clear, the graphic notation is not ideal, for if one thinks of following the circle around as a temporal act, the dotted lines--which always lie outside the circle--imply that the expressive performance always takes a little more time, which is of course not the case. What is most interesting about this chapter is the hypothesis that listeners (and performers) gather a repertoire of possible variations on metric patterns.

One reason for a careful linear reading of London's book is precisely because his use of the term 'meter' needs to be absorbed fully. In his introductory chapter, he states: "At minimum, a metrical pattern requires a tactus coordinated with one other level of organization" (p. 17), which may assure us that we are on familiar ground. It can then be startling to read that "the lower limit for meter, that is, the shortest interval we can hear or perform as an element of rhythmic figure, is about 100 milliseconds" (p. 27). This is clarified only when one realizes that he is using the term 'meter' to refer to each and all elements of the organization, and not just the tactus and its grouping level. London's usage, and his idea, becomes clearer as he continues:

“Conversely, the upper limit is around 5 to 6 seconds, a limit set by our capacities to hierarchically integrate successive events into a stable pattern... These upper and lower bounds can be regarded as a kind of *temporal envelope* for meter” (p. 27). Thus he introduces a key point of his model, outlined in Chapter 2: “The Upper and Lower Limits of Meter.” A crucial part of his model concerns the primacy of the range of the level of tactus (250-2000 ms), and particularly the salience of the 600 ms period. His explanation of the upper limit of 6 seconds for the temporal envelope is quite straightforward (though for those unused to psychological literature on the subject, it may take some study): given that 2 seconds seems to be the longest period directly perceivable (without intervening information), we can consider it the slowest possible level for a beat, and therefore a grouping of three of them is the slowest grouping period (as in a triple meter at a metronome marking of 40). London is careful to allow for possible flexibility in these boundaries, but insists that the laboratory evidence should not be ignored--a position that I share entirely. I would have enjoyed seeing more reflection on the periodicities in the 2-6 second range--what I have termed the “superpulse” (Mountain, 2001)--as my reading of the research suggests that this, though not so salient as the 600 ms period, has a particular significance in being less subject to expressive variation than lower levels. Chapter 2 concludes with an interesting set of charts of the various possible configurations of meter, with duple and triple groupings and subdivisions, which help illustrate his proposal that shifts of meter will tend to move to adjacent points on the chart, where at least one of the levels needs to be maintained. He also shows clearly how these physiological preferences for a certain range of periodicities can result in different interpretations of a musical passage based on differences in tempi.

In Chapter 6, London reverts to diagrams more familiar to music theorists--at least those involved in rhythmic analysis--to show several instances of what he calls “metric flux” in the first movement of Beethoven’s Fifth Symphony. Here, he focuses on the grouping levels above the tactus, and shows how the listener’s attention is shifted from one grouping level to another. (As a composer, I can confirm that this is a rich area for exploration for those who are interested in learning how to manipulate the listener’s sense of time in a musical work.) It seems slightly out of keeping with the rest of the book that London’s discussion of metric flux did not refer much to works of others in the field, such as Krebs (1999), who have provided numerous examples of this sort; on the other hand, the focus on a single work keeps the discussion clear and focused.

I was very pleased to see a section devoted to “Metric Malleability and Ambiguity,” as the lack of incorporation of ambiguity in Lerdahl and Jackendoff’s (1983) linguistic model for music was for me the fatal flaw in their work on musical rhythm. For example, the ambiguity in the grouping of long patterns of eighth notes in Bach’s unaccompanied violin and cello suites are, I suspect, the reason why these works are favourites of so many performers; they can be reorganized into different pleasing patterns according to different metric schemes at each playing. This is what London means by the term “malleability”: the possibility of a musical phrase to be reinterpreted with a change in meter.

He then introduces the term ‘ambiguity’ for examples that are normally referred to as containing metric dissonance. This for me is London’s weakest section, and it is telling that it comes under the chapter heading “Meter-Rhythm Interactions II: Problems.” As I have trained myself since childhood to be able to listen to and track multiple meters simultaneously, for sheer joy in the experience, I resist London’s claim that this is an impossibility. His argument seems reasonable: since entrainment involves a physical synchronization with the metric pattern, one cannot entrain with two different patterns at the same time. At most, he is willing to concede that

one might track the composite pattern of two dissonant lines. However, my delight with dissonant rhythms often lies in their incompatibility, where attempts to reconcile two strata will not produce any simple metric pattern. I do agree that the tendency is to listen to one or the other, and I think that this may be a necessary step (on first listening, for example). But the visceral effect of trying to follow two strata when they diverge (and the occasional dizziness that results in subtle cases such as those that abound in Ligeti) seems to suggest that it is precisely an entrainment in effect. This could quite possibly be achieved through a 'jumping back and forth' between two different configurations, much as psychology shows that we do in the case of a pitch series in contrapuntal organization.

In any case, this reservation is possibly a minor one, and it might not be necessary to modify the model very much to accommodate it. Moreover, it seems, from London's writing in this particular section that he is leaving the door open a crack for debate, and certainly it is only because he has clarified the issues sufficiently that one can begin to argue the details.

In conclusion, I would say that London's book provides an excellent description of a very apt model for musical meter--not perhaps the reality of meter, which is (as he admits) embedded in each individual work and even in individual performances, but a model that will greatly further our understanding of both meter and rhythm.

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References

- Hasty, C. (1997). *Meter as rhythm*. Oxford: Oxford University Press.
- Krebs, H. (1999). *Fantasy pieces: Metrical dissonance in the music of Robert Schumann*. Oxford: Oxford University Press.
- Lerdahl, F., and Jackendoff, R. (1983). *A generative theory of tonal music*. Cambridge: MIT Press.
- London, J. (2001). Rhythm. In J. Tyrell and S. Sadie (Eds.), *The new grove dictionary of music and musicians*, (2<sup>nd</sup> ed., Vol. 21, pp. 277-309). London: MacMillan.
- London, J. (2002). Rhythm in twentieth-century theory. In T. Christensen (Ed.), *The Cambridge history of Western music theory* (pp. 695-725). Cambridge: Cambridge University Press.
- Mountain, R. (2001, August). *Superpulse: Clarifications, refinements, implications*. Paper presented at the meeting of the Society for Music Perception and Cognition, Kingston, Ontario, Canada.