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Metric Conflict in the Brandenburg Concertos of J. S. Bach

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The paper discusses the factors generating metric conflict, along with its distribution, correlation with other structural parameters, and functional effects. The relationship between metric conflict and fluctuations in the depth of metric hierarchy is examined in detail. Some cases of metric displacement and metric irregularity are examined, when they form part of the context for particular episodes of conflict.

The conclusion argues for an approach to interpreting this and similar repertoires that leaves room for the emergence in performance of the independent metric organization of different parts, as an integral part of the ebb and flow of musical tension.

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METRIC CONFLICT IN

THE BRANDENBURG CONCERTOS

OF J. S. BACH

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CONTENTS:

Chapter 1: Introduction 1

Scope and Intention of the Study • Attribution of Accent • Metric Conflict • The Idea of Metric Hierarchy • Factors Promoting or Undermining Hierarchic Depth • Graphic Presentation

Chapter 2: Patterns of Metric Conflict 43

Projection of Different Groupings • Projection of Different Accentual Locations Within Similar Metric Groupings • Imitation as a Source of Conflict • Metric Conflict in the Absence of Imitation • Complex Textures • Effect of Metric Conflict on the Depth of Metric Hierarchy • Structural Implications of Metric Conflict

Chapter 3: Fluctuation in Depth of Metric Hierarchy 107

Movements Displaying a Moderate to High Degree of Fluctuation • Movements Displaying Limited Fluctuation • Movements Displaying No Fluctuation • Functional Implications of Observed Fluctuations

Chapter 4: Conclusion 133

Implications for Performance • Suggestions for Further Research: Comparative Analysis • Suggestions for Further Research: Empirical Experimentation • Suggestions for Further Research: Non-Western Music

Works Cited 143

Appendix I: Metric Analyses 151

Appendix II: Results of an Informal Experiment in Metric Perception 206

CHAPTER 1: INTRODUCTION

Scope and Intention of the Study

The present study is an examination of metric conflict in the Brandenburg Concertos by J. S. Bach (1685 – 1750). It grows out of a long-standing desire to better understand the mechanisms behind the rhythmic dynamism and suppleness of High Baroque music in general, and to explore the applicability of already-existing concepts of rhythmic and metric structure to a familiar and beloved repertoire that has not yet been systematically examined in this particular way.

I have chosen the Brandenburg Concertos as objects of study because they are perhaps the best-known of all Baroque concertos, admired as iconic of the genre for their perfection. Since they have not been subjected, as a set, to this type of analysis, it is my hope that new insights may be discovered within them.[1]

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[1] There are three book-length studies of the Brandenburg Concertos in English. Norman Carrell's *Bach's "Brandenburg" Concertos* (London: George Allen and Unwin, 1963) focuses mainly on matters of instrumentation, supplemented by detailed descriptive comments about the individual movements. No systematic rhythmic or harmonic analysis is offered, although rhythm is not ignored completely. (A characteristic comment is the description of the imitative horn calls at the beginning of the first movement of concerto No. 1: "The result is rather a jumble rhythmically…" [p. 43]). Malcolm Boyd's *Bach: The Brandenburg Concertos* (Cambridge: Cambridge University Press, 1993) treats the concertos systematically but focuses on sources and origins, instrumentation, and performance traditions. Michael Marrissen's *The Social and Religious Designs of J. S. Bach's Brandenburg Concertos* (Princeton: Princeton Univ. Press, 1995) also delves into questions of instrumentation as well as of topic, and the

Many authors have noted that the Brandenburg Concertos may not have been intended by Bach as a set, and indeed that they may have been composed at different points over an unknown period of time before they were collected by Bach into one manuscript for presentation to the Margrave of Brandenburg.[2] This uncertainty does not make them inappropriate for collective examination. Their very diversity makes them, as a group, a more interesting object of examination for this study. They represent a variety of approaches to the problem of composing a Baroque concerto, and thus potentially offer a variety of structures for analysis.

Attribution of Accent

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symbolic meanings they convey, finding that Bach subverts the usual hierarchy of social status in the Baroque orchestra by elevating the role of *ripienists* and undermining that of elite soloists, with the religiously-inspired intention of demonstrating the vanity of worldly values. Abraham Veinus's *The Concerto* (rev. ed., New York: Dover Publications, 1964) treats the Brandenburgs only cursorily, as do Pipa Drummond's *The German Concerto: Five Eighteenth-Century Studies* (Oxford: Oxford University Press, 1980) and Ralph Hill, ed., *The Concerto* (London: Penguin Books, 1952). The concertos are scrutinized in Hugo Leichentritt's *Musical Form* (Cambridge, MA: Harvard University Press, 1959), but the analyses are very brief, focusing on formal classification of sections.

Three book-length studies of the Brandenburg Concertos have been published in German. Elke Lang-Becker's *Johann Sebastian Bach: Die Brandenburgishcen Konzerte* (Munich: Wilhelm Fink, 1990) examines matters of style, analyzing how Bach articulated the *concertante* principle in each piece. Peter Schleuning's *Johann Sebastian Bach: Die Brandenburgishcen Konzerte* (Kassel: Barenreiter, 2003) is a work of historical musicology rather than analysis. Hasso Gottfried Petri's *Das Motiv als formbildende Kraft der inneren und äußeren Gestalt des musikalischen Kunstwerkes: Dargestellt an den Sechs Brandenburgischen Konzerten Johann Sebastian Bachs* (Frankfurt: Hänsel-hohenhausen, 2004) is a study of motivic-thematic structure in the Brandenburgs.

Numerous articles and book chapters are devoted to one or another of the Brandenburg Concertos, without examining the entire set. The only book-length studies of meter or rhythm in Baroque music are Mauro Botelho's *Rhythm, Meter, and Phrase: Temporal Structures in Johann Sebastian Bach's Concertos* (Ph.D. dissertation, University of Michigan, 1993), in which he analyzes only three concerto movements, one of which is the first movement of the third Brandenburg; and Channan Willner's *Durational Pacing in Händel's Instrumental Works: The Nature of Temporality in the Music of the High Baroque* (Ph.D. Dissertation, City University of New York, 2005), in which he analyzes orchestral and keyboard music by Handel and also pieces by François Couperin, but not the music of Bach.

[2] E.g. Boyd, pp. 11–15.

A study of metric structure is essentially a study of the distribution of metric accent. Metric accent is indicated ostensibly by the metric component of music notation, including meter signatures, barlines, and beams, but writers on rhythmic and metric theory have often observed that the true metric structure of music may at times be at odds with notation.[3] In fact, even such traditional, common-practice repertoire as the Brandenburg Concertos embody a level of metric variability that traditional notation is not suited to express.[4] Wallace Berry is an example of an author who has argued strongly for such a flexible reading of meter: "It is fundamental that meter is often independent of the notated bar-line, so that a necessary question in all analysis of meter is: Are the determinants of metric grouping in accord with the notated bar-line, and if not what is the 'real meter?' "[5] To answer such a question the analyst must have a way detecting the presence of metric units when they diverge from the notation. In effect, the analyst must have a system for attributing accent to some beats and not others.

According to the "generative" model of musical perception, drawing on ideas developed by Noam Chomsky and others about how language is understood, listeners perceive metric units intuitively. This intuition represents the unconscious application of a system of rules previously internalized by the listener, who is then described as an

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[3] In this paper I follow Wallace Berry in using the more accurate term "meter signature" instead of the traditionally accepted term "time signature." See for example Berry, p. 319*n*.

[4] The most common type of variability may be the kind of displacement that leads to the phenomenon known as "mid-bar downbeat." Charles Burkhart has examined this phenomenon in Bach's keyboard music. See Charles Burkhart, "Mid-Bar Downbeat in Bach's Keyboard Music," *Journal of Music Theory Pedagogy*, Vol. 9 (1994), pp. 3–26.

[5] Wallace Berry, *Structural Functions in Music* (Englewood Cliffs, NJ: Prentice-Hall, 1976), p. 324.

"experienced" listener.[6] The music theorist is not immune to this intuition of structure; indeed, to be valid, any analytical application of theoretical rules must necessarily be supported by the subjective experience of actual music. That said, a theoretical framework for analysis is equally necessary, in order to support the most objective possible results and to shed light in ambiguous cases.

Attribution of accent in this study will be made according to the rules elaborated by Fred Lerdahl and Ray Jackendoff in *A Generative Theory of Tonal Music* (1983), which is intended as a formal description of the intuitions of an "experienced" listener to common-practice tonal music. Lerdahl and Jackendoff propose "Metric Well-Formedness Rules" that establish the basic grammar of accentual organization by defining what structures are acceptable to such a listener, and "Metric Preference Rules" that help the listener evaluate different possible well-formed interpretations of raw perceptual data and to choose one over others as more likely or preferable.[7]

Lerdahl and Jackendoff's theory also incorporates analogous sets of Well-Formedness Rules and Preference Rules for other aspects of musical organization, designated as "grouping structure," "time-span reduction," and "prolongational reduction." However, since this study concentrates on metric structure, the metric rules will be the most important.

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[6] Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge [MA], London: MIT Press, 1983), pp. 1, 3, 5.

[7] For a full presentation of these rules see Lerdahl and Jackendoff, Chapt. 4.

Metric Well-Formedness Rules

The Well-Formedness rules will be experienced by most musicians as self-evident. There are four, and for a structure to be considered well-formed, all four must be satisfied:

Well-Formedness Rule 1: "Every attack point must be associated with a beat at the smallest metrical level present at that point in the piece."[8] This rule establishes the relationship between beats and attacks by specifying that every attack has metric status on some level, however low.

Well-Formedness Rule 2: "Every beat at a given level must also be a beat at all smaller levels present at that point in the piece."[9] This rule establishes the hierarchical relationship between levels.

Well-Formedness Rule 3: "At each metrical level, strong beats are spaced either two or three beats apart."[10] This is the Well-Formedness Rule that has the most relevance to practical analytical choices, because it establishes that basic metric groupings consist of only two or three beats.[11]

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[8] Lerdahl and Jackendoff, p. 72.

[9] ibid.

[10] Lerdahl and Jackendoff, p. 69.

[11] Some theorists, such as Riemann, have asserted that quadruple groupings, and even quintuple and septuple groupings, are basic and not aggregated out of smaller groupings; see for example Maury Yeston, *The Stratification of Musical Rhythm* (New Haven and London: Yale University Press, 1976), p. 26. This approach is still reflected today in the tendency of some contemporary theorists to concentrate on the presence of four-bar hypermeter without ever noting that this cannot exist without an underlying level of two-bar hypermeter; e.g. William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer Books, 1989), pp. 97, 269; Edward Cone, *Musical Form and Musical Performance* (New York: W. W. Norton, 1968), p. 79; Harald Krebs, *Fantasy Pieces: Metrical Dissonance in the Music of Robert Schumann* (New York: Oxford University Press, 1999), p. 215.

Well-Formedness Rule 4: "The tactus and immediately larger metric levels must consist of beats equally spaced throughout the piece. At subtactus metrical levels, weak beats must be equally spaced between the surrounding strong beats."[12] This rule is constructed so as to indicate that at higher hypermetric levels a greater degree of irregularity is acceptable.[13]

Metric Preference Rules

Lerdahl and Jackendoff's Preference Rules are more numerous than their Well-Formedness Rules; they are also in a way more central to analytical decisions than the Well-Formedness Rules, because they allow the analyst to choose at least somewhat objectively between different acceptable interpretations, some of which may be very closely equal in their plausibility. They also differ from the Well-Formedness Rules in that they often come into conflict with one another in analytical application. In these cases one rule may sometimes be strong enough to overrule another. However, they are not hierarchically related, and the authors decline to approach their weighting relative to one another formulaically. As Lehrdahl and Jackendoff write: "The reason that the rules fail to produce a definitive analysis is that we have not completely characterized what

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[12] Lerdahl and Jackendoff, p. 72.

[13] Even on the level of the notated measure, however, exceptions exist. Hemiola in triple meter is probably the most common and obvious of these exceptions in the Brandenburg Concertos. I also hold to Jonathan Kramer's assertion that "equally spaced" must be understood in terms of an equal number of elapsed beats on the next lower level, so that irregularity on one level may be subsumed into regularity on the next higher level. Kramer rejects Metric Preference Rule 4 on the basis of this assertion, but it seems to me that the two are not incompatible if one simply accepts Kramer's definition of "equally spaced" and applies it to Lerdahl and Jackendoff's formulation. (For a fuller discussion of this point, see Jonathan D. Kramer, *The Time of Music* [New York: Schirmer Books, 1988], pp. 98–102, 108.) This rule is also subject to the exceptions represented by "transformation operations" that result in metric "deletion" (See Lerdahl and Jackendoff, pp. 101–104).

happens when two of the rules come into conflict. Sometimes the outcome is a vague or ambiguous intuition; sometimes one rule overrides the other, resulting in an unambiguous judgment anyway….Our theory cannot provide a computable procedure for determining musical analyses."[14] Lerdahl and Jackendoff stress "the need for preference rules to balance local and global considerations."[15] Their own analyses of complex passages show careful attention to the strength of local application of each rule in every case.[16]

While the reader is encouraged to refer to Lerdahl and Jackendoff for a full presentation of these rules, those I have found most important in their application to analysis of the Brandenburg Concertos are listed below.

Preference Rule 1: "Where two or more groups or parts of groups can be construed as parallel, they preferably receive parallel metric structure."[17] This rule asserts that material heard more than once in a piece, even when it is subject to a certain amount of variation, tends to be heard in the context of the same metric organization every time it is heard.

Preference Rule 5: "Prefer a structure in which relatively strong beats occur at the inception of either

a. a relatively long pitch-event,

b. a relatively long duration of a dynamic,

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[14] Lerdahl and Jackendoff, pp. 54–55. These statements are made in the context of the presentation of Grouping Preference Rules, but apply equally to the Metric Preference Rules, as the authors make clear on p. 85.

[15] ibid.

[16] See, for example, Lerdahl and Jackendoff, pp. 90–96.

[17] Lerdahl and Jackendoff, p. 75.

c. a relatively long slur,

d. a relatively long pattern of articulation,

e. a relatively long duration of a pitch in the relevant levels of the time-span reduction, or

f. a relatively long duration of a harmony in the relevant levels of the time-span reduction."[18]

This rule describes what is commonly referred to as "durational accent," while also demonstrating the suppleness with which such an idea must be applied.[19] Of its several cases 5f is considered by Lerdahl and Jackendoff to have the strongest effect; indeed many, if not most, cases of metric irregularity are determined on the basis of harmonic rhythm alone.[20] However in the absence of harmonic motion, as for instance at the beginning of the first movement of Concerto No. 6, other factors such as the duration of a single note or some other parameter may be decisive.

In addition to cases (a) through (f) of Metric Preference Rule 5, as described above by Lerdahl and Jackendoff, I wish to propose a seventh case of Preference Rule 5, as follows: "5g: a relatively long duration of a texture." This is to acknowledge the phenomenon of "textural accent," which can have a significant impact, especially in a

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[18] Lerdahl and Jackendoff, p. 84.

[19] See for example Joel Lester, *The Rhythms of Tonal Music* (Carbondale and Edwardsville, IL: Southern Illinois University Press, 1986), p. 18.

[20] Lerdahl and Jackendoff, p. 84. Lester corroborates this observation. See Lester, p. 21.

genre like the Baroque *concerto grosso* that depends to a high degree on textural contrast for its effect.[21]

Preference Rule 6: "Prefer a metrically stable bass."[22] This rule expresses the observation that bass attacks are endowed with greater metrical prominence. The lower the register in which such attacks appear, the greater their metric significance. This rule argues against a syncopated or metrically irregular interpretation of melodic material when it appears in the bass, and also accords special metric salience to isolated bass notes.

Preference Rule 7: "Strongly prefer a metrical structure in which cadences are metrically stable; that is, strongly avoid violations of local metrical rules within cadences."[23] This rule expresses the tendency of cadences to be metrically straightforward. The most significant aspect of this rule may be that it makes no statement as to whether to interpret a cadence as weak-strong ["masculine"] or strong-weak ["feminine"].

Metric Conflict

This study describes general patterns and specific cases of metric conflict as it appears in the repertoire under examination. I will examine both causes and effects of

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[21] This is also corroborated by Lester. See Lester, pp. 28, 55.

[22] Lerdahl and Jackendoff, p. 88.

[23] Lerdahl and Jackendoff, pp. 88–89.

metric conflict, and make observations about how it operates in the service of musical form and coherence.

A Working Definition: Incompatible Metric Organizations

Our working definition of metric conflict will be the presence of *different elements in a musical texture projecting mutually incompatible metric organizations.* Lerdahl and Jackendoff represent such a situation in their formal system by the conflict between preference rules mentioned above. They describe as "archetypal" a pattern of organization where preference rules reinforce each other maximally, while conflicts among these rules generate deviations from archetypal patterns.[24] It is these conflicts that interest us.

Many authors refer to the same phenomenon as "metric dissonance."[25] My choice of "metric conflict" over "metric dissonance" is intended to help avoid any possible conflation between this phenomenon and the entirely separate one of harmonic dissonance, but should not be interpreted as a criticism of those authors (notably Krebs) who choose the other term.[26]

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[24] Lerdahl and Jackendoff, p. 288ff. The authors here refer both to mutual reinforcement between Preference Rules for different 'components' of structure (such as metric and grouping structure), and to mutual reinforcement between various Preference Rules for the same component.

[25] See, for example, the title of Krebs' important analytical work, *Fantasy Pieces: Metrical Dissonance in the Music of Robert Schumann*; also Justin London, *Hearing in Time: Psychological Aspects of Musical Meter* (Oxford, New York: Oxford University Press, 2004), p. 81; the title of an article by Mark Butler, "Turning the Beat Around: Reinterpretation, Metric Dissonance, and Asymmetry in Electronic Dance Music," *Music Theory Online,* vol. 7, no. 6 (Dec. 2001); and Floyd Grave, "Metrical Displacement and the Compound Measure in Eighteenth-Century Theory and Practice," *Theoria*, vol. 1 (1985), p. 31.

The Idea of Metric Hierarchy

Lerdahl and Jackendoff's Metric Well-Formedness Rules all refer to metric "levels." In this, they embody a basic assumption about the organization of meter. This view sees metric organization as recursive: the patterns of organization discernible in the formation of large units out of small units are reflected again in the formation out of these of still larger units. This occurs both on very local levels within the notated measure, and on much larger levels where measures function analogously to beats in the formation of longer metric units.

The structure that emerges from such a model is organized according to hierarchically related levels; thus we may speak of a "metric hierarchy." Because the hierarchic model of metric organization is of relatively recent origin, it may be useful to review the perspectives of the authors whose influence has most shaped the present study. The following review is arranged, with some exceptions, according to the chronological order of the appearance of some of these authors' principal works.

Heinrich Schenker

The ideas of the 20th-century theorist Heinrich Schenker form part of the context of any discussion of hierarchic metric structure, as he is the individual most identified with the idea that musical structure exists on hierarchically related levels. Although Schenker

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[26] Berlioz may have been the first to use the term "dissonance" in reference to temporal phenomena; see Krebs, p. 13*n*. Wallace Berry prefers "asymmetry" and "non-congruity," which he uses more or less interchangeably. See Berry, p. 364.

did not entirely neglect rhythm in his theoretical writings, he is much more closely identified with his theory of hierarchical voice-leading structures.[27] His ideas about structure have become so influential in the English music-theoretical literature since the middle of the twentieth century that Schenkerian terms such as "foreground" and "middleground" permeate discussion of rhythm and meter, without authors feeling the need to define them for the reader.[28] Schenker observes, in chapter 4 of *Der Freie Satz,* that duple metric organization predominates over triple in Western music, even attributing this preference to a biological basis: "Since the principle of systole and diastole is inherent in our very being, metric ordering in units of two and its multiples is the most natural to us."[29]

Edward Cone

The concept of metric organization on large structural levels is often referenced by the term "hypermeter." This word was coined by Edward Cone in his 1968 book, *Musical*

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[27] For a critical discussion of Schenker's writings on rhythm, see William Rothstein, *Rhythm and the Theory of Structural Levels (*Ph.D. dissertation: Yale University, 1981).

[28] See, for example, Berry, pp. 216, 244; Kramer, p. 86; and Maury Yeston, pp. 34, 118. *The New Grove Dictionary of Music and Musicians* defines *foreground* as "the layer in a piece or movement that preserves the contrapuntal and rhythmic essentials but lacks some ornamentation or embellishment (including note repetition) or indications of scoring." *Middleground* is defined by the same source as "one set of layers in a piece or movement that links the foreground to the background." Schenker himself never formally defined these terms, but began applying them to his analytical graphs in 1925 and 1926, with the first two volumes of his *Das Meisterwerk in der Musik.* See for example Heinrich Schenker, *The Masterwork in Music: A Yearbook,* ed. William Drabkin, tr. Ian Bent, et al (Cambridge: Cambridge University Press, 1994), v. 2, p. 78, where the term "middleground" appears for the first time (at the end of p. 134 in the original).

For a complete discussion of Schenkerian concepts, see Allen Forte and Steven Gilbert, *Introduction to Schenkerian Analysis* (New York: Norton, 1982).

[29] Heinrich Schenker, *Free Composition: Volume III of New Musical Theories and Fantasies,* ed. and tr. Ernst Oster (New York: Longman, 1979), p. 119.

Form and Musical Performance, to describe metric organization of units larger than the notated measure. He writes: "In Romantic music…one can find long stretches in which the measures combine into phrases that are themselves metrically conceived — into what I call hypermeasures. This is especially likely to occur whenever several measures in succession exhibit similarity of motivic, rhythmic, and harmonic construction. These almost demand to be counted as units.…As a result, the groupings are almost irresistibly drawn into a regular four-measure pattern."[30]

Cone's term has gradually come into common use in music-theoretical discourse. Several facets of his statement bear pointing out. Although he ostensibly is describing Romantic music, the conditions it offers as favorable for the formation of hypermeasures are also characteristic of high Baroque music such as the Brandenburg Concertos, especially sequentially-constructed passages, and also passages showing obvious forephrase-and-afterphrase construction, such as the ritornello themes of Concerto No. 2, first movement, and Concerto No. 6, third movement.[31] Secondly, while Cone speaks of four-bar hypermeasures, most contemporary thinking on metric organization admits of organization only according to sets of two or three.[32] "A regular four-measure pattern"

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[30] Cone, p. 82.

[31] I use the terms "forephrase" and "afterphrase" rather than "antecedent" and "consequent" because to some theorists the latter refers specifically to parallel construction, while the former refers more generally to a dependent relationship between two phrases. See Rothstein, *Phrase Rhythm,* p. 18.

[32] See, for example, Lehrdahl and Jackendoff's "Metric Preference Rule 3," which states: "At each metric level, strong beats are spaced either two or three beats apart" (Lerdahl and Jackendoff, p. 69); also Kramer, who tells us: "Metric counting goes generally 1212… or 123123… on several different hierarchic levels" (Kramer, p. 99). Grosvenor W. Cooper and Leonard B. Meyer, in *The Rhythmic Structure of Music* (Chicago: University of Chicago Press, 1960), also classify rhythms in groups of two or three beats, but differentiate between *rhythm* as "the way in which one or more unaccented beats are

implies the existence of a hierarchy including a two-measure pattern on an intermediate level, whose measure pairs would have to be paired in turn to create four-bar units.[33] Finally, Cone identifies hypermeasures with phrases, something that would be eschewed by some later theorists as an unwarranted conflation of separate categories.[34]

In regard to Bach's music in particular, and by extension the style of the High Baroque in general, Cone makes an important observation concerning the nature of its hierarchic metric organization (one later echoed by Joel Lester): "We can best understand such metric play if we assume that in this style the primary metric unit is not the measure but the beat… This is not to say that the measure is unreal, or purely conventional; but it is only one step in the hierarchical subdivision and combination of beats, which remain the unchanging elements. (Even the Late Baroque is, after all, not so far away from the Renaissance!)"[35]

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grouped in relation to an accented one" (p. 6), and *meter* as "the measure of the number of pulses between more or less regularly recurring accents" (p. 4).

[33] In a sense, Cone's "regular four-measure pattern" simply replicates 4/4 meter on a higher level. In fact, this shows why a "regular two-measure pattern" must be considered to be part of it. 4/4 meter actually consists of joined pairs of 2/4 measures (or "hypo-measures"), organized in strong-weak relationships. Baroque theorists such as Kirnberger (see below, p. 27) recognized this when they classified 4/4 as a "compound" meter. In the pattern of organization Cone describes, the notated measure takes the place of the quarter note, and by analogy, four-measure units are built out of two measure units. It is in this sense that four-bar hypermeter replicates 4/4 meter on a larger scale.

[34] See for example Kramer, pp. 416*n35* and 419*n89,* where he challenges Joel Lester on the same grounds.

[35] Cone, p. 66.

Cooper and Meyer

Cooper and Meyer, writing eight years before Cone, did not have the benefit of the word “hypermeter,” but instead expressed the same idea in terms of “architectonic levels.” After describing a hierarchic relationship between rhythmic motives on different levels, they write, “Metric structure is similarly architectonic. For instance, a 3/4 meter differs from a 6/8 meter in that the former is made up of three units of a lower-level 2/8 meter, while the latter is made up of two units of a lower level 3/8 meter. And either a 3/4 or a 6/8 meter may itself be combined with metric units on the same level to form more extensive, higher-level meters.”[36]

In this paper I will consider these “higher-level meters” referenced by Cooper and Meyer to be identical with what Cone calls “hypermeter.” I will also treat their use of the term “architectonic” as interchangeable with my use of “hierarchic.”

Arthur Komar

Writing in 1971, just a few years after Cone, Komar uses the word “levels” in the Schenkerian sense, but holds that meter operates on every Schenkerian level, including the background.[37] He analyzes the second movement of Beethoven’s Piano Sonata Op. 13 (“Pathétique”) in support of this idea, identifying main accents for the whole movement.

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[36] Cooper and Meyer, p. 2.

[37] Arthur Komar. *Theory of Suspensions: A Study of Metric and Pitch Relations in Tonal Music* (Princeton, NJ: Princeton University Press, 1971); see p. 16, p. 156.

Maury Yeston

Maury Yeston published *The Stratification of Musical Rhythm* in 1976. Yeston describes a three-stage analytical process that begins with a series of uninterpreted attacks, durations and rests, moves on to the identification of sub-patterns among the events of the musical surface, and finally examines interaction between the sub-patterns in order to attribute accent to some events rather than others. He lists a number of criteria for the identification of sub-patterns, including timbre, dynamics, density, and pattern recurrence itself. These criteria are analogous to the different cases of Lerdahl and Jackendoff's Metric Preference Rule 5. Yeston's central point is to demonstrate that surface rhythms are products of rhythmic sub-patterns on deeper, or middleground, levels. However, and despite his frequent reference to "middleground strata" and "levels of motion," Yeston never defines these concepts in relation to the notated measure and therefore, never addresses the topic of hypermeter or its hierarchical limits. Also, while Yeston speaks of both meter and rhythm, he does not precisely define the relationship between the two.

Wallace Berry

Wallace Berry, in *Structural Functions in Music*, also published in 1976, speaks of meter in terms of "structural levels, but does not assert the structural depth to which meter can be perceived. He does note that on higher levels, meter is more likely to be irregular than on lower levels.[38]

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[38] See for example Berry, p.319.

Lehrdal and Jackendoff

Lerdahl and Jackendoff, creators of the system of analytical “rules” used in this study, take a middle-of-the-road approach to hypermeter in *A Generative Theory of Tonal Music,* published in 1983. While recognizing the existence of metric hierarchies extending beyond the level of the notated meter, they argue against the presence of meter on the deepest level of structure. Referring to the characteristic “dot” notation they used to portray metric structure, they write: “Even though the dots in a metrical analysis could theoretically be built up to the level of a whole piece, such an exercise becomes perceptually irrelevant except for short pieces. Metrical structure is a relatively local phenomenon.”[39]

Still, their acceptance of some levels of hypermeter is important. They also accept (at least by implication) Cone’s term, “hypermeter.” In discussing the evenly-spaced beats characteristic of metric structure, they say: “In much of tonal music this metrical regularity also obtains beyond the measure level, producing regular ‘hypermeasures’ of two, four, and even eight measures.”[40] Lerdahl and Jackendoff also accept that hypermeter can be irregular: “[T]onal music often has from one to three levels of metrical structure that are larger than the level notated by the bar lines, corresponding to

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[39] Lerdahl and Jackendoff, p. 21.

[40] Lerdahl and Jackendoff, p. 70.

regularities of two, four, and even eight measures. Except in the most banal music, these levels are commonly subject to a certain amount of irregularity."[41]

As with Berry, irregularity is more common on higher levels than on lower levels, according to their view: "At the smallest level, metrical structure is responsible for most factors of segmentation; at the largest levels, grouping structure bears all the weight of segmentation. In between lies a transitional zone where grouping gradually takes over responsibility from metrical structure, as units of organization become larger and as metric intuitions become more attenuated because of the long time interval between beats. It is in this zone of musical organization that metrical irregularities appear in tonal music."[42]

It is important to observe that Lerdahl and Jackendoff do not make any qualitative distinction between the hierarchical structure within notated measures and the larger hierarchical structure that organizes different measures together. In fact (as will be seen below), their analytical notation expresses metric structure as a continuum of levels, with no particularly privileged status for the level of the notated measure. This is important because it indicates that the Metric Well-Formedness Rules and Metric Preference Rules they propose are intended to apply to metric structure at all levels, from the smallest to the largest.[43]

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[41] Lerdahl and Jackendoff, p. 99.

[42] ibid.

[43] The exception to this generalization is Well-Formedness Rule 4, which as noted earlier, is formulated in such a way as to admit a greater degree of irregularity at higher levels than at lower levels.

Joel Lester

By 1986 Joel Lester, in his book *The Rhythms of Tonal Music,* was able to look back on the recent literature and remark: "No aspect of tonal rhythmic theory has aroused more controversy than the existence and nature of metric organization above the level of the notated measure."[44] He argues in favor of hypermeter to some extent, citing the existence of "passages and entire movements in which the notated measure functions as a single beat and in which harmonic changes, durational accents, and textural accents establish multimeasure groupings as the primary metric level."[45]

Like Lerdahl and Jackendoff, Lester accepts Cone's term; he even dispenses with placing quotation marks around it. However, Lester also warns that "For any given passage, there is a level above which hypermeter is not definitively established. Either because the primary meter-causing factors (harmonic change, durational accents, and textural accents) do not operate at that level, or because there is no regular pulse, a hypermeter cannot be definitively asserted.…It is at this level — the level above which the meter-producing factors operate — that musicians disagree with each other about the metric status of measures and hypermeasures."[46]

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[44] Lester, p. 157.

[45] Lester, p. 160.

[46] Lester, p. 161. In reference to Bach's music, Lester notes the frequent presence of "multiple levels of essential activity" (p. 128), referring to rhythmic/harmonic/voice-leading interest on more than one level of motion, that allow various levels to be interpreted as the primary metric level.

Jonathan Kramer

Kramer, in his 1988 book, *The Time of Music*, takes no such moderate position. He argues in favor of a "deeply hierarchic" view of meter; based in part on a key element he contributes to the concept of metric regularity and irregularity. "The usual reason given why meter is not deeply hierarchic," according to Kramer, "is that it is by definition periodic, while in most music metric accents are not evenly spaced on deep levels. I believe, on the contrary, that in many cases deep-level metric accents *are* evenly spaced, if by 'evenly spaced' we mean having the same number of intervening weaker beats. Therefore, meter can be understood on all levels as fundamentally regular, but with frequent irregularities. And meter can be understood as deeply hierarchic, because the introduction of irregularities on one level does not necessarily destroy the fundamental regularity of deeper levels."[47]

In a glossary, Kramer offers his own definition of a hypermeasure as a "group of measures that functions on a deep hierarchic level much as does a measure on the surface," and hypermeter itself as simply a "hierarchy of measures."[48]

Embedding his ideas in the ongoing discourse on meter, Kramer illustrates his "deeply hierarchic" view of meter with an analysis of the same second movement of Beethoven's *Pathéthique* sonata analyzed in 1971 by Komar, although he comes to different analytical conclusions.[49]

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[47] Kramer, p. 102.

[48] Kramer, p. 453.

[49] Kramer, pp. 119–120.

Kramer also relates metric structure to more abstract ideas about time, in particular to the idea of the present or "now": "The present on any given hierarchic level is approximately equivalent to the timespan of a (hyper)measure."[50]

Apart from his conceptual contributions to the theory of metric structure, Kramer is also important for the clear and concise analytical notation he employs, a point to which we will return below.

William Rothstein

William Rothstein, in his 1989 work *Phrase Rhythm in Tonal Music*, provides his own definition of hypermeasures (which seems by now to be fully accepted as a common music-theoretical term): "Suprameasure units that are perceived *as if* they were measures, because they exhibit a regular alternation of strong and weak "beats" analogous to that of single … measures."[51] It is interesting to note that Rothstein's conception of hypermeter is one of the first to be framed psychologically, in terms of perception. This reflects a gradual shift in thinking about meter among music theorists, away from objectivism and toward a more psychological view that will be more fully realized in the work of Christopher Hasty and Justin London.

Like Kramer, Rothstein admits of irregularity in his conception of hypermeter, and stresses its importance in musical composition: "Just as the agreement or conflict of hypermeter and phrase structure is a compositional resource, so is the contrast between

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[50] Kramer, p. 371.

[51] Rothstein, p. 8.

metrical regularity (hypermeter) and irregularity (absence or modification of hypermeter)."[52]

The "phrase rhythm" referenced in the title of Rothstein's book refers to a broad conception of the pacing of musical events that includes not only hypermeter but also the structure of musical phrases and periods. The majority of his observations are made in regard to Classic/Romantic rather than Baroque music; in fact, he himself says, "I simply do not understand Baroque phrase rhythm as well as I think I understand rhythm in later tonal music. In fact, my analytical researches have helped convince me of the profound differences that exist between the phrase rhythms of the Baroque and those of Classic and Romantic music. I hope someday to understand Baroque rhythm much better than I do now." Rothstein does, however, offer "a very brief sketch" of Baroque practice, using Bach's C-major Invention as an example: in addition to a useful description of the *fortspinnung*-type phrase, he notes the frequency of phrase overlap and a resulting tendency for metric displacement.[53]

Christopher Hasty

Christopher Hasty, writing in 1997, speaks of "metric hierarchy" but eschews the term "hypermeter" in reference to higher-level meter, asserting that "we have no need of the term 'hypermeter' to refer to *metrical* formations larger than the bar."[54] Instead he

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[52] Rothstein, p. 13.

[53] Rothstein, p. 126.

[54] Christopher Hasty, *Meter as Rhythm* (New York, Oxford: Oxford University Press, 1977). See for example p. 18.

reserves the term “hypermeter” to refer to “a measuring of duration that is distinct from meter and yet meterlike” (without necessarily stating exactly what that is).[55]

Hasty’s book focuses primarily on the idea of “projection,” a psychological process by which meter is constructed.[56] His observations concerning the metric structure of actual pieces are secondary to his argument. He addresses but does not answer the question of how deep a metric hierarchy may extend, saying: “To seek the maximum length of projection is to ask how far mensural determinacy can be stretched. Obviously, there can be neither a general nor a definitive answer to this question.”[57] Hasty does propose a rough test of whether a proposed metric unit is susceptible to perception, by “stopping [at the end of such a proposed metric unit] and imagining a continuation in the ensuing silence.”[58] However he does not consider such a test definitive: the “failure of such a test does not necessarily mean that some acoustic event could not function as a realization of projected and proactive potential.”[59]

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[55] ibid.

[56] For a summary explanation of this idea, see Hasty, pp. 84–86.

[57] Hasty, p. 184.

[58] Hasty, p. 184.

[59] ibid.

Harald Krebs

Harald Krebs, in *Fantasy Pieces* (1999), develops the ideas first presented in his 1987 paper, "Some Extensions of the Concepts of Metrical Consonance and Dissonance."[60] He adheres to a mainstream use of the term "hypermeasure," as signifying "a metrical unit of greater length than a notated measure"; he also acknowledges disagreement among theorists over the hierarchic depth at which meter can be asserted (if at all).[61] While he does not offer an explicit position on the upper limit of hypermeter, the analyses in *Fantasy Pieces* do argue implicitly for a certain range of hierarchic depth, by referring to hypermeasures of four and six bars, and once to a hypermeasure of eight bars. [62]

William Caplin

William Caplin, writing in 2002 on "Theories of Rhythm in the Eighteenth and Nineteenth Centuries" in *The Cambridge History of Western Music Theory,* argues that "The High Baroque style, with its motoric pulses, regularized accentuations, and dance-derived rhythms, induced early eighteenth-century theorists to focus in detail on the classification of various metrical and durational patterns and to begin accounting for that

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[60] Harald Krebs, "Some Extensions of the Concepts of Metrical Consonance and Dissonance" in *Journal of Music Theory,* Vol. 31, No. 1 (Spring, 1987), pp. 99-120.

[61] Krebs, *Fantasy Pieces,* p. 261.

[62] Nor does he in his later essay on Josephine Lang. See Harald Krebs, "Hypermeter and Hypermetric Irregularity in the Songs of Josephine Lang," in Deborah Stein, ed., *Engaging Music: Essays in Music Analysis* (New York, Oxford: Oxford University Press, 2005), pp. 13–29. See for example Krebs, *Fantasy Pieces,* p. 239. Krebs, *Fantasy Pieces,* p. 215.

most elusive concept — metrical accent."[63] He notes a "strong conceptual inertia" in the writings of this period, and states that it was not until the second half of the century that music of the *galant* style began to influence the conception of meter as being hierarchically structured.[64]

The view that hierarchically-organized accent was not part of the theoretical concept of meter in the first half of the eighteenth century is also supported by Grave's 1985 article, "Metrical Displacement and the Compound Measure in Eighteenth-Century Theory and Practice."[65] However it is important to note that the evidence on this point (one of potential significance for the present study) is at least somewhat equivocal: Houle describes conducting techniques advocated by Monteclair in 1709and Grassineau in 1740 that strongly imply the recognition of a difference in accentual strength between the two halves of the compound (4/4 or 6/8) measure.[66] Grave and Burkhart both cite Kirnberger as a theorist who recognized an accentual distinction within the compound measure, at least in some cases.[67] (Kirnberger's *Akzenttheorie* is a "bottom-up" approach that begins with the lowest level of stimuli and groups them together to build up larger units. Although he describes an "accented-unaccented relationship between the two halves of a

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[63] William Caplin, "Theories of Musical Rhythm in the Eighteenth and Nineteenth Centuries," in Thomas Christensen, ed., *The Cambridge History of Western Music Theory* (New York, Cambridge: Cambridge University Press, 2002), 657–694. Caplin, p. 657.

[64] Caplin, pp. 657–658.

[65] Grave, pp. 33–36.

[66] George Houle,, *Meter in Music, 1600–1800: Performance, Perception, and Notation* (Bloomington: Indiana University Press, 1987), pp. 37–41.

[67] Grave, pp. 36–38; Burkhart, pp. 3–26.

4/4 bar, he does not extend the idea to levels above the measure.) Kirnberger studied with Bach in Leipzig between 1739 and 1741, and the impression Bach made upon him was apparently deep. He considered Bach the supreme musician and teacher, lamenting the fact that Bach had left behind him no didactic works. He proclaimed himself a disciple of Bach in his own didactic works, saying,

> In all his works Johann Sebastian Bach employs a completely pure style; every piece has a definite unified character. Rhythm, melody, harmony, in short everything that makes a composition really beautiful he has completely in his power, as witnessed by his written works. His method is the best because he proceeds step by step from the simplest to the most difficult, whereby even the step to fugue itself is no more difficult than any other step. For this reason I consider *the method of Johann Sebastian Bach to be the only and best one.*
>
> It is regrettable that this man never wrote anything of a theoretical nature about music and that his teachings have survived only through his students.
>
> I have sought to reduce the method of the late Joh. Seb. Bach to basic principles and to present his teachings to the best of my ability in my *Kunst des reinen Satzes.*[68]

Kirnberger's recognition of a difference in accentual strength between two halves of a 4/4 measure signifies implicit recognition of a metric hierarchy, at least within the measure. Thus, his conception of the compound measure indicates his recognition, and by implication Bach's as well, of a metric hierarchy to some extent.

The historical point here may be secondary in any case, as modern theories of meter focus on the listener's perception, which is not dependent on the composer's intention.

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[68] Johann Philipp Kirnberger, *Gedanken über due verschiedenen Lehrarten in der Komposition, als Vorbereitung zur Fugenkenntniss* (Berlin, 1872), pp. 4–5. Quoted in Kirnberger, *The Art of Strict Musical Composition [Die Kunst des reinen Satzes in der Musik],* transl. David Beach and Jurgen Thym (New Haven: Yale University Press, 1982) p. xvi.

Although it is not directly related to the question of hierarchical structure, another important contribution by Caplin is his 1983 article, “Tonal Function and Metrical Accent: A Historical Perspective.”[69] In this article based on his 1981 dissertation, he succinctly summarizes the views of various theorists on one of the most contentious questions related to rhythm and meter.[70]

Justin London

Justin London, in his 2004 book, *Hearing in Time,* asserts that “There is no essential distinction to be made between meter and so-called hypermeter….[H]aving several levels of metric structure present above the perceived beat is no more extraordinary than having several levels of subdivision below it.”[71]

London also suggests that differences in hierarchic depth are an important defining parameter of meters: “One may characterize meters in terms of their hierarchic depth — that is, whether a meter involves a rich hierarchy of expectation on many levels at once, or only a limited set of expectations as to when things are going to occur.”[72] This observation corroborates an important aspect of the present study.

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[69] William Earl Caplin. “Tonal Function and Metrical Accent: A Historical Perspective.” *Music Theory Spectrum,* 5 (1983): 1–14.

[70] William Earl Caplin. *Theories of Harmonic-Metric Relationships from Rameau to Riemann* (Ph.D. Dissertation: University of Chicago, 1981). This work is particularly valuable for its attempt to sort through the sometimes contradictory intricacies of Hugo Riemann’s thoughts on the subject.

[71] London, p. 19.

[72] London, p. 25.

Factors Promoting or Undermining Hierarchic Depth

Edward Cone's original 1968 description of a hypermeasure asserted that it is "especially likely to occur whenever several measures in succession exhibit similarity of motivic, rhythmic, and harmonic construction."[73] Accepting Cone's description seems reasonable, and leads to the corollary that dissimilarity or diversity of motivic, rhythmic, and harmonic construction will work against the generation of hypermeasures. Although more contemporary, psychological descriptions of meter such as those of London and Hasty frame the discussion in terms of mental processes like "attending behavior" or "projection," they do not exclude Cone's ideas.[74] His original description is still valid as a description of the qualities within the musical object that stimulate the mental processes underlying metric perception. Because these processes can operate on different levels at once, the larger the scale on which these qualities can be perceived, the deeper the hypermetric structure that will result.[75]

It may be added that hypermetric perception is proportionately more likely in a faster tempo than in a slower one, as accentual expectation on any given level will be greater to the extent that events are temporally more proximate to one another. (This is not meant to imply that there is a "threshold" tempo at which any given hypermetric level suddenly appears, but rather that there is a *continuum of perceptibility* of metric hierarchy, and that

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[73] See p. 13.

[74] London, p. 25; Hasty, p. 84

[75] London, p. 25.

as tempo gradually increases, any latent hypermetric organization is likely to become gradually more apparent to the listener.)[76]

We will see, in Chapter 2, how the conflicting sets of strong and weak accents in a situation of metric conflict can result in the strong accents tending to cancel each other out. Any such canceling-out of strong accents will undermine the perception of a metric hierarchy, since an accent that does not function as strong on any given level cannot function as an accent on a higher level.

Finally it must be stated that not all listeners will perceive the same patterns to the same degree even in the same musical object, and thus perception of hypermetric structure will vary somewhat from listener to listener. Even for Lerdahl and Jackendoff, "The 'experienced listener' is meant as an idealization. Rarely do two people hear a given piece in precisely the same way or with the same degree of richness."[77] This subjectivity in metric perception is reflected in the literature reviewed above, especially in the strong tendency of prominent authors to disagree with each other on important points.[78] This has profound importance as it renders all metric analysis to some degree tentative. Thus we

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[76] The Scherzo of Beethoven's Ninth Symphony is often offered as an example of tempo operating this way. See for example Lester, p. 108.

[77] Lerdahl and Jackendoff, p. 3.

[78] To cite only a few examples: See Komar's and Kramer's conflicting analyses of the second movement of Beethoven's *Pathétique* Sonata, described above. Another example is provided by the conflicting analyses by Cooper & Meyer, Berry, and Lester, of the second movement of Mozart's *Jupiter* Symphony (see Cooper and Meyer, pp. 89ff; Berry, p. 324–326; Lester, pp. 87–91). Elsewhere, Kramer faults Lester on the distinction between phrases and metric units (see note 33 above), and Lerdahl and Jackendoff fault Cooper and Meyer on the same point (Lerdahl and Jackendoff, pp. 26, 27). Kramer also gives an instructive analysis of the various and mutually exclusive positions held by authors from Schenker and Riemann to Berry and Benjamin of the accentual profile of the normative four-bar phrase (Kramer, pp. 88–96), while Lester finds that the very notion of the four-bar phrase as normative is so flawed that it leads to "absurd arguments" (Lester, p. 198).

may echo Wallace Berry: "We shall have to be continually aware that the importance of a theoretical problem is not invalidated by the difficulties of approaches to solutions or by the uncertainties and equivocations of proposed solutions."[79]

Graphic Presentation

The metric analyses forming the foundation for this study are presented in Appendix I. In their style of presentation they draw on two of the works already discussed. The format used is an elaboration of that used by Jonathan Kramer in *The Time of Music*. It is also very closely related conceptually, if less so visually, to that used by Lerdahl and Jackendoff in *A Generative Theory of Tonal Music*.

Different Approaches to Analytic Notation: Lerdahl & Jackendoff and Kramer

Lerdahl and Jackendoff use dots to represent beats, building up a hierarchical representation where dots are spaced farther apart on each level, signifying ever-larger scale metric patterns (example 1.1). Beats on any given level correspond to "strong" or accented beats on the next lower level; likewise, strong beats on any given level are identifiable as those beats corresponding to beats on the next higher level. These correspondences are reflected in the vertical alignment of the dots representing beats.

Lerdahl and Jackendoff generally combine metric analyses with "grouping" analyses, using hierarchically nested sets of horizontal slurs to represent periods, phrases and

[79] Berry, p. 302–303.

subphrases on various levels. Their analyses include staff notation, and grouping and metric analyses are arranged below the staff. These are arranged with higher hierarchic levels below lower ones; in other words, metric and grouping analyses move from local to large-scale levels as they extend vertically away from the staff notation.

Example 1.1

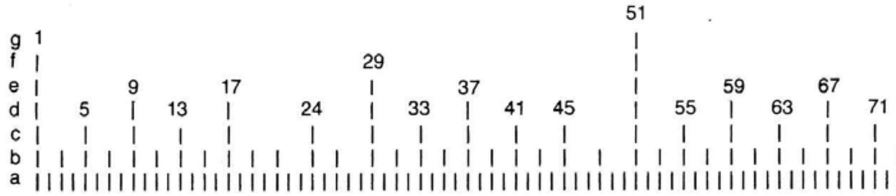
Lerdahl and Jackendoff's analysis of the beginning of Beethoven's Fifth Symphony, third movement. Metric analysis (indicated by dots) and "grouping" analysis (indicated by horizontal slurs) are arranged under staff notation. The spacing of the dots representing beats sometimes varies as a function of the spacing of notes within measures of the staff notation (e.g. in mm. 3–5 vs. mm. 5–7).

In Chapter 4 of *The Time of Music*, Kramer includes several analyses that focus on metric structure. While these are fundamentally similar to those of Lerdahl and Jackendoff, Kramer uses vertical lines instead of dots to represent beats (example 1.2). Kramer also dispenses with staff notation, labeling his analyses with measure numbers so the reader can refer independently to a score. Additionally, he arranges his levels so the lowest is on the bottom.

Kramer's analytical notation has some advantages over that of Lerdahl and Jackendoff. The vertical lines he uses have more visual impact than the dots used by the latter, building up, in my opinion, a more compelling visual representation of a multi-leveled metric hierarchy. Relinquishing the staff notation from the analysis allows him to substantially compress the horizontal dimension of the analytical notation, making it much more practical to present an analysis of large sections of music such as an entire movement. It also allows him to equalize the visual distance between points representing beats on the lowest level, while Lerdahl and Jackendoff are obliged sometimes to alter the distance to accommodate the actual spacing of notes, which can vary as the number of notes in a measure varies.

Disadvantages of Kramer's notation by comparison with that of Lerdahl and Jackendoff include his lack of any indication of phrase structure ("grouping" structure in Lerdahl and Jackendoff's terminology), as well as his lack of indication of levels of metric structure below that of the notated measure. The latter drawback is particularly important with regard to High Baroque repertoires such as the Brandenburg Concertos. Because the basic unit shown in Kramer's graphs is the notated measure, they are not able to represent situations of metric displacement, where the actual organization of metric accent diverges from the composer's metric notation.

Example 1.2



Kramer's metric analysis of Beethoven's Piano Sonata Op. 13, second movement.[80] Kramer does not include staff notation in his analysis, which allows him to show a larger section of music that Lerdahl and Jackendoff. Two drawbacks of his approach are that he does not address phrase or "grouping" structure, and that metric structure below the level of the notated measure is not indicated.

Modifications of Kramer's Technique

The notation I use in this study is essentially an extension of Kramer's metric graphs. One important difference is that I usually combine long and short vertical lines in the same level. There are two reasons for this. First, it is an effort to portray even more expressively the distinction between strong and weak accent (or "accent" and "unaccent") on each level. It is also because — like Lerdahl and Jackendoff, but unlike Kramer — I wish to indicate as far as practical the metric hierarchy within each measure, and not just above the measure. Without including in each graph separate hierarchical levels for different subdivisions of the measure, I have portrayed these different levels of accent with longer and shorter vertical lines.

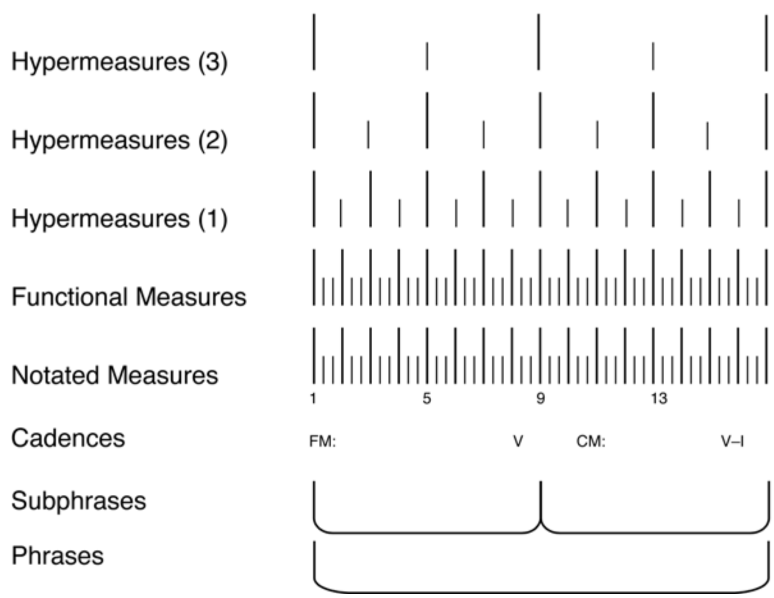
This also allows me to show metric displacements, or divergences between the "real" measure and the notated measure, an important and ubiquitous feature in these pieces. Where such divergences occur, I have included separate rows in the graph for "notated measures" (measures indicated by barlines in the composer's score) and "functional

[80] Kramer, p. 119.

measures" (actual units of metric organization, "functioning" as measures, irrespective of notation). In all cases these divergences stem from irregularities in the organization of metric units on some lower level, and the use of longer and shorter vertical lines allows me to show the level of units subject to such irregularities of organization.

I have also included, in most cases, a simplified "grouping" analysis below the metric analysis. This analysis is not highly developed, but is meant to situate the metric analysis within an overall phrase-rhythm context (example 1.3).

Example 1.3



Bach's Brandenburg Concerto No. 1, third movement, Polacca, mm. 1–16.[81] The metric graphs in this study place hierarchically-arranged levels of metric accent above, and a simplified "grouping" analysis, showing periods, phrases, and subphrases, below. Keys, important cadences, and measure numbers are also indicated. This and many other graphs include a separate layer for "functional," or real, measures, as these do not always coincide with notated measures.

[81] All musical examples in this paper are from the Brandenburg Concertos, unless otherwise noted.

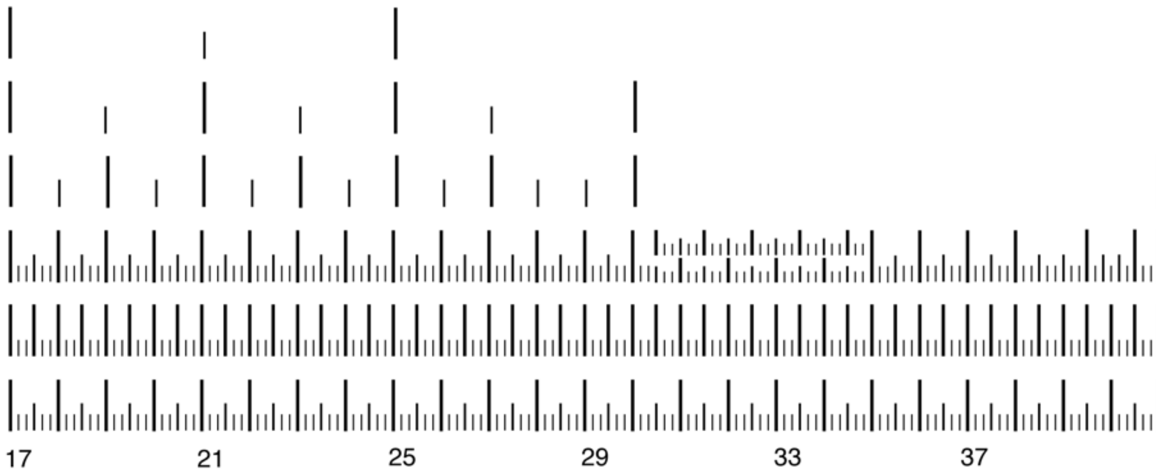
In some cases in the first concerto, I have included indications of relationships of symmetry or parallelism between different phrases, in an effort to place other analytical observations within the context of an awareness of Bach's use of arch form.

Both Lerdahl & Jackendoff and Kramer concern themselves primarily with the factors underlying normative metric structure, without addressing issues of metric conflict to any great extent.[82] In this study I have tried to analyze metric conflict in some detail. Harald Krebs has done considerable work on metric conflict (which he refers to as "metric dissonance") but has not attempted to represent metrically conflicted structures graphically.[83] Although the analytical notation I have employed cannot express every nuance of music as complex as the Brandenburg Concertos, I have attempted to introduce representation of metric conflict into my expanded version of Kramer's graphs by "splitting" certain sections of certain levels into two or more layers, each corresponding to one set of cues forming one element of the conflict (example 1.4).

[82] Lerdahl and Jackendoff state explicitly at the outset that they are dealing with phenomena at the mundane, "intuitively obvious" level, and that "artistic" theories operate at a higher level where the phenomena they describe are manipulated in complex ways in order to create a desired effect. See Lerdahl and Jackendoff, p. 7.

[83] See note 26.

Example 1.4



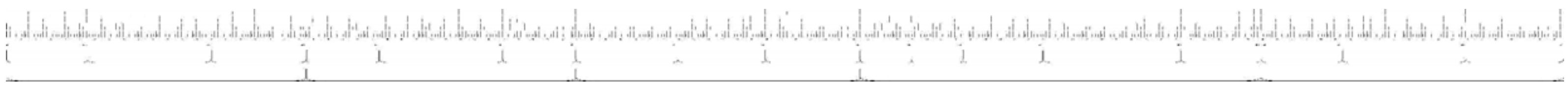
Metric graph of mm. 17–40 of Concerto No. 1, third movement. Metric conflicts have been indicated by “splitting” sections of certain levels into different layers, as shown here in mm. 30–34, corresponding to the different elements of the conflict.

Scale of the Analyses

The metric graphs of the analyses in this study are presented in Appendix I. Their scale surpasses those either of Lerdahl and Jackendoff or of Kramer. Lerdahl and Jackendoff nowhere present an analysis of a complete movement, and the longest passage analyzed by Kramer is the first movement of Beethoven’s *String Quartet in F major*, Op. 135, at 192 measures. It would appear that this is because their intention was not to analyze entire large movements but to focus on particular examples to illustrate their theoretical ideas. The present study, however, contains analyses of all the movements of the Brandenburg Concertos, up to 427 measures in length in the case of the first movement of Concerto No. 4 (example 1.5), and the level of detail is greater than that shown in Kramer’s analyses, since metric levels smaller than the measure are represented. The proportions of such analyses create practical problems of graphic representation. These analyses, even when printed on tabloid-size paper, require a powerful magnifier for the viewer to examine important details of specific passages, and the finest detail cannot be resolved except with the highest-resolution printer and specialty paper. For this reason the analyses have also been printed at a degree of magnification that spreads some of them over several pages. They are also offered in digital format, so that the viewer may at will "zoom in" to examine local detail or "zoom out" to view large-scale patterns.[84]

[84] At the time of writing (2008), these digital files may be accessed at *http://portfolio.du.edu/ecolahan*. Future technological developments being impossible to anticipate, I cannot predict the form their availability may subsequently assume.

Example 1.5



Complete Metric Graph of Concerto No. 4, first movement. The proportions of the metric analyses presented in this study create problems of graphic presentation. The difference in scale between the overall structure and the finest local detail render the printing of the analysis on paper inadequate. Therefore they have also been made available in digital form, allowing the viewer to "zoom in" and "zoom out" at will.

CHAPTER 2: PATTERNS OF METRIC CONFLICT

In the Brandenburg Concertos we will find that metric conflict most often occurs when different voices in a polyphonic texture project meter independently of one another.[1] This situation may obtain when different metric groupings are projected by different voices, or it may obtain when different voices project similar metric groupings but with the strong accents located in different places.

Projection of Different Groupings

As an example of the former, we may look to mm. 12–16 of the first concerto, third movement, where an extended pre-cadential hemiola is articulated in some parts (e.g. first oboe and piccolo violin) but contradicted in others (e.g. first and second horn). Note also that some parts that do articulate the hemiola arrive late to the party, corroborating the syncopation only immediately before the cadences in mm. 15 and 17 (e.g. third oboe,

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1 In more homophonically conceived music, on the other hand, metric conflict is often generated by different accentual factors operating independently within a single voice. Many instances of this type are described in Krebs, *Fantasy Pieces;* e.g. on pp. 89, 148, 213.

bass). Thus Bach is able to control the clarity of cross-rhythm to a very fine degree (example 2.1).

Example 2.1

Measures 12–16 of the third movement of Concerto No. 1 (with downbeat of m. 17).[2] Metric conflict is generated in this passage when, in the course of an extended pre-cadential hemiola, different metric groupings are articulated by different voices. Meter signatures indicate fluctuations in metric organization as each voice shifts independently between the normative meter and the hemiola pattern. (M. 15 in staves 3–5 is labeled "6/8" because it fails to project the hemiola pattern as strongly as mm. 14 or 16.) The original is notated in 6/8 throughout.

Another case of ambiguously articulated hemiola is seen in mm. 10–11 and 22–23 of the minuet from the fourth movement of the same concerto (example 2.2). This case is an example of a different type of complexity, because while the hemiola is articulated in the first oboe, first violin and piccolo violin, and contradicted in the second horn, there are also parts (e.g. first horn and bass) where the musical content can be heard with either the normative accentuation or the hemiola pattern.[3]

[2] In all examples, all voices are notated as sounding; i.e., transpositions are not shown.

Example 2.2a

Example 2.2b

Concerto No. 1, fourth movement, minuet, mm 9–12 and 21–24. As in example 2.1, metric conflict is generated when some voices articulate the pre-cadential hemiola and others do not. In this case, some voices fit equally well into both the normative metric context and the hemiola pattern: note the alternate metric interpretation of Horn 1 in (a) and of the bass in both (a) and (b).[4] The original is notated in 3/4 throughout.

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3 Such content is "metrically malleable" according to the ideas of Justin London. See Justin M. London, "Metric Ambiguity (?) in Bach's Brandenburg Concerto No. 3." *In Theory Only,* vol. 11, no. 7–8 (Feb 1991), p. 23. Two more examples of this kind of simultaneous projection of different meters in the music of Bach can be found in the French Suites. In mm. 46–49 of the Courante of French Suite No. 2, the left hand articulates 4/4 measures while the right hand articulates 3/8 measures and the meter signature of the piece is 3/4. This example is cited in Krebs, *Fantasy Pieces,* p. 71. (Note that four source versions exist for the second half of this courante, not all of which contain the passage in question. See J. S. Bach, *Französische Suiten,* ed. Hermann Keller (New York: C. F. Peters, 1951), p. 11*n*). Also, triple metric organization in the left hand is juxtaposed against duple meter in the right hand in mm. 16–18 of the Allemande of the *French Suite No. 6.* (This piece is cited in connection with metric displacement in Burkhart, "Mid-Bar Downbeat," however the passage in question is not noted.)

4 In this example 3/4 meter might be more clearly projected by beaming eighth-notes in pairs; I have however chosen to follow the practice of the editors of the *Neue Bach-Ausgabe* edition of the Brandenburg Concertos in beaming notes. In most cases, there is no difference between this and the *Bach-Gesellschaft* edition.)

Projection of Different Accentual Locations Within Similar Metric Groupings

As an example of the second type of conflict, where different voices project similar metric groupings but with the strong accents located in different places, we may observe mm. 101–105 of the first movement of Concerto No. 3 (example 2.3). Here two fragments from the ritornello theme are superimposed against each other: the head motive constituting the first 1-1/2 measures of the opening ritornello (motive A), and the contrasting motive that makes up the second 1-1/2 measures (motive B). The opening motive of the violas (motive C) is also present, but appears only in its normative relation to the head-motive and may be considered as paired with it. The cello choir (all three cello parts in unison) and bass take motive A (accompanied by motive C in the violins) while the viola choir takes motive B; cello and bass then repeat motive A at the dominant (accompanied by motive C in the violas) while the violins take motive B. Throughout the passage, motive A projects a series of measure downbeats normatively aligned with the notated bar-lines: The accentual organization of this part of the theme is well-established from the very first measure of the piece, and in this passage it lies in the same position with respect to the bar-lines that it has occupied from the outset. On the other hand, motive B projects a series of downbeats displaced to the middle of the measure ("mid-bar downbeat"): Strong accents are created in the middle of bars 101 and 103 by changes of texture and timbre in motive B. In addition, motive B is beginning-accented in its first appearance at the opening of the movement (although this fact is not made clear from the metric notation, a point that is discussed further in example 2.13, on p. 61 below), so that metric preference rule 1, the rule of parallelism, operates in such a way as to project accents in the middle of mm. 101, 103, and 105. We may say that in mm. 101–105 the downbeats projected by motive A and motive B are *out of phase* with one another. Immediately afterwards, at m. 106, motive A moves to the violins while motive B returns to the violas and eventually the cellos and bass. Starting in m. 106, motive B is re-positioned with regard to the bar-lines so that the downbeats it projects are in agreement with those of motive A. At this point, we may say that the metric accents are again *in phase*.[5] In effect, the running sixteenth-notes of motive B are metrically resolved to the head-motive, motive A. This fact draws attention to the conflict generated in the previous passage.[6]

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[5] Lerdahl and Jackendoff use the terms *in phase* and *out of phase* to describe the relationship between metric structure and grouping structure. For them, if a grouping unit and a metric unit begin and end in the same place, they are in phase. To the extent that they do not, they are out of phase. I am using the terms in their more general sense of *synchronized* and *unsynchronized,* as applied to the metric organization of different voices in a polyphonic texture.

[6] Many of Bach's fugues and inventions show this type of conflict in their expositions, e.g. the *Invention no. 13 in A minor,* where both the opening exposition and the re-exposition in the relative major (starting halfway through m. 6) show a disagreement between the two voices about which part of the measure is accented, as evidenced by the placement of subject entrances. Lester cites Schenker's analysis of the Fugue in C-sharp minor, *Well-Tempered Clavier* Book I, no. 4, in this regard as well. See Lester, p. 25.

Example 2.3a (as notated)

Example 2.3b (implied organization)

Measures 101 (second half) –107 (with downbeat of m. 108) of Concerto No. 3, first movement. Metric conflict arises in mm. 101–105 because different voices project downbeats at different points. Each part in itself is subject to the same metric grouping as the others, but points of metric articulation are out-of-phase: they do not “line up” vertically. Starting in m 106, the parts are back in phase. Example 2.3(a) shows the passage as notated in the score; 2.3(b) shows the barlines re-drawn to reflect the metric units projected by the music.

Imitation as a Source of Conflict

Conflicting accentual cues in different polyphonic voices in the Brandenburg Concertos arise most typically through imitative procedures (notwithstanding example 2.3, which represents a case where they do not). Lerdahl and Jackendoff's first "Metric Preference Rule" states: "Where two or more groups or parts of groups can be construed as parallel, they preferably receive parallel metric structure." If we accept this assertion, it means that motivic or melodic material, once presented, will tend to be heard in terms of its original metric organization when it is heard later in the piece, including cases where it is heard as result of imitative procedures such as canon, fugue, or free imitation. If, as is commonly the case, such an imitation juxtaposes material against itself in such a way that a metrically accented motive or event occurs simultaneously with a metrically unaccented motive or event, the result will be a conflict between accentual cues.

For example, we may observe the beginning of Concerto No. 1, where the horn call is introduced first by one horn and then imitated a measure later by the other (example 2.4). Here the conflict occurs on a hypermetric level: because the time interval of imitation is one measure, it reinforces metric organization at the level of the notated measure while simultaneously generating conflicting cues as to hypermetric grouping at the two-bar level.[7]

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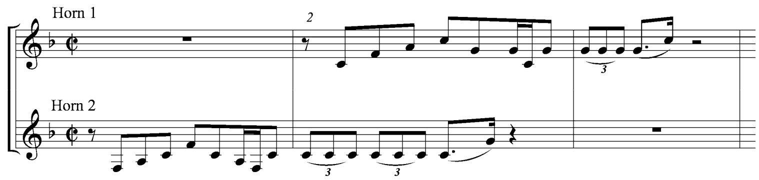
[7] I should note that this applies in cases such as the one at hand, where the melodic idea being imitated is longer than the time interval of imitation. If the idea stated by the horns was only one measure long, its imitation after one measure might have the opposite effect of clarifying two-bar hypermeter. It may also be the case that a listener will hear any imitative repetition of a motive like this one as a hypermetrically weaker "echo," even if it is partly superimposed upon the original iteration of the same motive. Even if this were true in the present case, however, the hypermetric organization of each horn part would still be in conflict with the other, as Metric Preference Rule 1 predicts. In such a case, the degree to which the

Example 2.4



The opening of the first movement of Concerto No. 1 (horns only). Motivic material imitated at the time interval of one measure, reinforcing metric organization at the level of the notated measure while creating hypermetric conflict at the two-bar level.

A similar situation pertains at the beginning of the minuet of the fourth movement of the same concerto, where the melodic head-motive presented in the first oboe, first violin and piccolo violin is imitated one measure later in the bass (example 2.5). Here the imitation at the time interval of one measure conflicts with the prominent two-bar hypermeter characteristic of a minuet.

following part is felt as weaker than the leading part would have to be taken into account in attempting to gauge the intensity of the conflict.

Example 2.5

The beginning of the minuet from the fourth movement of Concerto No. 1. The two-bar hypermeter characteristic of a minuet is undermined by the conflict resulting from the imitation of the opening motive at the time interval of one measure. The imitation of the motive is indicated by brackets.

A different type of example is found in mm. 53–56 of the first movement of the Concerto No. 1 (example 2.6), where imitative entrances of a one-measure sequence (and closely-related motives) follow each other at half-measure time intervals: first in the horns, then in the first oboe, followed by the piccolo violin, the first horn, the second horn, the first oboe again, and finally the piccolo violin in parallel with the first horn. Because the time-interval of imitation here is one-half measure, it sets up conflicting sets of metric cues within each measure.[8]

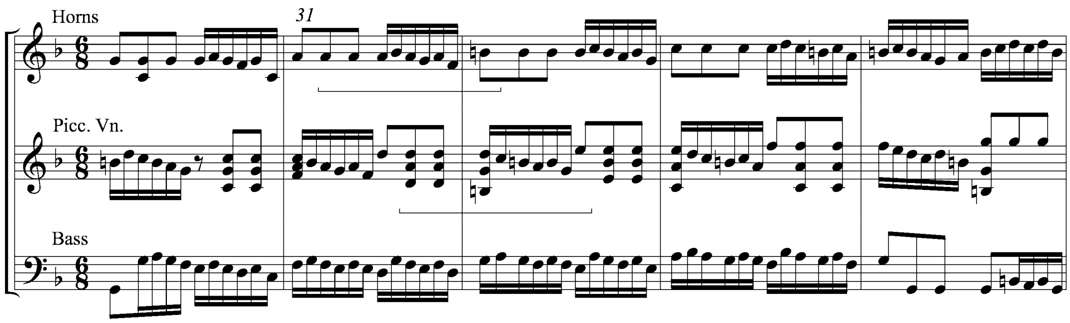
[8] The passage should be considered a series of points of imitation rather than a single melody with changes of timbre, because each entrance creates a new polyphonic layer, coming in at the interval of either a third above or a sixth below the previous entrance, against whose continuation it is heard. However even if it were heard to be a single melody with differences in timbre, these differences in timbre would have essentially the same effect as I have attributed to the overlapped entrances I have described.

Example 2.6

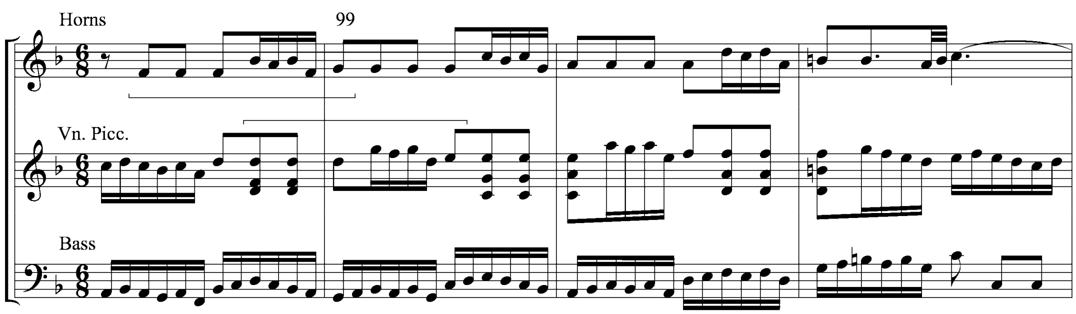
Concerto No. 1, first movement, mm. 53–56 (with downbeat of m. 57). Imitation of motivic material at the time interval of one-half measure creates conflicting metric cues within each measure, undermining metric organization at the notated level.

Other cases of imitation at the time-interval of a half-measure include the third movement of Concerto No. 1, mm. 30–34 and 98–101 (example 2.7), where the first horn and the piccolo violin engage in a spirited tug-of-war over the head-motive of the movement; and the first movement of Concerto No. 2, mm. 88–89 and 94–95 (example 2.8), where the ritornello head-motive in a metrically normative position is contradicted by a conflicting version in one (mm. 88–89) or two (mm. 94–95) other voices.

Example 2.7a



Example 2.7b



Concerto No. 1, third movement, mm. 30–34 (a) and 98–101 (b). Imitation (indicated by brackets) at the time interval of one-half measure creates a metric conflict between the piccolo violin and horns, undermining the level of the notated measure in favor of the half-measure.

Example 2.8a

Example 2.8b

Concerto No. 2, first movement, mm. 88–89 and 94–95. The ritornello head motive is imitated at the time-interval of one-half measure (as indicated by brackets), again undermining organization at the level of the notated measure.

“Inherent” Intensity of Conflict and Proximity of Cues

The second movement of concerto no. 1, mm. 12–14, shows an example of even closer imitation; here the material introduced by the first oboe in m. 12 is imitated at the unison one quarter-note later by the piccolo violin, leading to a three-measure canon (example 2.9). The canon changes to a canon in augmentation in the last two-thirds of m. 14; this is how the composer effects the metric re-alignment of the two voices on the downbeat of m. 15.[9] Here the time interval between the leading and following voice generates two conflicting sets of metric cues spaced more closely together than in previous examples. Krebs has observed that this kind of close proximity between conflicting cues increases the “inherent” intensity of metric conflict (or, in his words, metric dissonance): “A basic principle governing inherent intensity of displacement dissonances appears to be proximity to [metric] consonances; the more closely a given dissonance approaches a state of alignment, the more strongly dissonant it is.”[10]

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[9] The same thing happens in mm. 23–25, except that the roles of oboes and piccolo violin are reversed. (Note how the second and third oboes are shifted along with the first.)

[10] Krebs, *Fantasy Pieces,* p. 57.

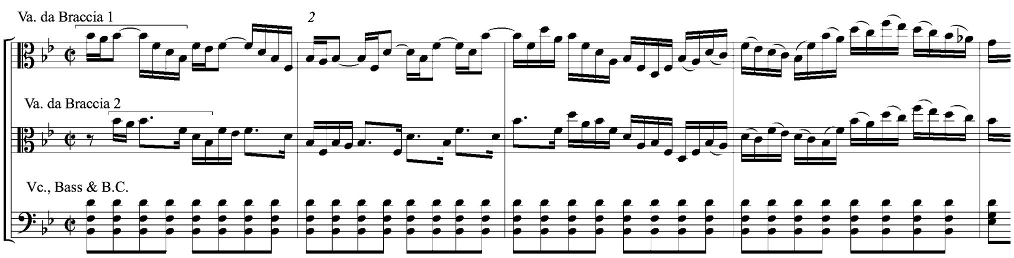
Example 2.9

Measures 12–14 (including the beginning of m. 15) of Concerto No. 1, second movement. Canonic imitation (indicated by brackets) at the unison between the first oboe and piccolo violin generates particularly intense metric conflict because of the short time interval between the leader and follower of the canon. Krebs has noted the importance of temporal proximity of conflicting sets of metric cues as a factor intensifying metric conflict.

An unusual example of the effect of close canon on metric cues in the absence of harmonic motion can be seen at the beginning of Concerto No. 6, which opens with an extended canon at the unison, at the time interval of one eighth-note, between the two *violas da braccio*, while at the same time each of the other parts repeats the same eighth-note for four full measures (example 2.10). Normally in tonal music, harmonic rhythm is one of the strongest factors in determining meter; this is the principle embodied in Lerdahl and Jackendoff's Metric Preference Rule 5f. However, in this case the harmony is static for an exceptionally long time (the longest sustained static harmony in the Brandenburg Concertos), effectively removing it from consideration in interpreting the meter.

When we look at the factors that remain in this passage we see that the accompanying voices are completely neutral regarding the conflict generated by the eighth-note canon, since they all articulate only the eighth-note level. Thus we are left with two equally salient sets of metric cues, displaced from one another by an eighth-note.

Example 2.10

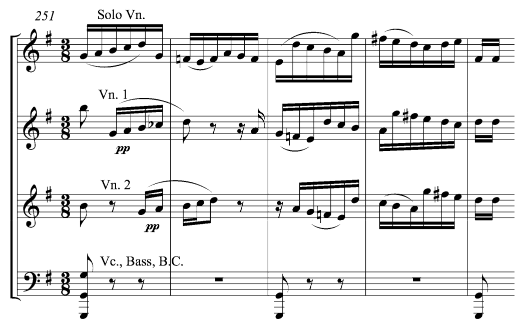


The opening of the first movement of Concerto No. 6. A strict canon at the unison, at the time interval of one eighth-note, unfolds against an unusually static harmonic background. Harmonic rhythm is usually one of the strongest factors in the definition of metric accent, but here it is removed from the equation.

A subtle blend of clarity and ambiguity is found in the first movement of Concerto No. 4, mm. 235–238 and 251–254 (example 2.11). A brief three-part canon at the unison is initiated by the solo violin and then followed at the time interval of one eighth-note by the first and then the second violins. The metrically disruptive effect of the canon is enhanced by gaps in the two following parts, which degrade the rationality of the procedure, but it is also ultimately undermined by isolated bass notes every two bars that provide just enough information to keep the prevailing meter ticking away in the background.

Example 2.11a

Example 2.11b



Concerto No. 4, first movement, mm. 235–238 (a) and 251–254 (b). A brief but intense metric conflict is generated by canonic imitation in three parts between the violins. The imitation is obscured by gaps in the two following voices, while regular accents in the bass serve to clarify the meter and generate continuity even in the presence of the conflict.

Imitation Can Exist Without Metric Conflict

Although metric conflict is often the result of imitative procedures, it is not inherent in imitative texture. Imitation can be organized in such a way as to reinforce the metric structure rather than undermining or ambiguating it. An example is the fugal exposition that begins the third movement of Concerto No. 4 (example 2.12). Here the opening statement by the violas is imitated by the second violins at the time interval of four measures. As the time interval of imitation is a whole multiple of the notated measure, the metric organization of the measure is not conflicted; indeed, as we will see below, the time interval of imitation corroborates several higher metric levels.[11]

[11] At some hierarchic level the conflict characteristic of imitation may well appear, but in a case such as this one the level at which conflict finally occurs is high enough to engage the listener's attention only weakly. Two examples similar to this one are the four-voice fugato that introduces the second half of the first movement of Concerto No. 2, beginning in m. 60 and extending through m. 67; and the fugato that articulates the moment of tonic return in the first movement of Concerto No. 3. In these cases, however, the effect is not as strong because the imitation appears at the time interval of two measures instead of four.

Example 2.12

The opening of the third movement of Concerto No. 4. Imitation at the time interval of four measures does not generate metric conflict within the notated measure; it corroborates multiple hypermetric levels instead.

Metric Conflict in the Absence of Imitation

Although the imitative textures characteristic of the Brandenburg Concertos make this the most common way for metrically conflicted structures to arise, such structures can also be created in the absence of imitation. Example 2.3, cited near the beginning of this chapter as an illustration of similar metric groupings with conflicting accentual projections, presents just such a case. The opening ritornello of the same movement presents another.

The first movement of Brandenburg Concerto No. 3 is generally remarkable for its level of metric complexity, much of which grows out of conditions that are built into the ritornello theme (example 2.13).[12] To begin with, mm. 1–3 of the piece are organized harmonically and motivically as two bars of 3/2 in spite of their notation as three bars in duple meter. This can be seen in the way the prolongation of the tonic in effect from the opening of m. 1 changes in the middle of m. 2 to a prolongation of the dominant, which

[12] For a detailed examination of this movement, see Botelho, chapter 4; also Botelho, "Meter and the Play of Ambiguity in the Third Brandenburg Concerto," *In Theory Only,* volume 11, no. 4 (Feb. 1990): pp. 1–35. London's idea of "metric malleability" is developed in his reply to Botelho's article (see note 3).

operates until the end of m. 3; and also in the motivic organization of the various parts (violin, viola, and cello/bass), which are in every case both very uniform in each 1-1/2 measure segment of the passage and also completely distinct in one segment from the other. Furthermore the violin part from the middle of m. 5 through the end of m. 6 is likely to be experienced by itself as effectively two bars of 3/4 (or one bar of 6/4), by virtue of the shift in the *bariolage* pattern from a tonic to a dominant pedal on the second quarter-note of m. 6. The metric coherence of these bars helps to define the violin part in m. 4 and the first half of m. 5 as another 3/2 measure.

Meanwhile the violas seem to articulate a measure of 3/2 beginning in the middle of m. 4 with material borrowed from the opening measure of the cellos, leaving the status of the first half of m. 4 in doubt. The cellos and basses have a duple measure of dominant prolongation in m. 6, while they are more ambiguous in mm. 4–5: they seem to follow the violas in articulating a 3/2 bar from the middle of m. 4 through the end of m. 5, both harmonically and by virtue of rhythmic-motivic consistency (Metric Preference Rule 5d predicts a strong accent at the beginning of a relatively long pattern of articulation); but the scalar descent to the prominent low G on the second quarter-note of m. 5, followed by an octave leap and another descent, opens the question of whether the low G (as metrically-stable bass note, predicted in metric preference rule 6) breaks that bar of 3/2 into two bars of 3/4…and in either case, the first half of bar 4 is an “orphan” – unaccounted for by any metric grouping with analogous units preceding or following it. In mm. 7–8, however, all this ambiguity is forgotten as coherence returns in a unison passage in that is clearly in duple meter.

Example 2.13a (as notated)

Example 2.13b (implied organization)

The opening ritornello of Concerto No. 3, first movement. Example 2.13(a) shows the passage as notated by the composer; 2.13(b) indicates fluctuations in metric organization implied by the actual musical content. This set of conflicts and displacements is generated without imitation.

The structure thus produced projects a variety of conflicting metric cues, the complexity of which is achieved without imitation.

As noted above, mm. 101–105 from the same movement have already been cited in example 2.3, where they illustrate conflicting metric cues. That passage also serves as an illustration of the present point, for its metric conflict is generated in the absence of imitation. This is in fact an echo of an earlier passage, at mm. 31–35 (example 2.14). In both of these passages, the juxtaposed motives from the ritornello create metric conflict because they tend to retain (or, psychologically speaking, to be perceived in terms of) the metric organization they had when they were first heard. In the earlier instance, mm. 34–37 make it clear that the running sixteenth-note motive (motive B) is derived from the second part of the ritornello theme: The head-motive, heard as a fragment in mm. 32–33, is repeated in mm. 34–35 as part of a statement of the ritornello theme that begins in the bass. This provides the opportunity for the third statement of motive B (after the first in mm. 31–33 and the second in mm. 33–35) to realize its identity fully in mm. 35–36.

Example 2.14

Concerto No. 3, first movement, mm. 31–37. This passage, similar to that quoted in example 2.3, generates metric conflict without using imitation. Here the material labeled as "motive B" in example 2.3 is heard three times (indicated by brackets); the third iteration reveals its source as part of the ritornello theme.

Although the second part of the ritornello theme originally begins on the second half of m. 2, nominally an unaccented point, it is in fact heard as accented.[13] This has to do with a separate problem, that of the relationship of the actual meter, as experienced by the listener, to the bar lines notated by the composer. This is related to the subject of mid-bar downbeat.[14] Of all the passages in the Brandenburg Concertos, the beginning of the first

[13] In an informal experiment conducted with members of an Aural Skills II class in the University of Denver Bachelor of Music Program, a majority of listeners chose 3/2 as the metric organization most appropriate for this passage (see Appendix III). I also had the opportunity to discuss this passage with conductor Lawrence Golan, who agreed as to its anomalous metric organization and explained ways in which different conductors might try to bring out its triple character in performance.

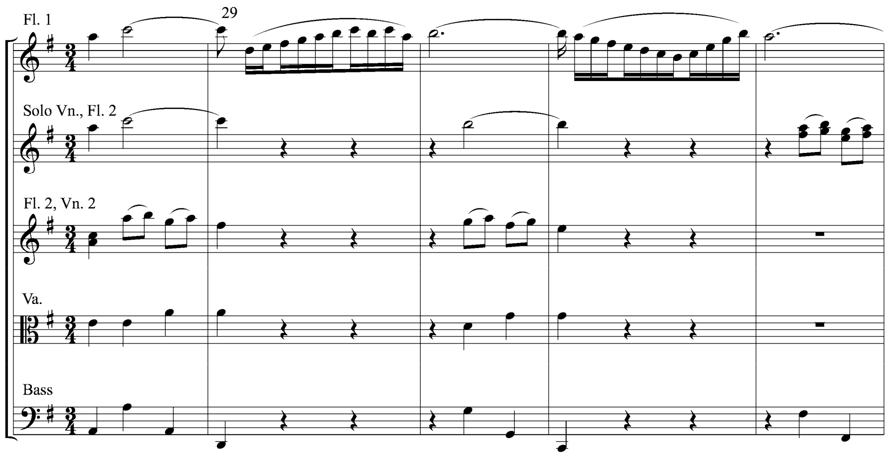
[14] See Burkhart, pp. 3–26.

movement of Concerto No. 3 shows by far the most striking lack of correspondence between what is shown on the page and what the listener actually may hear.

Another example of conflicting metric cues in the absence of imitation is seen in measures 28–32 of the second movement of Concerto No. 4 (example 2.15). Here a single player, the flute soloist, disputes with the ensemble over the nature of the downbeat. Throughout the movement a strong accent on the second beat of the (triple) measure has the effect of suggesting a displacement characteristic of a sarabande. The flute contradicts this tendency by strongly articulating a downbeat in mm. 30 and 32 that is normatively aligned with the notated bar-lines.[15]

[15] While it is neither unknown nor impossible for the first beat to be metrically stressed in a sarabande, here the flute's stress on the first beat is heard against the other parts' continued stress on the second beat.

Example 2.15



Concerto No. 4, second movement, mm. 28–32. The first flute strongly emphasizes the notated downbeat, in conflict with other factors, present from the beginning of the movement, that suggest a displacement of the measure accent to the second beat.

We see an example of the phenomenon operating at a hypermetric level in mm. 165–183 and mm. 293–310 of the first movement of the same concerto (example 2.16). In these two very similar passages, different polyphonic layers of texture seem to go their separate metric ways, with apparently sequential measure pairs popping up here and there in different parts, sometimes overlapping. Duple hypermetric organization, present and ubiquitous from the beginning of the movement, disappears.[16] The metric irregularity of these passages occurs in the absence of imitation; indeed, they have a random character that might be impossible to achieve with imitation, since imitation, metrically

[16] In the same informal experiment referred to above, a majority of listeners expressed their apprehension of duple hypermeter at the beginning of this movement by choosing 6/8 over 3/8 as a meter signature for the piece (see appendix II). When confronted with mm. 165–174 of the same movement and asked to group measures in pairs, they generally failed to agree on measure pairings, suggesting that the tendency to perceive duple hypermeter was weakened or absent. I also discussed this passage with conductor Lawrence Golan, who affirmed that while he found it preferable to conduct the beginning of the movement as a series of measure pairs, he would conduct the two passages consisting of mm. 165–183 and mm. 293–310 as a series of single, ungrouped measures.

destabilizing as it can be, always has an intrinsic periodicity defined by the time interval of the imitation itself. The much more regular hypermetric structure preceding and following these two passages serves to emphasize their irregularity still more.

Example 2.16a

Example 2.16b

Concerto No. 4, first movement, mm. 165–183 (a) and 293–310 (b). In these two similar passages, irregularity and conflict are generated without imitation.

Split Downbeat

An important way in which metric conflict may arise in the absence of imitation is a phenomenon that has been identified by William Rothstein as "split downbeat."[17] This is an effect that occurs specifically within the context of a homophonic texture, and it characteristically manifests on a hypermetric level. As Rothstein explains, "In a melody and accompaniment texture, a hypermetrical downbeat may be 'split,' appearing first in the accompaniment, then in the melody."[18] The sequence of accented and unaccented measures in the accompaniment is sometimes maintained out-of-phase with those in the melody for some time, preserving the presence of split downbeat.[19]

In the Brandenburg Concertos, the homophonic texture necessary for this phenomenon is generally absent. However in the second movement of Concerto No. 2, we find a texture that is a blend of homophony and polyphony (example 2.17). Here, the trio of flute, oboe and violin is accompanied by a continuo part that stands outside of the imitative texture binding the upper parts together.

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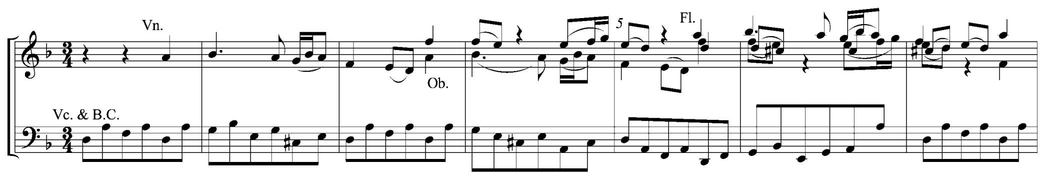
[17] Rothstein, pp. 61–64.

[18] Rothstein, p. 58.

[19] Rothstein cites this phenomenon in a discussion of Schubert's *Piano Sonata* in D, op. 53, fourth movement, where it occurs in mm. 19–20. Another example from the nineteenth-century literature is the Schumann *Fantasy Piece* for clarinet and piano, op. 73, no. 1, where it occurs at the beginning. Schubert's *Waltz* in A major, cited by Lerdahl and Jackendoff (p. 250 ff.) as a highly complex example of the relationship between grouping structure and metric structure, may be understood in much simpler terms if it is recognized as an example of split downbeat, with left hand and right hand remaining out-of-phase with each other on the level of the two-bar hypermeasure until the end.

Example 2.17



The opening of Concerto No. 2, second movement. Imitative entrances of the violin, oboe, and flute, spaced at time intervals of two measures, reinforce a regular two-bar hypermeter. However, the accented measures of this hypermeter (e.g. mm. 2, 4, and 6) are at odds with the accented measures in the continuo part (mm. 1, 3, and 5), creating what Rothstein calls "split downbeat."

This continuo part begins by alternating back and forth between bars of tonic and dominant harmony. It seems most natural to hear the first bar as accented in relation to the second bar. First, the opening arpeggiation of the tonic D minor triad is relatively stable harmonically, compared to the arpeggiation of the dissonant C sharp diminished chord in the second bar. In addition, the design of the arpeggiation itself supports such an interpretation: The bass D on the downbeat of the tonic is lower than the bass on the downbeat of the second measure, lending it greater metric stability. A lower bass than this opening D does not arrive until the third beat of the second measure, and when it does it is a C#, the leading tone harmonized with an unstable chord and pointing strongly to the bass D that re-establishes the stable, root-position tonic harmony at the beginning of the third measure (which turns out to repeat, and therefore emphasize, the first).

In the melody part, on the other hand, it is easier to hear the second bar as accented in relation to the first and third. In fact, the melody has, practically speaking, no m. 1: it begins with a pickup to m. 2. The first note of m. 2 is then singled out for emphasis in two ways: It is a relatively long dotted-quarter note, three times the value of the bass motion and half again as long as the melody note preceding it, and it forms a local contour peak, falling away by step (not only once but twice) before the arrival of m. 3. Melodic entrances proceed at intervals of two bars, with melodic parallelism working together with changes in texture (the addition of voices) and timbre (each entrance introduces the distinct timbre of violin, oboe, or flute) to reinforce a regular alternation of strong and weak measures, but the continuo never resolves its own pattern of accents to that of the other parts. The resulting split downbeat is thus maintained throughout.[20] Resolution of this conflict only comes at the end of the movement, when all the parts come together in the pre-cadential hemiola.

This is the only case of melody-and-accompaniment type split downbeat in the Brandenburg Concertos.

Complex Textures

Most of the metrically conflicted textures we have cited are examples of two conflicting metric layers, competing on a relatively more or less equal basis for supremacy.[21] However it is important to note that more than two metric layers may exist at the same time, creating more complex textures. We have already examined the opening

[20] According to Rothstein, split downbeat can only be asserted unequivocally in cases where the hypermeter is already established prior the entrances that cause the split. Certainly it is true that such an assertion would be more unassailable than one made at the beginning of a piece. In this view, the present case presents a degree of ambiguity.

[21] Sometimes one or the other is allowed to "win"; sometimes the very ambiguity seems to be the point.

ritornello of Concerto No. 3, but might note that for all the complexity of mm. 4–6, there are never more than two conflicting metric layers present at one moment.

A more complex example from this point of view may be found in mm. 69–78 of the first movement of Concerto No. 4 (example 2.18). Here again as in example 2.11, the conflict takes place primarily on a hypermetric level. Emerging from a context of regular duple hypermeter, this passage begins with an unequivocal strong hyperbeat on m. 69 but quickly becomes irregular. The solo violin projects a three-bar hypermeasure, followed by a two-bar hypermeasure comprising a hemiola (with its own local rhythmic complication derived from preceding motivic material), followed by another two-bar hypermeasure, followed by another three-bar hypermeasure: (3 + 2) + (2 + 3). Against this organization the flutes project a series of regular two-bar hypermeasures; the change in surface rhythmic articulation at m. 75 tends to group them as (2 + 2 + 2) + (2 + 2). The violas generally corroborate the flutes, except that mm. 73–74 strongly suggest hemiola; this hemiola is consistent with the two-bar hypermeter of the flutes but *overlaps* the hemiola in the solo violin, with m. 73 belonging to the first half of the former but the second half of the latter. The first and second violins project their own profile, with a pair of two-bar hypermeasures in mm. 69–72, followed by a pair of three-bar hypermeasures beginning with the change in rhythmic articulation in m. 73: (2 + 2) + (3 + 3). The organization in these parts converges with that of the solo violin in the last three-bar hypermeasure; or more strictly speaking in the previous bar, as the final, unaccented bar of a two-bar hypermeasure in the solo violin coincides with the final, unaccented bar of a three-bar hypermeasure in the *ripieno* violins.

The cellos and basses enter with the pickup to m. 70, a bar later than the rest of the parts begin their passage. It is widely understood that a note need not be present for a beat to be metrically accented, but it is also recognized that a metric accent is more likely to fall on a note than on a rest. Lerdahl and Jackendoff express this idea in their third metric preference rule, "Prefer a metrical structure in which beats of level L_i that coincide with the inception of pitch events are strong beats of L_i."[22] In other words, prefer strong beats that coincide with attacks to those that coincide with rests or the continuation of sustained tones. This rule may be overridden by others; however, in the present case the silence of the cellos and bass for more than four measures before their entrance in m. 70 heightens the accentual effect of their appearance. If we consider this part in isolation, we find that it begins with a hypermetric accent that is out of phase with the other parts in the texture, and that it proceeds with a three-bar hypermeasure followed by three two-bar hypermeasures: (3 + 2) + (2 + 2).

Thus the solo violin, flutes, *ripieno* violins, and cello/bass create a texture with four different metric layers. This number is momentarily raised to five with the hemiola in the viola.

[22] Lehrdahl and Jackendoff, p. 76.

Example 2.18a (as notated)

Example 2.18b (fluctuant hypermetric organization)

Concerto No. 4, first movement, mm. 69–78. A complex set of metric conflicts with four independent layers of organization; momentarily increased to five with the hemiola in the violas. Example 2.18a shows the score as notated, while the barlines and parenthetical meter signatures in 18b indicate hypermetric organization.

Effect of Metric Conflict on Depth of Metric Hierarchy

In addition to being interesting and expressive in its own right, metric conflict has a direct effect on an important parameter of metric organization: the depth of metric hierarchy. Metric conflict often has the effect of suppressing hierarchic depth, sometimes subtly and sometimes dramatically. When this happens, the moment when a deeper hierarchy re-emerges can be felt as a strong metric arrival point. The effect is analogous to the strong harmonic arrival that is experienced at the resolution of a large-scale dissonance such as a dominant pedal.

Accents "Canceling Out" One Another

When conflicting metric cues arise, they often are distributed in such a way that on some level, the same beats will be marked as strong by one set of cues and weak by another. In other words, given a hypothetical set of beats 1, 2, 3, and 4, beats 1 and 3 will be marked as strong and beats 2 and 4 marked as weak *by one set of cues or layer of texture;* while beats 2 and 4 will be marked as strong and beats 1 and 3 marked as weak *by another set of cues or layer of structure.*

London has pointed out the important fact that in such a situation, conflicting strong and weak beats tend to cancel each other out. In a discussion of the Beethoven song, *An die ferne Geliebte,* he identifies just such a set of conflicting metric cues, and argues that

> when the two metric streams are folded together the result is an accent on every beat – as if every beat were a downbeat. Because this cannot be so according to [well-formedness constraint] 5, the effect of folding the two streams together is to efface the measure entirely. To be sure, a listener could simply hold to the primary meter as it has been already well-established and hear the shadow patterning as counterstresses that chafe against but do not displace the established meter. But … a collapse of higher metrical levels seems most likely.[23]

[23] London, *Hearing in Time*, p.84. He makes this point in the course of arguing that different meters cannot be perceived simultaneously. London uses "WFC 5," referring to his own "Well-Formedness Constraint 5," one of a set of 'principles' he has established in reference to certain technical definitions he has formulated, and which are apparently inspired by Lerdahl and Jackendoff's "Metric Well-Formedness Rules" and "Metric Preference Rules." Well-Formedness Constraint 5 states: "Each subcycle must connect non-adjacent time points on the next lowest cycle. For example, each successive segment of the

Later he makes the same point in discussing a passage from Beethoven's *Symphony no. 5:* "the upshot of the conflicting metric orientations is that they cancel each other out, much like those in the passage from Beethoven's *An die ferne Geliebte.*"[24]

In these situations the listener is left uncertain about when, or even whether, to anticipate accent on higher levels, leading to the "collapse of higher metrical levels" London describes. The situation obtains wherever strong beats in one part coincide with weak beats in another part *on the same hierarchic level.* Such a coincidence of strong and weak beats causes the canceling-out that prevents any higher level from forming. Bars 12–14 of Concerto no. 1, second movement (cited earlier in example 2.7), as well as mm. 23–25, show this effect in the Brandenburg Concertos. Here the time interval of one quarter-note between the leading and following voice undermines the measure level and causes the quarter-note level to emerge as the highest clearly articulated metric level. (The half-measure level is obviously bypassed, as in unsyncopated triple meter there is no half-measure level to articulate.) We may observe that the greater the intensity of metric conflict due to proximity of conflicting cues (see Krebs' observation relating proximity and intensity, p. 54), the greater the suppression that the hierarchy will suffer. This is because the hierarchic level on which strong beats and weak beats coincide is proportionately lower.

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beat cycle must skip over at least one time-point on the N-cycle" (London, *Hearing in Time,* p. 72). To paraphrase London, for two beats to be strong, they must be separated by at least one weak beat. The adjacency of strong beats would equally violate Lerdahl and Jackendoff's "Metric Well-Formedness Rule 3," which states: "At each metric level, strong beats are spaced either two or three beats apart" (Lerdahl and Jackendoff, p. 69).

[24] London, p. 95.

Another example of metric conflict involving imitation at the time interval of one-half measure cited earlier was in mm. 30–34 and 98–101 of Concerto No. 1, third movement (example 2.7). Here the sense of the measure is weakened enough by the intense struggle between the piccolo violin and the first horn that the location of the downbeat is in doubt. This is shown by the fact that at the end of the latter passage, it is shifted, without any noticeable discontinuity in the music, to the middle of the measure.

In the first movement of Concerto No. 4, we previously examined two cases of conflict on a hypermetric level. In mm. 69–78 (example 2.18) the complex metric conflict causes the hierarchy to collapse to the level of the measure, only to be re-established in the double hemiola in all voices that intervenes before the cadential arrival and the highly organized material that follows. (This is true in all four subsequent reiterations of the passage later in the piece.)[25] In the two passages of mm. 165–183 and 293–310 (example 2.16), the metric conflict again causes all hierarchic levels above that of the notated measure to weaken to the point of disappearance. Both of these passages are then followed by material that causes the hierarchy to re-establish itself immediately; in the first case an embellished statement of the ritornello theme, and in the second case slow-moving harmony combined with motivic repetition at the level of four bars.

Accents Reinforcing One Another

Finally we should observe that in the cases where we noted that imitation was organized in such a way as to corroborate meter rather than to generate conflict,

[25] Except of course that the last such event marks the end of the movement and no material follows the cadence.

hierarchic depth was enhanced. At the beginning of the third movement of Concerto No. 4, seen in example 2.12 (p. 58), the four-bar time interval between the subject in the violas and the answer in the second violins not only emphasizes hypermetric organization at the four-bar level, but also corroborates by implication (and also by virtue of the organization of the subject itself) all underlying levels, including the two-bar level, the measure level, and the half-measure.

The four-bar level thus established is immediately undermined by the two-bar codettain mm. 9–10, so that the next entrance, normatively anticipated in m. 9, is delayed until m. 11; however we may note that this temporary suspension of the four-bar level does not affect the underlying levels of two bars, one bar, and one-half bar.[26] Following the codetta, the next two entrances re-establish the four-bar level (first violin at m. 11, answer in cellos and bass at m. 15); indeed the next entrance after m. 15, the answer in the flutes eight bars later at m. 23, further corroborates the four-bar level and implicitly extends the hierarchy to the eight-bar level.

"Actual" Intensity of Conflict and Relative Strength of Cues

We have already noted Krebs's observation that the *inherent* intensity of metric conflict may be increased or decreased respectively by the greater or lesser proximity of conflicting sets of cues. It seems also true that this inherent intensity exists as a potential,

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[26] I follow Ebenezer Prout, *Fugue* (New York: Greenwood Press, 1969 [reprinted from the original edition published in 1891]) and André Gédalge, *Traité de la fugue,* tr. Davis (Norman: University of Oklahoma Press, 1965) in using "codetta" to refer to the short non-thematic passage sometimes found between two subject entrances in a fugue exposition. Another translation of Gédalge, that by Levin (Mattapan, MA: Gamut Music Co., 1964), renders the term as "coda." The same feature is commonly referred to by contemporary American authors as a "bridge," e.g. William Renwick, *Analyzing Fugue: A Schenkerian Approach* (Stuyvesant, N.Y.: Pendragon Press, 1995).

which may be more or less fully expressed according to whether the two layers involved are relatively equal or unequal, respectively, in accentual strength. In other words, the *actual* intensity of a given metric conflict may be weakened if one of the layers involved is overpowered or dominated by others. We might say that this factor regulates the degree to which the *inherent* intensity is *actualized*.

For example, we observed in example 2.5 (p. 51) the conflict at the beginning of the minuet of Concerto No. 1, generated by the imitation one measure later in the bass of the opening motive in the first violin, piccolo violin, and oboe; however, this conflict is relatively weak because the difference in register between the initial motive and its imitation contributes to a difference in salience that causes the imitation to be overpowered by other voices, allowing two-bar hypermeter to continue despite the momentary challenge to its integrity. Likewise, the conflict in mm. 88–89 and 94–95 of the first movement of Concerto No. 2, described in example 2.8 (p. 53), is weak because the orchestral texture generally corroborates the normatively aligned version of the meter, so that the conflicting version is experienced as ephemeral at most and hypermeter is undisturbed. (In fact, the conflict is easy to overlook altogether.) In the opening ritornello of Concerto No. 3, first movement (example 2.13, p. 61), the bar of 6/4 (or two bars of 3/4) projected by the violin from the second half of m. 5 through the end of measure 6 is too fleeting to fully undermine the metric hierarchy, which in any case is only beginning to establish itself at that point in the piece. In fact it indirectly supports the metric hierarchy with its conflict, because the moment of resolution of that conflict is the downbeat of the unison passage in m. 7, which is emphasized as a result.

A more nuanced illustration of this point may be seen in the first movement of Concerto No. 6, discussed at greater length below in Examples 2.24 through 2.28 (pp. 95–99), where the first of a series of passages based on imitative entrances introduces the episode at m. 17. Here the higher register of the *violas da braccio* dominates the lower register of the *violas da gamba* and cello, allowing the *violas da braccio* to effectively displace the downbeat to mid-bar. Later, in mm. 56–57, virtually the same material is presented; here, however, imitation is at the unison, generating a much more equal, and thus much more intense, conflict over the proper position of the downbeat.[27]

Clarifying Factors Mitigate Conflict

A related observation is that metric conflict may be strong, but still mitigated by factors that serve to clarify the meter. For instance, in example 2.10 (p. 56) we observed the canonically-generated metric conflict at the beginning of the opening ritornello of Concerto No. 6, first movement; a relatively intense conflict because of the close adjacency of the conflicting cues (imitation at the time interval of one eighth-note). We may also observe that the leader and follower of the canon each independently articulate with great clarity both the half-measure (by motivic repetition) and the measure (by change in rhythmic articulation). Although the conflict at the level of the eighth-note is intense, this level is sufficiently removed in scale from those larger levels that the sense

[27] As if in recognition of this greater intensity of conflict, and the concomitant need to allow it to dissipate, the after-phrase following this series of entrances, in mm. 59–61, is one bar longer than in corresponding passages in mm. 19–21 and 34–36.

of the measure is maintained, although its boundaries may be experienced as somewhat fuzzy, owing to the accentual ambiguity at the eighth-note level.

Mm. 235–238 and 251–254 of Concerto No. 4, first movement, shown in example 2.11 (p. 57) also illustrate this idea: a relatively intense conflict generated by a three-part canon at the time interval of one eighth-note fails to undermine the meter because isolated bass notes serve to simultaneously reinforce it.

Structural Implications of Metric Conflict

As observed above, some authors refer to the metric conflict generated in a polyphonic texture as "metric dissonance."[28] Although I do not use this term, it is important to recognize that metric conflict can play as important a role in formal organization (using the term to refer to every scale of reference from the most local to the most global) as that played by harmonic dissonance. Furthermore, in some movements that prominently feature metric conflict, there are clear correlations that can be drawn between the appearance of metric conflict and other structural parameters of the piece.

Concerto No. 1, Third Movement: Metric Conflict and the Preparation of a Defective Da Capo Recapitulation

One of the most dramatic examples is in mm 30–34 and 98–102 of the third movement of Concerto No. 1, referenced above in example 2.7 (p. 53). We have already

[28] See Chapter 1, note 24.

seen that in these measures, the relatively intense metric conflict between the first horn and piccolo violin suppresses the metric hierarchy and places the location of the measure downbeat in doubt. Examination of both of the passages shows that this metric conflict, and more particularly its resolution, is associated with important structural events.

In the first instance, the metrically conflicted passage occurs as part of an extended ritornello beginning in m. 21. The ritornello *Vordersatz* is first heard in the tonic key of F major, leading to a half-cadence on C at m. 24. Mm. 25–30, still based on the ritornello *Vordersatz,* introduce a virtuosic triple-stop texture in the piccolo violin and also continue the harmonic motion to an emphatic arrival on G major, preparing the tonicization of C major.

Halfway through m. 30, however, the *tutti* texture drops away and the metric conflict between the horn and piccolo violin begins, accompanied only by a metrically neutral bass. Tonally, the passage serves to prolong the G major harmony, heightening the anticipation of arrival on the tonic of the new key of C major. The metric conflict here is correlated with the prolongation of harmonic tension. Then, on the downbeat of m. 35, the harmonic tension and metric conflict are simultaneously resolved, as the ritornello *Vordersatz* recommences from the beginning in the new key of C major. This modulation is then confirmed in a prominent cadence in m. 40 (which is articulated with a local metric irregularity, in the form of a metrically displaced hemiola).

In the second passage from example 2.7, the sequence of events unfolds generally as before, but the outcome is different. The passage of metric conflict in mm. 98–102 arises in the same way as the analogous passage earlier in the piece; however, instead of continuing the harmonic motion to the dominant of C major, it is the dominant of F major that is prolonged throughout the passage. Then when the harmonic and metric resolution arrive, the ritornello *Vordersatz* recommences in the tonic key of F major. However in this case the metric conflict is not resolved as in the earlier passage, in favor of the normative accentual position advocated by the horn, but rather in favor of the displaced accentual position advocated by the piccolo violin. Thus the ritornello that follows is metrically defective, displaced by one-half measure, with the downbeat in the middle of the bar.[29] This defective ritornello is broken off after four bars, and the cadence in m. 108, analogous in most details to the cadence in m. 40, serves to re-align the meter with the notated bar-lines. Then and only then, the *Vordersatz* begins again, leading into what turns out to be a full *da capo* recapitulation of the opening ritornello, a closing gesture that ends the movement.

As is common in Bach's concertos, (and particularly common in the first movement of this concerto), the two passages form a symmetrically balanced pair: one modulates, the other does not; one resolves the metric conflict to the notated meter of the horn, one resolves it in favor of the displaced "shadow meter" of the piccolo violin.[30] It is true that the second passage does not generate the harmonic tension of the first because it does not

[29] "Defective" is not meant here in any perjorative sense, but in the strictly limited sense of "not right," the same way that a false recapitulation in a Haydn string quartet might be called "tonally defective." In both cases there is an element of "wrongness" in the recapitulation, and this is confirmed by the composer's need to correct the flawed parameter and recapitulate the material again before the form can be complete.

[30] This term, attributed by London to Samarotto (see London, *Hearing in Time,* p. 81), is defined by William Rothstein as "a secondary meter formed by series of a regularly recurring accents, when those accents do not coincide with the prevailing meter (or hypermeter)…" See Rothstein, "Beethoven with and without *Kunstgepräng:* Metrical Ambiguity Reconsidered." In C. Reynolds, L. Lockwood, and J. Webster, eds., *Beethoven Forum IV* (Lincoln: University of Nebraska Press, 1995), p. 167.

modulate. However, it is also fair to point out that it maintains metric tension much longer because of the metrically displaced version of the ritornello *Vordersatz* it leads to. However, we may observe that the entire complex of metrically conflicted events serves to set up a situation wherein the closing *da capo* ritornello begins metrically out-of-phase, is interrupted by a passage that serves to "correct" the meter, and then recommences to be heard in full and end the piece.

Concerto No. 4, First Movement: Using Metric Conflict to Articulate the Approach of Important Sectional Cadences

In example 2.18 (p. 73), we observed a metric conflict that arises in a polyphonically complex texture in mm. 69–78 of the first movement of concerto no. 4. This conflict plays a significant structural role when we consider that in this movement, the entire section from m. 1 up to the beginning of m. 83 may be considered the opening ritornello, with the opening theme being heard in the tonic in mm. 1–12, in the dominant in mm. 23–34, and again in the tonic in mm. 57–68.[31] From this perspective the conflict arising in mm. 69–78 is important because it precedes the cadence that closes the extended opening ritornello, which is the first clearly articulated cadence in the piece.

This movement begins with a hypermetric structure articulated at the two-bar and six-bar levels. The two-bar level is in fact so strong that listeners may tend to perceive it as

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[31] Boyd, p. 83. Various authors have commented on the tendency of these concertos to modify the structural norms of the Venetian *ritornello-allegro* paradigm. See Boyd, p. 50; also Michael Marrissen, *The Social and Religious Designs of J. S. Bach's Brandenburg Concertos* (Princeton: Princeton University Press, 1995), p. 50, and Pipa Drummond, *The German Concerto: Five Eighteenth-Century Studies* (Oxford: Oxford University Press, 1980), p. 52 ff.

the primary metric level (see note 20, above). The six-bar level is generated by the opening theme's six-bar length and characteristic two-fold repetition, and is heard eight times in the opening ritornello, being present for 48 bars, or more than one-half of the total of 82 bars in the ritornello period.[32]

At the approach to the cadence, beginning around measure 69, this stable metric context is undermined by the conflict of mm. 69–78, leading to the collapse of the six- and two-bar levels. This generates a tension that drives the dramatic pace forward until, just before the cadence, the metric conflict gives way to four bars of hemiola (another type of metric conflict, but a regular and accentually stable one) in mm. 79–82, which serve to maintain metric tension while creating enough accentual and syntactic expectation that the cadential arrival in m. 83 is experienced as a highly anticipated (and thus accented) event. The following episode then dissolves metric tension by restoring the six-bar level heard at the opening of the movement (although it is repeatedly interrupted, generating new tensions).

In mm. 143–156, 221–234, and 329–342, the same material in recapitulated in E minor, C major, and B minor, respectively, marking the second, third, and fourth important structural cadences in the movement. In mm. 413–426, it is recapitulated in the original key of G major as part of the *da capo* recapitulation of the entire opening ritornello that begins in m. 354. Thus, all major cadences in the movement are articulated by the same passage, in which metric conflict plays an important role in generating tension that is then resolved by the cadential material.

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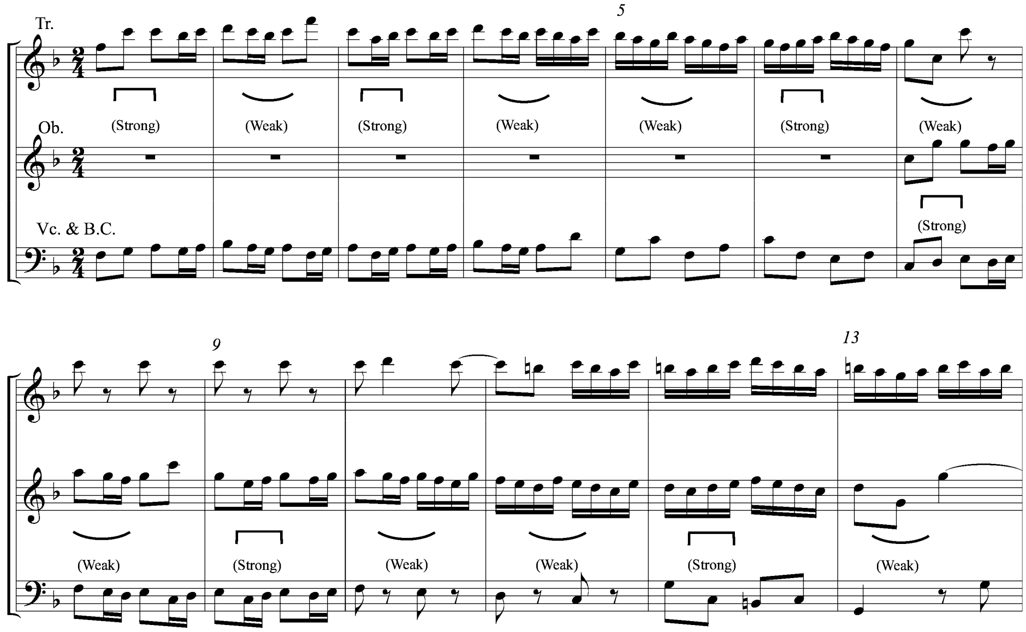
[32] See Analysis of Concerto No. 4 in Appendix no. I.

Concerto No. 2, Third Movement: Metric Modification of the Subject Correlated with Modification of the Modulatory Scheme

The third movement of Brandenburg No. 2 provides an example of metric structure that is manipulated in the service of harmonic structure. First, it will be observed that the seven-bar fugue subject that is introduced at the opening of the movement has an irregular hypermetric organization of "strong-weak-strong-weak-weak-strong-weak," generated by the change from tonic to dominant harmony on the sixth measure (example 2.19).

Example 2.19



The opening of Concerto No. 2, third movement, mm. 1–13. The fugue subject that forms the thematic basis for the movement has an irregular hypermetric organization of strong-weak-strong-weak-weak-strong-weak. The "weak" last bar of the first entrance in the trumpet coincides with the "strong" first bar of the second entrance in the oboe, creating a hypermetric overlap.

The second entrance of the subject begins in m. 7 with an accented measure, in parallel conformity to the first entrance. However this accented measure in the oboe, juxtaposed with the unaccented seventh measure of the first entrance in the trumpet, creates a hypermetric overlap between parts.

Lehrdahl and Jackendoff argue that only grouping structure is susceptible to overlap, not metric structure; they would label this a case of metric "deletion."[33] Kramer prefers

[33] Lerdahl and Jackendoff, p. 337. They eschew the term "elision" in reference to metric structure, using it only in connection with grouping structure. I try to avoid the term "elision" as well, both because Lerdal and Jackendoff do, and also because it seems that it is often used without a qualifying reference to either metric or phrase (grouping) structure, so that it means sometimes one, sometimes the other, and sometimes both, tending to reinforce the conflation of different categories that bedevils rhythmic theory.

the term "overlap" as more evocative of the way a listener experiences the musical event.[34] I believe the idea of metric overlap is easy to accept, once we accept the idea of polyphonically generated metric conflict. As Lester has written, referring to the failure of literature on rhythm to take into account the rhythmic structure of polyphony, "The root of the problem is the general insistence by writers on rhythm that a phrase must project only a single accentual profile and that the task of the analyst is to find that one profile."[35]

Returning to example 2.19, we see that the trumpet and oboe entrances are in the tonic and dominant respectively, and that the harmonic modulation to the dominant is in fact achieved through pivoting on the dominant harmony in the overlapped m. 7. The linking of the two subject entries through metric overlap creates an effect of destabilizing unexpectedness that drives the exposition forward rhythmically, just as the tonal motion characteristic of the subject-answer relationship drives it forward harmonically.

Two-bar hypermeter emerges during the six-bar codetta (counting m. 13 as overlapped between the second entrance and the codetta), before the next pair of entrances begins at m. 21. The metric overlapping of entrances is then repeated in mm. 21–33 as the solo violin and flute make their appearance. After another codetta, this time of eight bars, the bass cadences in the dominant and drops out, strongly articulating the beginning of a final, redundant entrance at m. 41 (example 2.20). Here for the first time, the subject is heard without metric overlap at the end; indeed it is hard to discern its role here unless it is perceived as the model for the preceding subject-answer pairs, which

[34] Kramer, p. 418.

[35] Lester, p. 252.

would then constitute modified versions of the prototype.[36] After this entrance the continuo re-enters and the orchestral strings make their first appearance, signaling that the exposition of the subject is now "complete."

Example 2.20

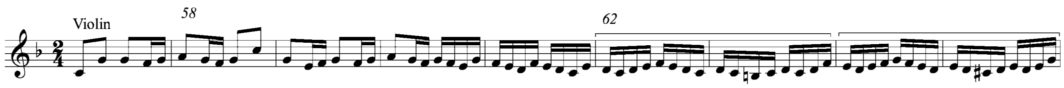
Concerto No. 2, third movement, mm. 41–47 (with beginning of m. 48). After the subject has been presented by all four soloists, it returns to the trumpet in a texturally emphasized redundant entrance before the cadence ending the exposition. This entrance is the first to be presented without metric overlap, and represents a possible prototype for the versions already heard.

Throughout the course of the movement, the unfolding of events is considerably varied in subsequent expositions. For instance, after the modulation to the dominant is cadentially re-affirmed in m. 57, another subject entrance immediately follows; however this entrance takes a variant form sequentially extended from seven measures to nine, and again without metric overlap (example 2.21). This entrance does not modulate up a fifth but rather up a major second: the sequential extension to the subject facilitates the

[36] Even if one accepts this interpretation of the subject entrance at m. 41, I am not necessarily suggesting that it was conceived before the earlier, "modified" version.

tonicization of the submediant key of F major. Note that the absence of metric overlap correlates with the absence of a pivot modulation.

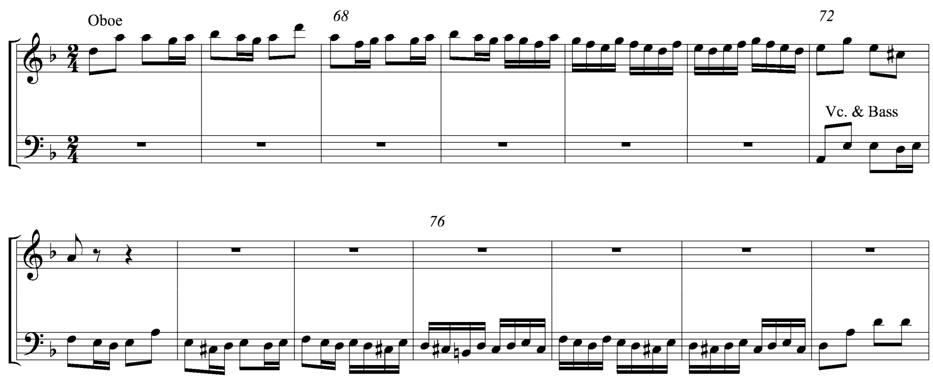
Example 2.21



Concerto No. 2, third movement, mm. 57–65 (non-thematic voices omitted). This sequentially extended version of the subject modulates up a major second instead of a perfect fifth, facilitating the tonicization of the submediant of F major. Metric overlap is not present.

This tonicization of the submediant key sets the stage for another entrance pair, metrically linked as before, starting out in the submediant and modulating briefly to its minor dominant (example 2.22). The first member of this pair (m. 66) is normative in form, while the second (m. 72) is altered to an eight-bar form that returns to the key of the first, instead of continuing to a half-cadence in the dominant as is the case with the first two pairs. It ends without metric overlap but in fact with a second unaccented bar preceding the sequential passage that leads to the dominant.

Example 2.22



Concerto No. 2, third movement, mm. 66–78 (non-thematic voices omitted). In this metrically overlapped entrance pair, the second member takes a modified, eight-bar form that returns to the underlying harmony of its predecessor.

Beginning in m. 107, a set of three metrically linked entrances begins to bring the movement to close (example 2.23). The first two (mm. 107 and 113) are in the original seven-bar form and modulate first from the subdominant to the tonic, and then from the tonic to the dominant. The third (m. 119) is in the eight-bar modified form introduced in m. 72, which eschews overlap at the end and returns to the key of its predecessor.[37]

[37] This is somewhat disguised by a deceptive cadence in m. 126 and the transfer of the last bar of the modified subject from the bass to the flute.

Example 2.23

Concerto No. 2, third movement, mm. 107–126 (non-thematic voices omitted). A set of three metrically overlapped subject entrances near the end of the movement. The first two take the normative form, including a metrically overlapped pivot modulation at the end, while the third takes the metrically and harmonically modified form seen in example 2.22.

Our analysis reveals that metrically linked subject pairs are used to facilitate modulation by pivot harmony to the dominant, in mm. 1–13, 21–33, 65–72, and (a set of three) 107–126. Conversely, we see that subject entrances are modified to end without overlap when it is desirable to interrupt the chain of modulations (mm. 47, 79, 126). The entrance at m. 57 belongs to neither category: it is modified in length and non-overlapped, but it does modulate. However, its modulation is up a major second instead of a perfect fifth, underscoring the relationship between metric modification of the subject and attendant modification of the modulatory scheme.

Concerto No. 6, First Movement (a): Metric Conflict and the Articulation of Thematic Recurrence

Metric conflict generated by imitative textures is pervasive in the first movement of Concerto No. 6, and is related to its structural organization in two main ways. First, we noted above, in example 2.10 (p.56), the relatively intense metric conflict that characterizes the ritornello theme, with a canon at the time-interval of one eighth-note against a harmonically static background. This metric conflict is present at every appearance of the ritornello theme: mm. 1–17, 25–28, 46–52, 73–80, 86–91, and 114–130. It is thus exactly correlated with recurrences of the ritornello theme and may be considered part thereof; indeed it plays a prominent role in articulating the ritornello structure of the piece, in this way: In the paradigmatic concerto-grosso movement, ritornello passages are scored for *tutti* while episodes are scored in a contrasting *concertino* texture. Bach does not make a similar use of textural contrast to support the ritornello structure here, and as a consequence, other parameter-fluctuations correlated with recurrences of the ritornello (such as metric conflict) are even more important.

Concerto No. 6, First Movement (b): Escalation and De-Escalation of Metric Conflict Within a Series of Related Episodes

Completely different, but also metrically conflicted, material characterizes a set of closely-related episodes beginning at mm. 17, 28, 32, 56, 65, 92, and 103, as entrances of the same motive in different instrumental voices fall on different halves of the measure. Examination of these passages reveals a ratcheting-up followed by a dropping-off of the level of metric conflict expressed in each.

In the passage beginning in m. 17 the intensity of metric conflict is lower, because of the distribution of registers between the various instruments. The bass of the passage is a low pedal played by the double bass and continuo, and the entrances of the cellos and *violas da gamba* take place in the octave just above this note. The entrances of the *violas da braccio* occur an octave higher than this, forming the treble of the passage, as opposed to the inner voice formed by the cellos and *violas da gamba.* They thus occupy the surface of the texture, and are more prominent than the lower instruments, even though the latter are quite perceptible in the imitative fabric. This allows them to successfully assert their version of the downbeat despite a certain amount of conflicting accentual information (example 2.24).[38]

[38] The passage beginning in m. 28 is scored similarly as to register but for reduced forces; significantly the pedal bass is left out, allowing the cellos to act as the bass of the passage and thereby raising their prominence in the texture. Of all the passages based on this material, it is the only one that does so. If Bach had treated similarly the rest of the series of related passages under discussion, it would have had a significant effect on the way we experience the different versions of the same conflict.

Example 2.24

Concerto No. 6, first movement, mm. 17–21. Metric conflict is generated by overlapping imitative entrances in the higher and lower registers. Higher-register passages in the *violas da braccio* conflict with lower-register passages in the cellos and in the *violas da gamba*. The higher register in which they are set allows the *violas da braccio* to assert a displacement of the downbeat to the middle of the measure.

In m. 32 the *violas da braccio* still sound an octave higher than the cellos and *violas da gamba*, but the higher overall range of the passage (it represents essentially a transposition up a perfect fifth of example 2.24) puts the lower instruments into a tessitura where their sound is much more strident and urgent, according them a prominence they did not have originally and causing them to conflict more aggressively with the *violas da braccio* (figure 25).

Example 2.25

Concerto No. 6, first movement, mm. 32–36. All entrances are transposed up a perfect fifth. The cellos and violas da gamba reach a tessitura where their presence is increased relative to the violas da braccio. This increases the intensity of the conflict, mitigating the dominance exercised by the higher parts over the lower**.**

In m. 56, metric conflict in this group of events reaches a peak as cellos, *violas da gamba*, and *violas da braccio* all have their entrances on the same pitch. Now all of the instruments involved in the conflict are operating on the melodic surface of the texture, and none is part of a less-prominent inner voice. The ascent of the cellos and *violas da gamba* to the surface has removed register as a differentiating factor and thus created real uncertainty over the position of the downbeat (example 2.26).

Example 2.26

Concerto No. 6, first movement, mm. 56–61 (with the downbeat of m. 62). *The metric conflict between the violas da braccio emphasizing the notated downbeat and the cellos and violas da gamba emphasizing the middle of the bar reaches its peak as all entrances are made in the same register. Real uncertainty about the position of the downbeat results.*

In m. 65, events return to their earlier condition as the cellos state the motive first an octave lower, then fully two octaves lower, than the *violas da braccio*; resulting in a rapid de-escalation of their metric confrontation (example 2.27).

Example 2.27

Concerto No. 6, first movement, mm. 65–68. The earlier dominance of the violas da braccio is restored as the cellos enter, first one octave lower and then two octaves lower. Note how the violas da braccio also are supported metrically by the accompanimental voices.

Much later in the piece, in m. 92 metric conflict returns with a vengeance in a kind of harkening back to earlier events, but here as a result of the *violas da braccio* and *violas da gamba*, each previously united in collective opposition to the other, falling out within their own ranks (example 2.28).[39]

[39] This passage is really a hybrid. Although based on the same motive as the others, it is, in its specific melodic content, actually more closely related to a series of related but metrically non-conflicted passages beginning in mm. 40, 53, and 84.

Example 2.28

Concerto No. 6, first movement, mm. 92–95 (with beginning of m. 96). In examples 2.24 – 2.27, the two violas da gamba were united in their conflict with the two violas da braccio. Metric conflict returns with a vengeance as the members of each pair now disagree over the placement of the downbeat.

Thus we can identify, in this series of episodes, a growth, peak, and decline in intensity of metric conflict; all of which takes place approximately within the first half of the movement. Conflict returns, momentarily and transformed, as a sort of coda late in the piece. We see not necessarily a correlation with other aspects of structural organization, but a highly coherent structure that exists on its own, independently of other parameters.

Concerto No. 1, Second Movement: Metric Conflict and Phrase Expansion

Slow movements in the Brandenburg Concertos seem to have generally less concise relationships between metric conflict and formal organization. Indeed, they display less metric conflict overall. However, the second movement of Concerto No. 1 can be shown to correlate metric conflict closely with discrete episodes of phrase expansion.

This movement has five overlapping phrases, all of which are based on the prototype presented in mm. 1–5 (example 2.29). The second phrase (mm. 5–9) is basically a simple transposition down a perfect fifth of the first phrase, with m. 5 serving simultaneously as tonic in D minor for the first phrase and minor dominant in G minor for the second phrase, and with the main melodic material being transferred from the first oboe to the piccolo violin. The third phrase (mm. 9–20) begins according to the by-now-established pattern, with m. 9 serving simultaneously as tonic in G minor and minor dominant in C minor; the melodic theme is now transferred to the bass (bassoon, cello, and continuo). In this phrase, however, the pattern is interrupted by two internal expansions: a three-bar expansion in mm. 12–14, intervening between the third and fourth bars of the phrase prototype; and a four-bar expansion in mm. 16–19, intervening between the fourth and fifth bars of the phrase prototype. The length of the phrase is expanded from five bars to twelve as a result (example 2.30).

Example 2.29

Concerto No. 1, second movement, mm. 1–4 (with beginning of m. 5). The first phrase of the piece, which serves as a prototype for all the others.

Example 2.30

Concerto No. 1, second movement, mm. 9–19 (with beginning of m. 20). Measures are numbered from the beginning of the phrase to indicate expansions: i.e., mm. IIIa, IIIb, and IIIc indicate an expansion inserted between mm. III and IV of the prototype shown in example 2.29; and mm. IVa, IVb, IVc, and IVd indicate an expansion inserted between mm. IV and V of the prototype. The metric conflict that arises and is resolved in the course of the first expansion is out of character for the piece but does not disturb the integrity of the composition because it is contained within the expansion.

The second expansion plays an important structural role: reinforcing the cadence both rhythmically, with a hemiola in mm. 18–19, and harmonically, providing a bass motion of an ascending perfect fourth between mm. 19 and 20, which is missing from the prototype. It is the first expansion that comprises the highly dissonant (both metrically and harmonically) canon between the oboe and piccolo violin, noted above in example 2.9. This first expansion also marks a tonal departure from the phrase prototype, as it comprises a modulation from C minor (the key at the beginning of the phrase) to A minor (the key of the cadential arrival in m. 20, which is already evident in the prominent role of G-sharp in m. 14).

The fourth phrase follows the new, expanded model introduced in the third phrase, except that is does not include the internal modulation but instead remains in D minor throughout.[40] It does include both internal expansions, along with the metrically conflicted canon in the first expansion.

Intense metric conflict is found in this piece only in the first expansion of phrases three and four; it is found nowhere else in the movement. Charles Burkhart, in his analysis of Chopin's A-flat Mazurka, Op. 59, no. 2, notes that a certain prominent phrase expansion is set off harmonically from the rest of the composition in which it occurs by "an astonishing eruption of chromaticism" that marks it as out of character for the piece as a whole. He goes on to suggest that "Chopin could get away with such a seeming inconsistency only because he placed it in an expansion — that is, in what we sense to be

[40] It does retain the harmonic pivot on its overlapping first measure (m. 20) which simultaneously serves as the tonic of A minor for the previous phrase and the minor dominant of D minor for the following phrase. The moment when the modulation from D minor to B minor fails to take place is m. 23, at the beginning of the first expansion; note how the leading voice of the canon enters a minor second higher than the weeping motive, rather than a major second lower as in the previous phrase.

‘nonessential’ measures — outside the norm.”[41] The same observation may be made here: these episodes of intense metric conflict fit so well into the continuity of the movement because they take place within well-defined expansions of a phrase prototype, a kind of rhetorical “aside” that is especially suited to accommodate such a stylistic non-sequitur.

Ambiguity in the Structural Role of Conflict

While we are sometimes able clearly to identify the structural role played by metric conflict, at other times the structural role played by metric conflict is less clear. For an example, we may look once again to the first movement of Concerto No. 4. While we have already identified a recurring passage of metric conflict in this movement that plays an important role in articulating every major cadence (see the discussion of example 2.18 on pp. 84–85), the movement also includes two similar (though not identical) passages of polyphonically-generated metric conflict that do not immediately precede major cadences, and that resist any obvious structural interpretation.

We have seen above, in connection with example 2.16 (p. 67), that in mm. 165–183 the musical fabric emerges from a fairly regular metric organization into a passage of considerable irregularity. The orchestral texture drops away (much as it does in mm. 30–34 and 98–102 of Concerto No. 1, third movement) to highlight a duet between the two flutes, accompanied by cello and continuo. In general the passage provides very few cues

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[41] Charles Burkhart, “The Phrase Rhythm of Chopin’s A-Flat Major Mazuka, Op. 59, No. 2” in *Engaging Music: Essays in Musical Analysis,* ed. Deborah Stein (New York, Oxford: Oxford University Press, 2005), p. 10.

as to metric organization above the measure, and those cues that are forthcoming are not consistent. Altogether the metric uncertainty lasts for a period of twenty measures, which is then followed by a contrasting and hypermetrically stable passage of 24 bars in mm. 185–208. Measure 184 seems to function as an "upbeat" to m. 185, restoring hypermetric clarity at the last moment before the ritornello theme reappears.

A very similar passage occurs in mm. 293–310, with some differences. Here the solo violin also participates, instead of dropping out as before, and the *ripieno* strings also chime in at mm. 298–302. This passage is also followed by a contrasting and highly metrically stable passage, but one unrelated to that following mm. 165–183.

The two passages are closely related in content and character, yet they arise in different circumstances and give way to different situations. Their structural role is not clear.

As noted above, aside from the case of Concerto no. 1, the slow second movements of the Brandenburg Concertos show generally less structural use of metric conflict. In the second movements of Concerto No. 2 and Concerto No. 5, low-intensity metric conflict is pervasive but not associated with any particular features, nor does it have a particular structure of its own. In the second movement of Concerto No. 6 there is little salient metric conflict to discuss (although there are interesting observations to be made about phrase expansion). The second movement of concerto no. 3 is notated as two chords, and does not furnish enough information for analysis. The second movement of Concerto 4 displays considerable complexity, but without clear structural implication.

We have seen, in this close examination of metric conflict in the Brandenburg concertos, that it is generated in various ways, including imitation and irregular organization; that it is regulated in other ways, including registral and textural balance as well as mitigation by strategically placed cues, and that it may or may not be associated with clear structural landmarks in other musical parameters. We have also seen that the presence or absence of metric conflict has a distinct effect on the depth of metric hierarchy generated at any given point in a piece. We turn next to variation in the depth of metric hierarchy as a musical parameter in itself, to see what it can tell us about the way a piece unfolds.

CHAPTER 3: FLUCTUATION IN DEPTH OF METRIC HIERARCHY

We have seen in the course of our examination of metric conflict in the Brandenburg Concertos that it has a strong effect on the depth of metric hierarchy projected. In this chapter we will focus directly on hierarchic depth, how it changes in the course of a piece, and both the causes and effects of those changes.

Justin London notes that when he conceived his book, *Hearing in Time*, "a number of presumptions seemed obvious," including the idea that "meters with many hierarchic levels are more complex than those with fewer levels."[1] In this chapter, while I do not characterize one meter as more or less complex than another, we will see that, contrary to London's initial assumption, complexity in the musical object, as represented by metric conflict (an example of what Lerdahl and Jackendoff call deviation from "archetypal patterns"), lends itself to a shallower hierarchy of meter, while simplicity (as represented by lack of deviation from "archetypal patterns") promotes depth of metric hierarchy.[2]

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[1] London, p. 52.

[2] See Chapt. 1, note 23.

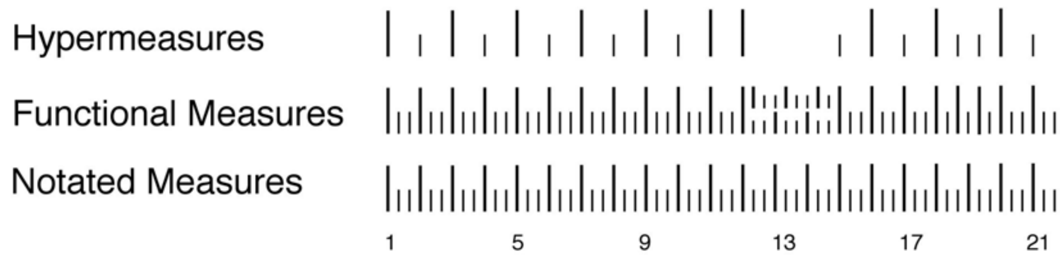
Movements Displaying a Moderate to High Degree of Fluctuation

The second movement of Concerto No. 1 fluctuates between a single hypermetric level in mm. 1–9, 16–21, and 27–39; and sections where metric conflict suppresses the metric hierarchy to the extent of eliminating the level of the notated measure, leaving the quarter-note (mm. 12–14 and 23–25) as the highest metric level (example 3.1).[3]

The third movement of Concerto No. 1 (example 3.2) fluctuates between the emergence of up to three hypermetric levels in mm. 17–24 and 84–91, and sections where metric conflict suppresses the hierarchy down to the level of the half-measure (mm. 30–34, 97–102).

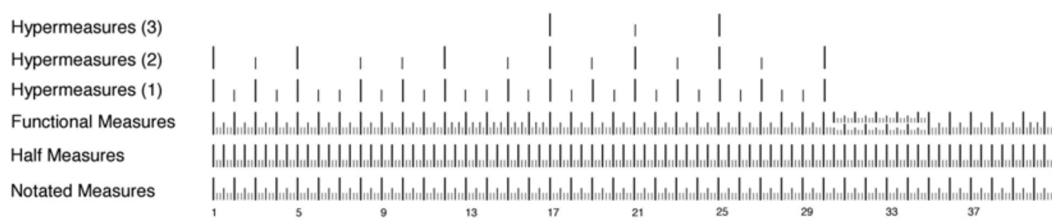
[3] In the following list of movements characterized according to their degree of fluctuation in depth of hypermetric structure, all descriptions reference the metric analyses shown in Appendix 1, pp. 154–209.

Example 3.1



Metric graph of mm. 1–21 of Concerto No. 1, second movement. The bottom layer shows notated measures, the top layer shows the first hypermetric level. The intermediate layer indicates "functional" measures, the metric groupings projected by the sound-object regardless of notation. These comprise the three 2/8 measures that constitute the hemiola in mm. 18–19, and the two conflicting metric organizations projected by the canon in mm. 12–14, indicated by the split into two layers at that point in the graph. (See p. 39 for an explanation of this aspect of the analytical notation.) The hemiola has no effect on hypermetric organization, but the imitative conflict has the effect of obscuring any metric organization above the level of the quarter-note, with the result that hierarchic depth is temporarily suppressed. (All examples of analytic notation in this chapter are drawn from the complete metric graphs in appendix 1.)

Example 3.2



Metric graph of mm. 17–40 of Concerto No. 1, third movement. This excerpt comprises a fluctuation between a relatively deep hierarchy and the suppression of all levels above the half-measure, brought about by the conflict between the horn and the piccolo violin discussed in the previous chapter. (In this graph the layer indicating notated measures and the layer indicating "functional" measures are separated by a layer indicating half-measures, because in a "compound" meter [6/8 or 4/4] like this one, irregularities in the grouping of half-measures are responsible for most of the irregularities on the level of functional measures.[4] An example can be seen in mm. 38–40, with a triple grouping of half-measures, followed by a hemiola, followed by the "metric deletion" of an unaccented half-measure.)

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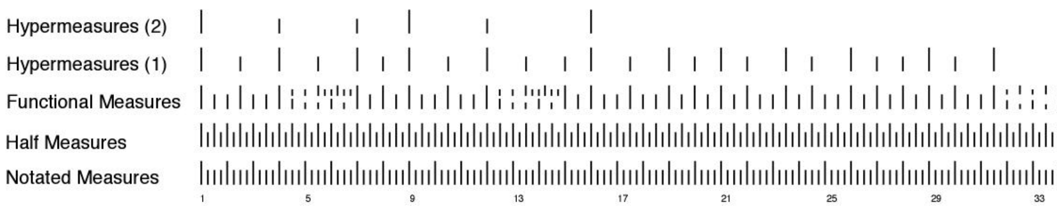
4 Kirnberger, a student and follower of Bach, generally considered the 4/4 measure "compound" like the 6/8 measure, in the sense that it had a strong half and a weak half. See Kirnberger, *Art of Strict Musical Composition,* p. 392.

The first movement of Concerto No. 3 (example 3.3) fluctuates between up to two hypermetric levels (mm. 1–16, 40–101, 108–136) and suppression of the metric hierarchy down to the half-measure level (mm. 31–35, 101–105).

Example 3.3

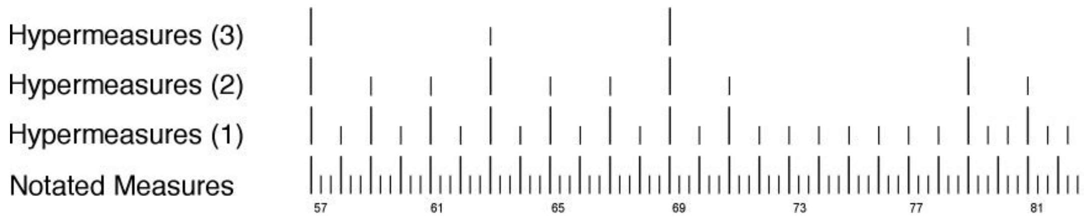


Metric graph of mm. 1–33 of Concerto No. 3, first movement. The three-level hierarchy established at the beginning of the piece is reduced by stages, until the conflict that begins in m. 31 suppresses all levels above the half-measure. Note in this piece the extreme lack of correspondence between notated measures and functional measures, which are again indicated as groupings of notated half-measures. The first two splits in the functional measure level indicate the metric conflicts in the ritornello discussed earlier in example 2.13; the later split beginning halfway through m. 31 indicates the conflict discussed in example 2.3.

The first movement of Concerto No. 4 (example 3.4) fluctuates between up to three hypermetric levels (mm. 1–69, 125–137, 185–220, 263–292, 311–328, 345–412) and suppression of the hierarchy down to the level of the notated measure (mm. 71–78, 145–152, 165–184, 223–230, 295–310, 331–338, 415–422). Note that in the sections characterized by deeper structure, the first hypermetric level may be perceived by listeners as the primary (or notated) level.[5]

[5] See Chapt. 2, note 14.

Example 3.4

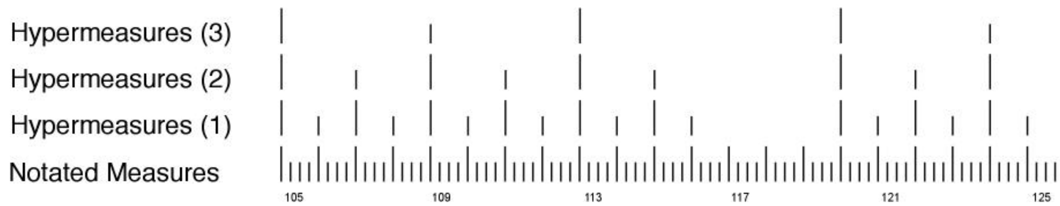


Metric graph of mm. 57–82 of Concerto No. 4, first movement. A relatively deep hierarchy is suspended by a complex metric conflict in mm. 71–78 as the first important cadence approaches. (The conflict is not notated here because of its excessive complexity, but it is discussed in detail in the previous chapter.) Note the double hemiola in mm. 79–82, which re-establishes a hypermetric context just before the cadential arrival on the downbeat of m. 83.

The third movement of Concerto No. 4 (example 3.5) fluctuates between up to three hypermetric levels where imitative subject entrances create "similarity of motivic, rhythmic, and harmonic construction" over a large enough time interval (mm. 1–23, 43–66, 79–112, 120–245), and only one level (mm. 29–40, 69–78), with one brief suppression of the hierarchy down to the level of the notated measure (mm. 116–119).[6]

[6] The conditions proposed by Edward Cone as most favorable for the projection of hypermeasures, as quoted earlier on p. 13. See Cone, *Musical Form and Musical Performance,* p. 82.

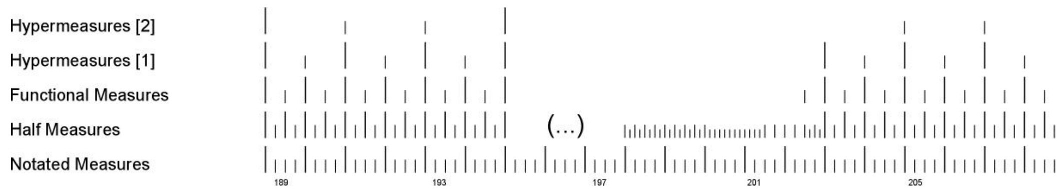
Example 3.5



Metric graph of mm. 105–126 of Concerto No. 4, third movement. A highly-organized metric environment is interrupted by a lack of reinforcing cues after the *ripieno* violins drop out in m. 113. The quick tempo of the movement is reflected in the fact that the pre-established metric organization persists for a few bars even in the absence of reinforcement. (This graph does not show layers for half-measures or functional measures because, atypically, there is exact correspondence of notated measures to real measures.)

The first movement of Concerto No. 5 generally maintains two hypermetric levels but generates three in mm. 71–100, and later fluctuates dramatically when meter disappears completely at the climax of the harpsichord "cadenza" (mm. 195–197). Meter is then re-established in stages between m. 198 and m. 209 (example 3.6).

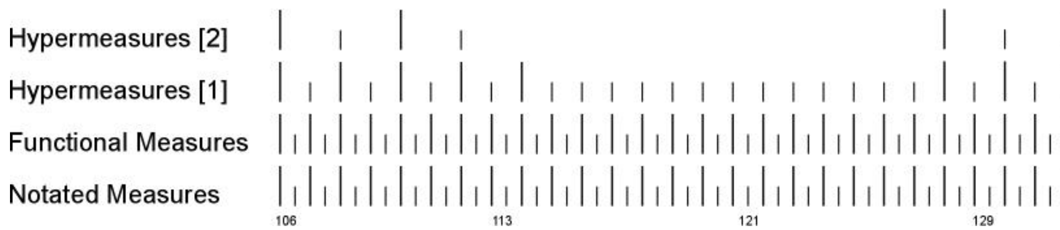
Example 3.6



Metric graph of mm. 189–208 of Concerto No. 5, first movement. Meter suddenly and dramatically disappears at the climax of the harpsichord "cadenza," in mm. 195–197, as indicated by the parenthetical ellipsis. It is then gradually re-established before the slowing of surface motion that prepares the arrival of the closing ritornello.

The third movement of Concerto No. 5 (example 3.7) generally maintains two hypermetric levels but in three places (mm. 114–127, 163–176, 220–224) eliminates hypermeter completely in favor of the notated measure as the highest level. (In the first and third cases, cues supporting 2-bar hypermeter are absent long enough for the 1-measure level to emerge as primary. These passages also include strong textural and pitch-change accents on the second half of the bar, which may have a role in destabilizing the hypermeter. In the second case, the emphasis on the one-measure level is generated by canonic imitation at the time interval of one measure.)

Example 3.7



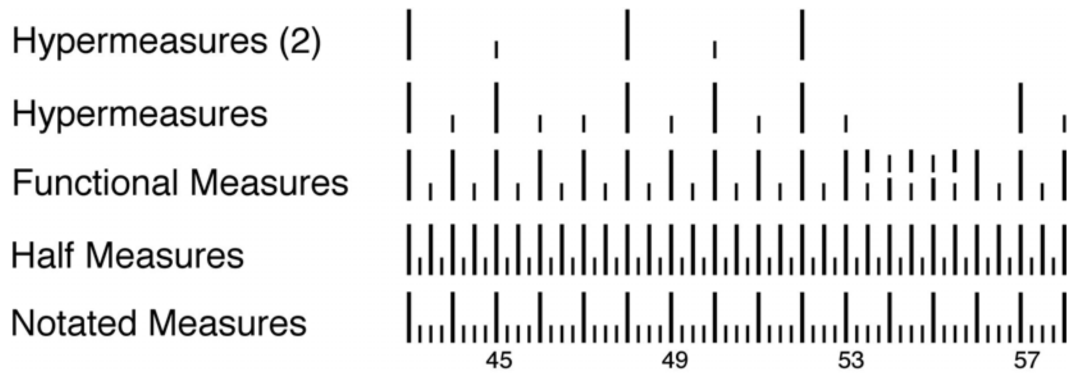
Metric Graph of mm. 106–131 of Concerto No. 5, third movement. Cues sustaining two levels of hypermeter are temporarily absent, allowing the one-measure level to emerge as primary. In effect, although the harpsichord supports accented downbeats, it fails to support accented "hyper-downbeats." (The layers indicating notated and functional measures coincide in this excerpt. In fact, they are out of alignment only [but very significantly] in the first two bars of the movement.

Movements Displaying Limited Fluctuation

The first movement of Concerto No. 1 generally maintains only one level, although two levels are generated in the head of the ritornello, along with its two repetitions beginning in mm. 43 and 72. After the first of these, in mm. 53–56, metric conflict generated by motivic imitation temporarily suppresses the metric hierarchy down to the level of the half-measure (example 3.8).[7]

[7] See also Ex. 2.6.

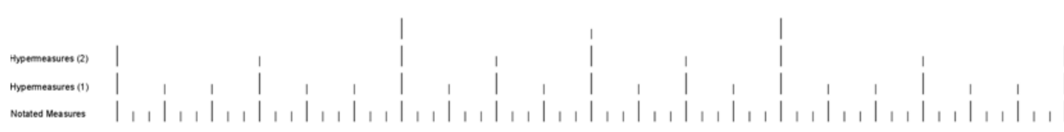
Example 3.8



Metric Graph of mm. 43–57 of Concerto No. 1, first movement. The ritornello in mm. 43–51 temporarily generates a second hypermetric level, while the conflict initiated in m. 53 suppresses the hierarchy down to the level of the half-measure. (The bass in mm. 53–54 is constructed by sequencing a half-measure model, and is accentually neutral with regard to emphasizing one half of the measure over the other.)

The second movement of Concerto No. 6 displays two levels of hypermetric structure throughout (a high degree for a slow-tempo movement), but temporarily generates a third level in mm. 40–47 as the large lead-in to the final period contains motivic parallelisms that create longer-term connections (example 3.9).

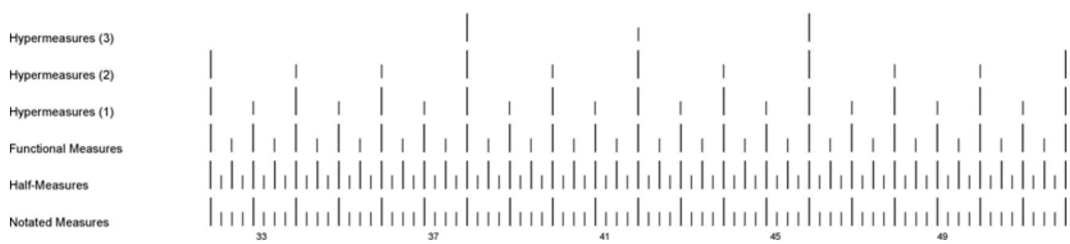
Example 3.9



Metric Graph of mm. 34–53 of Concerto No. 6, second movement. Motivic parallelisms in the large lead-in to the last period create regular periodicities that temporarily generate a third hypermetric level in mm. 40–47.

The third movement of Concerto No. 6 generally maintains two hypermetric levels although it shows three-level structure in some sections. These sections coincide with recapitulations of the ritornello theme and reflect its highly symmetrical, antecedent-consequent structure (example 3.10).

Example 3.10



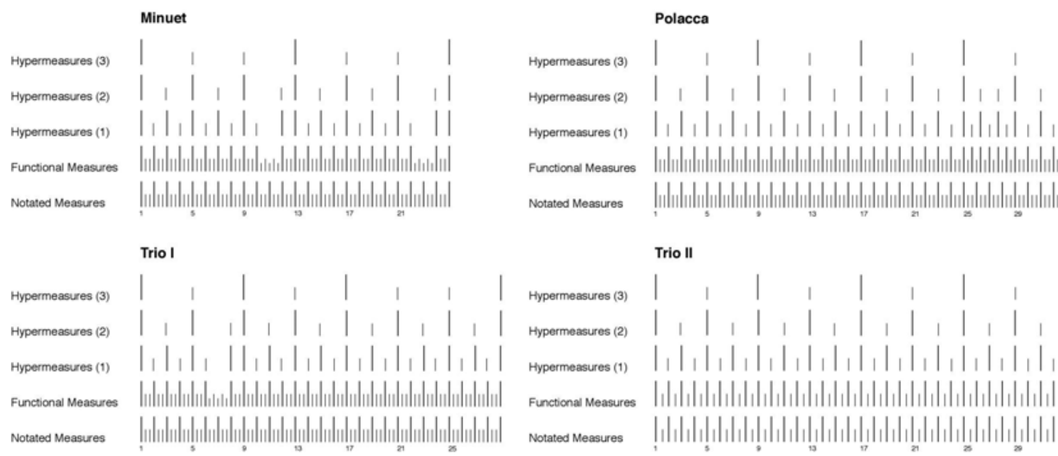
Metric Graph of mm. 32–51 of Concerto No. 6, third movement. The regular structure of the ritornello theme temporarily generates a third hypermetric level in mm. 38–45.

Movements Displaying No Fluctuation

Deeper Structures

The fourth movement of Concerto No. 1 exhibits highly regular three-level structure throughout. In the two trios and the *Polacca,* the highest-level hypermeasures are eight bars; in the minuet they are twelve bars by virtue of triple grouping on the third hypermetric level. This is the only actual dance movement in the set (example 3.11).

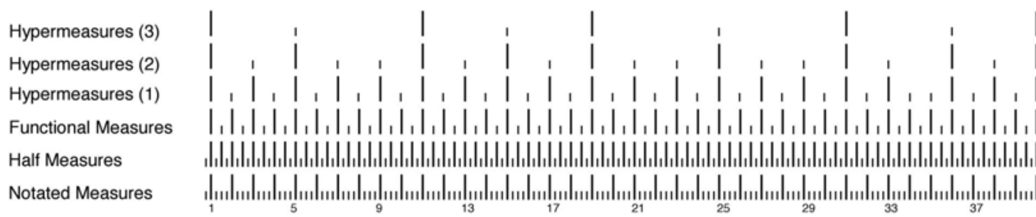
Example 3.11



Metric Graph of Concerto No. 1, fourth movement. The only dance movement in any of the six concertos, all four sections of this movement display very consistent three-level structure. Even the irregularities created by the pre-cadential hemiolas in the Minuet and Trio I, as well as the anomalous shift to duple meter in the penultimate phrase of the Polacca, are subsumed into higher-level regularity.

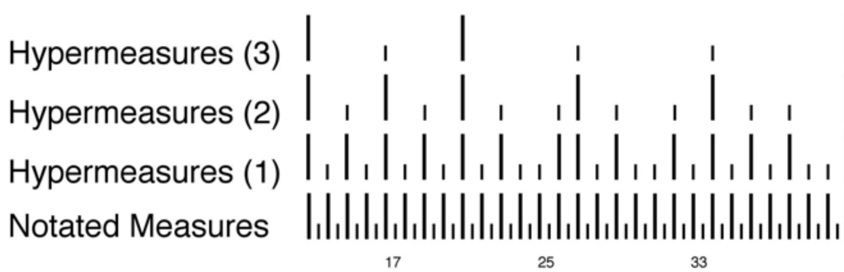
The first and third movements of Concerto No. 2 both show three-level structure throughout. In the first movement this is facilitated by the duple symmetry in the ritornello theme itself (although the expected second four-bar segment, from m. 5 to m. 9, is lengthened by two bars when the head-motive return is delayed until m. 11) and by the four-bar length of the subject imitated after m. 60. Also in the first movement, duple organization is normative on the first and to a slightly lesser extent the third hypermetric levels; the greatest degree of irregularity is seen on the intermediate second level (example 3.12). In the third movement the fugue subject is irregular in metric structure, but imitative entrances generate the “similarity of motivic, rhythmic, and harmonic construction” necessary for the formation of hypermeasures. Irregularity on all levels generates wide disparity in third-level unit lengths, from as small as eight bars in mm. 13–20 to as great as twenty in mm. 21–40 (example 3.13).

Example 3.12



Metric Graph of Concerto No. 2, first movement, mm. 1–39. Duple organization is normative on the first and third hypermetric levels; the greatest degree of irregularity is seen on the second level.

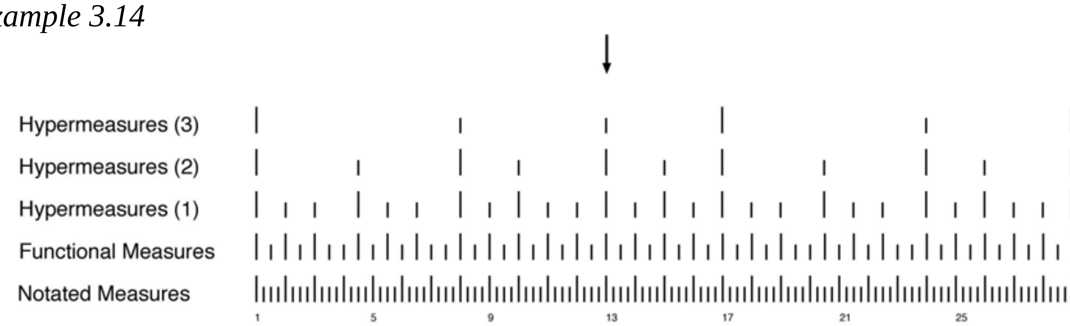
Example 3.13



Metric Graph of Concerto No. 2, third movement, mm. 13–40. Irregularity on all levels generates wide disparity in third-level unit lengths, from as small as eight bars in mm. 13–20 to as great as twenty in mm. 21–40.

The third movement of Concerto No. 3 shows three-level structure throughout, facilitated by near-exact thematic recapitulation and a fast tempo. This case shows a strong preference for triple structures to appear at the end of a hypermetric unit. Note in the metric analysis that the first third-level unit is shown extending across the double bar, as the motivic parallelism is initiated at m. 17. In practice this structure would be modified in a performance observing the notated repeat signs: The first repeat of the A section would form a shorter third-level unit than the second repeat (example 3.14).

Example 3.14



Metric Graph of Concerto No. 3, third movement, mm. 1–28. The arrow indicates the beginning of the second repeated section, or "B" section. The third-level hypermeasure is shown extending across this demarcation, because the transposed recapitulation of the opening bars in mm. 17–23 creates a compelling parallelism with the beginning, generating a stronger metric accent than in m. 13. However in a performance observing the notated repeat signs, the repeat of the "A" section would create a similarly strong accent after the first twelve bars. Only on the second repeat would the first third-level hypermeasure extend to sixteen bars. Conversely, the second repeat of the "B" section would begin at m. 13 as a continuation of the closing hypermeasure, with a stronger accent again coming at m. 17. In this way Bach strengthens formal cohesion by creating a hypermetric structure out-of-phase with the large-scale sectional structure.

The first movement of Concerto No. 6 has two hypermetric levels throughout. This is relatively shallow for a first movement, but may be related to the extreme irregularity of harmonic motion in the ritornello theme. The piece includes many cases of relatively low-level conflictgenerated through imitation, but in general these are not sufficiently intense to undermine the perception of a prevailing hypermetric structure.[8]

Shallow Structures

The second movement of Concerto No. 2 has one hypermetric level throughout; two-bar hypermeasures are corroborated strongly by the two-bar time interval between imitative entrances of treble voices at the beginning of every phrase. However this hypermetric level is also undermined throughout the movement by a conflict that exists between the accentual organization of the treble voices and that of the bass, whose accented measures coincide with unaccented measures in the other voices. Example 3.15 portrays this conflict by including two contradictory patterns of organization in the hypermeasure layer, in the manner first described in example 1.4, p. 39.[9]

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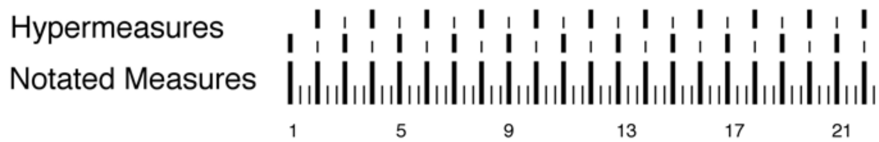
8 E.g. Chapter 2, example 10, and examples 24–28. By "low-level conflict" I am referring to the hierarchic level on which conflict takes place, and not to its relative intensity or lack of intensity.

9 For the musical notation of this passage, see Chapter 2, example 17.

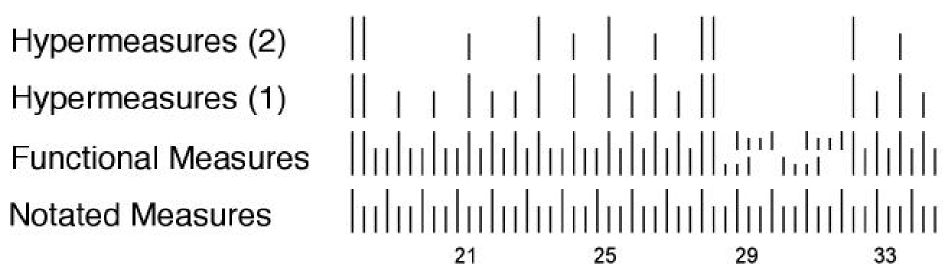
Example 3.15



Metric Graph of Concerto No. 2, second movement, mm. 1–22. Regular two-bar hypermeter is undercut by the "split downbeat" phenomenon described in Chapter 2, ex. 17. The hypermetric conflict that results is represented by the split into two layers in the first (and only) hypermetric level in the graph, in the manner shown on p. 39.

Irregularity and conflict in the metric structure of the second movement of Concerto No. 4, second movement, prevents more than one hypermetric level from emerging (example 3.16).

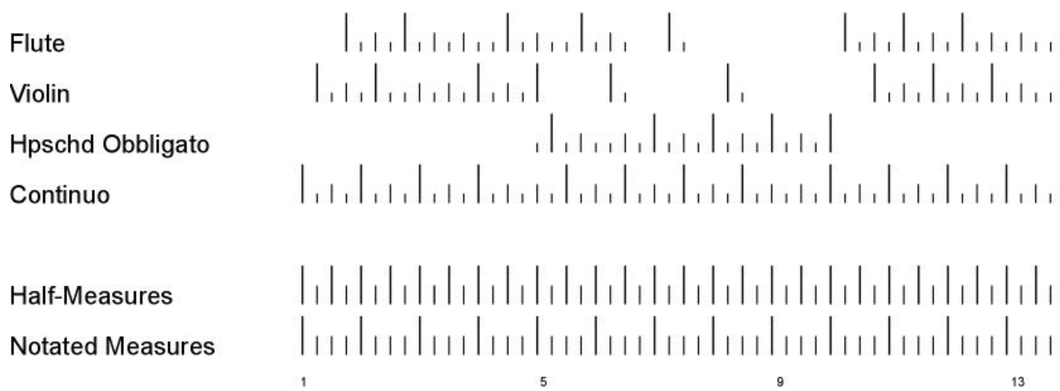
Example 3.16



Metric Graph of Concerto No. 4, second movement, mm. 18–34. A high degree of irregularity and conflict works against the projection of deep hypermeter.

In the second movement of Concerto No. 5, the extreme complexity of the metric relationships between different polyphonic layersprevents any hypermetric organization from developing, and at some points obscures the measure considerably at the notated level (example 3.17).[10]

Example 3.17



Metric Graph of Concerto No. 5, second movement, mm. 1–13. Different metric profiles projected by different voices prevent any hypermetric organization from emerging. (Note that here, the graph does not represent hierarchic levels, but rather co-equal strands in the polyphonic texture.)

Functional Implications of Observed Fluctuations

Correlations with Other Structural Features

In some cases, clear correlations may be observed between fluctuation in depth of metric hierarchy and other parameters of structural articulation.

[10] By "layers" I am referring to the different polyphonic strands that go together to make up the complete texture, not to be confused with hierarchically-related levels.

In the first movement of Concerto No. 1, the hierarchy is enhanced as noted above[11] at the three iterations of the ritornello head theme at mm. 1–5, 43–51, and 72–76. The enhancement is generated by the relatively symmetrical relationship between the two subphrases of the first five-bar phrase. The two-bar forephrase and three-bar afterphrase begin with the same motive, with the greater length of the latter attributable to extra sequential repetition of the same material. Such antecedent-consequent relations are otherwise absent in the piece.

In the case of mm. 43–51, the enhancement is sustained longer (than in mm. 1–5 or 72–76) by virtue of additional sequential repetition of the material in the following concertino passage. These measures occur at a structurally significant point because they begin at the exact mid-point of the movement, which is constructed in a modified but still highly symmetrical arch form.

As was also noted above, a similar enhancement of hierarchic depth obtains in the ritornelli of Concerto No. 6, third movement.[12]

In the second movement of Concerto No. 1, the suppression of hierarchic depth in mm. 12–14 and 23–25 is associated specifically with modifications to the basic phrase prototype whose repetition constitutes the entirety of the movement up to the coda.

In the third movement of Concerto No. 1, as noted in the previous chapter, the suppression of hierarchic depth in mm. 30–34 is associated with an episode of metric conflict that is set apart texturally by making it into an accompanied duet between the

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[11] p. 114.

[12] p. 116.

piccolo violin and the first horn. The resolution of this conflict (in favor of the notated meter, articulated by the horn) in m. 35 coincides with the initiation of a ritornello fragment culminating in the first full cadence in the dominant, and thus the conflict itself constitutes one aspect of the move to the dominant.

In a parallel passage at mm. 97–102, also previously noted, the same conditions are repeated but the resolution is in favor of the displaced version of the meter asserted by the piccolo violin; this in turn leads to a putative *da capo* recapitulation of the opening ritornello that is broken off after four bars, and then begins again after the actual meter has been re-aligned with the notated meter. [13]

In the first movement of Concerto No. 3, the episodes of conflict that suppress the metric hierarchy in mm. 31–35 and 101–105 stem from recurrences of ritornello material wherein two ideas from the ritornello are superimposed in conflicting metric positions relative to the barline. The seeds of this conflict are sown in the opening measures, when the disparity between the duple metric notation and actual triple metric organization of the music cause the second idea to begin in a metrically displaced position.

In the first movement of Concerto No. 4, hierarchic depth is suppressed in episodes of metric conflict just prior to important cadences, in mm. 69–78, 143–152, 221–230, 329–328, and 413–422.

[13] In considering the role of the piccolo violin and horn in these two passages, it is interesting to note that this movement was the only one among all four in the first concerto that was composed "with the piccolo violin in mind from the start," according to Michael Marissen. The character of the duet between the two instruments is illuminated by a remark by Telemann, who describes this type of violin as being able to "out-shriek half a dozen ordinary violins." See Marissen, pp. 27, 33.

In the first movement of Concerto No. 5, the sudden disappearance of the metric hierarchy at m. 195 coincides with the cadenza-like climax of the harpsichord solo. The gradual restoration of the metric hierarchy is associated with the approach of the closing ritornello recapitulation.

In the third movement of Concerto No. 5, suppression of hypermetric structure is associated in mm. 114–117 with the end of a large period and the approach of an important cadence, much as it is in the first movement of Concerto No. 4. The same situation pertains as a distant echo in mm. 220–224.

In the second movement of Concerto No. 6, the deepening of the hypermetric structure from two levels to three is associated with a formal subsection that is exceptional within the movement: a large lead-in to the last period. It seems here that as periodic structure is interrupted, metric structure is reinforced.

To summarize: In several places ritornelli or ritornello fragments are associated with greater depth of metric hierarchy, indicating that thematic articulation and metric stability are working hand-in-hand. In other passages hypermetric depth is suppressed by metric conflict prior to important structural cadences, and then re-established as part of the cadential gesture, lending support to the idea that re-establishment of hierarchic depth after an episode of suppression functions as a strong arrival. Finally, we see changes in the depth of metric hierarchy associated in two slow movements with expansions of the regular phrase structure, although in one case it is enhanced and in the other it is suppressed.

Lack of Correlation

In other places, fluctuation in depth of metric hierarchy seems to function independently, as evidenced by inconsistent correlation or lack of correlation with other aspects of musical structure. For instance, in the third movement of Concerto No. 4, hypermetric structure is partially suppressed in mm. 29–41 as the factors responsible for large-scale meter (in this case, primarily the distance between subject entrances) cease to operate.[14] This section is heard immediately prior to the first important cadence in the piece and helps to create the drive that articulates its approach. However, a thematically related section of suppressed hypermeter in mm. 69–79 ends some measures before the cadence ending the period, as subject entrances spaced at two measure intervals re-establish the hypermeter. In addition, an even greater suppression of hierarchic depth in mm. 113–120 ends with the re-establishment of hypermeter well before the end of the period; in this case the metrically less-stable portion occupies roughly the middle of the period in which it is found. While in the first case, suppressed hypermeter and its associated metric instability seems functionally related to the drive toward the cadence, in the second and third cases it does not.

In the first movement of Concerto No. 5, the enhancement of the hypermetric structure from two levels to three in mm. 71–100 signifies the sequential organization of a long passage characterized by significantly slowed harmonic motion and motivic change. The significance of this passage is unclear, although its prominence is not in

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[14] A redundant subject entrance in the flutes (mm. 36–39) sounds at first like the re-establishment of hypermeter, but its metric implication is contrary to the two-bar hypermeter still operating and is also overruled by the pair of accents in mm. 41 and 43, and so only results in a fairly local hypermetric conflict.

doubt: the passage is in *tutti* texture but not thematically related to the ritornello. The harpsichord part is notated *obbligato* instead of continuo, but that is true of most of the movement. The characteristic harpsichord arpeggio figure heard in this section is also heard much later in the harpsichord solo (mm. 163–165 and 184–194), but neither initiates the solo nor articulates its most dramatic moments. It immediately precedes the dramatic suppression of meter in m. 195, but is not associated with the re-establishment of meter toward the end of the solo. The enhancement of hypermetric depth brought about in mm. 71–100 does not seem to correlate with other important structural articulations.

In the third movement of Concerto No. 5, the suppression of the metric hierarchy in mm. 163–176 is located neither at the beginning nor at the end of a large period. Here the hierarchic suppression is associated with a canon at the time interval of one measure in severe, learned style that is marked by an absence of cadential punctuation on even the most local level.

The Effect of Fluctuation in Hypermetric Depth: Psychological Perspectives

Justin London's book *Hearing in Time* contains a thorough review of theory and research in perceptual psychology as it relates to the perception of rhythm and meter. By shedding light on the question of what effect a metric hierarchy has on the listener, psychology helps us to evaluate the importance of fluctuations in the depth of that hierarchy.

London cites the pioneering American psychologist William James, who writes that the "attending process" requires "the anticipatory preparation from within of the ideational centers concerned with the object to which attention is being paid."[15] More recent psychologists such as Ulrich Neisser have developed this idea by applying the anticipatory model of attending to aural perception specifically: "The listener continually develops more or less specific readinesses (anticipations) for what will come next, based on information he has already picked up. These anticipations — which must themselves be formed in terms of temporal patterns, not isolated moments — govern what he will pick up next, and in turn are modified by it. Without them, he would hear only a blooming, buzzing confusion."[16]

Psychologists Daniel Kahnemann and Mari Reiss Jones have specifically refined the theory of how we perceive rhythm. Jones writes: "according to the rhythmic attending theory, people rely on invariances abstracted from the temporal rhythmicities of a particular context to prepare for 'when' forthcoming events will happen."[17] Also, "The interaction of the perceiver with moving world patterns is described by the principle of synchronization. Successive event onsets in world patterns simultaneously define a series of nested time periods, and corresponding to each world time period there is a

[15] William James, *The Principles of Psychology* (New York: Dover Books, 1950) (Reprint of 1890 edition), p. 439.

[16] Ulrich Neisser, *Cognition and Reality* (San Francisco: Freeman, 1976), p. 27. The phrase "blooming, buzzing confusion" is a reference to William James's famous description of the human infant's experience of its sensory world. See James, p. 488.

[17] Mari Reiss Jones, "Attentional Rhythmicity in Human Perception" in J. R. Evans and M. Clynes, eds., *Rhythm in Psychological, Linguistic, and Musical Processes* (Springfield, Il: Thomas, 1986), p. 23.

synchronized perceptual rhythm with a similar period."[18] London refers to such synchronizations as "entrainment." He calls meter "the anticipatory schema that is the result of our inherent abilities to entrain periodic stimuli in our environment."[19]

To London, a meter with many hierarchic levels is a different meter from one with few levels. He observes that, "one may characterize meters in terms of hierarchic depth — that is, whether a meter involves a rich hierarchy of expectation on many levels at once, or only a limited set of expectations as to when things are going to occur."[20] He applies this observation to hierarchies both above and below the level of the notated meter: "[A]s the number of metric levels both above and below the beat can and does fluctuate, there is no substantive distinction between meter and so-called hypermeters."[21]

This hierarchic organization of expectation fulfills a psychological need on the part of the listener. In London's words, "We actively seek and generate temporal structure through our attending behaviors."[22] Because it fulfills a need, it results in aesthetic satisfaction.

To paraphrase a remark I have heard a distinguished teacher make in a masterclass, "There is nothing more disturbing than hearing a piece and not being able to tell what meter it is in." Although this remark was made in reference to inferior playing, it also

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[18] Mari Riess Jones, "Time: Our Lost Dimension: Toward a New Theory of Perception, Attention, and Memory" in *Psychological Review,* Vol. 83 (1976), No. 5, p. 328.

[19] London, *Hearing in Time,* p. 12.

[20] London, *Hearing in Time,* p. 25.

[21] ibid.

[22] ibid.

has profound importance for the handling of meter in the hands of a masterful composer. To the extent that the temporal anticipations we speak of are aroused and satisfied on multiple levels, the listener experiences a predictable aesthetic environment on multiple levels as well; while to the extent that the same expectations are thwarted, or fail to arise, the listener is exposed to James's "blooming, buzzing confusion."

Thus a relatively deep metric hierarchy, embodying London's "rich hierarchy of anticipation," is experienced by the listener as a predictable, stable musical environment; one where our temporal expectations are continually satisfied on multiple levels. A diminished hierarchy, in contrast, is experienced as unstable and unpredictable; an environment where satisfaction is denied, and where the unexpected is more likely to happen.[23] In the words of George Houle, "Hierarchical metrical structure in a piece conveys peace and order through regularity….Quick shifts of metrical grouping provide excitement and energy."[24]

Many episodes of reduced hypermetric depth are associated with metric dissonance or conflicting sets of metric cues on some level; others reflect the absence of cues. In both cases, instability — unpredictability of the "anticipatory schema" actively sought by the listener — is the result. Just as importantly, if not more so, when a deeper metric hierarchy is re-established by either the re-emergence of strong metric cues or the resolution of conflict between different sets of cues, the greater predictability is

[23] Berry has observed that metric instability is associated with increased musical tension, and stability with decreased tension. He uses the terms "progression" and "recession" to refer globally to such increase and decrease of tension. See Berry, pp. 4, 13.

[24] Houle, p. 33.

experienced as a stable point of reference, much as the return of the tonic in any piece of tonal music. A sense of arrival is the result.

Fluctuation in hypermetric depth can thus be seen as an important parameter in the control of tension and relaxation within a composition.

CHAPTER 4: CONCLUSION

Our examination of metric conflict in the Brandenburg Concertos has shown us that metric conflict and the attendant fluctuations in depth of metric hierarchy together represent a significant structural parameter in these compositions. Sometimes these phenomena are correlated with other structural parameters. Sometimes they constitute an independent structural parameter of their own, regulating the increase and decrease of musical tension according to their own functional principles.

Implications for Performance

Without offering conductors or instrumentalists any specific advice as to particular techniques or interpretive strategies, some general observations as to performance implication are inescapable. One is that the presence, absence, and degree of metric conflict reflect an important musical dimension regulated by specific compositional choices. It would follow that an interpretation which enhances the projection of such metric conflict would be closer to the true nature of a piece than one which smoothes it over or renders it indistinct.

Another is that the potential utility of a conductor, even a conductor of great skill, in bringing out instances of metric conflict or other metric irregularities is limited, because the conductor communicates with the entire orchestra at once.[1] If two parts of the ensemble have divergent metric structures in the parts they are to play, it would be impossible (or at least very difficult) for the conductor to communicate them both at the same time. Even if the entire ensemble articulated some metric irregularity together, as for instance in a case of mid-bar downbeat like the one at m. 102 of the third movement of Concerto No. 1, or the temporary triple metric organization at the beginning of the first movement of Concerto No. 3, the conductor must always keep in mind that some players may be counting measures of rest, waiting for their entrance, and dependent on the conductor to supply them with the information they need in order to come in at the right time. In such a situation it could be disastrous for the conductor to suddenly switch from beating in a duple pattern to beating in a triple pattern, or vice-versa.

A conductor may often employ a special gesture to indicate a common form of metric irregularity such as a pre-cadential hemiola. However in a more subtle complexity such as the canonic passage at the beginning of the first movement of Concerto No. 6, where two sections play the same exact material but temporally separated by one eighth-note, it is hard to imagine any combination of hand and arm gestures that could communicate the co-equal prominence of two metric patterns with downbeats an eighth-note apart.

It is then worth noting that there is no particular reason to think that these pieces were intended for performance with a conductor. Although the role of the conductor as time-

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[1] I am indebted to conductor Lawrence Golan for making this and the following points clear to me.

beater was established at least as early as the day of Jean-Baptiste Lully (1632–1687), as the circumstances of his death attest, it was more common, even as late as the middle of the eighteenth century, for a composer or *Kapellmeister* to lead an orchestral performance from the keyboard or the violin.[2] Mattheson apparently favored this method (at least for conducting a choir), writing in 1739: "As regards performance, a capellmeister should, next to singing, also be able to play the clavier, and in fact quite well, because in performance he can best accompany all of the others and direct at the same time. I have always fared better when I have played as well as sung along, rather than merely stood there to give the beat. The choir is very encouraged when one joins in the playing and singing, and one can animate people much better."[3] Bach himself also conducted this way.[4]

Some modern orchestras also have made a practice of performing without a conductor, such as the Orpheus Chamber Orchestra and the Prague Chamber Orchestra Without Conductor.

Thus we may observe that all problems related to a conductor's attempts to communicate metric complexity to the ensemble are immediately eliminated when the conductor is eliminated. This is not to say that all difficulties related to metric complexity may be resolved by excluding the conductor, but it will certainly eliminate the difficulty of *conducting* metric complexity. Each player (or section, if a part is taken by more than

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2 *New Grove Encyclopedia of Music and Musicians,* 2nd ed., s.v. "Conducting."

3 Johann Mattheson, *Der vollkommene Capellmeister,* tr. Ernest Harriss (Ann Arbor: UMI Research Press, 1981), p. 867.

4 *New Grove Encyclopedia of Music and Musicians,* 2nd ed., s.v. "Conducting."

one player) can then be allowed to interpret the organization of his or her part with all the complexity and irregularity that it might contain, and to let the metric chips fall where they may. It is not unreasonable in certain passages for different players to place their downbeats in different places, or to organize their material into different metrical patterns. Where this organization comes into conflict with the organization of another part, the conflict would then be more evident to the listener. Projection of metric conflict would thereby be enhanced, as would the contrast between the "roughness" or "bumpiness" of such passages and the smoothness of less-conflicted or minimally-conflicted passages.

This perspective on the role of the conductor in performing the repertoire in question raises a separate issue related to historical performance practice. Why is it that we normatively deem it appropriate to use a conductor in performing rhythmically complex music from later repertoires, if we are willing to consider dispensing with one in High Baroque music? In response to this question it may be appropriate to propose that a conductor may not always be necessary, even in repertoires (for instance the music of Berlioz and Brahms) originating in historical eras when the role of a conductor in directing an orchestral performance was a given. While thorough consideration of such an issue is outside the scope of the present study, it presents a possibly fruitful avenue for further research. In addition, willingness to experiment in this realm could have profound results, both musicologically and in terms of contemporary performance practice

Suggestions for Further Research: Comparative Analysis

Although this study is the first (to my knowledge) to approach a formally related set of compositions like the Brandenburg Concertos and subject them systematically to metric analysis, it remains limited in scope. We have only briefly touched upon horizontal metric irregularity, discussing it only as it relates to specific instances of vertical metric conflict.[5] An entire study could be devoted to examining this issue in its several guises. Such a study would be strongly complementary to the present one.

Another way to expand the scope of our study might be to examine related repertoire; in particular, other iconic sets of Baroque concertos such as Vivaldi's Op. 3 or Handel's Op. 6. It might be very instructive, for example, to see whether Bach's creative reinterpretation of Vivaldi's formal paradigms is accompanied by a more diverse approach to metric conflict and resolution. Still another approach would be to attempt a comparison between the Venetian concerto style exemplified by Vivaldi and the earlier Roman style exemplified by Corelli and his own followers. Where Vivaldi is credited with having simplified and rationalized the tonal structure of the concerto, we might see whether this was accompanied by a simplification of the metric organization as well.

[5] We noted in passing, for instance, that in the first movement of Concerto No. 2, metric irregularity is more pronounced on the second hypermetric level than on the first or third, while the third movement of the same piece is highly irregular on all hypermetric levels, leading to a cumulative disparity of unit lengths on the third level. See examples 3.12 and 3.13, p. 118. Elsewhere we observed that an important cadence in the third movement of Concerto no. 1 was articulated with a metrically displaced hemiola (p. 82). In fact this hemiola is part of a complex irregularity consisting of an extra weak half-measure, followed by the displaced hemiola, followed by the resolution of the displacement by the deletion of a strong half-measure. What is more, this sequence of irregularity occurs three times in three different contexts: mm. 38–41, mm. 61–64, and especially prominently in mm. 81–84; its recurrence in different melodic contexts gives it an importance similar to that of a recurring motive, and allows it to tie different parts of the movement more strongly together.

Close study of various composers along these lines might make a modest contribution in the direction of a taxonomy of style in the Baroque concerto.

Equally one might compare these parameters in the concerto to the way they are present in other genres. For example, it might be anticipated that the concerto, intended for public, formal performance, might show different features or tendencies than the solo suite or chamber sonata, intended for performance in a different context.

Other comparisons between forms, styles, genres, and composers will occur to the reader. Any such comparative analysis, however, must depend for its validity on being based on a systematic investigation of a particular part of the repertoire.

Suggestions for Further Research: Empirical Experimentation

Appendix II reports the results of an informal experiment (or, more accurately, series of experiments) that was conducted to test certain of the conclusions reached in performing the analyses that are described in this study. The author felt this would be desirable in view of the inescapably subjective nature of much metric analysis. It will be seen at a glance that this experiment was both small in scope and primitive in design. It would undoubtedly be interesting to perform a series of more comprehensive experiments to examine the extent to which metric perceptions vary from listener to listener, using both a larger set of samples as well as standard experimental procedures such as varying the order in which stimuli are presented, and so on. The perceptions of different groups could be compared; for instance persons with no or rudimentary musical training could be compared with others with advanced musical training. (One potential obstacle to this approach is that advanced musicians would be more likely to be independently familiar with the repertoire under examination.) Another variation that could be used in performing the experiments would be the use of MIDI-generated recordings of the excerpts in question, so that subjects could not be influenced by the way pieces were played by performers. In the experiment as it was performed, recordings by human performers were used, with the result that the accentual structures projected by the sound object were influenced not only by the composer's choices but also by the performers' intent, which might not always be the same. A standard MIDI-generated recording will have no trace of accent to emphasize one note over another. This is experienced by some listeners to be tedious and annoying, but it could be very useful for examining how music itself projects accent from within.

An important note regarding the significance of experimental results arrived at by methods described here: The experiment conducted in connection with this paper necessarily dealt with the responses of modern listeners to old music. In light of this it might be argued that it is most likely to demonstrate changes in approach to notation. However, the idea that the interpretation of metric notation has changed over the centuries is very significant in the context of the present study. If, in fact, we can show that when Bach drew a barline it meant something different to him than we are trained to believe it means today, then that could mean there is no particular reason to think the first note after the barline is intended by Bach to be metrically strong, or that last note before the barline is metrically weak. If that is the case, the case for metric conflict is easier to make. It would be, metrically speaking, as if the music were not barred at all.

Suggestions for Further Research: Non-Western Music

It seems clear that the type of analysis conducted here need not be limited to Western music. In fact, a number of World Musics show highly developed metric structures that operate along different lines than the ones underlying the repertoire we are familiar with. Hindustani music, for instance, is organized according to the system of *tals.* Each *tal* describes the organization of a repeated structural unit called an *avarta,* divided into sub-units called *vibhag* which may or may not be equal in length, and which are in turn constituted by grouping basic units called *matra,* which may be thought of as beats. The analogy between the structure thus described and the Western idea of a metric hierarchy is suggestive, and investigation of the *tal* system according to our methods might allow us to gain some insight into the structure of the system as a whole. It might also illuminate both the similarities and differences between the Hindustani system and the Western system.

Balinese gamelan is also a highly developed musical tradition with multilayered metric structure. The term *colotomic structure* was used by Colin McPhee to describe the organization of beats within repeating cycles in his classic study of Balinese gamelan, *Music in Bali*.[6] This term is still used, but what it refers to is essentially meter, in that it revolves around the alternation of strong and weak accent on multiple levels.

Balinese music is deeply hierarchic, typically characterized by fast repeated patterns on the surface, against a background of slowly repeating nested cycles. These cycles generate the form of each composition, much more unequivocally than does metric structure in, for instance, the Brandenburg Concertos. McPhee's book was based on extremely thorough research performed in the 1930s, and describes traditional gamelan styles in great detail. However it neglects some stylistic innovations that were well underway even during his time in Bali, and is of course silent in the face of the vast development of contemporary styles that has taken place since then.[7] This author, for instance, presented a paper in 2007 demonstrating that a contemporary composition by Balinese composer I Madé Lasmawan makes contextual use of formal ambiguity created by irregularity of temporal organization to express the feelings of structural ambiguity and spatial disorientation in a particular urban environment.[8]

A multitude of possibilities exist for fruitful application of the techniques used in this paper, suitably modified, to the traditional and modern repertoire of Balinese gamelan. In particular, metric analysis is likely to be useful in demonstrating the differences between

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[6] Colin McPhee, *Music in Bali* (New Haven: Yale University Press, 1966), p.84.

[7] For instance, it makes literally no mention of the fusion of *angklung* and *kebyar* style that was already inspiring a great resurgence in the popularity and relevance of *angklung* playing in Bali.

[8] Ellwood Colahan, "Tradition and Innovation in Balinese *Gamelan Angklung*: Issues in the Development of *Angklung Kebyar* and the Music of American *Gamelan Tunas Mekar,*" unpublished paper, March 2007.

traditional and contemporary genres in Balinese music and in tracing the development of contemporary style in Balinese composition.

What this paper does, though modest, is hopefully significant. I have tried to bring together some of the most important elements in published metric theory to develop a methodology for analysis and apply it to an as-yet-unexamined repertoire. In the process, many interesting features have come to light. The significance of some is clear, while that of others is obscure. Only time and repeated investigation of this and similar repertoires will allow the deduction of stylistics norms of metric structure in whose context these and other individual findings may be more fully interpreted.

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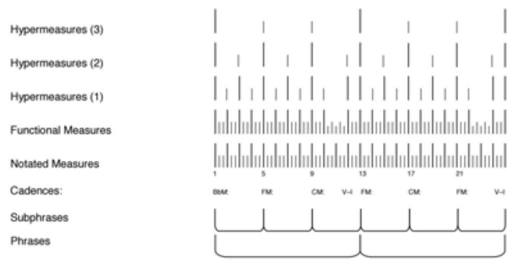
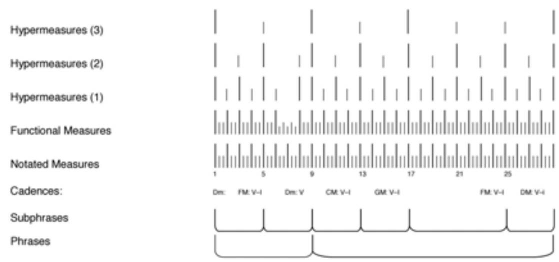
APPENDIX I: METRIC ANALYSES

J.S. Bach: Brandenburg Concerto No.1,4th Movement:

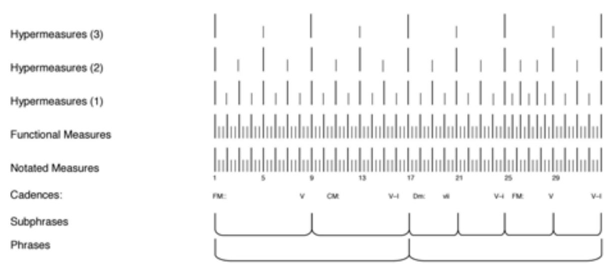
Minuet



Trio I



Polacca



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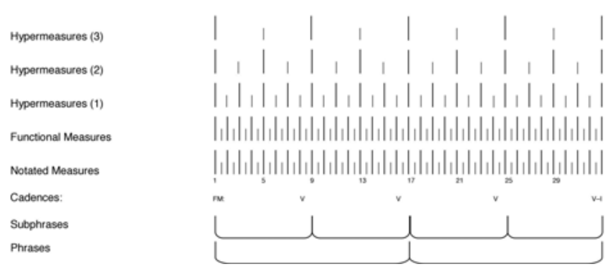
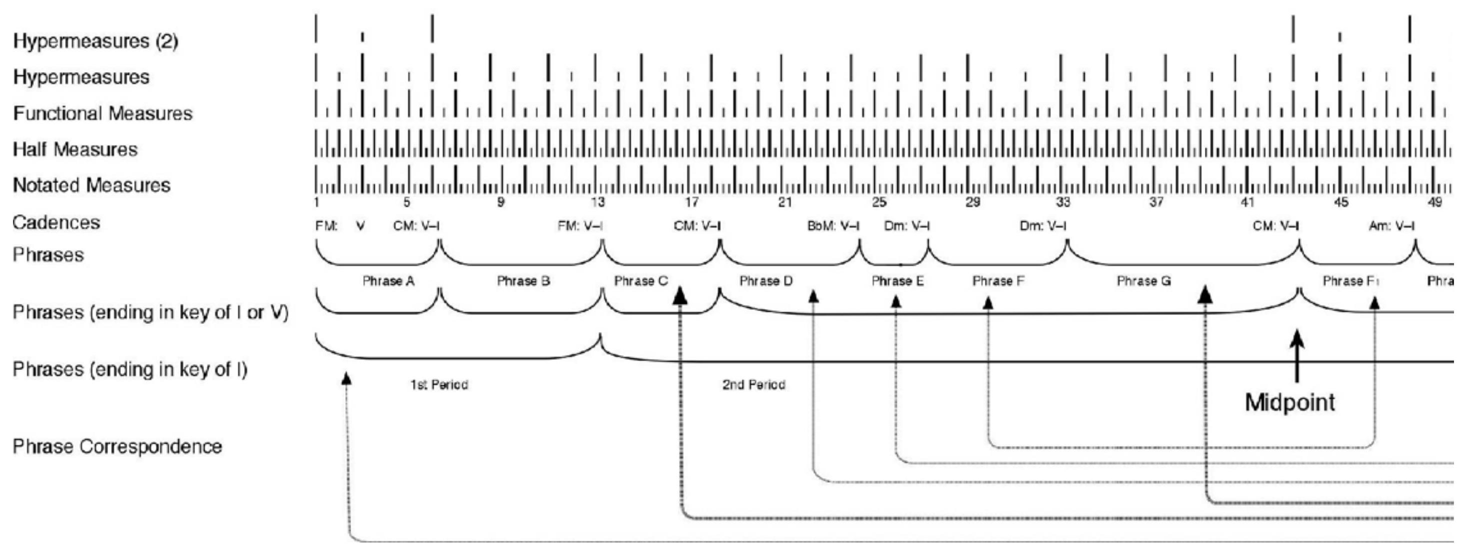


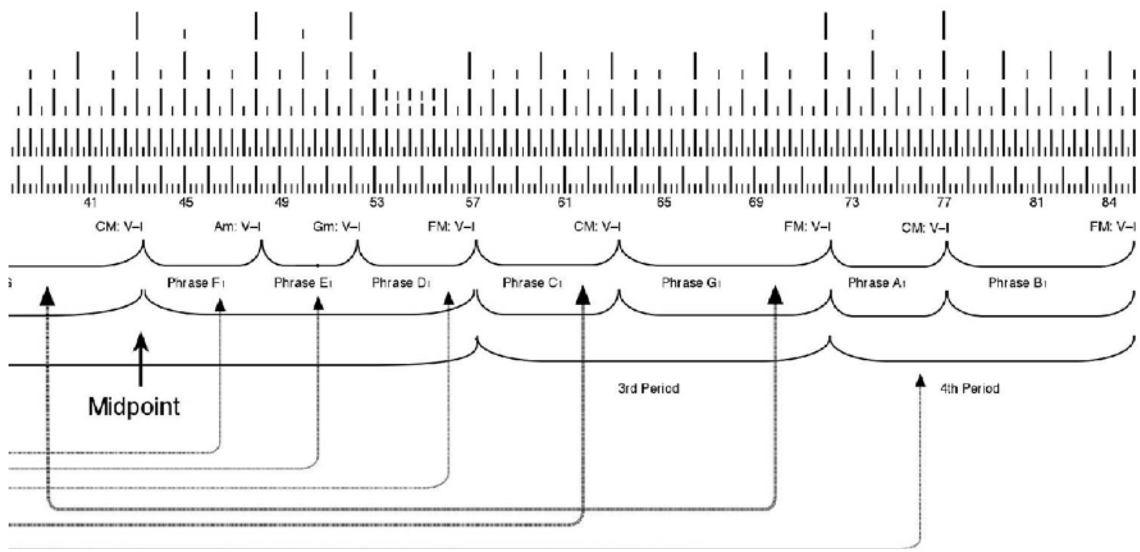
J.S. Bach: Brandenburg Concerto No.5, 1st Movement:

J.S. Bach: Brandenburg Concerto No.5, 2nd Movement:

J.S. Bach: Brandenburg Concerto No.5, 3rd Movement:

J.S. Bach: Brandenburg Concerto No.1, 1st Movement:





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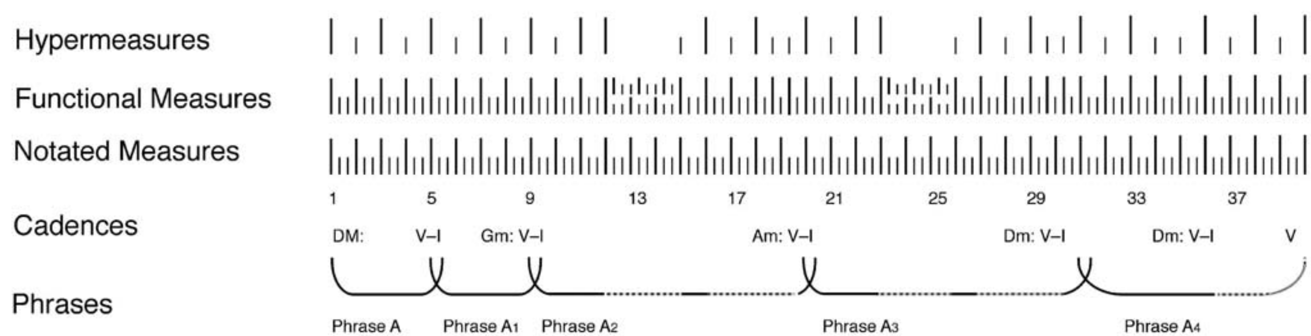

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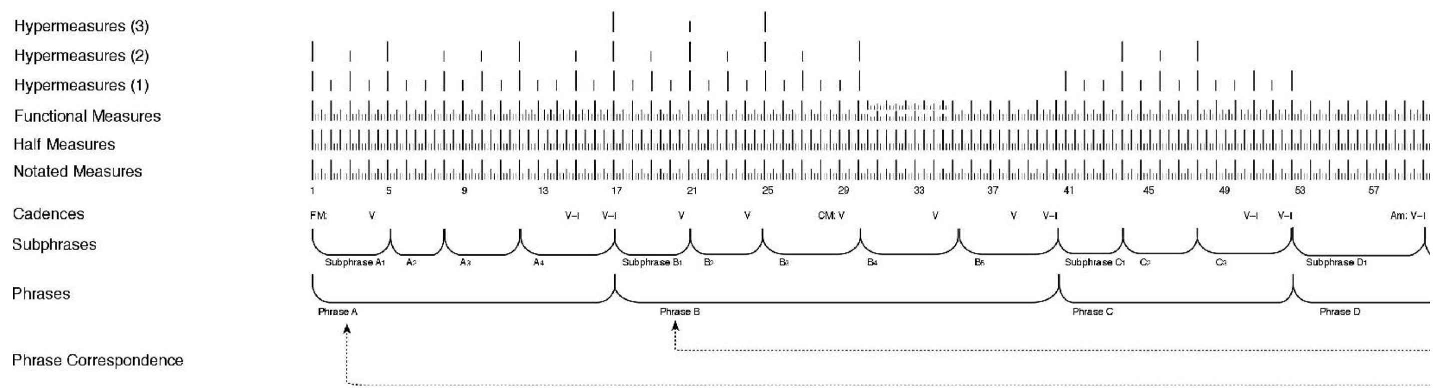

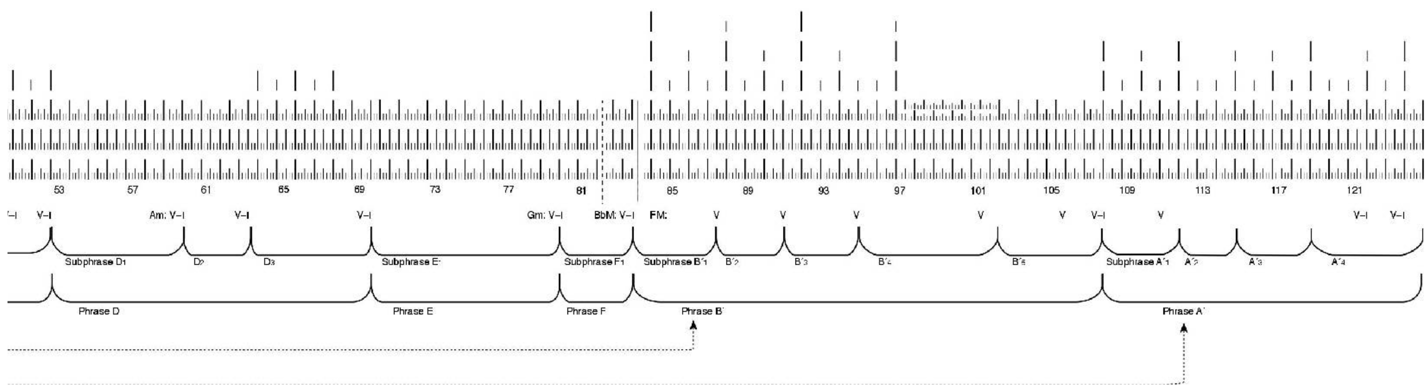

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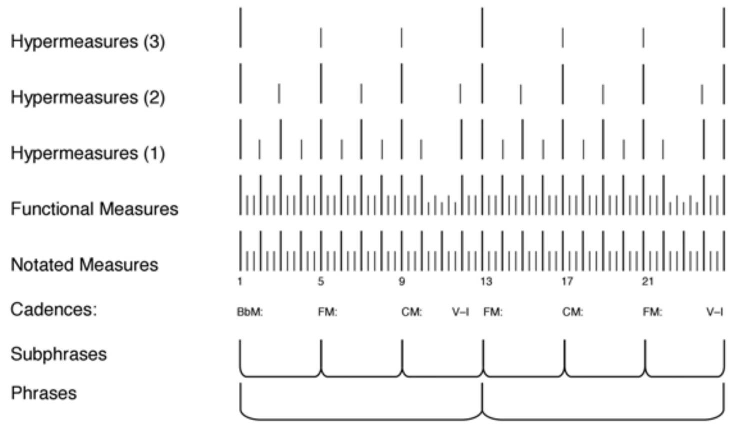
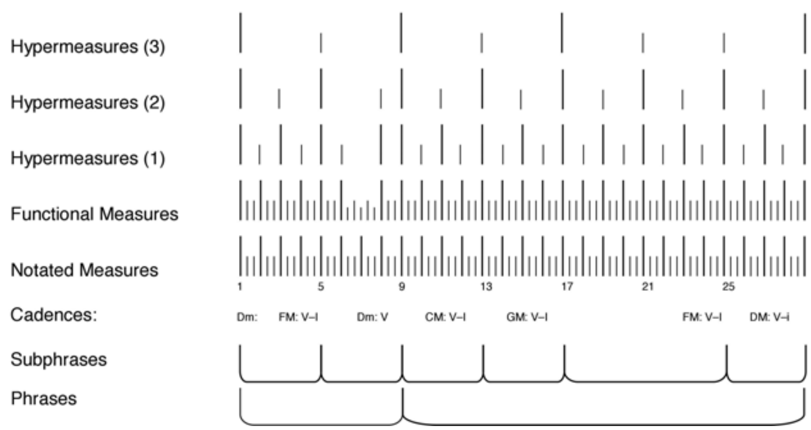
J.S. Bach: Brandenburg Concerto No.1,4th Movement:

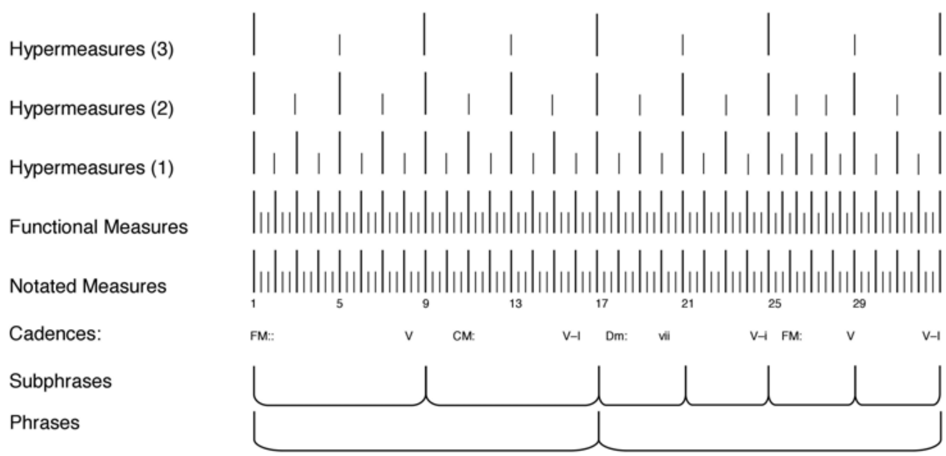
Minuet



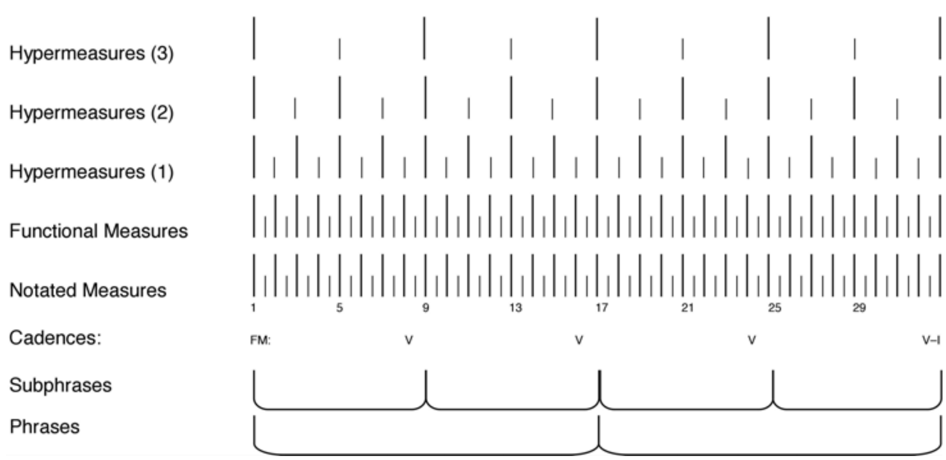
Trio I



Polacca



Trio II



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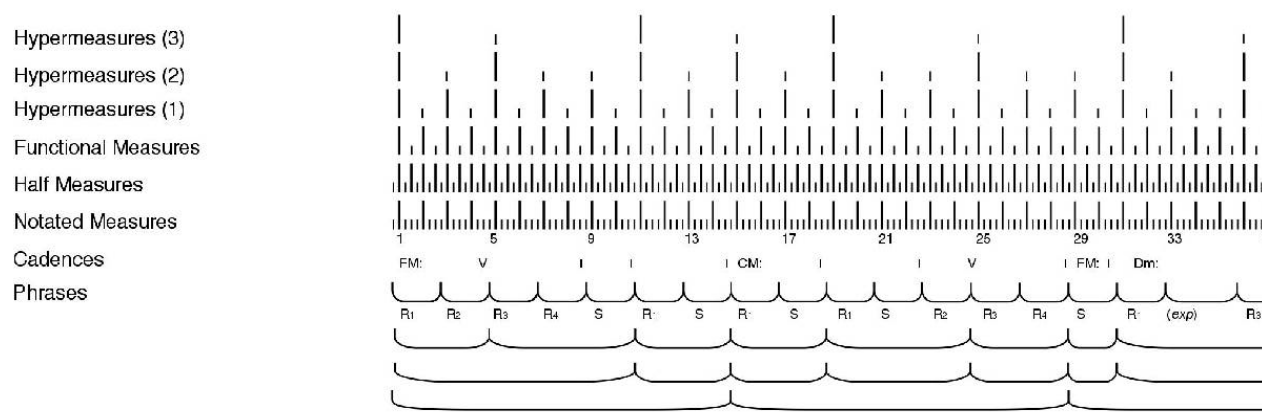
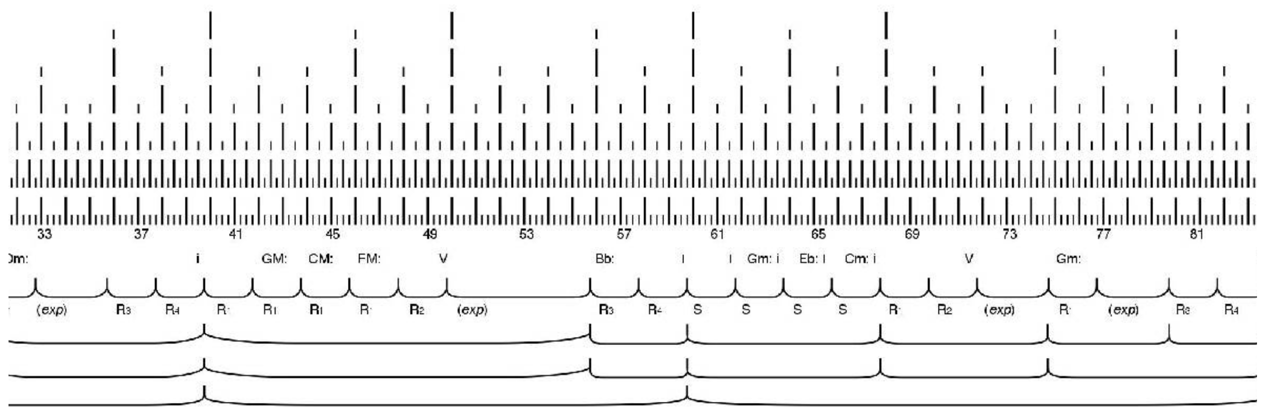
J.S. Bach: Brandenburg Concerto No.2, 1st Movement:





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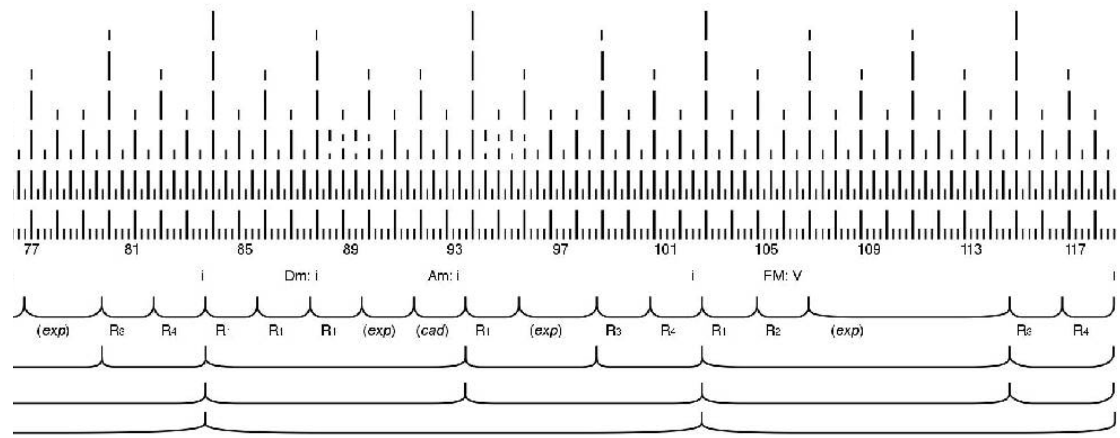

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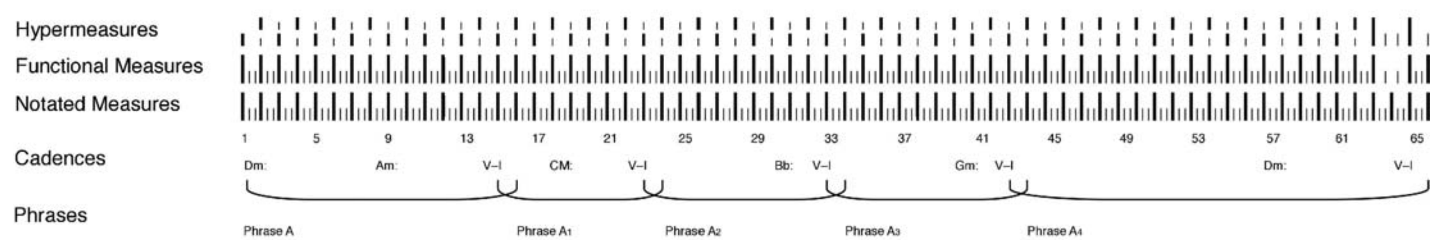

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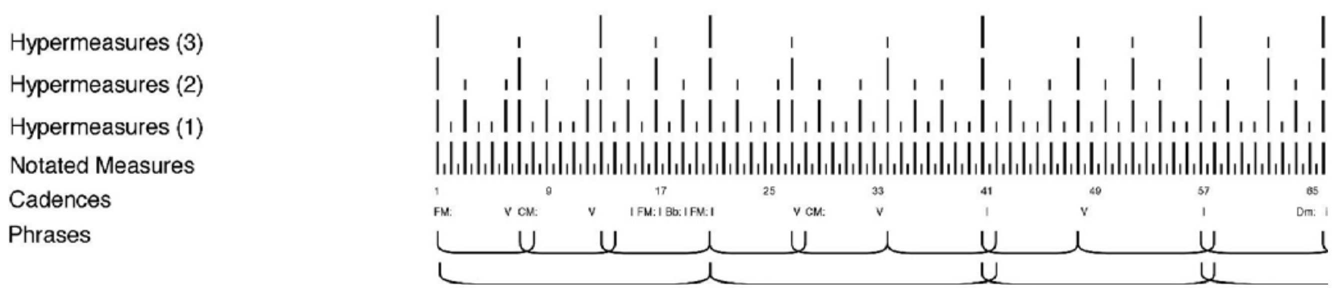

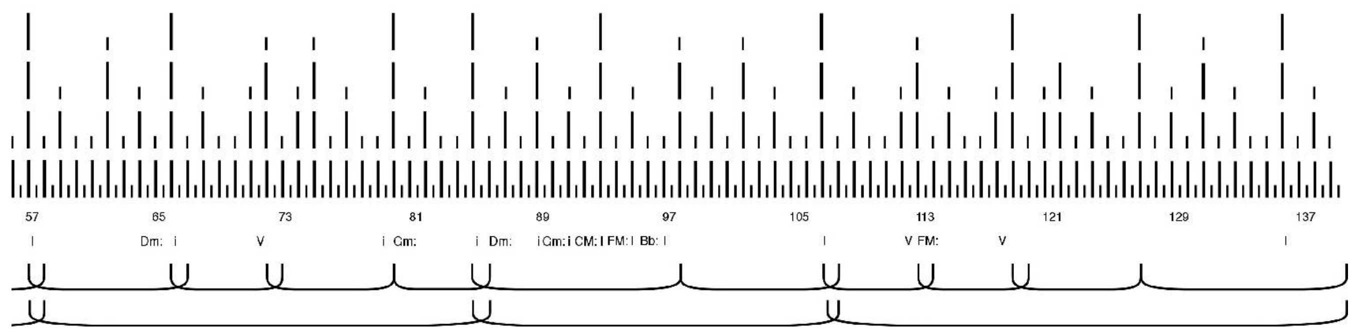

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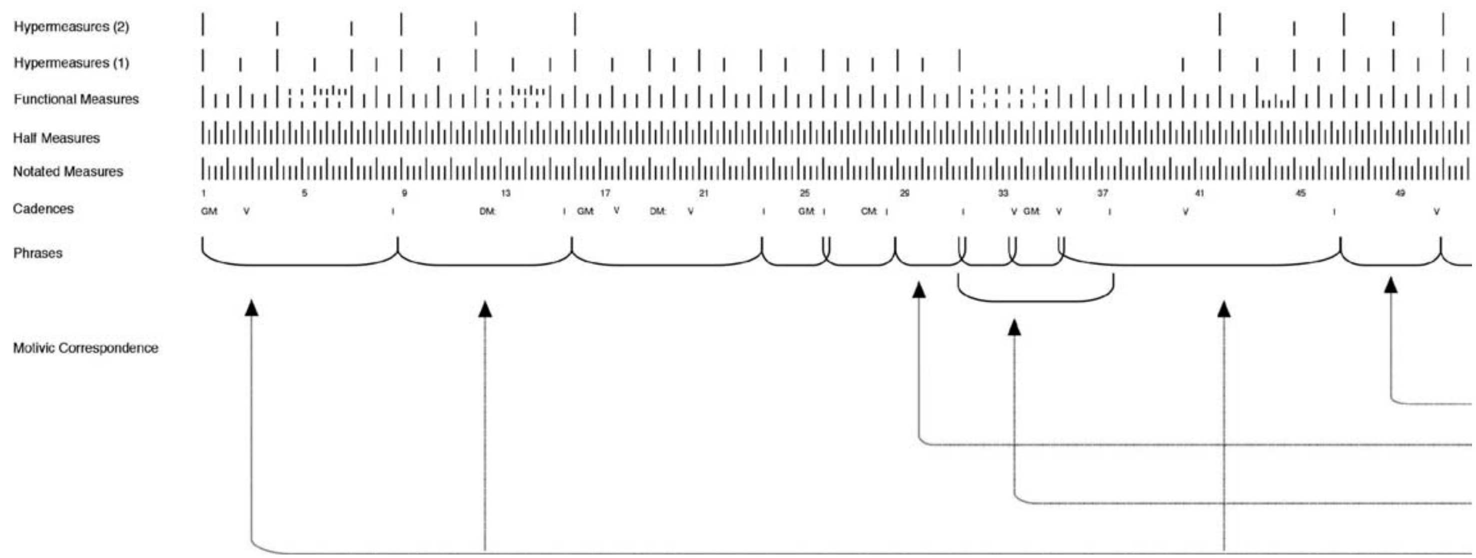

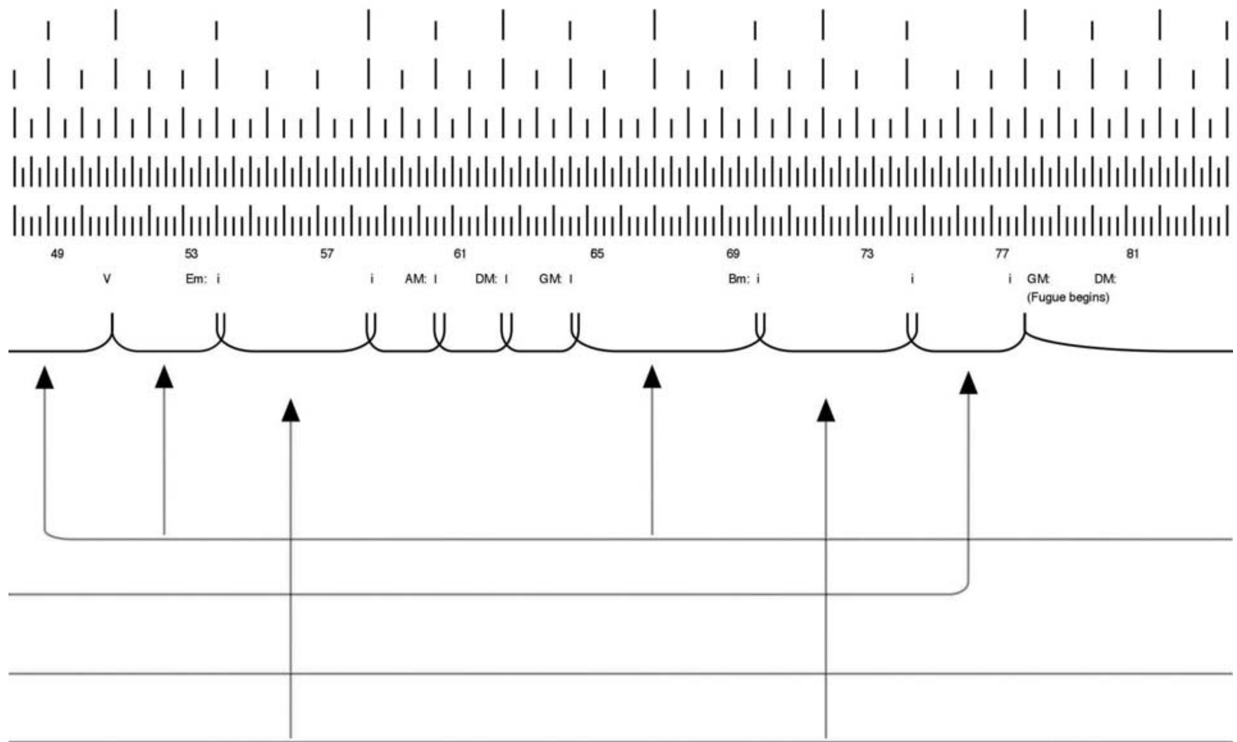

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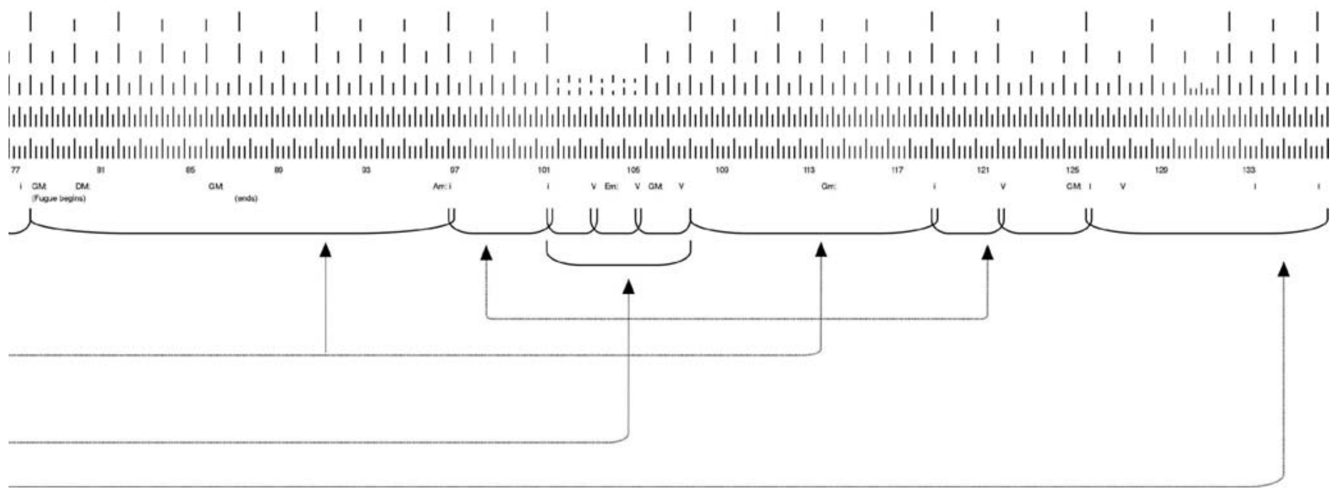

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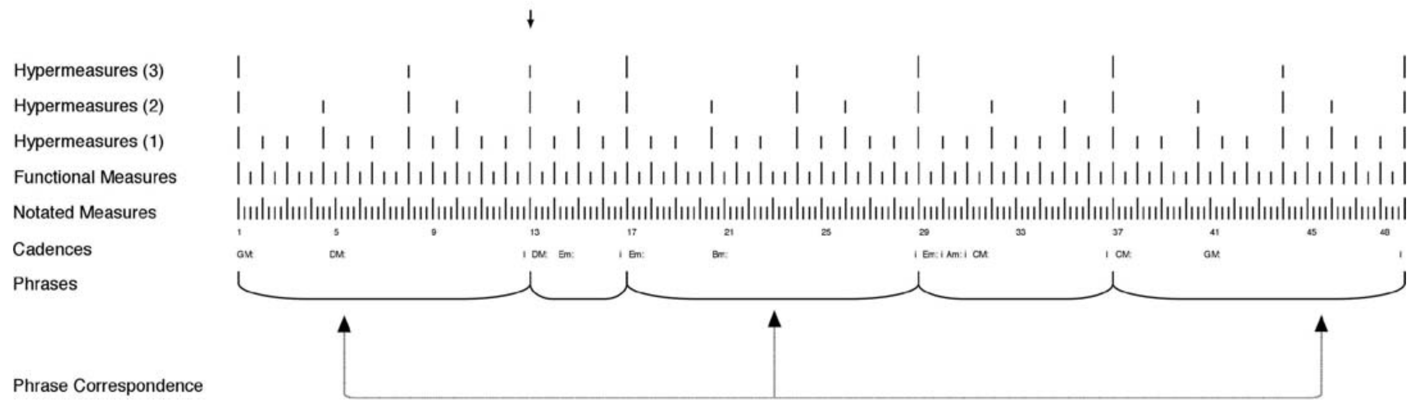

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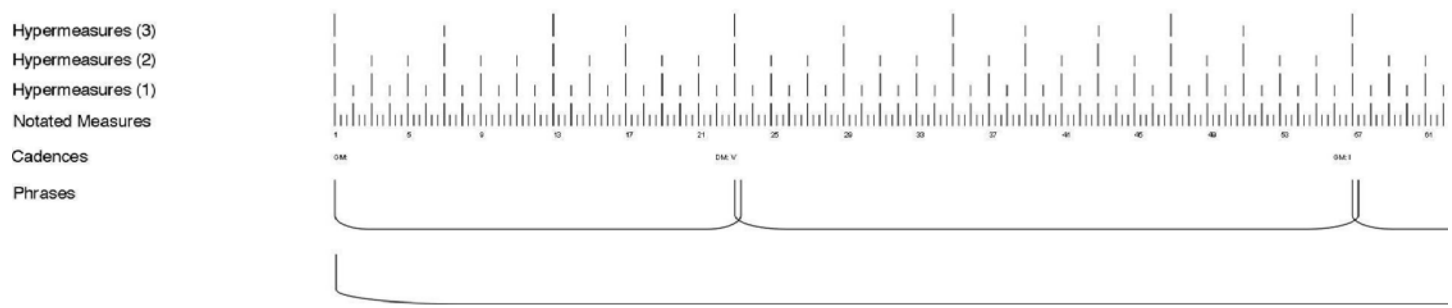

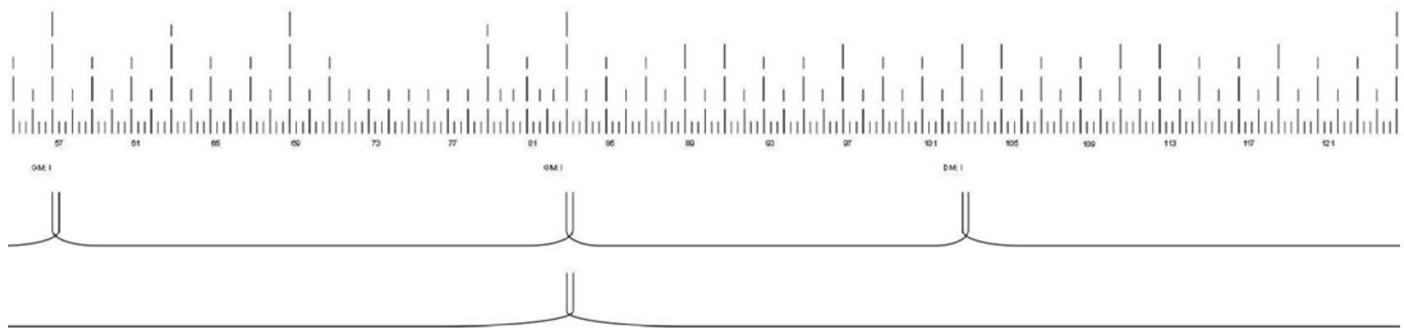

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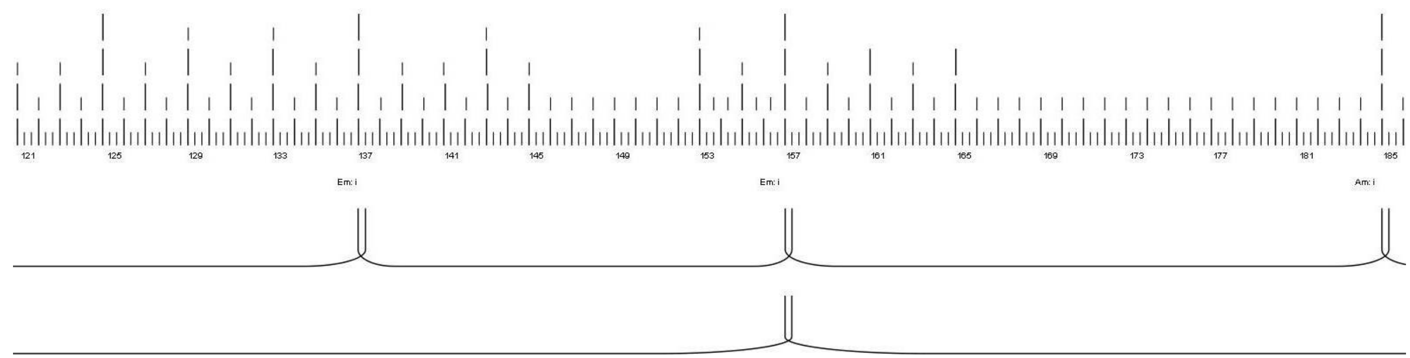

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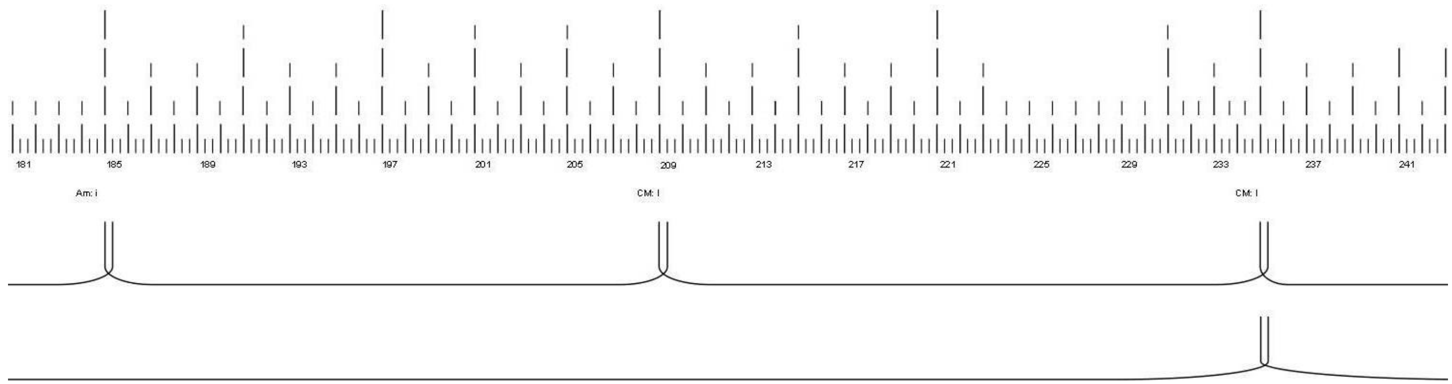

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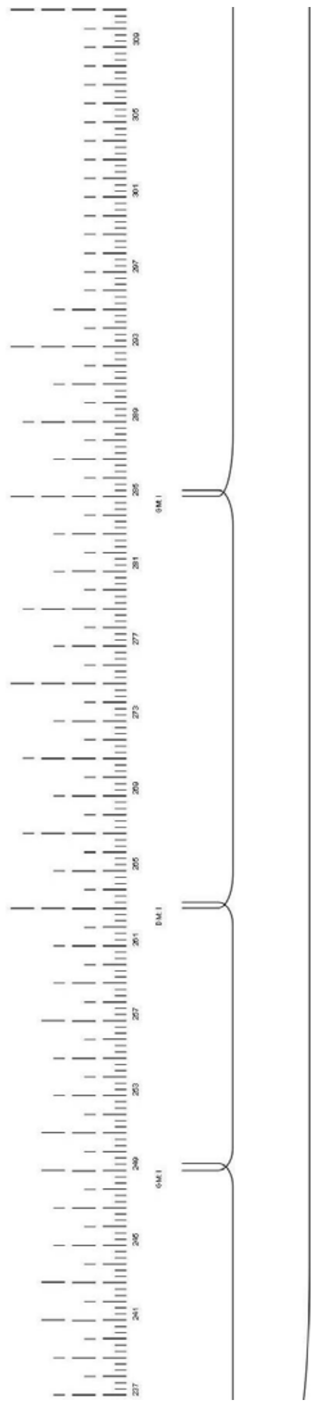

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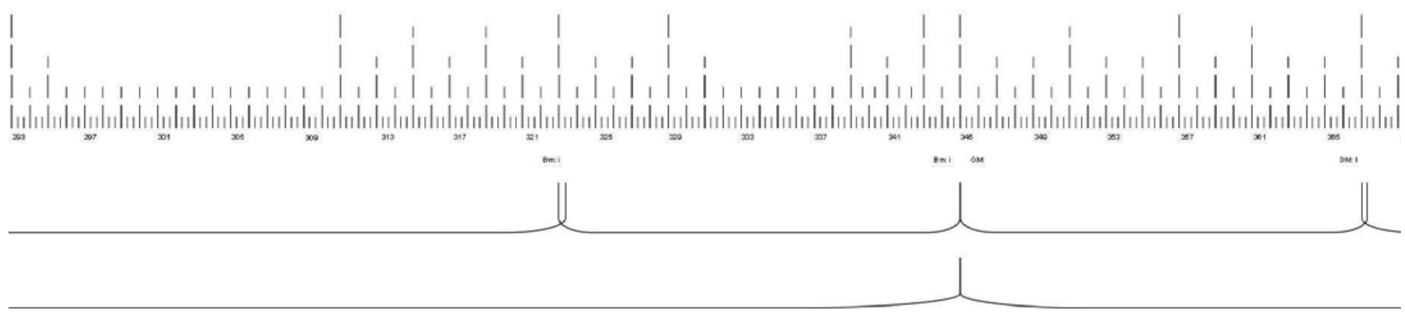

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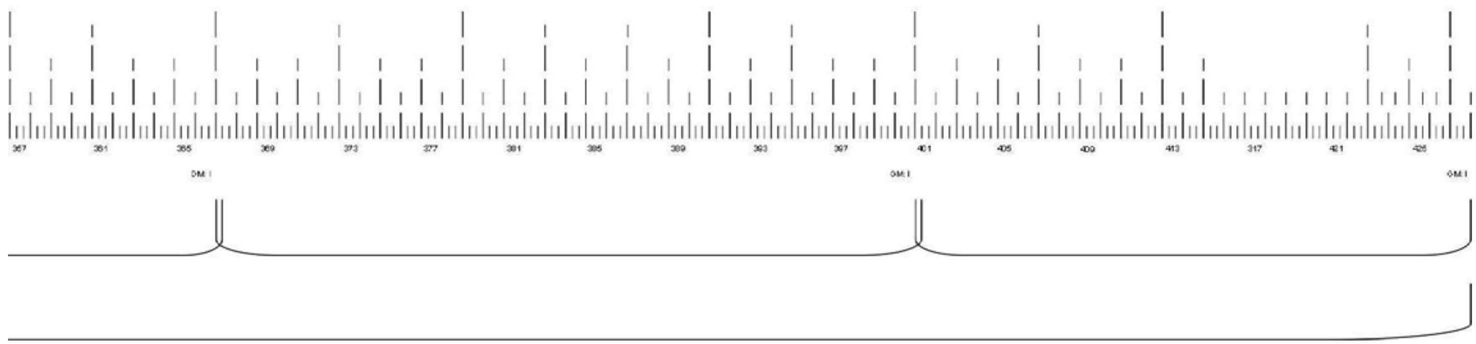

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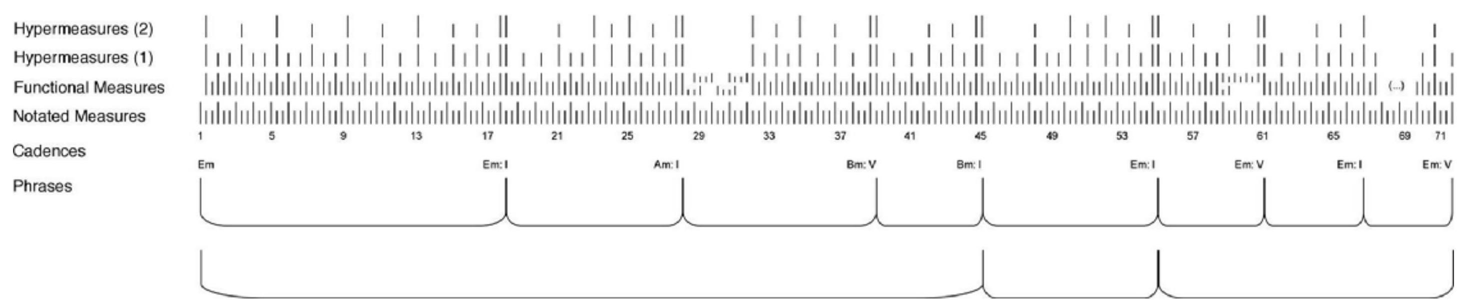

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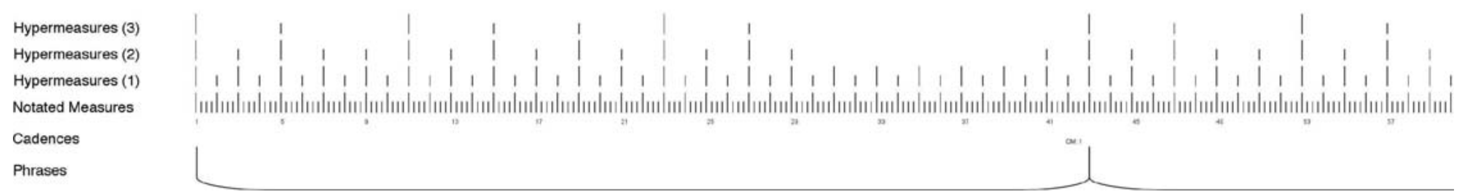

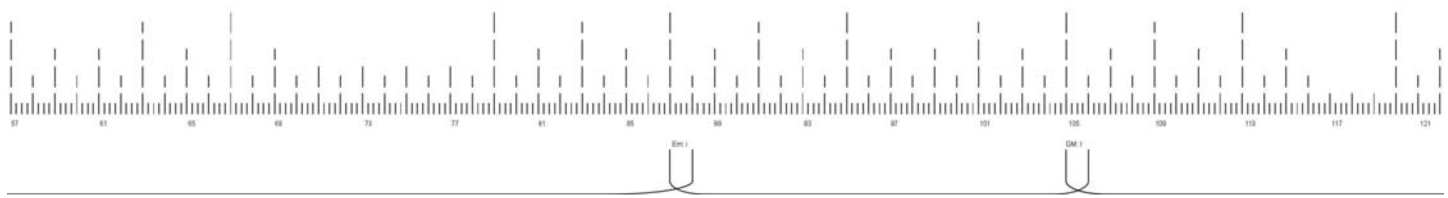

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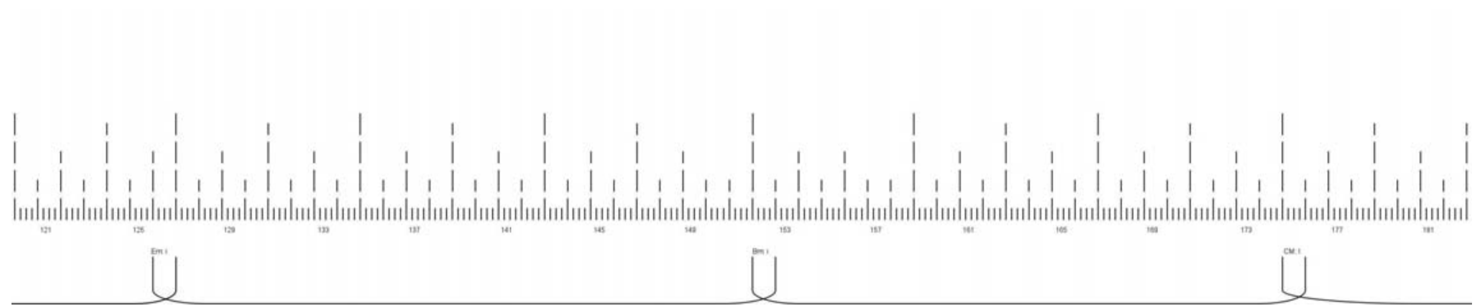

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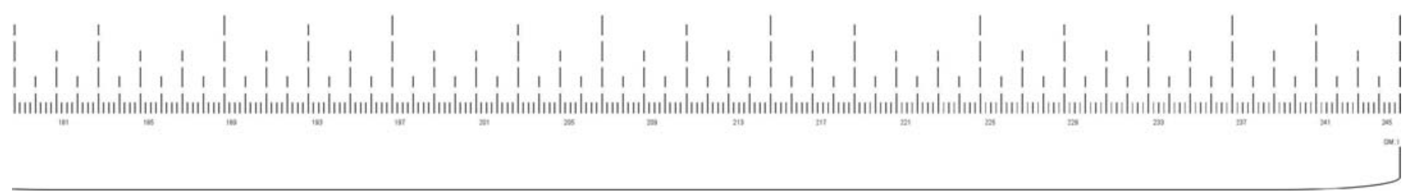

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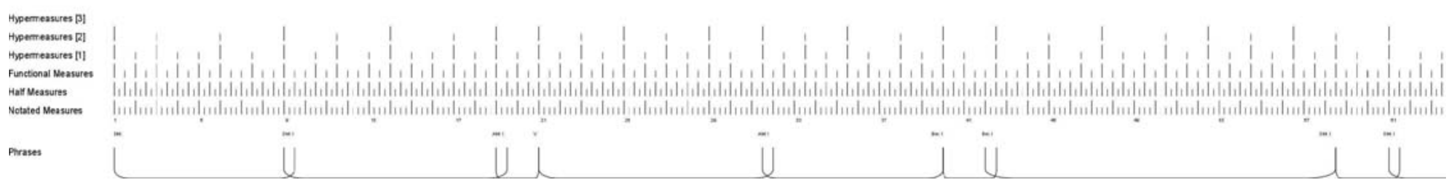

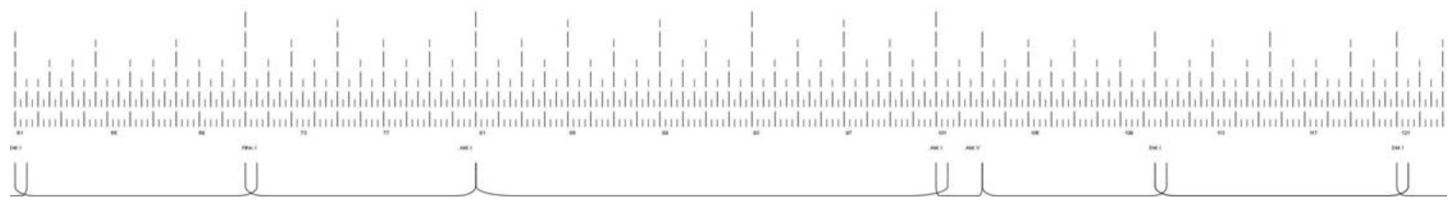

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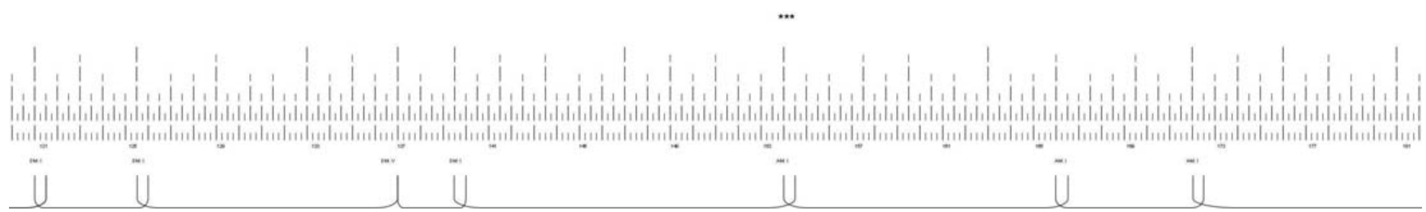

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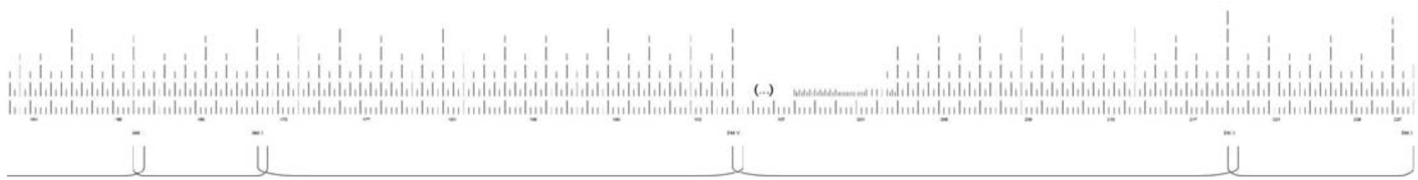

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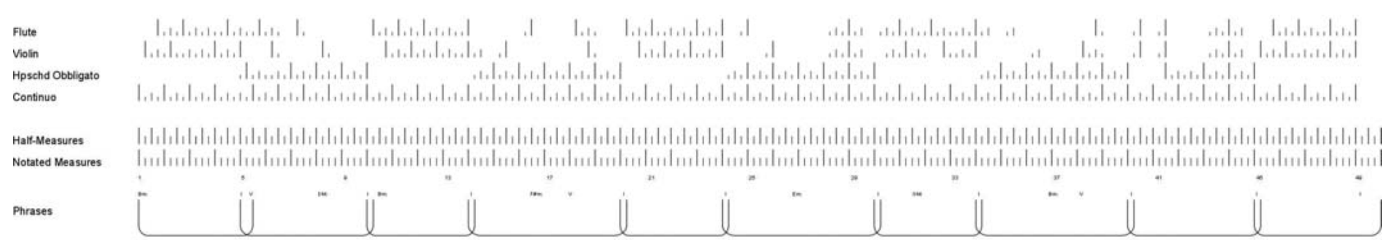

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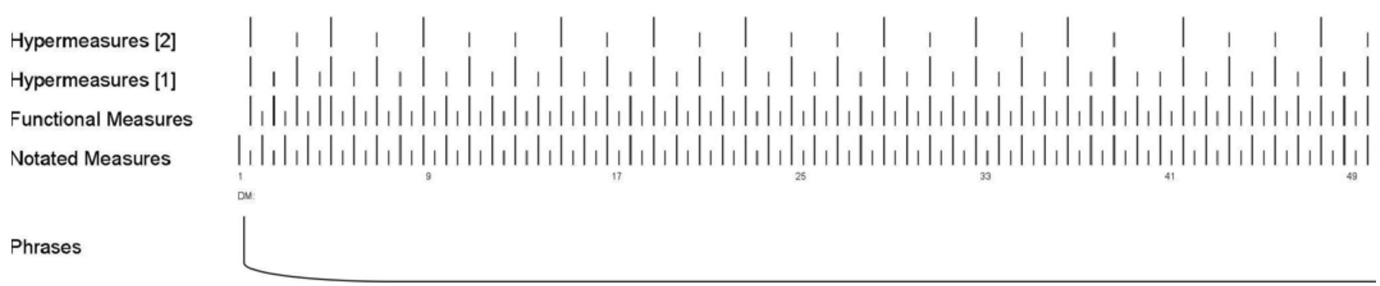

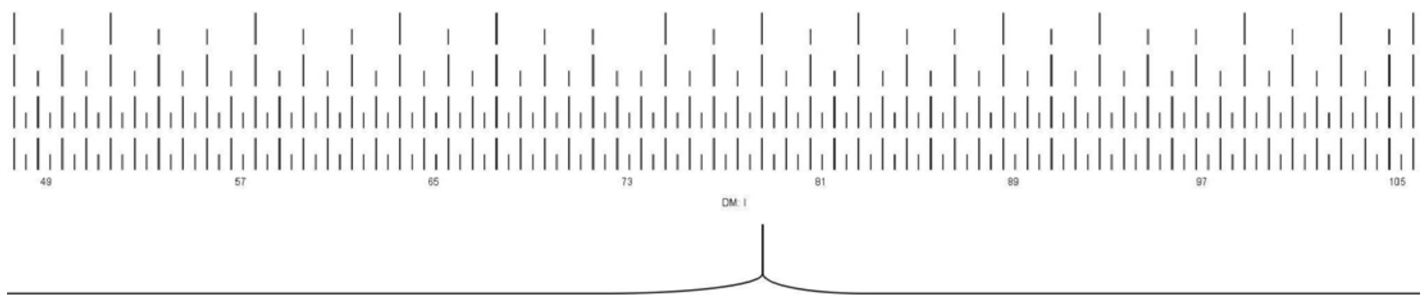

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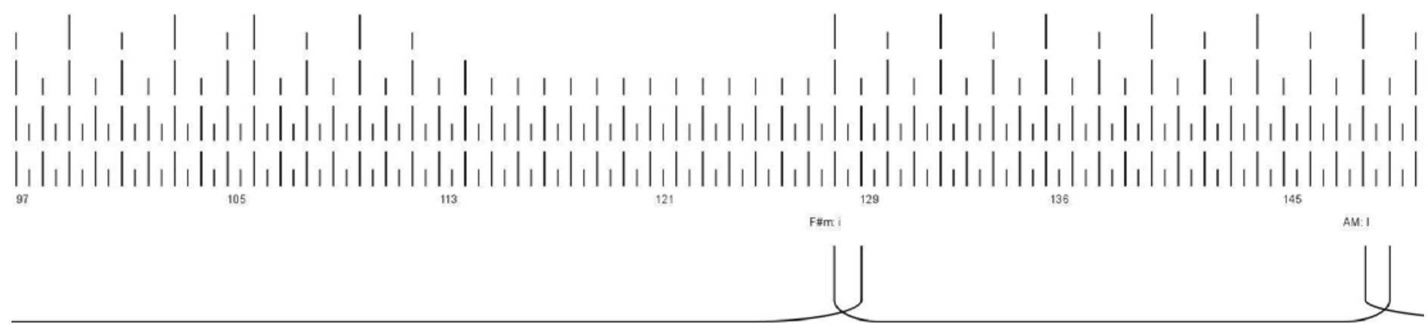

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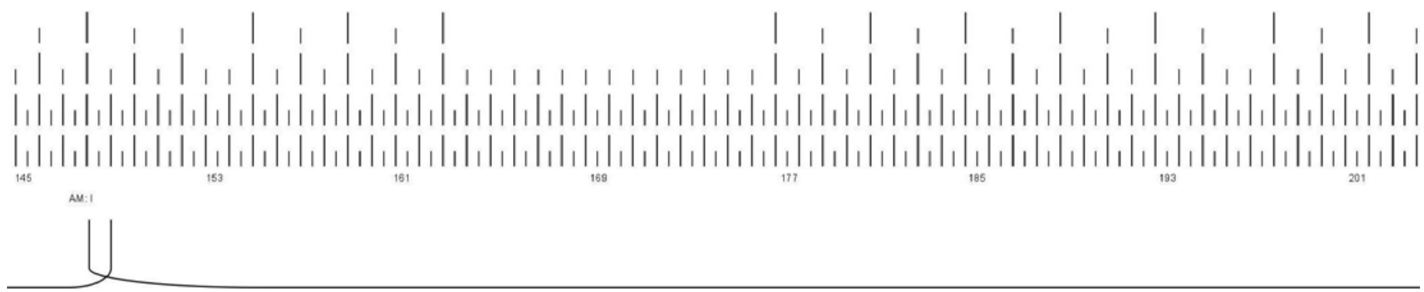

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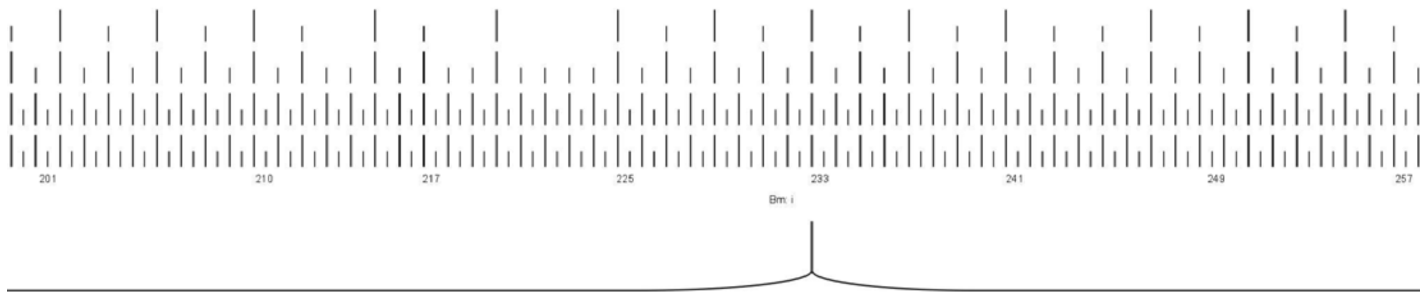
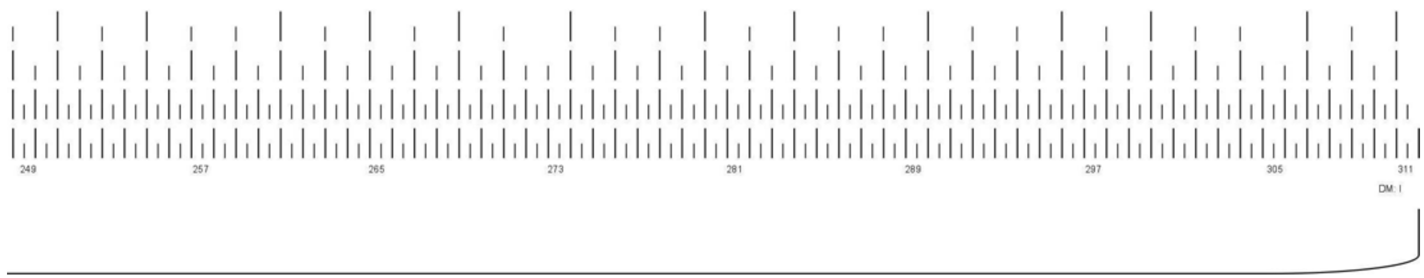
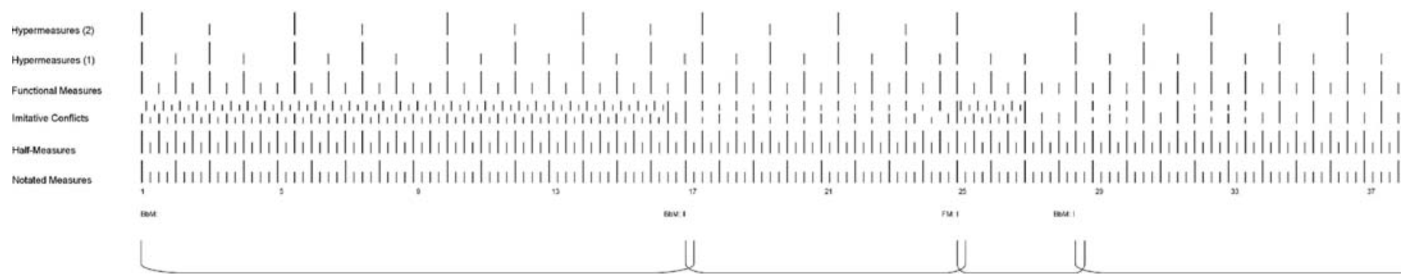


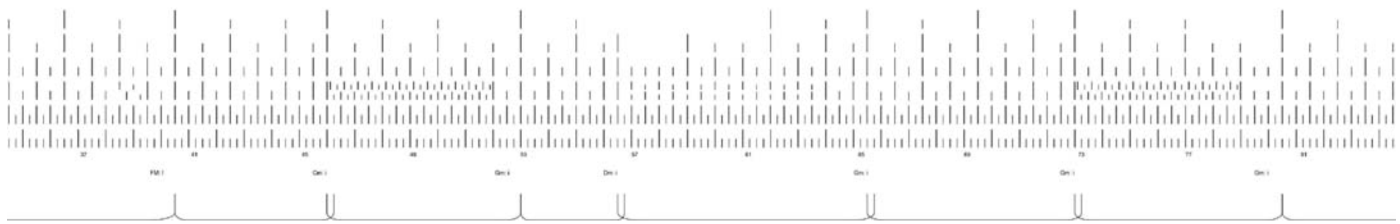
Concerto No. 5, 3rd Movement, continued.



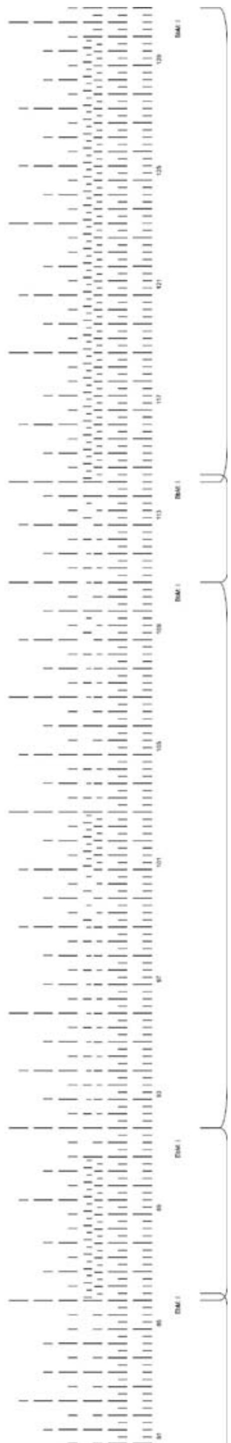
Concerto No. 5, 3rd Movement, continued.

J.S. Bach: Brandenburg Concerto No.6, 1st Movement:



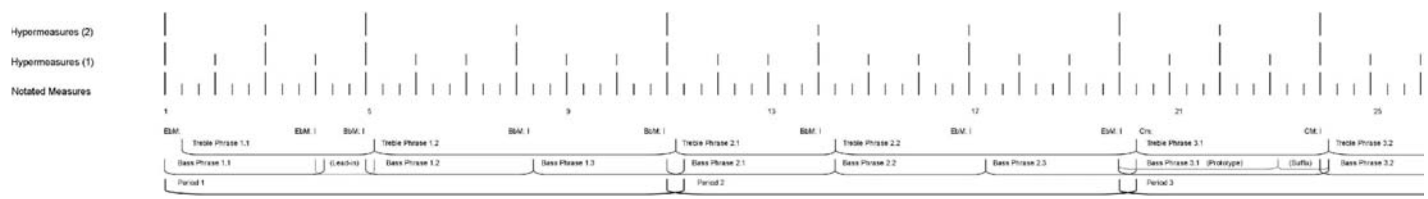


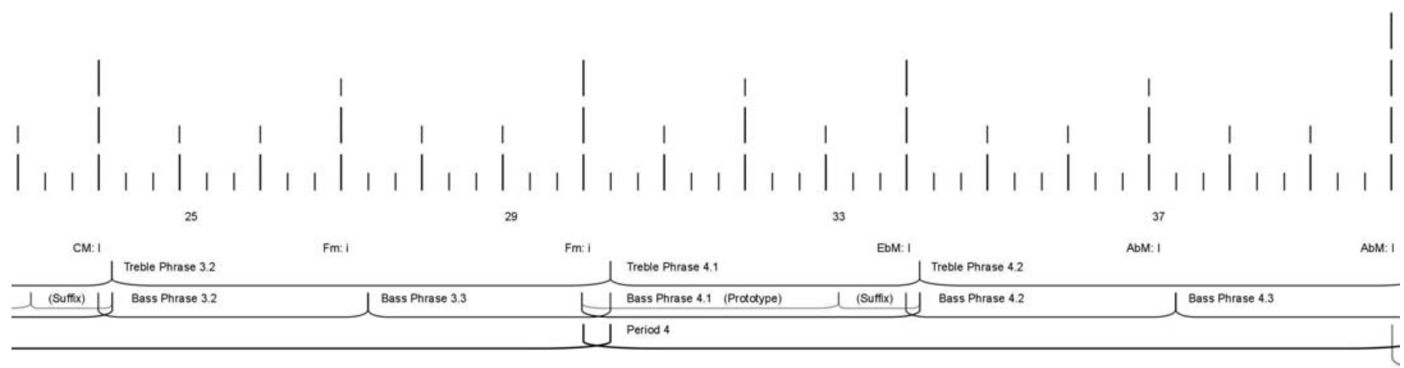
Concerto No. 6, 1st Movement, continued.



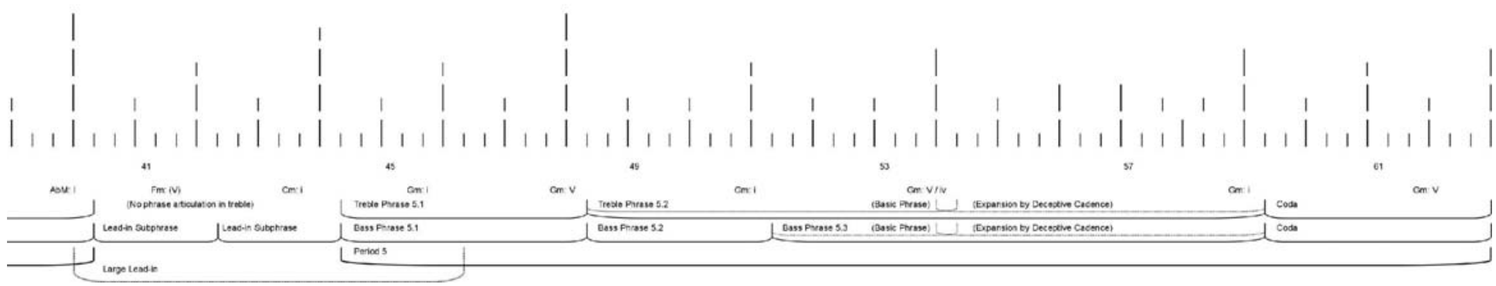
Concerto No. 6, 1st Movement, continued.

J.S. Bach: Brandenburg Concerto No.6, 2nd Movement:



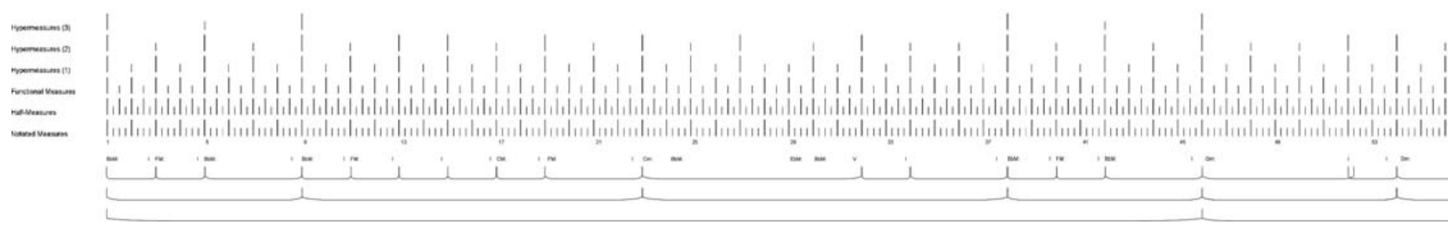


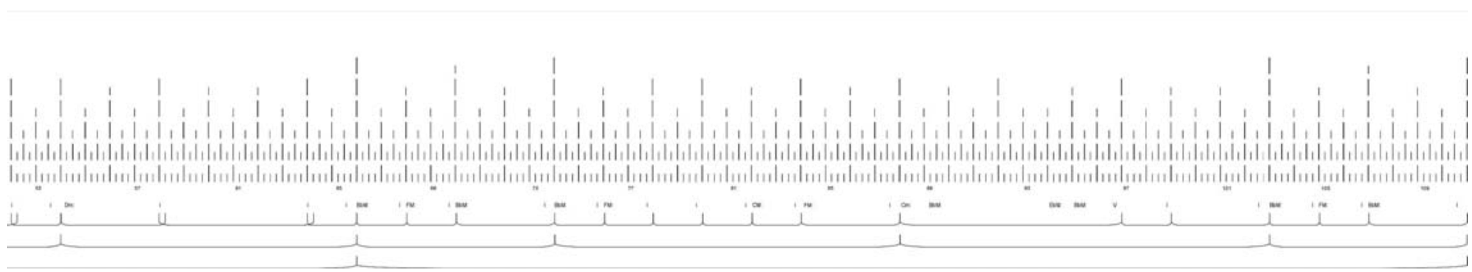
Concerto No. 6, 2nd Movement, continued.



Concerto No. 6, 2nd Movement, continued.

J.S. Bach: Brandenburg Concerto No.6, 3rd Movement:





Concerto No. 6, 2nd Movement, continued.

APPENDIX II: RESULTS OF AN INFORMAL EXPERIMENT IN METRIC PERCEPTION

Tabulation of "Experimental" Results

Seven members of a second-year Aural Skills class were played short excerpts from the Brandenburg Concertos, and offered various notation examples to match with the excerpts they were played. Participants were asked to rate notation examples in order of preferability as representations of the music they had heard. Results for each example show the response given by each respondent, A through G. Reproductions of the notation examples are shown as they were presented to participants, except that those shown to participants were not labeled "version 1," "version 2," etc.

Example A (mm. 1 – 18 of Concerto IV/i):

Version 1 [as in score – barred in 3/8]

More Preferable: A, E, G

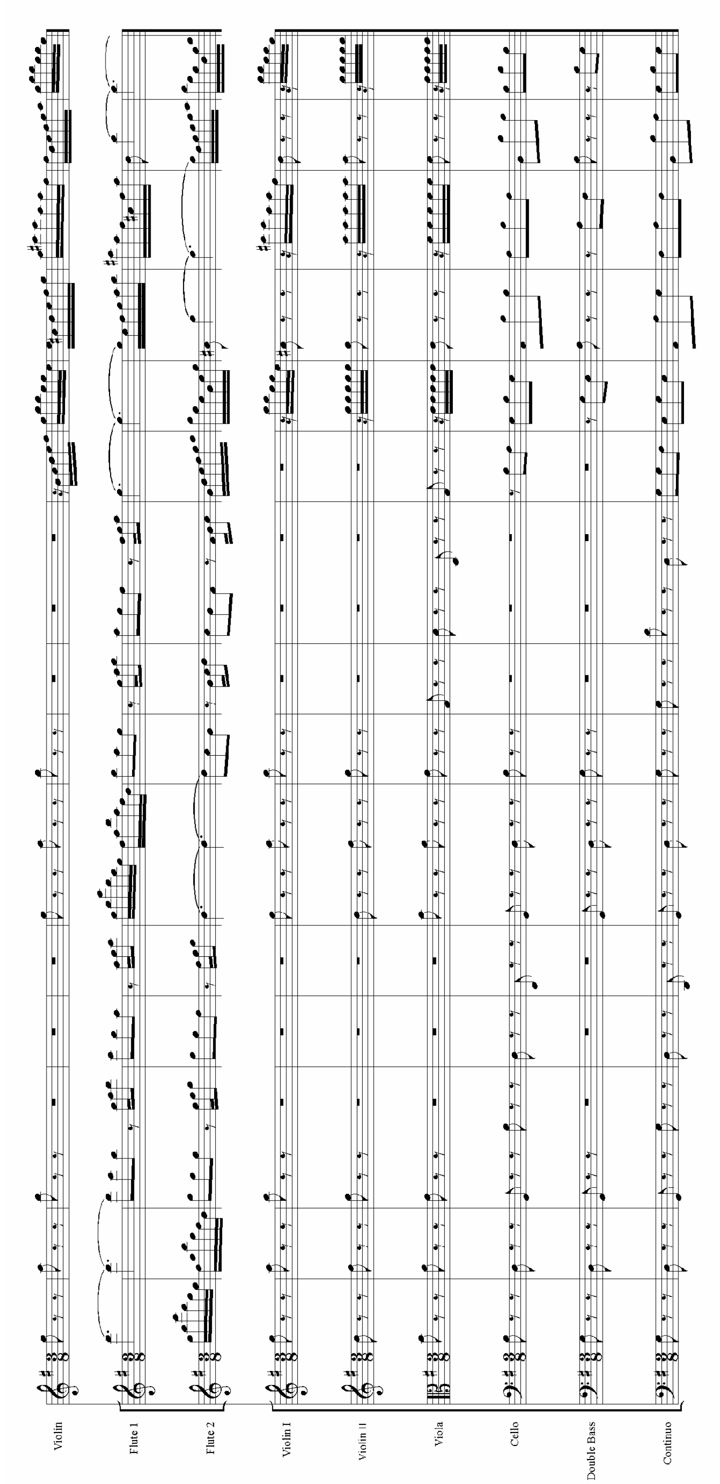
Less Preferable: B, C, D, F,

Version 2 [re-barred in 6/8 instead of 3/8]

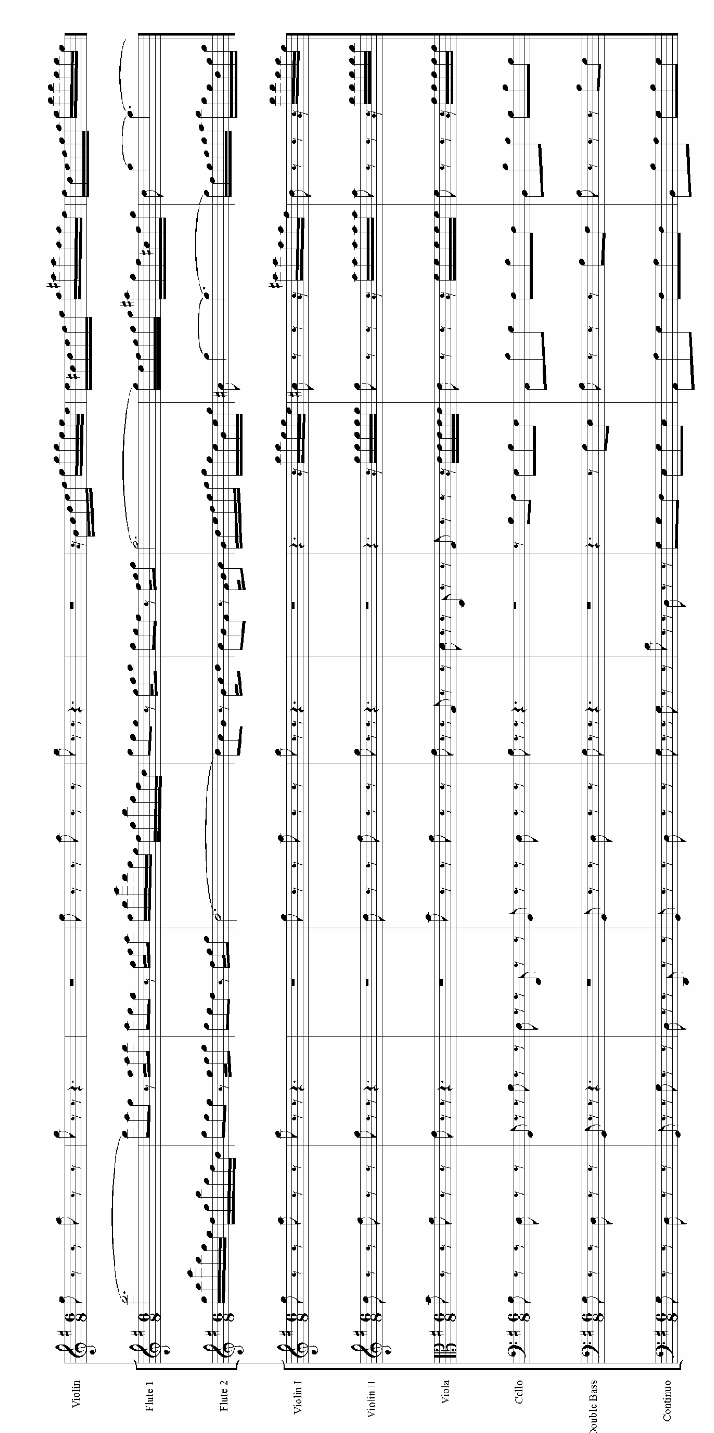
More Preferable: B, C, D, F,

Less Preferable: A, E, G

Analysis: The experimental hypothesis predicted that a large majority of respondents would prefer the notation in 6/8 meter because of the very strong 2-bar hypermeter. In reality only the smallest possible majority of respondents preferred 6/8 meter; the respondents were virtually evenly split between the two. The hypothesis was not confirmed.



Example A (version 1) ☐ More Preferable ☐ Less Preferable



Example A (version 2) □ More Preferable □ Less Preferable

Example B (mm. 4.3 – 6.2 of Concerto III/iii):

Version 1 [re-barred so that section in dominant begins on downbeat]

More Preferable: A, B, C, D, E, F, G

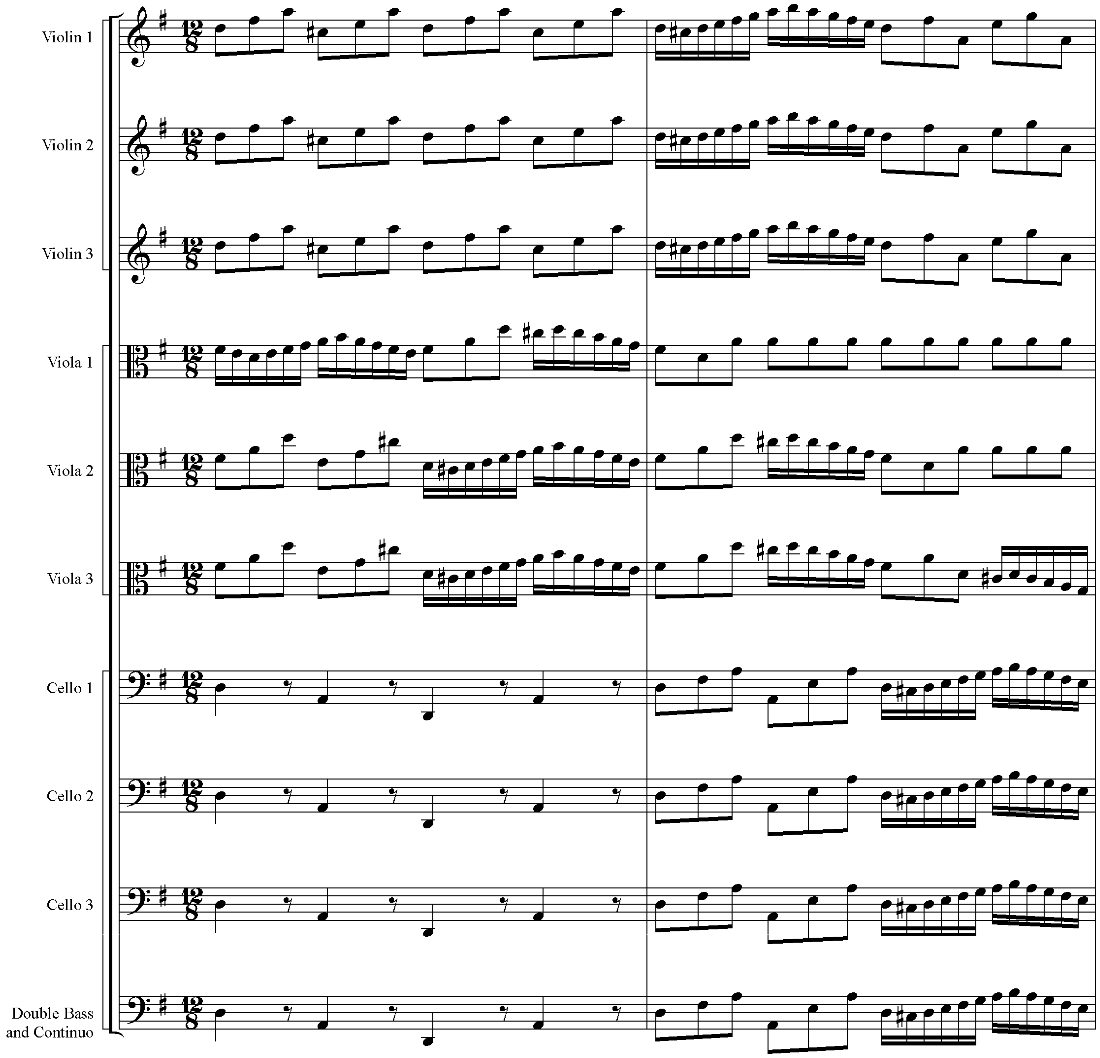
Less Preferable: None

Version 2 [as in score – section in dominant begins in middle of measure]

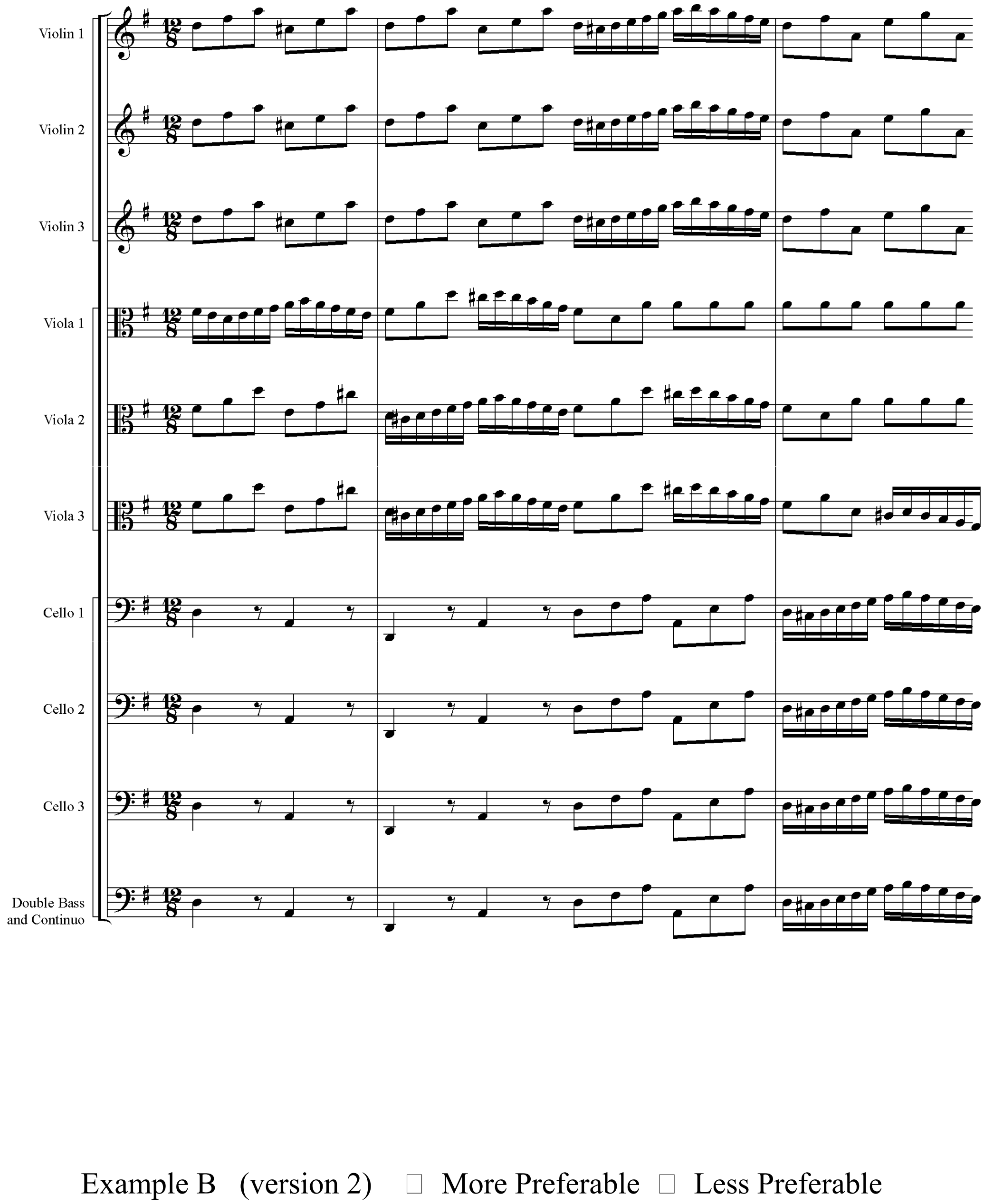
More Preferable: None

Less Preferable: A, B, C, D, E, F, G

Analysis: The example presents a typical and unambiguous case of mid-bar downbeat. The experimental hypothesis predicted a large number of respondents would prefer the notation that was re-barred so as to re-align the downbeat. All respondents preferred the re-barred version. The hypothesis was confirmed.



Example B (version 1) ☐ More Preferable ☐ Less Preferable



Example B (version 2) ☐ More Preferable ☐ Less Preferable

Example C (mm. 9.2 – 13.1 of Concerto IV/ii):

Version 1 [re-barred to show actual beat 2 as beat 1]

Most Preferable: A, D, F

Less Preferable: B, C, E, G

Least Preferable: None

Version 2 [as in score]

Most Preferable: B, C, E, G

Less Preferable: A, D,

Least Preferable: F

Version 3 [re-barred to show actual beat 3 as beat 1]

Most Preferable: None

Less Preferable: F

Least Preferable: A, B, C, D, E, G

Analysis: The example showed a passage with a strong accent on the second beat. Based on informal interviews with students, the experimental hypothesis predicted a majority would perceive the downbeat as displaced to the second quarter-note of the measure [prefer version 1]. In reality a small majority preferred the authentic version. The hypothesis was not confirmed.

Example C (version 1) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable

Example C (version 2) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable

Example C (version 3) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable

Example D (mm. 1.1 –5.2 of Concerto V/ii, minus opening eighth-note downbeat):

Version 1 [re-barred to show actual beat 2 as beat 1]

Most Preferable: F

Less Preferable: A, C, D, E,

Least Preferable: B, G

Version 2 [as in score, with authentic barring]

Most Preferable: A, C, D, E, G

Less Preferable: B,

Least Preferable: F

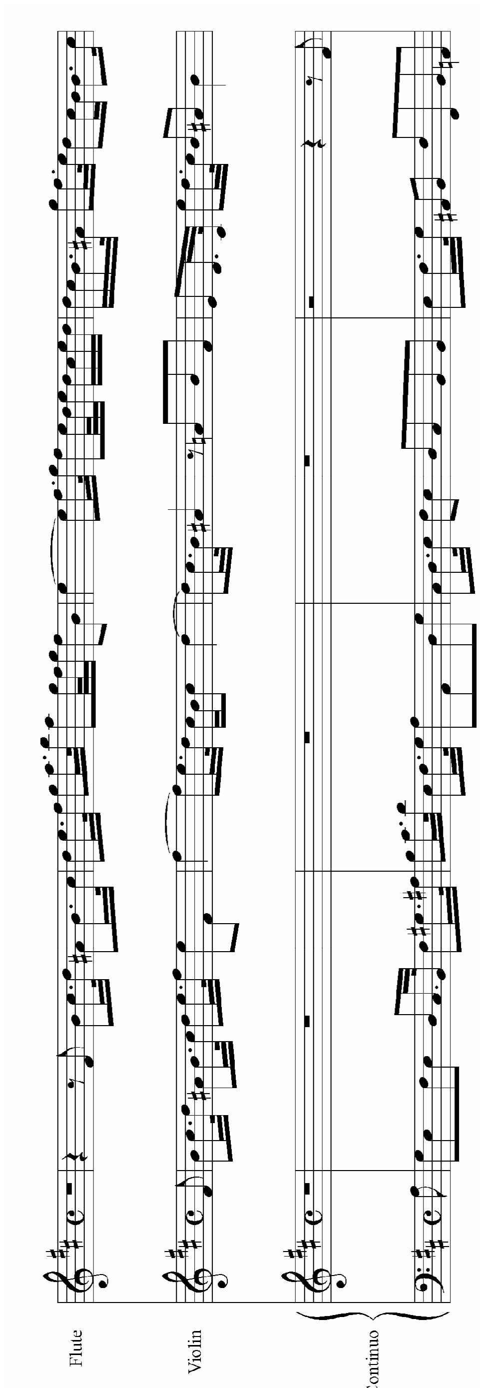
Version 3 [re-barred to show actual beat 3 as beat 1]

Most Preferable: B,

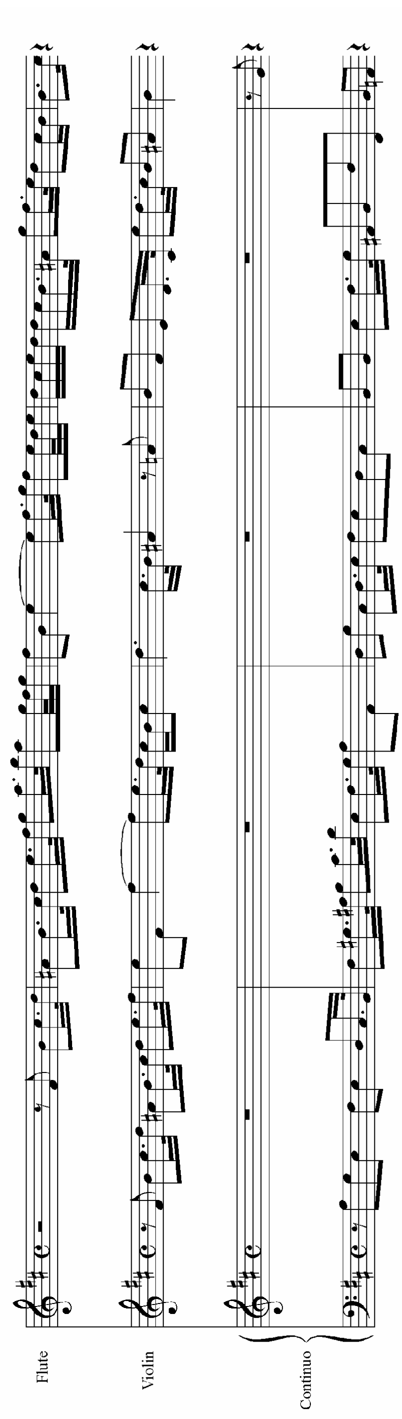
Less Preferable: F, G

Least Preferable: A, C, D, E,

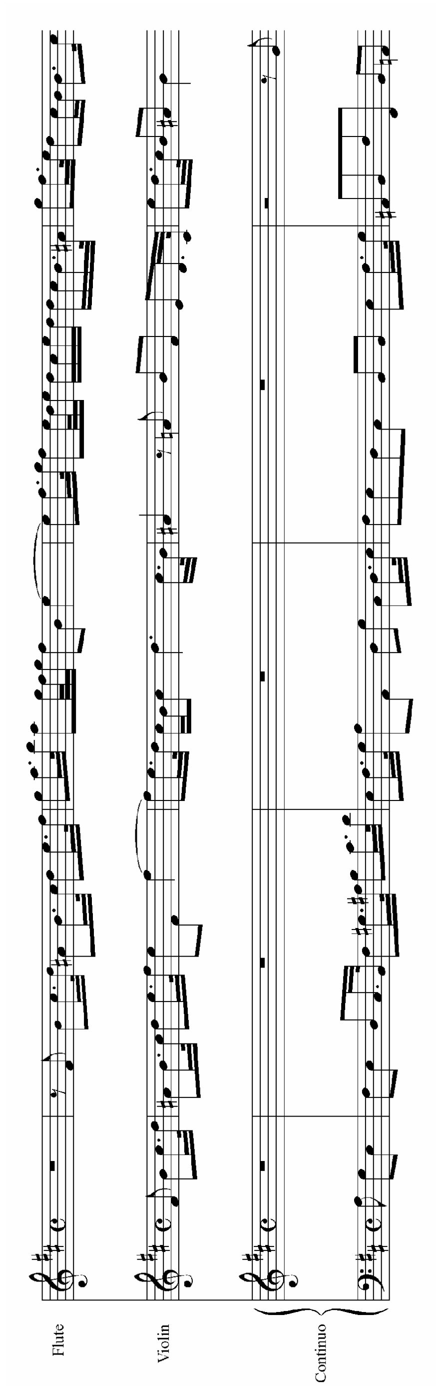
Analysis: The experimental hypothesis predicted that, with the opening downbeat removed, a majority of respondents would perceive the downbeat on the second quarter-note of the measure [prefer version 1]. In reality a large majority of respondents preferred the authentic version, even without the cue of the opening downbeat. The hypothesis was not confirmed.



Example D (version 1) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable



Example D (version 2) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable



Example D (version 3) ☐ Most Preferable ☐ Less Preferable ☐ Least Preferable

Example E (mm. 1.1 – 5.4 of Concerto V/iii):

Version 1 [notated in 6/8, with actual beat 2 as beat 1]

Most Preferable: A, B, E, F

More Preferable: D

Less Preferable: C

Least Preferable: None

Version 2 [notated in 12/8, with actual beat 2 as beat 1]

Most Preferable: D, G

More Preferable: A, B, E, F

Less Preferable: NNone

Least Preferable: C,

Version 3 [notated in 6/8, with actual beat 1 as beat 1]

Most Preferable: C,

More Preferable: None

Less Preferable: A, D, E, F

Least Preferable: B, G

Version 4 [notated in 12/8, with actual beat 1 as beat 1]

Most Preferable: None

More Preferable: C

Less Preferable: B, G

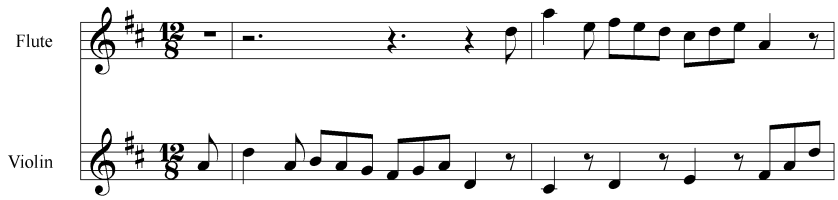
Least Preferable: A, D, E, F

Analysis: A large majority of respondents mistook the second beat for the downbeat. A fair majority of respondents preferred 6/8 notation to 12/8 [the actual score is notated in 2/4, with the first bar dotted and triplets in the second bar].

The experimental hypothesis predicted a strong preference for the first long value as the downbeat (instead of a rest) and was confirmed. The choice of 6/8 vs. 12/8 meter was included to obscure the subject under investigation [just to cloud the issue].

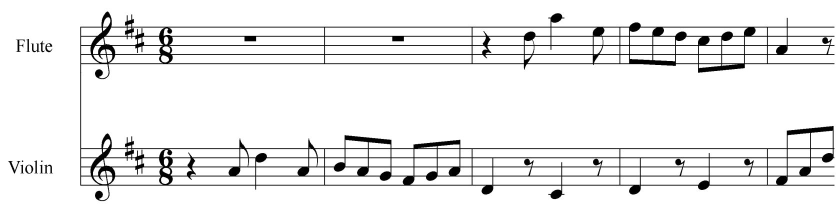
Example E (V.1)

☐ Most Preferable ☐ More Preferable ☐ Less Preferable ☐ Least Preferable



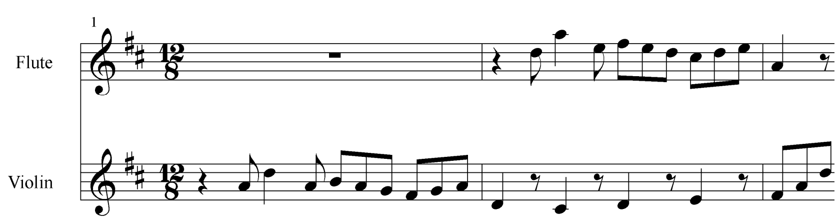
Example E (V.2)

☐ Most Preferable ☐ More Preferable ☐ Less Preferable ☐ Least Preferable



Example E (V.3)

☐ Most Preferable ☐ More Preferable ☐ Less Preferable ☐ Least Preferable



Example E (V.4)

☐ Most Preferable ☐ More Preferable ☐ Less Preferable ☐ Least Preferable

Example F (mm. 1 – 2 of Concerto III/i):

Version 1 [as in score – notated as three measures of cut time]:

More Preferable: B, D, G

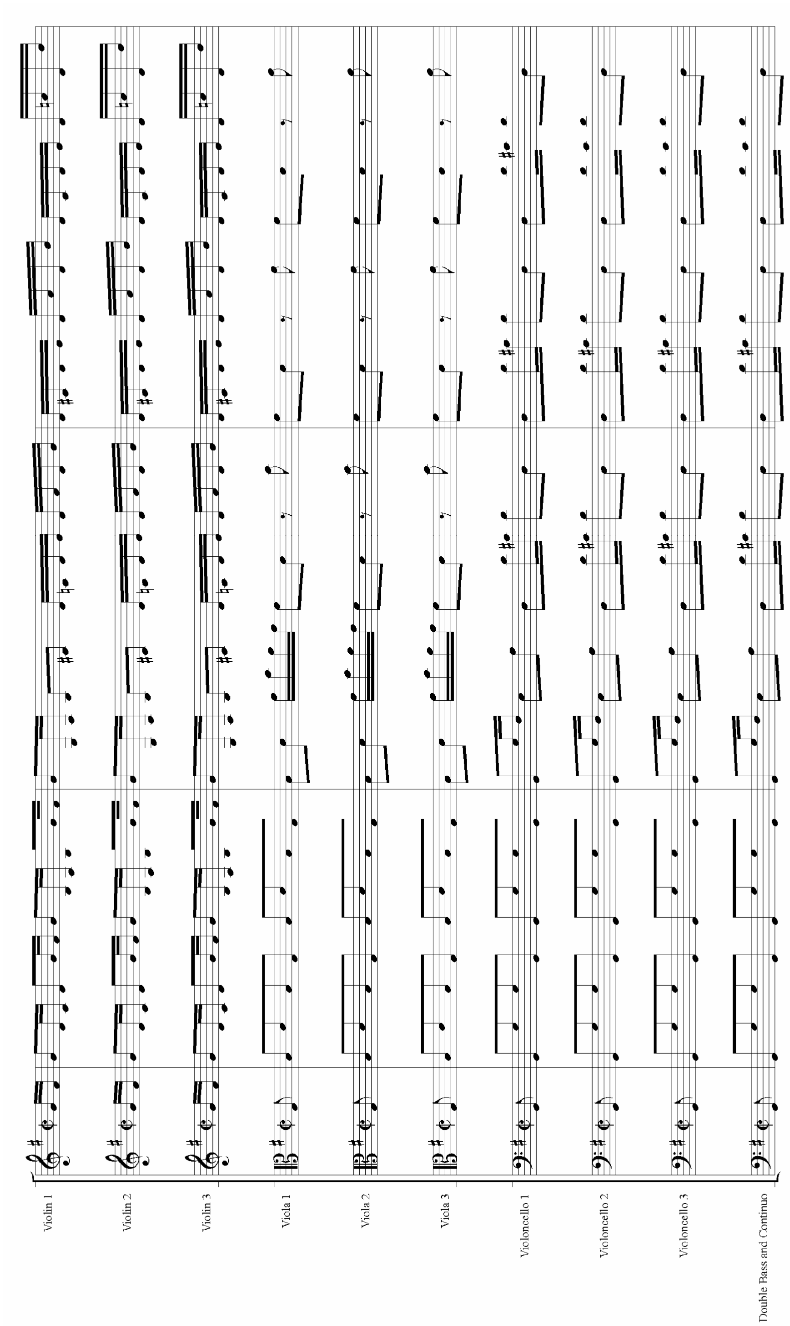
Less Preferable: A, C, E, F

Version 2 [re-barred as two measures of 3/2]:

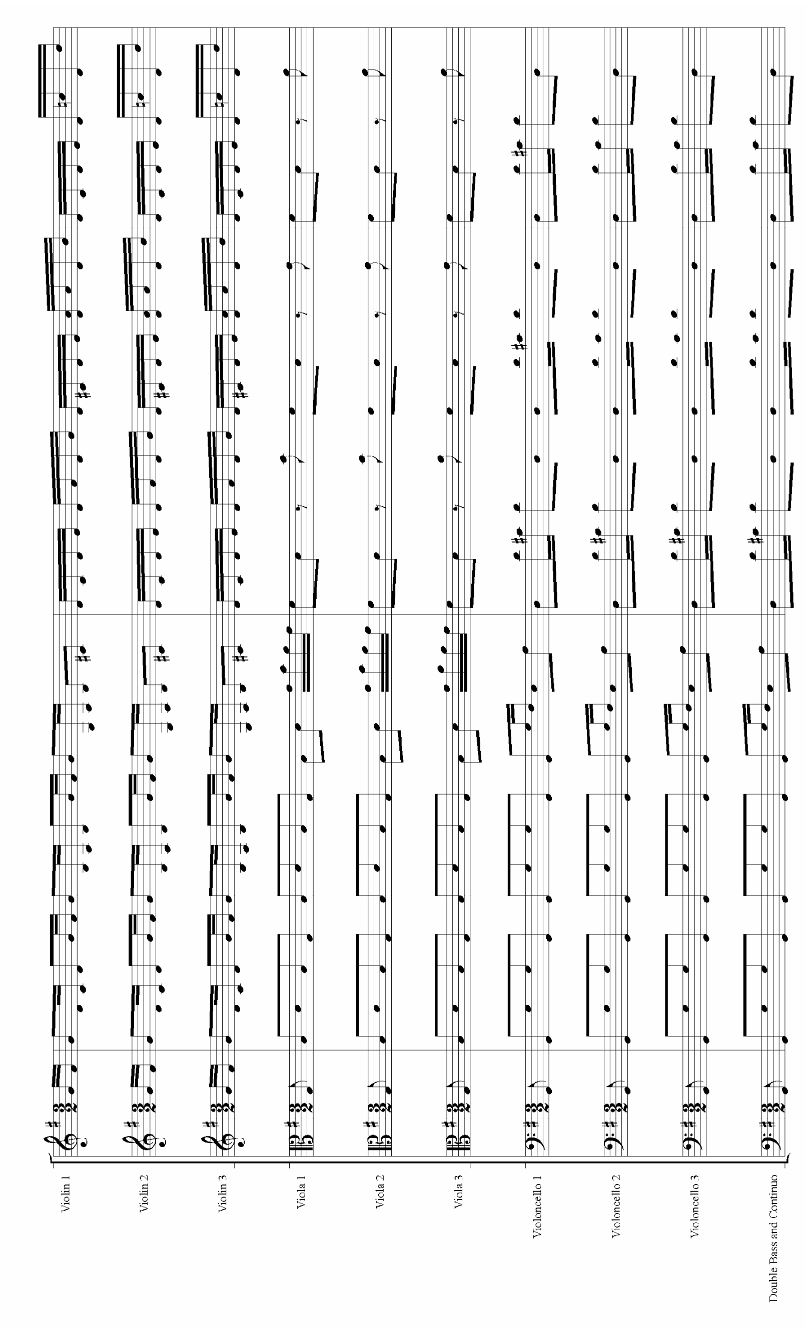
More Preferable: A, C, E, F

Less Preferable: B, D, G

Analysis: Only the smallest possible majority considered the re-barred version as a preferable representation of what they had heard. Respondents were virtually evenly split. The experimental hypothesis predicted a strong majority preference for the re-barred version. The hypothesis was not confirmed, although the possibility of hearing in the excerpt in the predicted way was confirmed.



Example F (version 1) ☐ Most Preferable ☐ Least Preferable



Example F (version 2) ☐ Most Preferable ☐ Least Preferable

Example G (mm. 102.2 – 109.2 of Concerto I/iii):

Version 1 [as in score]:

More Preferable: C, D, F

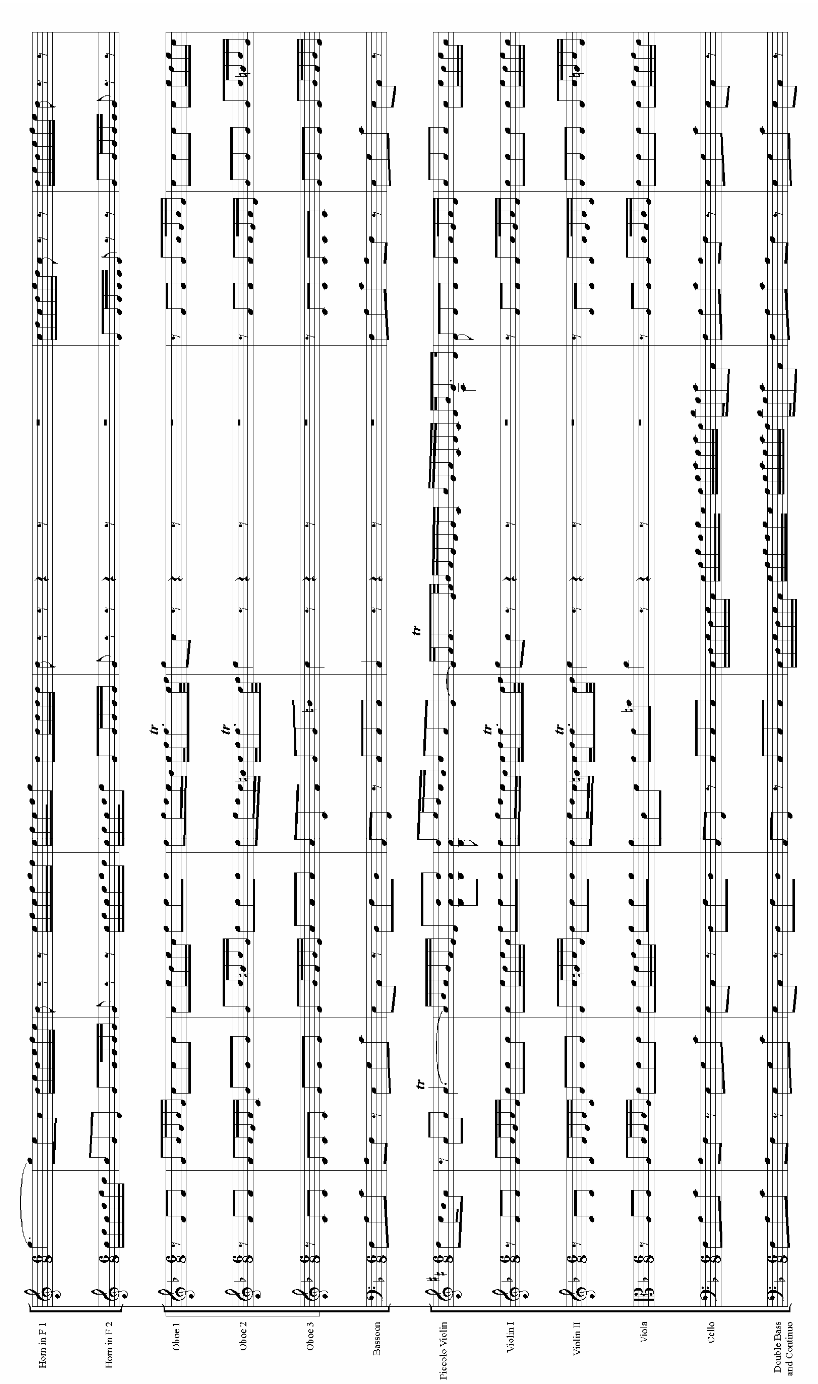
Less Preferable: A, B, E, G

Version 2 [re-barred to show actual beat 2 as beat 1]:

More Preferable: A, B, F,

Less Preferable: C, D, E, G,

Analysis: The smallest possible majority preferred the re-barred version to the authentic version. Respondents were virtually evenly split between the two. The preferred version aligns the "felt" downbeat with the notated barlines at the beginning of the passage, while the authentic version does the opposite. The experimental hypothesis did not predict a majority preference. The hypothesis predicted a fairly even split because neither version has a "correct" downbeat throughout the passage. The prediction was confirmed.



Example G (version 1) ☐ Most Preferable ☐ Least Preferable

Example G (version 2) ☐ Most Preferable ☐ Least Preferable

Example H (mm. 165 – 174 of Concerto IV/i):

Version 1 [Notated in 6/8, with odd-numbered (actual) 3/8 measures as the first half of the bar]:

More Preferable: A, B, E

Less Preferable: C, D, F, G

Version 2 [Notated in 6/8, with even-numbered (actual) 3/8 measures as the first half of the bar]:

More Preferable: C, D, F, G

Less Preferable: A, B, E

Analysis: This passage is actually notated in 3/8. By showing it barred in 6/8, the experiment asked respondents to make judgements regarding hypermetric organization of the actual music. The experimental hypothesis was that the passage showed so much conflict and so little hypermetric organization that respondents would generally disagree. The hypothesis did not predict an overall preference.

NOTE: Due to an error in preparation, the second system of “Version 1” incorrectly duplicated the first system of “Version 2.” [The error has since been corrected but is evident in the examples returned by the respondents.]

Respondents were apprised of this mistake and asked to examine only the first system of both examples.

The smallest possible majority of respondents preferred version 2 to version 1 as an accurate representation of what they had heard. Respondents were virtually evenly split between the two. The hypothesis was confirmed.

Example H (version 1) ☐ Most Preferable ☐ Least Preferable

Example H (version 2) ☐ Most Preferable ☐ Least Preferable

SUMMARY OF RESULTS

This experiment was conducted in order to test certain analytical judgements, by inquiring into whether listeners might perceive what they heard in the manner that was predicted in analysis. As such, it was neither an outright failure or an unqualified success. The experimental hypothesis was confirmed in four cases and not confirmed in four others. However three of the failures to confirm might be marked with a conceptual asterisk: in cases A, C, and F, listeners were more or less evenly divided in their responses, showing that it was possible to hear the excerpt in the predicted manner, although it was also possible not to do so.