

Metric and Hypermetric Dissonance in the *Menuetto* of Mozart's Symphony in G Minor, K. 550

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As I completed this article, I learned of the death of Howard Mayer Brown, one of the great musicologists of our time, cherished as colleague and mentor at the University of Chicago and throughout the music-scholarly and early music world. Although known as a Renaissance specialist, Howard was passionate about many musics and many branches of music scholarship. The original edition of *Das Meisterwerk in der Musik* that I consulted in preparing this study was a gift to me some years ago from Howard's personal library. Such acts of generosity, with minimal fuss, were the *cantus firmus* of his life. I dedicate this article to the memory of Howard's generous spirit.

I

Hypothesized parallels between pitch and time have provided a vessel, in recent years, for the transfer of conceptual resources from the wealthy dominion of pitch theory to the developing world of rhythmic theory. A prime insight fundamental to some recent rhythmic theory rests on the analogy that meter orients our temporal experience in ways similar to those in which tonality orients our pitch interpretations.¹ Matters are complicated by the difficulty of separating pitch from rhythm: time unfolds through specific events, which are normally characterized in terms of their pitch values; conversely, although pitches are represented in scores as static points, their acoustic life as frequencies requires extension through time. These intertwinings would seem to contradict a claim of parallelism; nonetheless, there is at least heuristic value in such a

¹A general discussion of orientation is found in Jay Rahn, *A Theory for All Music: Problems and Solutions to the Analysis of Non-Western Forms* (Toronto: University of Toronto Press, 1983), 77.

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claim.² Points of tonal and metric orientation, evenly dispersed across a linear continuum so as to suggest its modularity, provide a constant framework which is reinforced by some specific events, perturbed by others. Perturbations, whether in the form of neighbor tones or passing tones, syncopations or hemiolas, can be maintained across sufficiently impressive territory as to suggest an alternative orientation.

While these similarities between events in the domains of pitch and time may be quite general, they furnish a basis for the transfer of more specific concepts and terms. Among these is the dissonance/consonance duality, by which some rhythmic theorists characterize metric perturbations—such as syncopations and hemiolas—and their resolutions. This extension of consonance and dissonance to the domain of rhythm, apparently first suggested by Charles Seeger, and developed by Maury Yeston, has been recently refined in important ways by Harald Krebs.³ Krebs distinguishes between direct metric dissonances, where conflicting meters are explicitly present during a single temporal span, and indirect metric dissonances, where conflicts result from successive juxtaposition of conflicting meters. In the latter case, the conflict arises because “the first interpretive level is not immediately effaced upon the appearance of the second, but is continued in the listener’s mind. The attacks of the imagined continuation of the first level do not coincide with the actually sounding attacks of the second, resulting in a sense of collision.”⁴ Krebs’s characterization implicitly emphasizes parallels with tonal theory, where dissonances are not limited to simultaneous sounds (B with F), but also result from

²The “intertwining yet parallel” paradox arises frequently in metaphorically based discourse; a familiar example is the perennial claim that “music is (like) a language,” notwithstanding that there is a “musical” element in speech, and a linguistic element in texted music.

³Charles Seeger, “On Dissonant Counterpoint,” *Modern Music* 7/4 (1930):25-31; Maury Yeston, *The Stratification of Musical Rhythm* (New Haven: Yale University Press 1976); Harald Krebs, “Some Extensions of the Concept of Metrical Consonance and Dissonance,” *Journal of Music Theory* 31/1 (1987):99-120.

⁴Krebs, 105.

successions which collide within the ear of the listener, who supplies a mental continuation of the earlier sound into the time-span of the later one (B, then F).

Krebs goes a step further when he posits that most tonal compositions bear a "primary metrical consonance," which is normally marked by the meter signature and the location of the bar-lines. This metric consonance "remains subliminally present where it is contradicted on the surface. . . . just as the background tonic triad in the pitch domain acts as an omnipresent subliminal reference point for the hearing of the harmonic events of a given tonal work."⁵ For example, a section that bears internal metric consonance, such as the *Ritmo di tre battute* in the second movement of Beethoven's Ninth Symphony, might still be considered dissonant within its larger context (e.g., relative to the *quattro battute* established as a norm earlier in the movement) just as a Trio in the dominant is thought to indirectly clash with the global tonic of the Minuet. Implicit in the analogy between "primary metric consonance" and "background triad" is a further claim: that the primary metric consonance is subject to *prolongation* through *displacement* by a meter with which it is dissonant.⁶

A recent publication of mine stretched the metric consonance/dissonance metaphor yet further.⁷ In the Scherzo from Beethoven's Ninth Symphony, alternations between indirectly dissonant meters are not limited to the tactus level, the venue of the *tre/quattro battute* conflict referred to in the previous paragraph. They occur as well at the sub-tactus level of the notated meter, which alternates between triple (in the Scherzo proper) and duple (in the Trio), and at several super-tactus (hypermetric) levels as

⁵Ibid.

⁶A more overtly transformational approach to rhythmic dissonance is found in William Rothstein's "Rhythmic Displacement and Rhythmic Normalization" (in *Trends in Schenkerian Research*, edited by Allen Cadwallader, New York: Schirmer, 1990), 87-113. Rothstein treats syncopations (Krebs's Type-B dissonance) but not hemiola-type structures (Krebs's Type-A), the latter of which are the concern of the current study.

⁷Richard Cohn, "Dramatization of Hypermetric Conflicts in the Scherzo of Beethoven's Ninth Symphony," *19th-Century Music* 15/3 (1992):22-40.

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well. I suggested that these alternations create a large-scale design of indirect dissonance and resolution, which is related to familiar teleological models of large-scale tonal conflict and resolution. I further proposed that direct hypermetric dissonances—essentially large-scale hemiolas—serve as pivots through which indirect hypermetric dissonances are mediated.

These analytic findings raise general issues concerning the scope of the pitch-time analogy. To what degree can a theory of pitch serve as a basis for a theory of rhythm? The notion that pitch and time are isomorphic is a venerable one, stretching back to antiquity.⁸ Recent work by Jeff Pressing suggests that tonal and rhythmic systems, in a diverse array of musical cultures, share abstract properties that perhaps point toward a mutual basis in a single cognitive deep structure.⁹ Does identification of pitch-time isomorphisms reflect unfathomable ontological kinships between pitch and time, encouraging speculations about unseen unifying forces or laws that might take the form of nature, probability, or God?¹⁰ Or does it perform a more modest heuristic, metaphorical duty, providing a way to communicate aspects of the unfamiliar by taking advantage of parallels with the more familiar?¹¹

The Scherzo from the Ninth Symphony also raises such questions of scope in other ways. From the compositional side of the fabric, does the Scherzo's teleological approach to metric

⁸See Lewis Rowell, "Aristoxenus on Rhythm," *Journal of Music Theory* 23 (1979), 66–67.

⁹Jeff Pressing, "Cognitive Isomorphisms Between Pitch and Rhythm in World Musics: West Africa, the Balkans and Western Tonality," *Studies in Music* (Australia) 17 (1983), 45.

¹⁰Such speculations are suggested in Moritz Hauptmann's work, which seeks a basis for both tonality and meter in Hegelian dialectics, and more recently in Ernő Lendvai's assertion that Bartók's pitch and rhythm are both founded on Fibonacci proportions. See *Béla Bartók: An Analysis of his Style* (London: Kahn & Averill, 1971).

¹¹An ingenious example of the exploitation of pitch-time parallels for purely heuristic purposes is David Lewin's analysis of the rhythm of Carter's String Quartet no. 1, in *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987), 68.

dissonance, modulation, inter-level migration, and resolution partake of a stylistic tradition—or does it represent a unique compositional exploration of a unique compositional problem? From the beholder's side, where the analyst is situated: to what extent does the conceptual framework developed for the Scherzo apply to other compositions of this genre or period? Such questions can only be answered by careful re-examination of members of the various concentrically related stylistic corpora to which the Scherzo belongs, and such examination can only proceed one composition at a time.

This study, which focuses on the *Menuetto* of Mozart's Symphony in G minor, K. 550, suggests that the conceptual framework and the specific tools crafted for the analysis of the Beethoven Scherzo also can be profitably applied to other members of the corpus to which that composition belongs. At the same time, it will help locate the point where the metaphor of metric consonance/dissonance breaks down, where parallels between rhythmic and pitch structure in classical music detach. The study is limited to the *Menuetto* proper, not the Minuet-Trio-Minuet series that is frequently referred to as the "*Menuetto* movement."

II

I begin by refining the theoretical framework introduced in "Dramatization." The earlier work began by defining "metric complex," a term that now strikes me as superfluous. The current exposition begins on more familiar ground.

Definition 1. A time-span XY initiates at time X , terminates at time Y , and includes all time-points between X and Y .

Definition 2. $L(XY)$, the length of time-span XY , is $Y-X$.

Note that we have not yet established a unit of measurement through which a value can be assigned to L .

We now turn attention to the pulse-values that equally partition time-span XY . Definition 3 gives these in the form of an ordered set of integers.

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Definition 3. $P(XY)$, the **P-set** of time-span XY , is the set of integers p_i , ordered from smallest to largest, such that

XY is perceived to be partitioned into $\frac{L(xy)}{P_i}$ subspans of

length p_i , where $1 \leq p_i \leq L(XY)$, and $\frac{L(xy)}{P_i}$ is an integer.

We will assume that all P-sets begin with 1, the smallest unit of equal division (= fastest pulse) of time-span XY that is worth noticing for the analytic purposes at hand. This is normally equivalent to the notated beat or the perceived tactus, but need not be so limited. In so doing, we establish a standard for assigning an integer value to L . We also assume, for formal reasons, that all P-sets end with $L(XY)$, which is perceived to equally partition itself.

The reference to perception in Definition 3 acknowledges that not all pulse-values that potentially partition a length L evenly are necessarily active in a given time-span XY of length L . Where $L = 6$, the following P-sets can occur:

1. $\langle 1, 3, 6 \rangle$, as in a measure of $\frac{6}{8}$
2. $\langle 1, 2, 6 \rangle$, as in a measure of $\frac{3}{4}$
3. $\langle 1, 6 \rangle$, the intersection of (1) and (2), as in a rapid sextuplet without internal accent;
4. $\langle 1, 2, 3, 6 \rangle$, the union of (1) and (2), as in a direct hemiola.

Each P-set of L represents an **interpretation** of L . The number of possible interpretations of length L is a function of the cardinality of its F-set:

Definition 4. The **F-set** for length L is the ordered set of integers that divide L evenly, including 1 and L .

Theorem 1. If $\#F$ is the cardinality of the F-set of L , then the length L has $2^{\#F-2}$ interpretations.

Whether an interpretation of L is consonant or dissonant is determined from characteristics of the P-set. Following Yeston, metric

consonance exists when all pairs of pulse-levels are in an inclusion relation.¹² This occurs if and only if for all pairs of values in a P-set the larger value is an integral multiple of the smaller.

Definition 5. An interpretation of length L is **consonant** if,

for all $\langle p_n, p_{n+1} \rangle \in P(XY)$, $\frac{P_{n+1}}{P_n}$ is an integer.

Table 1 explores the P-sets for $L = 18$, the most common case in the Mozart Minuet. The F-set for 18 is $\langle 1, 2, 3, 6, 9, 18 \rangle$, so there are $2^4 = 16$ interpretations. Table 1 classifies them as either consonant or dissonant. The significance of the third column, "degree of dissonance," will be discussed later.

Table 1. P-sets for $L = 18$

CONSONANT	DISSONANT	DEGREE OF DISSONANCE
$\langle 1, 18 \rangle$	$\langle 1, 2, 3, 18 \rangle$	1
$\langle 1, 2, 18 \rangle$	$\langle 1, 2, 9, 18 \rangle$	1
$\langle 1, 3, 18 \rangle$	$\langle 1, 6, 9, 18 \rangle$	1
$\langle 1, 6, 18 \rangle$	$\langle 1, 2, 3, 6, 18 \rangle$	1
$\langle 1, 9, 18 \rangle$	$\langle 1, 2, 3, 9, 18 \rangle$	2
$\langle 1, 2, 6, 18 \rangle$	$\langle 1, 2, 6, 9, 18 \rangle$	2
$\langle 1, 3, 6, 18 \rangle$	$\langle 1, 3, 6, 9, 18 \rangle$	1
$\langle 1, 3, 9, 18 \rangle$	$\langle 1, 2, 3, 6, 9, 18 \rangle$	3

Note that the definition of consonance does not specify how many pulse-levels are perceived, but only that the specified pulse-levels are consonant with each other. For example, the consonance of P-set $\langle 1, 18 \rangle$ neglects to acknowledge the absence of potential intervening pulse-levels, which are normally inferred by a listener without much prompting. This absence often reflects a listener's inability to arbitrate the competing demands of two or more

¹²Yeston, 78ff.

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intervening dissonant pulse-levels, a contingency that Definition 5 fails to reflect.¹³ Definition 6 aims to close this loophole.¹⁴

Definition 6. An interpretation of length L is **fully consonant** if, for all $\langle p_n, p_{n+1} \rangle \in P(XY)$, $\frac{P_{n+1}}{P_n}$ is a prime integer.

Of the consonant interpretations of $L = 18$ in Table 1, only the last three are fully consonant.

Because full consonance is the norm in classical music, the crucial question for the analysis of meter is: Given a time-span of length L , how many fully consonant interpretations are available? This is addressed by factorizing L into a *multiset*, which, unlike an ordinary set, can have multiple identical elements.¹⁵ For example, a multiset Q could consist of the elements $\{a, a, b, a, b, c, b, c, a\}$. A multiset can be represented as a set of ordered tuples, $\{(x_1, m_1), (x_2, m_2), \dots, (x_n, m_n)\}$, where x_i is a distinct (unduplicated) element of the multiset, and m_i is a positive integer counting the occurrences of x_i in the multiset. In this mode, Q would be represented as $\{(a, 4), (b, 3), (c, 2)\}$. The set $\{x_1, x_2, \dots, x_n\}$ of distinct elements is the *underlying set* of the multiset. The underlying set of Q is $\{a, b, c\}$. The ordered set $\{m_1, m_2, \dots, m_n\}$ is the *multiplicity set* of the multiset. The multiplicity set of Q is $\{4, 3, 2\}$. A multiset $\{(x_1, m_1), (x_2, m_2), \dots, (x_n, m_n)\}$ may also be represented in the form $\{x_1^{m_1}, x_2^{m_2}, \dots, x_n^{m_n}\}$, with the second

¹³Inference of missing levels is discussed in Carl Schachter, "Rhythm and Linear Analysis: Aspects of Meter," *Music Forum* 6/1 (1987): 13–16.

¹⁴The concept of *fully consonant interpretation*, as defined here, is equivalent to *sequence of multiples*, as presented in Arthur Komar, *A Theory of Suspensions* (Princeton: Princeton University Press, 1971; Austin TX: Peer Publications, 1979), 51–57. It is also equivalent to *interpretation* as used in Cohn, "Dramatization," 194 and *passim*.

¹⁵I am indebted to Robert Morelli, of the University of Chicago Department of Mathematics, for this term, and for help with formulating Theorem 2.

member of the ordered tuple appearing as an exponent. Since this mode of representation is especially intuitive when a multiset represents the factorization of an integer, it is adopted here. The underlying set consists exclusively of integers, which will be canonically ordered from lowest to highest.

Definition 7. $F(L)$, the factorization of L , is a multiset $\{x_1^{m_1}, x_2^{m_2}, \dots, x_n^{m_n}\}$, where x_i are prime positive integers, such that $1 < x_i < L$, and $\{x_1^{m_1} \cdot x_2^{m_2} \cdot \dots \cdot x_n^{m_n}\} = L$.

Theorem 2. The number of fully consonant interpretations of a length L is given by
$$\frac{(m_1 + m_2 + \dots + m_n)!}{m_1! m_2! \dots m_n!}$$

The multiset $F(L)$ also yields the number of pulse-levels for a fully consonant interpretation of L :

Theorem 3. If time-span XY of length L is fully consonant, then there are $m_1 + m_2 + \dots + m_n$ pulse-levels in XY .

Table 2 gives some illustrations of theorems 2 and 3, using common metric situations.

“Dramatization” introduced the opposition *pure/mixed* to classify time-spans (“complexes” in that context) according to whether they bore singular or multiple fully consonant interpretations.¹⁶ Theorem 2 allows this binary distinction to rest on firmer formal ground. The theorem shows that a pure span arises when the cardinality of the set underlying multiset $F(L)$ is 1, and a mixed span arises when the cardinality of the underlying set exceeds 1. The pure span arises, then, only when L is the power of a prime integer. Since $\{2\}$ and $\{3\}$ are the sole metric generators in practically all cases, the relevant underlying sets are $\{2\}$, pure

¹⁶Cohn, “Dramatization,” 194. My formulation of “pure duple/triple” was influenced, I suspect, by Ernő Lendvai’s “absolute even/odd meters.” See *The Workshop of Bartók and Kodály* (Budapest: Editio Musica, 1983), 333.

Table 2.

Length (L)	Factorization (F(L))	# of pulse levels	# of fully consonant interpretations
4	$\{2^2\}$	2	$2! / 2! = 1$
64	$\{2^6\}$	6	$6! / 6! = 1$
243	$\{3^3\}$	5	$5! / 5! = 1$
6	$\{2^1, 3^1\}$	2	$2! / 1!1! = 2$
12	$\{2^2, 3^1\}$	3	$3! / 2!1! = 3$
18	$\{2^1, 3^2\}$	3	$3! / 2!1! = 3$
36	$\{2^2, 3^2\}$	4	$4! / 2!2! = 6$

duple, and {3}, pure triple (e.g., the first three cases in Table 2).¹⁷ A mixed span arises if L is a multiple of two or more distinct primes (e.g., the last four cases in Table 2).

Informally, we can understand the situation as follows: if L is a power of prime integer n , then, in a fully consonant interpretation of L , all adjacent pulse levels reflect the ratio $n:1$. Consequently, all fully consonant interpretations of L are identical. If, however, L is a multiple of two or more distinct primes, then there is some flexibility in the assignment of prime ratios to adjacent pulse-levels. The degree of flexibility varies according to the number of primes and the number of the occurrences of each prime. What is crucial, however, is that in a mixed span there is always more than one way to assign ratios to pulse-levels, and thus the potential metric interpretations for a span of mixed length are plural. Consequently, mixed meters have a potential for instability that is denied to pure meters, which admit but a single metric interpretation.¹⁸

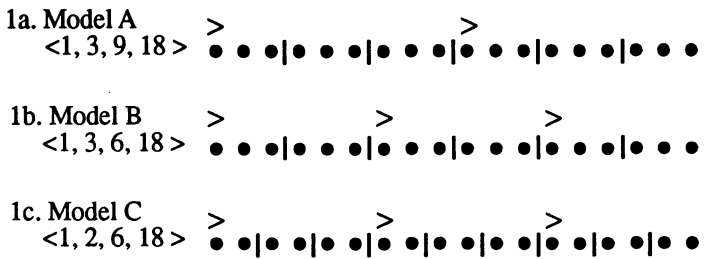
The smallest mixed length, $L = 6$, illustrates this instability in a familiar situation. The two fully consonant interpretations of $L = 6$ are $\langle 1,2,6 \rangle$ and $\langle 1,3,6 \rangle$. Alternation between these P-sets induces an indirect hemiola. The simultaneous activation of both fully consonant interpretations creates a composite P-set, $\langle 1,2,3,6 \rangle$, which embodies a direct 2:3 dissonance, a direct hemiola.

A more complex case is presented by $L = 18$, which emerges as normative in the Mozart Minuet. A fully consonant realization of 18 has three levels, and there are three fully consonant interpretations (see Table 2). In each of these interpretations (presented schematically in Example 1), two levels bear triple meter, while the third bears duple meter. The three interpretations differ according to the location of the duple relation between adjacent pulse-levels. A duple relation at the highest level produces Model A, P-set $\langle 1,3,9,18 \rangle$. A duple relation at the middle level produces Model B, P-set $\langle 1,3,6,18 \rangle$. A duple relation at the lowest level produces Model C, P-set $\langle 1,2,6,18 \rangle$.

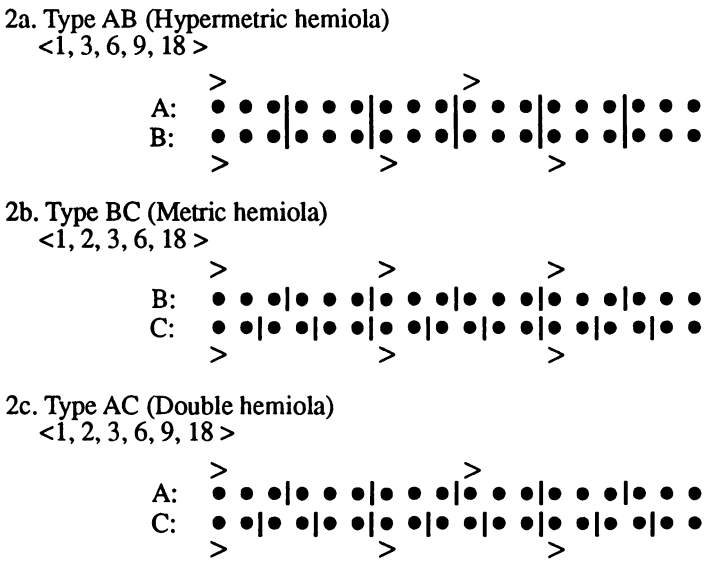
¹⁷Larger primes may also serve as a basis for pure meters, but in practice they are rare, and are not relevant to the analytic work presented here.

¹⁸Of course, pure spans may still be subdivided asymmetrically as the sum of unequal spans, for example $9 = 2+2+2+3$.

Example 1. Metric interpretations of 18 pulses.



Example 2. Hemiolas resulting from pairs of Models.



Example 2 explores some dissonant interpretations of $L = 18$, specifically those that result from the pair-wise union of models A through C. Model AB has a P-set of $\langle 1, 3, 6, 9, 18 \rangle$. Model BC has a P-set of $\langle 1, 2, 3, 6, 18 \rangle$. Model AC has a P-set of $\langle 1, 2, 3, 6, 9, 18 \rangle$. As shown in Table 1, Model AC has a higher degree of dissonance than the other models in Example 2.

Definition 8. The degree of dissonance of a P-set counts the number of pulse-pairs in the P-set that have a non-integer ratio.

Models AB and BC have a single degree of dissonance: 6:9 and 2:3, respectively. The dissonance structures of these models are equivalent, as both embody 2:3 ratios. Model AC possesses three degrees of dissonance: 2:3, 6:9, and 2:9. Because Model AC represents all possible P-values for $L = 18$, its P-set is identical to the P-set for the union of all three models, ABC, and Model AC thus represents the maximum degree of metric dissonance for $L = 18$.¹⁹

In traditional music-theoretic terms, Models AB and BC are both hemiolas, which differ only in the time-spans they occupy. Model AB represents a single hemiola whose duration is the entire time-span. Model BC concatenates three hemiolas, each of whose duration is one-third of the time-span. Model AC represents a special case, since it embeds a 2:3 relation at two levels simultaneously. I know of no standard term for this phenomenon. *Double hemiola* seems logical, and is hereby inscribed into the music-theoretic lexicon.

The conceptual framework is now sufficient to proceed with the analysis at hand. This exposition invites further development,

¹⁹ $L = 18$ is similar to $L = 12$ (discussed in Cohn, "Dramatization," 195), in the sense that the two lengths have equivalent multiplicity sets. The equivalent fully consonant P-sets for $L = 12$ are Model A: $\langle 1, 3, 6, 12 \rangle$; Model B: $\langle 1, 2, 6, 12 \rangle$; and Model C: $\langle 1, 2, 4, 12 \rangle$. In a study of $L = 12$ in a Brahms Capriccio, Lewin considers Model B to be tonically situated between Models A and C. Like dominant and subdominant, Models A and C do not communicate directly, except through the mediation of Model B. This metaphor captures, through a different medium, the relatively high degree of dissonance between Models A and C. See David Lewin, "On Harmony and Meter in Brahms's Opus 76 No. 8," *19th-Century Music* 4 (1981), 251.

toward a general theory of meter and metric dissonance, but such developments are not motivated by the analytic demands of the Mozart Minuet.

III

The opening two measures of the Menuetto pose a problem. Are its six beats, a mixed length, heard as three groups of two ($\langle 1,2,6 \rangle$), as the leading melodic line suggests? Or are they heard as two groups of three ($\langle 1,3,6 \rangle$), commensurate with rhythmic patterns in the lower voices? Clearly there are two pulse-levels, one assigned duple meter, the other, triple. But how are these assignments made? The addition of the third measure clarifies, by extending the mixed span of six beats to a pure span of nine beats. We now learn that triple meter holds at both metric and hypermetric levels. Indeed, the lower voices interpret this 9-beat span in a fully consonant way, $\langle 1,3,9 \rangle$, with the 3-pulse articulated by new harmonies at each notated downbeat. The leading melodic line divides this span asymmetrically, as $2 + 2 + 2 + 3$. Taken together, the two rhythmic strands are dissonant for six beats before achieving consonance for the final three beats. This situation is modelled in Example 3.

Measures 4–6 reproduce the rhythmic configuration of their antecedent, doubling the length of the span. This time 18 is given a fully consonant interpretation by the bass and inner voices, as $\langle 1,3,9,18 \rangle$, Model A from Example 1. But the status of 18 as a *stable* span is in question. It implies a duple organization at the second level of hypermeter ($18 = 9 \times 2$), but we may recall that our duple oriented hypotheses have to this point later been revised with the addition of a third unit of equal size, which transforms mixed meters into pure ones. The segment beginning at measure 7, which begins in rhythmic parallel with the preceding segments, constitutes exactly such a threat. Yet here the threat is decisively deterred. The opening six-beat metrically dissonant figure is detached from its third, metrically consonant measure, which is discarded. The latent six-beat unit of measures 1–2 now emerges as a norm. The six-beat unit of measures 7–8 is thrice replicated, the final replication reaching a cadence at measure 14. The segment beginning at measure 7 is revealed not as the “purifier” of the previous 18-beat mixed span, but as the initiator of a new segment with its own mode of metric organization. Consequently the initial 18-beat segment is retrospectively stabilized. The two-measure

Example 3. Mozart, K.550, Minuet: mm.1-6.

Musical score for Example 3, showing measures 1 through 6 of Mozart's Minuet in G major, K.550. The score is written in 3/4 time. The notation includes treble and bass staves. Measures 1-6 are grouped by brackets with numbers 1-6 above them. A thick vertical line separates measures 3 and 4.

Example 4. Normalization of mm.1-6.

Musical score for Example 4, showing the normalization of measures 1 through 6 of Mozart's Minuet in G major, K.550. The score is written in 3/4 time. The notation includes treble and bass staves. Measures 1-6 are grouped by brackets with numbers 1-6 above them. Arrows labeled "displaced" point to specific notes in measures 1, 2, 3, and 4.

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norm that emerges at measure 7, by disrupting the triple hypermeter, deflects the threat of a triple pulse at a yet higher level, just as the three-beat norm that emerges at measure 3 deflects the threat of the duple norm spreading upward.

2 ³ beats?	No, (2 x 3) + 3 beats.
3 ² measures?	No, (3 x 2) + 2 measures.

The shift from triple to duple hypermeter at m. 7 marks the beginning of a longer segment that eventually leads to a cadence at m. 14. Beginning at m. 9, triple meter is stabilized at the tactus level for the first time in the composition. Only now do notated first beats consistently and unambiguously behave as downbeats. This stability provides a basis for stability at higher pulse levels. Duple hypermeter becomes locally normative, and is replicated at two higher levels, creating a segment of eight measures, the only unambiguously pure duple segment of the composition.

A number of norms established in this opening phrase emerge as thematic elements in the Minuet as a whole:

1. The conflict between duple and triple meter, which is realized as a direct low-level dissonance at the opening of each segment, and as an indirect higher-level dissonance between the hypermetric norms of the phrase's two halves;
2. The tendency for these conflicts, across spans of mixed length (6 beats, 6 measures), to resolve through accretion of extra units, producing a span of pure length (9 beats, 8 measures).
3. Most specifically, the tendency (in the opening half of the phrase only) of metrically unstable spans (6 beats of metric dissonance) to be resolved by a metrically stable span of half its length (3 beats of consonance), creating a 2:1 proportion of dissonance : resolution.
4. Most generally, the binding of different levels in the metric hierarchy through replications in rhythmic patterning.

The last point requires some elaboration. The primary agent that contributes to the binding of levels is the descending-third

figure that emerges as motivic in the opening measures and is durationally contracted as the phrase proceeds. In a Schenkerian reading, the three tones of the descending thirds in the antecedent phrase, along with their supporting harmonies, are conceptually distributed evenly across the three measures such that each occupies three beats.²⁰ The prefixing of a fourth tone, which arpeggiates up to the initial tone of the $\hat{3}$ -line, evicts the primary tones from their downbeat, forcing them to migrate to new domiciles in conformance with the "principle of durational equalization."²¹ This process is illustrated by Example 4, which shows how the opening measures derive from their normalized contrapuntal model.

These melodic descending thirds reappear in the cadential segment at measure 9, with their durations compressed from nine beats to three. Example 5 illustrates this process of compression. The relationship is slightly complicated by the unequal distribution of the three constituents of these passing motions. This new distribution results from the chaining of third-spans, with the terminus of each passing figure serving as the initiator of the next figure. As a consequence of this chaining, each three-beat measure brings two rather than three new events in the melody. These events are distributed unevenly, as quarter + half, or half + quarter. In one sense, this uneven distribution weakens the sense of binding with the opening, where the same components were evenly distributed. In another sense, however, the sense of level-binding is reinforced: the 2:1 dissonance:consonance norm, previously distributed across nine beats, is transformed to a 2:1 surface-

²⁰Heinrich Schenker, *Das Meisterwerk in der Musik*, ii (München: Drei Masken, 1926), 146. Translated in Sylvan Kalib, *Thirteen Essays From the Three Yearbooks 'Das Meisterwerk in der Musik' by Heinrich Schenker: An Annotated Translation* (Ph. D. diss., Northwestern University, 1973), ii, 406.

²¹See Rothstein, "Rhythmic Displacement," 91–92. The distribution of the four tones across the nine beats is not precisely equalized, but it does conform to the principal of maximal evenness, as discussed in John Clough and Jack Douthett, "Maximally Even Sets," *Journal of Music Theory* 35/1–2 (1991):93–173. The application of the Clough/Douthett model to rhythm and meter merits strong pursuit.

Example 5. Descending thirds, mm. 1–26.

(Compression with chaining)

Measures 1–13. The score shows a descending line of thirds. Brackets above the staff indicate 'Compression with chaining' for measures 1–4 (2+1), 5–7 (1+2), and 8–11 (2+1). Measure numbers 1, 4, 7, 9, 11, and 13 are circled.

(Expansion with chaining) (Compression with chaining)

Measures 14–26. The score continues the descending line of thirds. Brackets above the staff indicate '(Expansion with chaining)' for measures 14–18 (2+1), 19–21 (2+1), and 22–24 (1+2). Brackets below the staff indicate 'Compression' for measures 25–26 (2+1). Measure numbers 15, 18, 21, 24, and 26 are circled.

durational norm across three beats—further evidence of inter-level compression.²²

Before proceeding to the material that follows the double bar, let us pause to notice yet one more norm that is established in the opening phrase: its cadence occurs in a hypermetrically understated position, the eighth downbeat of an eight-measure segment, and thus the weak downbeat of a weak hypermeasure.²³ As we approach the structural cadence at measure 36, the significance of this feature will become apparent.

The process of compression that occurs in measures 7–14 is reversed in the segment that opens the Minuet's second phrase. The entire phrase (which leads to the dominant at m. 27) is modelled in many respects after the opening phrase, although the modelling becomes weaker as the phrase progresses. The initial segment consists of a pair of triple hypermeasures whose attack-point disposition is identical to that of the opening measures. New pitch-events, however, cause the structural rhythm to be altered. Whereas the descending thirds that opened the composition were non-overlapping, those that begin the second phrase are chained in the same manner as at the end of the first phrase. (The shifting of the point of initiation of the thirds with respect to the boundaries of the three-measure groups weakens but does not entirely efface this connection.) Each link in the chain is expanded threefold to occupy nine beats instead of the previous three. The division of 2 + 1 at the beat level in mm. 8–12 is also replicated, at the measure level, in mm. 15–20 (See Example 5). These features contribute further to the binding of meter to hypermeter.

In some respects, the concluding segment of the second phrase, beginning at m. 21, is closely modelled on the cadential segment of the opening phrase. As before, the descending thirds of the immediately preceding measures are accelerated, in a 2:1 surface rhythm, and there is also a strong affinity of surface figuration. There are, however, some significant differences as well. Whereas

²²Level c) of Schenker's graph in *Meisterwerk* ii (marked "Anhang IX zu Seite 145") emphasizes the connections between these descending thirds.

²³Any lingering doubt about the hypermetric status of this point of cadence is effaced at the repetition of the first phrase, with its hypermetrically strong first downbeat.

the basic length of measures 7–14 was eight measures, with a pure duple distribution, the segment beginning at measure 21 has a basic length of six measures, which is expanded to a literal length of seven when the sixth measure is repeated in a different register.²⁴

What is the metric structure of this new six-measure, eighteen-beat segment? Mozart has taught us, in the opening phrase, to expect a shift to duple hypermeter after a pair of triple hypermeasures, and the continued affinities between these two phrases encourage a reading of measures 21–26 according to Model B, $\langle 1, 3, 6, 18 \rangle$, where 6 indicates a duple hypermeter at the first level. Such a reading is given in Example 6a. But Mozart has also taught us, in the opening two measures, that spans of six units have a mischievous potential to host metric ambiguity, in ways that are denied to pure spans, such as the parallel segment that closes the first phrase. And the agent of mischief here is the bass, where the crucial arrival of C \sharp occurs on the downbeat of measure 24, the fourth downbeat of the segment. This suggests that this 18-beat span be heard according to Model A, $\langle 1, 3, 9, 18 \rangle$, where 9 indicates a triple hypermeter at the first level. (See Example 6b.) This suggestion is consistent with the prolongational rhythm of the immediately preceding segment. The 12-measure phrase beginning at measure 15 prolongs B \flat , g, and E \flat for three measures each, leading to an accented arrival at c, at which point the prolongational rhythm accelerates as the transpositional pattern through diatonic space is broken and the end of the phrase approaches. This circumstance might well cause the entire phrase to be heard in triple hypermeter, in effect overriding our inclination to hear these measures as we heard the analogous measures of the first phrase.

Both duple and triple hearings are plausible. To the extent that we are able to balance them simultaneously in our awareness, the six-measure span embodies a hemiola, a direct metric dissonance that reflects and expands the hemiolas that so dominate the six-beat spans of this composition. It is not clear, however, to what extent it is psychologically viable to balance both of these hearings simultaneously. It may simply be a rabbit/duck proposition: that the two hearings are plausible, perhaps even equally plausible, does not

²⁴Schenker (*Meisterwerk* ii, 147) attributes this expansion to the demands of registral coupling. See Kalib, ii, 407. “Basic length” is discussed in William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer, 1989), 106.

Example 6. Two readings of hypermeter in mm.21–28.

a. Duple hypermeter

Example 6a shows a musical score for piano in 9/8 time, measures 21 through 28. The score is written for both hands. The right hand starts with a half note G4 (circled 21), followed by a dotted half note Bb4 (circled 23), and then a series of eighth and quarter notes. The left hand starts with a half note G3 (circled 21), followed by a dotted half note Bb3 (circled 23), and then a series of eighth and quarter notes. The measures are grouped into four measures of two measures each, indicating a duple hypermeter reading.

b. Triple hypermeter

Example 6b shows the same musical score for piano in 9/8 time, measures 21 through 28. The right hand starts with a half note G4 (circled 21), followed by a dotted half note Bb4 (circled 24), and then a series of eighth and quarter notes. The left hand starts with a half note G3 (circled 21), followed by a dotted half note Bb3 (circled 24), and then a series of eighth and quarter notes. The measures are grouped into three measures of three measures each, indicating a triple hypermeter reading.

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entail that they can maintain a dual command on a single moment of awareness. And if they cannot maintain such a dual command, then it is not clear that the metaphor of “dissonance” is appropriate in this case. This would be akin to classifying a pivot chord as dissonant on the basis of its simultaneous referability to two different tonal centers.

Nonetheless, it is fruitful to view these measures as metrically dissonant, because of what happens in the following phrase. Measure 28 marks the return to tonic and the beginning of a phrase that qualifies as a quasi-reprise, in spite of some remarkable alterations. The phrase, which is the longest continuous segment in the Minuet, cadences on the downbeat of its ninth measure. A canon between the two violins, each doubled by their own entourage of woodwinds, lasts for six measures, until the downbeat of m. 34, before proceeding to the cadence at the downbeat of m. 36. My expository strategy, for reasons that I hope will become apparent, will be to first study the canonic passage in isolation from the larger phrase in which it is ultimately enclosed.

In measures 28–33, the suggestions of both duple and triple hypermeter from the previous six-measure span are superimposed, creating a direct hypermetric hemiola. This superposition is not simply carried out by the union of two models of the previous segment, Models A and B. Instead, Model C is substituted for Model B, creating a double hemiola with Model A: the duple/triple hypermetric conflict is matched by a similar conflict at the lower level. There is no question of a rabbit/duck hearing here; the conflicts are whipped into a vivid froth.

To investigate the complex anatomy of this double hemiola, we need to examine each voice individually. The passage is modelled in Example 7. As at the opening of the movement, the bass follows Model A ($\langle 1,3,9,18 \rangle$). The 3-pulse is articulated by harmonic changes, while the 9-pulse results from the strict rotation of the harmonies among tonic, subdominant, and dominant functions, as indicated in Example 7.

The *dux* of the canon follows Model C ($\langle 1,2,6,18 \rangle$). The line begins with a version of the six-beat melodic head-motive, with its duple organized low-level pulse ($\langle 1,2,6 \rangle$). Having completed its six beats, the melody refuses to knuckle under to the notated triple meter, as it had in all previous instances. Instead, it concatenates similar six-beat segments, until the entire eighteen-beat span has elapsed. The 6-pulse dissonates with the 9-pulse of the bass, at the

Example 7. Measures 28–36.

The musical score consists of three staves. The top staff is in treble clef, the middle staff is in treble clef, and the bottom staff is in bass clef. The music is in 3/4 time and features a key signature of one flat (B-flat). The score is divided into measures 28 through 36. Measures 28 and 30 are marked with a circled '28' and a circled '30' respectively. Measures 32 and 34 are marked with a circled '32' and a circled '34' respectively. The piano part includes lyrics: 'T S D T' for measures 28-30, 'T S D' for measures 31-33, and 'T S D T' for measures 34-36. The piano part is marked with a circled '28' and a circled '34'. The piano part includes a circled '2' and a circled '3' in measures 28-30, and a circled '2' and a circled '3' in measures 31-33, and a circled '2' and a circled '3' in measures 34-36. The piano part includes a circled '2' and a circled '3' in measures 28-30, and a circled '2' and a circled '3' in measures 31-33, and a circled '2' and a circled '3' in measures 34-36. The piano part includes a circled '2' and a circled '3' in measures 28-30, and a circled '2' and a circled '3' in measures 31-33, and a circled '2' and a circled '3' in measures 34-36.

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same moment that, at the lower level, the 2-pulse of the melody dissonates with the 3-pulse of the bass, exactly as modelled by Example 2c.

The *comes*, which follows at the distance of one measure, is rhythmically equivalent to the *dux*, and thus also enters into double hemiola with the bass, although its spans are shifted relative to the underlying tonal structure. Paradoxically, the combination of the canonic voices alleviates the metric dissonance at the lower level. The three-beat interval separating them creates a composite upper-voice rhythm that restores the 3-pulse that each voice lacks individually. Each voice individually adheres to Model C ($\langle 1,2,6,18 \rangle$); taken together, they follow Model B ($\langle 1,3,6,18 \rangle$). Note that only the lower level 2:3 dissonance is alleviated by this circumstance; the hypermetric 6:9 dissonance remains unaffected.

Having explored the eighteen-beat span of metric dissonance, let us now view it in the context of the larger phrase in which it resides. Once the double hemiola concludes at the downbeat of measure 34, all rhythmic dissonances abruptly resolve. The bass exercises its authority over the upper voices, which cease their canon and fall directly into a state of metric consonance with each other and with the bass, a state that continues until the cadence at the downbeat of measure 36. About the internal structure of measures 34–36, there is little to say. But there is much to say about the single, unbroken gesture that combines the six measures of metric dissonance with the three measures of resolution.

The nine-measure phrase beginning at measure 28 constitutes an exact augmentation of the rhythmic structure of measures 1–3, and all similar three-measure segments that dominate the surface of the Minuet. This can be seen most clearly through comparing the pattern of measures in Example 7 with the pattern of beats in Example 3. The following redescription of mm. 28–36, which parallels the description of mm. 1–3 offered above (p. 14), illustrates the strength of this relationship:

The opening two hypermeasures of the quasi-reprise pose a problem. Are its six measures, a mixed length, heard as three groups of two ($\langle 1,2,6 \rangle$), as the leading melodic line suggests? Or are they heard as two groups of three ($\langle 1,3,6 \rangle$), as the bass implies? Clearly there are two hypermetric pulse-levels, one of which is assigned

duple hypermeter, the other one triple. But how are these assignments made? The addition of the third hypermeasure clarifies, by extending the mixed span of six measures to a pure span of nine measures. We now learn that triple meter holds at both levels of hypermeter. Indeed, the lower voices interpret this 9-measure span in a fully consonant way, $\langle 1,3,9 \rangle$, with the 3-pulse articulated by new harmonies at each notated downbeat. The leading melodic line divides this span asymmetrically, as $2 + 2 + 2 + 3$. Compositely, the two rhythmic strands are dissonant for six measures before achieving consonance for the final three measures.

Gazing back across the terrain traversed so far, a coherent narrative emerges. The Minuet poses a problem, the duple/triple conflict, which is solved in favor of triple meter at the tactus level, but is left unsolved at the level of hypermeter. At first, the hypermetric conflict is posed indirectly, but as the movement progresses, it becomes increasingly palpable. Through a binding of levels, an expectation arises that this emerging hypermetric conflict will also be resolved in favor of triple. The conflict reaches peak intensity just after the Golden Section, where triple hypermeter is strongly challenged by the behavior of the upper voices. This challenge is replicated at the level of the tactus, threatening the stability of the previously secure triple meter, as if the unravelling of triple meter were migrating down the metric hierarchy. At the denouement, triple meter is re-stabilized, one level of triple hypermeter emerges ascendant, and yet one more level of hypermeter begins to take on a triple aspect. In short, triple meter emerges triumphant.

Up to this point, the narrative has pursued a classic teleological paradigm, which indeed resembles, in many ways, the account of the Scherzo from Beethoven's Ninth Symphony. In both movements, a conflict between duple and triple meter is played out through metric dissonance structures imposed on mixed meters. In both movements, metric states migrate through adjacent levels of the hierarchy, resulting eventually in pure metric spans which resolve dissonances at all levels. And in both movements, metric closure is coordinated with tonal closure. These similarities raise questions concerning the status of the metric dissonance metaphor. Resolution of pitch dissonance is not merely an optional feature, as,

for example, a tight motivic network is considered to be. It is held to be a functional imperative, both at the level of local, direct dissonance—resolutions of sevenths or suspensions—and at the level of global, indirect dissonance—as in the resolution of the Urlinie, or the “rule” that off-tonic expository material must be reprised in the tonic. Are there similar inter-opus stylistic constraints that also govern the treatment of metric dissonance in classical music?

These conjectures are enticing, but the minuet isn’t over yet. Six more measures are yet to be danced. The metric analysis of measures 37–42 appears unproblematic enough that Schenker wrote simply that they constitute a “six-measure phrase, 2 x 3, through which the conclusion of the piece is rounded off in a manner corresponding to the beginning.”²⁵ Indeed, the melody is a direct repetition of the opening six measures, with an alteration in pitch but not rhythm at the final cadence. It is not clear how to interpret this event in terms of the narrative I proposed. Does it signify a retreat from the purity of the previous phrase into the flexible mixed meter of the opening? Or a reminiscence of a freer, more idyllic time, enunciated by the flute, icon of dreams?²⁶

Fortunately, these questions can be avoided by noticing that they are based on a purely musical reading that is insufficient. If, as Schenker suggests, we let the parallelism between these measures and the opening six measures be our guide, then it follows that the minuet closes in a weak metric position: the third beat of a weak hypermeasure. Why then does the Minuet feel metrically as well as tonally closed? This impression does not derive from the flute alone, which presents no new rhythmic features. It must be prompted by the bassoon, which comes spilling chromatically out of the point of cadence at m. 36 (see Example 8a). Consider especially the motion into the downbeat of m. 37. The motion from D to G in the flute at that point has the same anacrusic function it has had from the beginning; but one cannot say the same about the bassoon’s move from F♯ to F, which is embedded in a continuous chromatic descent from $\hat{1}$ to $\hat{5}$. Far from being a point of metric stability, the F bisects the territory between two more stable

²⁵Schenker, *Meisterwerk* ii, 147; Kalib ii, 407.

²⁶Not only in Mendelssohn. See the end of the bass aria just preceding the final chorus of Haydn’s *The Seasons*.

Example 8a. Measures 36–42.

Musical score for Example 8a, Measures 36–42. The score is written for piano (p) and features a treble and bass staff. Measures 36–42 are shown. A bracket above measures 36–38 is labeled '3', indicating a triplet. A bracket below measures 36–38 is labeled '2', indicating a pair. A bracket above measures 39–41 is labeled '3', indicating a triplet. A bracket below measures 39–41 is labeled '2', indicating a pair. The notes are: 36 (F4, C4), 37 (F4, C4), 38 (F4, C4), 39 (F4, C4), 40 (F4, C4), 41 (F4, C4), 42 (F4, C4).

Example 8b. Measures 28–42.

Musical score for Example 8b, Measures 28–42. The score is written for piano (p) and features a treble and bass staff. Measures 28–42 are shown. A bracket above measures 28–30 is labeled '3', indicating a triplet. A bracket below measures 28–30 is labeled '2', indicating a pair. A bracket above measures 31–33 is labeled '3', indicating a triplet. A bracket below measures 31–33 is labeled '2', indicating a pair. The notes are: 28 (F4, C4), 29 (F4, C4), 30 (F4, C4), 31 (F4, C4), 32 (F4, C4), 33 (F4, C4), 34 (F4, C4), 35 (F4, C4), 36 (F4, C4), 37 (F4, C4), 38 (F4, C4), 39 (F4, C4), 40 (F4, C4), 41 (F4, C4), 42 (F4, C4).

downbeats. Can it be that the bassoon's hypermeter is duple in this passage? Several features confirm this hypothesis. The downward journey through chromatic space was heard only once before in the movement: from the hypermetrically strong downbeat of measure 11 to the hypermetrically strong downbeat of measure 13, in the midst of the only passage of unambiguously duple hypermeter in the entire minuet. Identification of these moments suggests hypermetric weight be placed on the downbeat of m. 38. Neighbors in bassoon and first oboe lead to a cadential $\frac{6}{4}$ at the downbeat of m. 40, whose hypermetric strength is confirmed by the re-entry of the strings at this point. It is these duple markers that create the expectation of a strong measure at 42, an expectation fulfilled by the appearance of the final tonic.

This reading is outlined in Example 8a. Note that, under this interpretation, there are actually two different types of metric dissonances in this passage. There is the hemiola-type dissonance (Krebs's Type-A), the familiar conflicting divisions of spans of 18 beats. But there is also a syncope-type dissonance (Krebs's Type-B), which was first introduced to the Minuet in the canonic upper lines of mm. 28–33. The voices disagree as to the boundaries of the six-measure span, with the flute and oboe beginning one measure after the bassoon. It seems, then, that far from securing, or even maintaining, the metric stability earned just before the cadence at 36, the final measures actually subvert that stability.

The impact of this instability is more serious still. Once the duple reading of the bassoon is established, it reverberates backward, calling into question our understanding of the earlier measures which are apparently so secure in their pure triple. If measure 36 is a hypermetric downbeat, then is it really the ninth measure of a pure triple span? Could it, instead, act as the downbeat that follows, but does not participate in, a complete eight-measure unit, a pure duple span? The implications are subversive indeed: by mere elimination of the final measure of a nine-measure span, its alleged pure triple quality is unmasked as a "duple agent." The analysis of measures 28–36 offered in Example 7 threatens to unravel, thread by thread.

At the root of this subversion is the dual status of the cadence at measure 36. The metric status of cadences is one of the thorniest and most vexed questions that music theorists have labored to sort

out in recent years.²⁷ It is clear that cadences are capable of drawing metric weight simply by virtue of their cadential status. But it is equally clear that cadences are not inherently strong, and sometimes remain hypermetrically weak. The criteria for assignment of metric weight to a cadence are frequently in conflict, and criteria for arbitrating such conflicts are quite fuzzy.

The approach to m. 36 contains features that both bestow and withhold metric weight on the point of cadence. The strongest feature that bestows weight is the harmonic rhythm of the bass. As Example 7 shows, the rotation of harmonic functions causes tonic to be marked as a bearer of hypermetric weight at mm. 31 and 34. The acceleration in rotational rate, which brings the tonic arrival one measure early, puts pressure on a listener to mark m. 36 as strong, even though it disrupts the ongoing bass hypermeter. A listener who succumbs to this pressure will hear duple hypermeter in the bass, beginning at measure 34 and continuing to the final cadence. Such a listener might, indeed, be motivated to trace duple hypermeter all the way back to the downbeat of measure 21. Ignoring the anarchistic "extra measure" 27 (which even-handedly interferes with any and all efforts to impose total hypermetric order), he/she follows duple hypermeter through the bass up to the reprise at m. 28, transfers attention to the violins as the leading hypermetric voices, and then returns to the bass at m. 34.

At the same time, there is a strong motivation for hearing the point of cadence at m. 36 as hypermetrically weak in relation to the phrase for which it is a cadence: the approach substantively parallels the approach to measure 14, the only prior authentic cadence in the minuet, which unambiguously falls on the weak eighth measure of a pure duple span. A listener attuned to this correspondence will hear m. 36 as weak, at least initially, and hear in this weakness a confirmation of a triple hypermeter that was initiated in the bass at the downbeat of measure 28. Such a listener might trace the triple hypermeter back to measure 15, where the second "half" of the Minuet begins (again ignoring the interference at measure 27). When the bassoon line tumbles out of the point of cadence, this listener may retrospectively reinterpret the point of cadence as hypermetrically strong, or may instead choose to

²⁷The positions on this issue are lucidly summarized in Jonathan Kramer, *The Time of Music* (New York: Schirmer, 1988), 84–98.

continue the triple hypermeter, as it is appropriated by the flute, into the final cadence.

Both of the hypothetical listeners just described will find reason to bring the Menuetto home to a hypermetric “tonic state”—what Krebs might term a primary hypermetric consonance—but will have opposite views on which state is established as figure, and which as ground, at the opening of the piece. The duple listener might find the origins of this state in the latent duple hypermeter of the opening two measures, before their “purification” through the accretion of measure 3, and might consider the shift to duple hypermeter at the end of the first phrase to be a harbinger of its ultimate emergence at the end of the Menuetto, and throughout the Trio as well. Such a listener might even carry duple hypermeter as a stylistic norm, perhaps even a Platonic one, and will thus hear the triple hypermeter a mm. 1–6 and 15–20 as dissonant states that are rectified by the shift to duple hypermeter at measure 7, and again (though more problematically) at measure 21.²⁸ The totalizing triple listener will consider the triple hypermeter of the opening as establishing a contextual norm, and the duple hypermeasures beginning in measure 7 as introducing a state of disequilibrium that requires rectification (analogous, perhaps, to the D-minor tonic that is the tonal target of this segment). This triple totalizer will hear that rectification emerge and stabilize as the piece moves toward its structural cadence at m. 36.

Both listeners, however, will need to contend with the presence of elements that dissonate with the primary hypermetric consonance, right up to the end of the movement. Furthermore, the listeners will discover in each other a threat to the security of their interpretive conceits. It is difficult to imagine a dialogue between these two listeners that might be arbitrated and decided on rational grounds. There is no analogue for ultimate metric ambiguity in Mozart’s tonal universe: the normative Classical-era composition presents its background triad from the outset and establishes it unambiguously at the close. It is not until the 1820s that closing tonics indirectly dissonate with opening tonics, or closing harmonies embody direct dissonances that call into question the identity of the

²⁸The normative status of duple hypermeter is discussed in Rothstein, *Phrase Rhythm*, 33–40.

closing tonic itself.²⁹ Although primary hypermetric consonance may be a useful construction in the context of individual compositions, the Menuetto under consideration here suggests that it does not serve as a global constraint on compositions in the Classical style.³⁰

We might at this point posit a third listener, a truly contextual one (in Babbitt's sense), for whom the norm in this piece is neither duple nor triple hypermeter, but rather the tension between the two of them. For this listener, the metrically and hypermetrically dissonant final measures are not an afterthought, but rather play the essential role of bringing the piece to its true state of equilibrium through disequilibrium, following the alleged purification of triple meter at 34–36—and by extension, of mm. 28–36—which is unmasked as a *fata morgana*. On this reading, the six measures of duple/triple conflict beginning at m. 28 are not resolved by the cadence at m. 36. Rather, they are perpetuated by an exchange of metric function that occurs at the downbeat of m. 34, the point where the upper voices adopt the triple meter and hypermeter of the bass, and also where the bass appropriates the six-beat spans that had been the province of the melody (Example 8b). The hypermetric exchange of parts is of thematic significance: not only does it assure the continuation of the metric dissonance structure up to the final cadence, but it echoes an earlier exchange of metric roles at measure 15, where the secure triple meter of 'cello/bass is shifted into the violins and the implied duple is shifted from violins to 'cello/bass.³¹

²⁹Discussions of these two types of compositions, and the problems they pose to the analyst, are found respectively in Harald Krebs, "Tonal and Formal Dualism in Chopin's Scherzo, Op. 31," *Music Theory Spectrum* 13 (1990):48–60, and Robert P. Morgan, "Dissonant Prolongations: Theoretical and Compositional Precedents," *Journal of Music Theory* 20 (1976):49–91.

³⁰Nor, for that matter, is it clear that the primary metric consonance at the level of the tactus always dominates at the end of the movement. Consider, for example, the Scherzo of Beethoven's String Quartet op. 135, which ends in a state of indirect hemiola with virtually the entire movement that precedes it.

³¹A consideration of the shifting roles of bass and soprano as carriers of conflicting modes of stability might well implicate questions of gender, leading

Mozart's tonal universe also lacks an analogue for this third listener, who revels in the inarbitrariness of the first two listeners and instead finds a primary path through the movement by focusing on the metric dissonance structure itself. It is not clear whether the third listener actually hears a type of "dissonant prolongation" in the metric realm, or whether his/her hearing is more associatively based.³² Along these same lines, however, it is not clear to what extent dissonant prolongation in the tonal realm, or consonant prolongation in the metric realm, is "really" prolongational. For that matter, the "actual existence" of Schenkerian prolongation—in its aboriginal application to consonances in the tonal realm—is not ontologically unproblematic.³³ What we should ask of prolongation, in each of its aspects, is no different than what we should ask of the consonance/dissonance duality and its transfer into the domain of meter: that it aid in the construction of models that help us to clarify our insights into compositions and to communicate them to each other. The mere existence of powerful points of metaphorical contact between pitch and metric structures need not lead us to await isomorphisms as some sort of "natural" state of affairs. Better not to pursue our metaphors beyond their limits: the effectiveness of the metric consonance/dissonance metaphor need not compel us to extrapolate a set of teleological imperatives of

to an enriched reading of the movement, which is, after and before all, a dance. That the bass controls the meter, just as it controls the harmony, and that the violins are victimized into a state of metric indecisiveness, disorder, and fickleness by the competing demands of, on the one hand, their desire to assert their own sense of metric order and, on the other hand, the pressure to conform to the purifying triple rigidity of the basses, is suggestive. (The identification of bass with master, cantus with servant has a venerable heritage. See Suzanne G. Cusick, "Gendering Modern Music: Thoughts on the Monteverdi-Artusi Controversy," *Journal of the American Musicological Society* 46/1 (1993), 10.) Equally suggestive from this viewpoint is the subversion of this hierarchy at the end of the piece.

³²The prolongation/association distinction is emphasized in Joseph Straus, "The Problem of Prolongation in Post-Tonal Music," *Journal of Music Theory* 31 (1987):1–22.

³³See Nicholas Cook, "Music Theory and 'Good Comparison': A Viennese Perspective," *Journal of Music Theory* 33/1 (1989):117–142.

global dissonance resolution, even when we know of cases, such as the Scherzo of Beethoven's Ninth Symphony, where these imperatives appear to be confirmed.