NOTES ON METRICAL THEORY

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TO ACCOMPANY CHAPTER 6 OF

Mozart's Music of Friends: Social Interplay in the Chamber Works

INTRODUCTION

This document provides an introduction to the theories of meter and phrase rhythm that are fundamental to Chapter 6 of *Mozart's Music of Friends*. The discussion is tailored specifically for readers of that chapter (especially those who are not music theorists or who have not studied the scholarly literature from which I draw). Those seeking a more complete, technically rigorous treatment should consult the selected bibliography below. Throughout the document, **boldface type** indicates terms that appear in the glossary below.

All of the ideas presented here are adapted wholesale from other authors' work, especially William Rothstein (from whose writings I have borrowed several examples), as well as Fred Lerdahl and Ray Jackendoff, Danuta Mirka, and Carl Schachter. I am grateful to these scholars for their important contributions to metrical theory. Having acknowledged my debt to their work, however, I will henceforth provide citations only sparingly.

Meter is not a merely intellectual concept; it is an aspect of music that listeners hear and feel deeply. To get the most from this chapter, readers are encouraged to listen to and conduct along with the examples in order to "feel the groove" more viscerally. Taking the time to do so, perhaps repeating each passage more than once, will make for a more musically engaging experience. I will begin with some comparatively straightforward examples to derive analytical concepts and methods that will be useful later on in more challenging contexts. I therefore beg the reader's forgiveness if I occasionally indulge in points that may seem obvious, since they are undertaken in service of establishing theoretical concepts needed for more challenging situations.

One final caveat: Throughout this document, I will sometimes speak of ways "we" tend to hear meter or assert that a particular metrical interpretation "fits the music" or feels "natural" or "correct." Such language is difficult to avoid in a text that introduces theoretical models of metrical listening habits, but I would not wish to present my metrical interpretations as immutable facts. This issue is especially acute for metrical organization at levels higher than the notated bars – that is, for hypermeter (defined below). At lower levels, the bar lines and note beams in a score usually provide objective testimony as to the metrical structure as the composer understood it. But since higher metrical levels are unnotated and tend to be irregular, the analytical enterprise becomes inherently more interpretive, making it difficult to "prove" a particular analysis of an ambiguous passage to be the "right" one. As Carl Schachter has memorably written:

> An irreducible residue of personal opinion remains in any metrical analysis of a piece which . . . lends itself to more than one plausible interpretation . . . Perhaps the government might one day appoint a Commissar of Metrics who will decide such matters for us. Before that day arrives, however, we shall have to live with these disagreements as best we can (Schachter 1998 [1980], 101).

I offer the metrical analyses both here and in *Mozart's Music of Friends* as invitations to hear musical excerpts in particular ways, not *prescriptions* of how they must be heard.

Meter and Measures

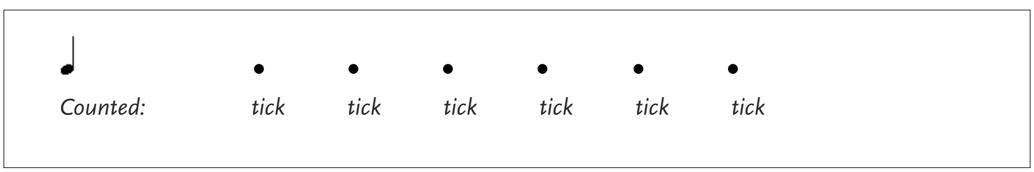
To begin with the familiar: What does it mean to say that a waltz is composed in $\frac{3}{4}$ meter? One simple answer would observe that each bar can be counted in quarter notes, of which the first is strong and the second and third are weak. This structure is reinforced visually by the bar lines in a waltz's score, but the phenomenon of meter does not truly depend on musical notation; unnotated music can exhibit the same kind of metrical organization, and listeners who do not read music can tap their feet, clap their hands, or dance in time with the meter of the music they hear. Such behaviors underscore the visceral way in which meter is experienced. The mental process of organizing the music into bars of three beats is intrinsic to the act of listening to (or dancing) a waltz. Such "counting" is generally a tacit experience we feel in our bodies rather than a product of conscious thought (dance teachers and conductors excepted, of course). Meter is not just something music *has* but also something listeners *do*.

The reference above to "strong" and "weak" beats warrants some clarification. A beat's strength or weakness does not refer to how loudly it is played (a *dynamic* or *performed* accent); it would be a blundering, tedious performance that relentlessly emphasized every downbeat. Rather, the beats heard as strong possess a certain quality of "downbeatness" called **metrical accent** that the other beats lack. That a waltzing couple takes the largest steps on each successive downbeat demonstrates that those beats are felt as somehow equivalent, sharing some property that distinguishes the "ooms" from the "pah pahs."

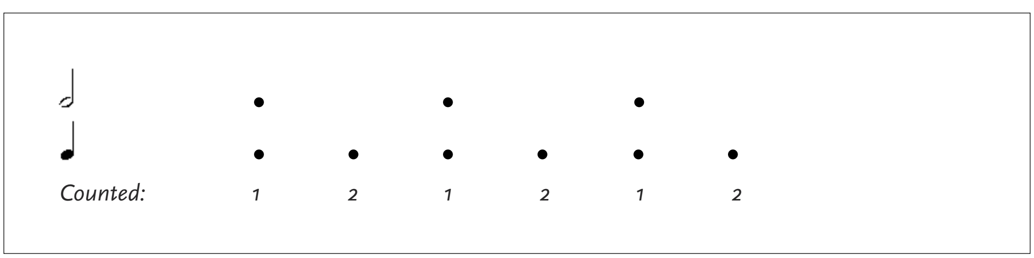
The role of metrical accents in defining meter can be represented schematically using dot diagrams, as in Fig. 1:

Fig. 1 Dot diagrams of metrical structures

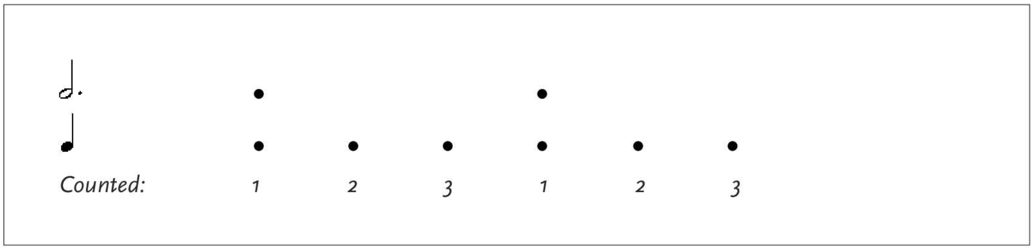
a. No meter (equal, undifferentiated quarter notes)



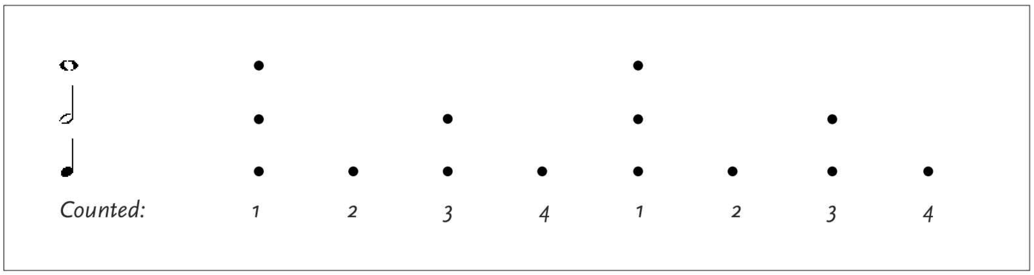
b. $\frac{2}{4}$ meter (metrical accent on every other quarter)



c. $\frac{3}{4}$ meter (metrical accent on every third quarter)



d. $\frac{4}{4}$ meter (metrical accent every other quarter; and, at higher level, metrical accent every other half)



In part A, the dots represent equal pulses, neutral units that measure time like the "tick, tick, tick" of an analog clock or metronome. Such an undifferentiated succession of pulses does not, in itself, constitute a meter. But parts B and C show how two **metrical levels** can combine hierarchically to represent a meter. In those diagrams, beats at the quarter-note level are established as metrically accented (strong) only if they are also beats at the next higher level. The regular patterning of strong and weak beats thus establishes the $\frac{2}{4}$ meter in part B or the $\frac{3}{4}$ meter in part C. In these dot diagrams, strong beats at a given metrical level are always separated by either one or two weak beats at the next lower level (as shown in parts B and C, respectively), and never by three or more weak beats.

A similar logic governs the diagram of $\frac{4}{4}$ meter shown in part D. It is common knowledge that the strongest beat of a $\frac{4}{4}$ bar is its downbeat, followed by the moderately strong third beat, with beats 2 and 4 sharing an equally weak status. Part D illustrates why this is the case: A comparison of its lower pair of levels demonstrates that beats 1 and 3 are stronger than 2 and 4, whereas a comparison of the upper pair establishes beat 1 as stronger than beat 3. The important takeaway is this: *Qualities of metrical accent or unaccent are only meaningful in reference to a specific metrical level*. The question "Is beat 3 metrically strong or weak?" cannot be answered as worded, since beat 3 is metrically weak at the half-note level but metrically strong at the quarter-note level. In other words, the phrase "metrically strong" (or "metrically accented") is actually shorthand for "metrically *stronger* than some other beat(s) that exist(s) at a given level." Likewise, beats 2 and 4 are, in turn, are not *inherently* weak since, although they are metrically weak at the quarter-note level, they are metrically strong at the eighth-note level (not shown in the diagram). Strength and weakness – for beats as for people – is inherently comparative.

Hypermeter

A couple dancing to Strauss's "Blue Danube" waltz (see Ex. 1) would surely feel the oom-pah-pah that corresponds to the $\frac{3}{4}$ bars notated in the score. But the dancers will likely also experience higher levels of metrical patterning, too. In the same way that individual beats cohere together to form bars, whole bars may in turn be organized into still larger units.

Ex. 1 Strauss, "Blue Danube" Waltz (excerpt renumbered as mm. 1–33)

As an experiment, try listening to (or imagining) the music in Ex. 1 while conducting a four-pattern two different ways. First, try conducting a four-pattern with one beat per bar, aligning your pattern to the numbers in Ex. 1. Measure 1 will be conducted as an upbeat, and the first "1" will fall in m. 2. Now try the passage again, but this time, commence the four-pattern with a "1." This alternative way of conducting mostly follows the brackets in the example, with downbeats in mm. 1, 5, 9, and so on. How do these two ways of conducting feel differently to you? Do you prefer one to the other?

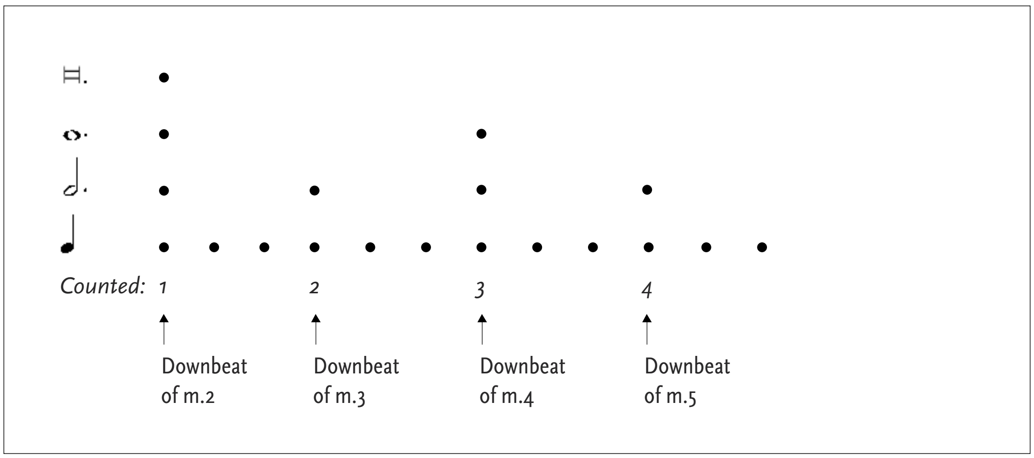
For most listeners, the first way of conducting – matching the numbers in Ex. 1 – will feel far more natural, whereas the other way may feel awkward or even difficult to perform. We will soon take up the question of which musical features tend to make a particular counting seem like a good fit or a poor one – why placing a "1" in m. 2 feels "correct." But for now, our unscientific experiment has an important finding: Even though the downbeats of m. 1 and m. 2 ostensibly are equally strong metrical positions, the downbeat of m. 2 nevertheless feels metrically stronger, like a downbeat on a higher order. Our intuitive preference to commence the 1–2–3–4 counting in m. 2 parallels the way a couple waltzing at a ball would also commence the dance on that downbeat, rather than in m. 1.

The phenomenon of meter at levels higher than the notated bar is known as **hypermeter**. A four-bar **hypermeasure** comprises four bars (or **hyperbeats**), of which the first stands as a hyperdownbeat. In principle, *meter and hypermeter are precisely identical concepts* and – particularly in highly symmetrical music such as the "Blue Danube" waltz – they differ only in that the latter operates at higher levels. Since the structure of a four-bar hypermeasure is identical to that of a $\frac{4}{4}$ measure, a listener not following a score could reasonably imagine the passage notated as shown in Ex. 2:

Ex. 2 Alternative Notation of "Blue Danube" Waltz

This alternative notation may be unconventional, since waltzes are almost always notated in $\frac{3}{4}$, with one *oom-pah-pah* per bar, but it is by no means wrong. With respect to Strauss's notation in Ex. 1, Ex. 2 represents a kind of "zooming out" to experience the passage from a more global vantage point. Thus, if Strauss's score is a map of the composition, Ex. 2 is but a map at a different scale; both are equally valid representations, even if they may draw attention to different aspects of the waltz. In principle, the hypermeasures shown in Ex. 2 have precisely the same musical meaning and ontological status as the measures in Strauss's score. There is nothing inherently more "real" about the level of the notated measure, and the dot diagram in Fig. 2 shows how a hypermeasure shares the same organizing principles as notated measures (compare Fig. 1).

Fig. 2 Dot diagram of "Blue Danube" Waltz, mm. 2–5, as a four-bar hypermeasure



The notation in Ex. 2 is known as a **durational reduction** of Ex. 1, so named since it "reduces" the score's $\frac{3}{4}$ bars to quarter notes. Music theorists use this analytical technique to demonstrate their interpretation of a passage's hypermeter (see Schachter 1999 [1980]). The two examples communicate equivalent information, since the counting numbers annotated in Ex. 1 correspond to the placement of bar lines in in Ex. 2.

Having discussed the theoretical equivalence of meter (at the level of the bar line) and hypermeter (at higher levels) *in principle*, let us now qualify the point by noting some ways they differ *in practice*. The fact that hypermeter is not notated in scores is significant in two ways. First, whereas the notated meter tends to remain steady across a movement (or large sections thereof), the hypermeter is rarely so regular. Broadly speaking, hypermeter in eighteenth-century music tends to be far more flexible, sometimes even erratic, compared to hypermeter in much nineteenth-century music. The "Blue Danube" waltz, as a composition intended for dancing, has an unusually regular hypermetrical structure, since four-bar groups combine symmetrically to form units of eight, sixteen, and thirty-two bars. Many instrumental compositions by such composers as Schubert, Bruckner, and Tchaikovsky exhibit a similar tendency toward symmetry.

In music in which the hypermeter is less regular – such as most of the music analyzed in *Mozart's*

Music of Friends – one could speak of passages proceding through phases in which (1) an initial phase in which a hypermeter is established, and (2) the ongoing hypermeter is subsequently sustained, until (3) any strongly contravening or disruptive signal(s) may arise sufficient to either make the hypermeter ambiguous or to establish a new hypermeter (Mirka 2009). Junctures of hypermetric irregularity may be experienced as moments of surprise or conflict and are therefore of considerable musical and analytical interest. This leads to our second point distinguishing notated measures from hypermeasures: Since there is no change of "hypermeter signature" to indicate moments of hypermetrical irregularity, it is therefore incumbent on the analyst to justify why the original counting no longer "fits" and why a new one seems better (or, in the case of hypermetrical ambiguity or conflicts, to explain which musical features "fit" one plausible hypermetrical interpretation and which support another).

Grouping; "Arrival" vs. "Departure" Metrical Types; and Listening Habits

Returning to Ex. 1: Whereas the numbers indicate the four-bar hypermeter, the brackets in the example indicate four-bar units of a different kind. These units, which are the motivic building blocks of the 32-bar phrase, are called **groups**. Like meter, grouping is organized hierarchically, since small groups, at the level of a motive, combine to form larger groups. Units of form such as phrases, themes, expositions, and complete movements are all examples of groups.

Throughout the excerpt, each short-short-short-long figure hangs together as a group since the quarter notes tend to be heard as upbeats to the longer notes that follow. Thus, the first measure of Ex. 1 is a *beginning* of a certain kind: It is the first bar of the four-bar group (and, for that matter, the first bar of the 32-bar phrase, which is a group on a higher order). But despite its status as a "1" bar in terms of grouping, it is a hypermetrical "4," since the hyperdownbeat falls on the following measure. Using numbers in these two contradictory ways would be terribly confusing (and, indeed, many scholarly disputes over which bar to label as "1" seem to boil down to whether the "1" refers to grouping or meter, since these do not always coincide). Therefore, to avoid any misunderstanding and to maintain a distinction between these concepts, I have consistently used brackets to indicate grouping, reserving numbers for hypermeter only. I observe this notation throughout both this document and *Mozart's Music of Friends.*

Maintining a conceptual distinction between grouping and (hyper)meter is important because there is no fixed, a *priori* relationship between them. Consider the following two examples (Exx. 3–4), each drawn from the opening of a Mozart sonata movement:

Ex. 3 Mozart Sonata in A Major, K. 331 (i)

Ex. 4 Mozart Sonata in C Major, K. 545 (iii)

These two themes share much in common: Each is a parallel period, comprising an antecedent phrase ending on a half cadence (HC) followed by a consequent phrase ending with a perfect authentic cadence (PAC). Moreover, each antecedent or consequent phrase has a sentential organization (a 1:1:2 proportion, whereby two statements of an initial motive are followed by a longer unit leading to the cadence). But they differ in the relationship of grouping and meter. In the excerpt from K. 331, the bar lines *frame* the motives. Grouping and meter are therefore highly *congruent* or *in-phase*, since motives (groups) begin on metrically accented positions and end on metrically unaccented ones. The cadences – each marking the end of a four-bar group (the antecedent or consequent phrases) – fall in weak parts of weak measures. This structure may be described as **departure meter**, also known as beginning-accented construction, since groups seem to "depart" from strong metrical positions and culminate at weak ones. But the motives in K. 545 *straddle* the bar lines, moving from weak positions to strong ones. Grouping and meter are therefore *non-congruent* or *out-of-phase*. Such a structure may be described as **arrival meter** or end-accented construction, since melodic groups "arrive" as positions of metrical strength. The cadences, once again marking the end of four-bar groups, fall on downbeats, a stronger metrical position than the cadences of the previous excerpt.

Fig. 3: Contrasting "Departure" and "Arrival" Metrical Types

METRICAL TYPE	MOTION OF GROUPS	RELATION OF GROUPING & METER	CADENCE PLACEMENT
Departure meter	From strong to weak (beginning accented)	In-phase (congruent)	Relatively weak positions
Arrival meter	From weak to strong (end accented)	Out-of-phase (non-congruent)	Relatively strong positions

In certain styles of music – especially German instrumental beginning with Beethoven and Schubert – departure meter tends to be the predominant metrical type. Other styles – notably Baroque music and French and Italian opera – tend to favor arrival meter, partly due to text-setting conventions in those languages (which were influential during the Baroque). Listeners accustomed to a diet of post-1800 German instrumental music may be habituated to hearing group beginnings as strong metrical positions. But such listeners may be in for a surprise with music composed in arrival meter; listening without following a score, they will often feel downbeats and upbeats in precisely the opposite way from how the composer notated them.

Ex. 5 Bach, Badinerie from Orchestral Suite No. 2 in B Minor, BWV 1067 (short score)

Ex. 6 Haydn, Quartet in C Major ("Emperor"), op. 76, no. 3 (ii)

Ex. 7 Verdi, Rigoletto, No. 8 (Aria Duca)

On the other hand, for other listeners, the arrival meter in Exx. 5, 6, and 7 will seem perfectly natural. These may include not only musicians who specialize in Baroque repertoire and/or French or Italian opera but also musicians trained in German-speaking countries, where the metrical theories of Hugo Riemann remain profoundly influential. Riemann's desire to hear musical groups move from weak to strong – a principle of *Auftaktigkeit*, or "upbeatness," derived from his study of eighteenth-century composition treatises – was so pronounced that it led him in many cases to "correct" nineteenth-century composers' scores to conform to these principles (see Rothstein 2008, 118–21). Riemann's approach to meter spread to the United States, particularly among wind players, through the influential oboist and conductor Marcel Tabuteau.

Haydn and Mozart stand at a crossroads between these two conceptions of meter, and their music partakes of both styles (as shown in Exx. 3 and 4). And it stands to reason: Although both are composers of German instrumental music (and German *Lieder*), active just one generation before Beethoven, they nevertheless each came of age during the twilight of the Baroque, were trained partly by Italians, and composed numerous Italian operas. The key point to remember is that departure meter (and its attendant in-phase relationship between grouping and meter) should *not* be assumed as a default preference in their music, not even in their instrumental music. While it may be challenging for listeners and analysts strongly habituated to preferring one or the other metrical type, learning to untether grouping and meter both in our listening habits and in our thinking about meter is a worthwhile endeavor. Such flexible listening will make us sensitive to a variety of metrical effects.

Metrical Preference Rules

An essential question from Part I remains unresolved: How come one hypermetrical counting seems to "fit" a passage while another does not? To begin to answer this, let us first consider the equivalent issue at the level of the notated meter. Why does the notation in Ex. 8a seem "correct" while those of Exx. 8b, 8c, and 8d do not? To ask this question slightly differently, which musical features in this passage would compel a listener to understand the metrical structure as shown in Ex. 8a? Or to ask yet another way, when Strauss first notated the waltz, after having conceived it in his imagination or perhaps through improvisation, the notation in Ex. 8a probably seemed immediately obvious to him, whereas Exx. 8b, 8c, and 8d were probably never even considered. Why should this be so?

Ex. 8: Four versions of the "Blue Danube" Waltz

a.

b.

c.

d.

The main problem with Ex. 8d is that successive statements of the *oom-pah-pah* figure haphazardly commence on each possible beat. Since meter is an organizing principle, we tend where possible to prefer interpretations that place equivalent statements of a figure in parallel metrical positions. In that respect, Exx. 8a, 8b, and 8c are all improvements, since these three versions each place the figure in a consistent metrical position. We have thus clarified why this passage is in triple meter ($\substack{3\\4}$ rather than $\substack{4\\4}$), but to choose among the remaining three options, we must explain which events belong on downbeats. Strauss's version has several important advantages over the alternatives in Exx. 8b and 8c:

(1) it aligns changes of harmony with relatively strong metrical positions;
(2) it aligns long notes with relatively strong metrical positions;
(3) it aligns the commencement of the first oom-pah-pah figuration with a relatively strong metrical position;
(4) it aligns the commencement of slurs with relatively strong metrical positions;
(5) it aligns bass notes ("ooms"), rather than bass rests ("pa-pas") with relatively strong metrical positions;
(6) it aligns the most stable verticalities of each measure (such as the root-position "ooms," rather than the second-inversion "pa-pas") with relatively strong metrical positions.

As noted in Part I, the word "relatively" is key: The factors listed here compare beats at the quarter-note level and explain why each downbeat (as notated in Ex. 8a) tends to be heard as metrically *stronger* than the second or third quarters of each measure. Exx. 8b and 8c are, therefore, doubtful interpretations.

In theorizing the musical signals that support hearing a particular beat as stronger than another on the same level, we are retracing the footsteps of Lerdahl and Jackendoff (1983), who introduced a more formalized list of what they call **metrical preference** rules (MPRs). The following list of MPRs (shown in Fig. 4) is adapted from Lerdahl and Jackendoff's, incorporating some minor reformulations and one addition (MPR 11) introduced by other authors.

Fig. 4 Metrical Preference Rules (as adapted in *Mozart's Music of Friends*)

1) **Parallelism**	Prefer to assign parallel metrical structures to parallel segments.
2) **Strong Beat Early**	Weakly prefer to assign the strongest beat relatively early in a group.
3) **Event**	Prefer to align strong beats with onsets of notes.
4) **Stress**	Prefer to align strong beats with relatively stressed notes.
5) **Length**	Prefer to align strong beats with the inception of long events, such as: **a.** a relatively long note; **b.** a relatively long duration of a dynamic; **c.** a relatively long slur; **d.** a relatively long pattern; **e.** a relatively long tone (i.e., an abstractly prolonged note); **f.** a relatively long harmony.
6) **Bass**	Prefer a metrically stable bass. (This rule intensifies other MPRs as they apply to the bass.)
7) **Cadence**	Strongly prefer a metrically stable cadence. NB: This rule does not prefer cadences to fall on weak or strong beats; it merely prefers for them to fall on beats.
8) **Suspension**	Strongly prefer a metrical structure in which a suspension is on a stronger beat than its resolution. This rule applies to the suspended sixth and fourth in a cadential $^6_4$ chord.
9) **Stability**	Prefer to align stronger beats with the onsets of relatively stable harmonies and weaker beats with less stable harmonies. This rule also applies to stable and unstable notes (i.e., non-chord tones such as passing and neighbor tones are preferably aligned with relatively weak metrical positions).
10) **Duple Bias**	Prefer duple over triple relationships between metrical levels.
11) **First Statement Stronger**	When a motive is immediately repeated at the same or another pitch level, prefer to align the strongest beat in the first statement with a stronger metrical position than the strongest beat in the second statement.

Several of these MPRs accord with our intuitions about the four variant options in Ex. 8. For instance, the principle of parallelism (MPR 1) helped eliminate the $\frac{4}{4}$ interpretation (Ex. 8d), trumping the principle of duple bias (MPR 10). MPR 1 is neutral with respect to Exx. 8a, 8b, and 8c, since all three versions observe a parallel treatment of the *oom-pah-pah* figures. However, Ex. 8a emerges as the favorite option since it alone aligns the inception of relatively long events with strong metrical positions (MPR 5) – specifically, relatively long notes (MPR 5a), slurs (MPR 5c), accompanimental patterns (5d), and harmonies (5f). In this context, "relatively long" means exactly ethat: a three-note slur is longer than unslurred notes that precede or follow it, just as the three-bar-long ties in the melody are a longer rhythmic duration that the quarter notes that punctuate them.

Regarding the accompaniment: Since only the "ooms" constitute *bona fide* bass notes (the "pa-pas" reside in inner voices), the "ooms" are favored as metrically strong according to the event rule (MPR 3, amplified by MPR 6 since it applies to the bass). Simply put, MPR 3 favors inceptions of notes over beats that either sustain ongoing notes or have rests. Continuing with the accompaniment, in mm. 2–5 and 10–13, the chordal roots on the downbeats (the "ooms") are also favored over the waltz $\frac{6}{4}$ chords (the "pa-pas") on account of their greater harmonic stability (MPR 8, also amplified by MPR 6 since it involves the bass). One might object that, in mm. 6–9, the "oom" is the chordal fifth and the "pa-pas" are a more-stable root-position chord, so in these four bars, the stability rule (MPR 8) would favor the second beats over the downbeats. However – and this is an essential principle for music of any complexity – *no single MPR is ever decisive, and it is normal for various MPRs to be in conflict*. In this instance, the preponderance of MPRs continue to support Strauss's notated bar lines in mm. 6–9, since these bars are parallel with mm. 2–5 (MPR 1), which in turn means that most of the rules that were decisive in mm. 2–5 will apply here as well (such as the bass notes, inception of long melody notes, etc.). Moreover, as we will see soon, duple bias (MPR 10) operating at higher levels favors a steady meter; the $\frac{3}{4}$ meter, once established, tends to remain in effect in the absence of very strong signals sufficient to overwhelm the ongoing meter.

There is no algorithm for weighing various MPRs in an analysis, and when MPRs come into conflict, it can be difficult to judge which factors will prevail. That said, the two rules that tend to have the strongest impact for most listeners are MPR 5f (harmonic rhythm) and MPR 8 (suspensions, including the suspended sixth and fourth in a cadential $\frac{6}{4}$ chord). These powerful MPRs will usually override weaker ones – such as the preferences for early strong beats (MPR 2) or for duple rather than triple relations (MPR 10) – although these lesser MPRs may nevertheless become decisive in certain contexts.

Since the waltz excerpt has nearly overstayed its welcome, it remains only to observe that the same list of MPRs operates at levels higher than the notated measures and can explain our intuitions about the four-bar hypermetrical level. In Part I, we discovered that a four-bar hypermeter felt natural beginning in m. 2 but awkward beginning in m. 1. Two weak preferences would prefer the downbeat of m. 1 as stronger than that of m. 2: the former is an earlier timepoint (MPR 2) and is the inception of a slur (MPR 5c). However, these MPRs are overwhelmed by the much stronger metrical cues activated on the downbeat of m. 2, including:

(1) the entrance of a bass voice, after having rested in m. 1 (MPR 3, amplified by MPR 6);
(2) the inception of a long note in the melody (MPR 5a) ;

(3) the inception of the oom-pah-pah pattern (MPR 5d);
(4) the inception of a bass tone D, prolonged in mm. 2–5 (MPR 5e, amplified by MPR 6); and
(5) the (arguable) inception of a D major harmony, active in mm. 2–5 (MPR 5f).

Many of these same MPRs are activated again in mm. 6, 10, and 14, supporting the interpretation of a four-bar hypermeter commencing in m. 2. Further reinforcement occurs with the B–A suspension in mm. 14–17, which supports the downbeat of m. 14 as metrically stronger than that of m. 16 (MPR 8).

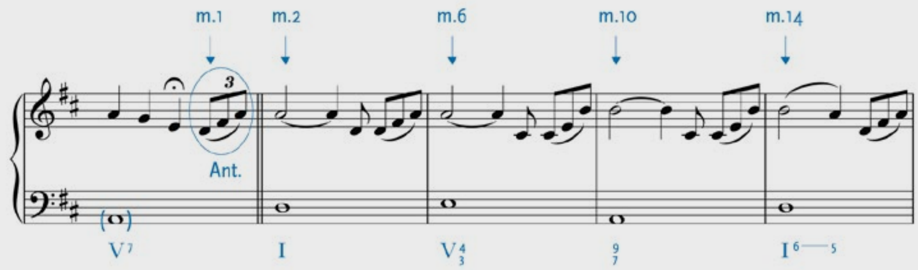
Enrichment: An Aside about Harmonic Ambiguity

To clarify one outstanding detail distinguishing between MPRs 5e (governing prolonged tones) and MPR 5f (governing harmonic rhythm) as they apply to the "Blue Danube" passage: For much of the waltz, the "ooms" repeat the same bass tone for four consecutive bars (D in mm. 2–5, E in mm. 6–9, A in mm. 10–13, and D in mm. 14–17, etc.). Each introduction of a new "oom" notes thus constitutes the inception of a prolonged tone, activating MPR 5e, amplified by a MPR 6 since they pertain to the bass voice. These prolonged bass tones are essentially coextensive with the prolonged harmonies, meaning that the triggering of MPR 5e tends to entail MPR 5f, one of the strongest metrical signals.

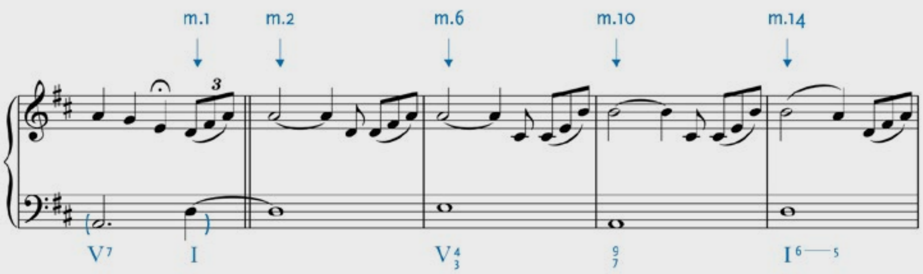
However, this relationship is nuanced by an ambiguity surrounding the initial tonic harmony as the waltz proper commences following the extended introduction. Two harmonic interpretations of this juncture are shown in Ex. 9. (I will continue to label the first bar of the waltz proper as m. 1, even though it is preceded by the waltz's extended introduction not shown in the example.) Since no explicit bass note sounds in m. 1 or in the immediately preceding measures, two possible interpretations of the implied bass notes are shown parenthetically. Analysis A interprets the prevailing harmonies as coinciding exactly with the prolonged bass tones and with the hypermeasures shown in the example. According to this hearing, the initial tonic harmony commences in m. 2. But what of the D-major arpeggio in the unaccompanied melody in m. 1? Does this tonic arpeggio not signal a change of harmony from V to I after the fermata? That interpretation is shown in Analysis B, whereby m. 1 is analyzed as the inception of the tonic harmony. Accordingly, MPR 5F would be activated with the inception of tonic harmony in m. 1 whereas MPR 5e would be triggered when the D "ooms" commence in m. 2.

Ex. 9: From introduction to waltz proper: durational reduction with two possible harmonic analyses

a.



b.



The important principle is this: Since m. 1 is an unaccompanied, melodic upbeat measure, the lack of explicit harmony leaves the passage open to interpretation (as regards MPR 5f, one of the strongest MPRs). Analysis B is the more literal reading, but it results in an oddly syncopated harmonic rhythm, and the anomolous, five-bar-long tonic harmony is conspicuous given that the following harmonies all last precisely four bars. Analysis A, on the other hand, interprets the V harmony as still prevailing in m. 1, within which the unaccompanied melodic arpeggio is heard as an anticipation of the following harmony, which commences only with the *oom-pah-pahs* in m. 2. My strong tendency to hear the passage according to Analysis A may be informed by intuitive preferences (1) to align the inception of tonic harmony with other strong signals of hypermetrical strength in m. 2, (2) to as well as a preference to favor a harmony explicitly established by the bass (in m. 2) over one merely implied by an unaccompanied melody (in m. 1), and (3) to hear a regular harmonic rhythm, with a four-bar-long tonic harmony in mm. 2–5 matching the other four-bar-long harmonies that follow.

Hypermetrical Reinterpretation

Ex. 10 Haydn Symphony No. 104, Allegro (i)

a. Primary theme

b. Recomposition without phrase overlap

In this passage from Haydn's Symphony No. 104, m. 32 expresses a curious paradox: Although it is the final measure of the main theme (mm. 16–32, a parallel period), it is also the first measure of the transition. The term **phrase overlap** denotes such a juncture in which the ending of one phrase coincides with the beginning of the next. Measure 32 could also alternatively be described as an **elision**, since the D-major chord that would have best completed the main theme – in terms of register, dynamic, and orchestration – is replaced by one that launches the transition. The following reconstruction restores the elided harmony and eliminates the phrase overlap, resulting in a decidedly squarer effect compared to Haydn's version, which launches the transition with tremendous momentum.

So far, we have discussed the "both/and" aspect of m. 32 in terms *grouping*, as an overlap between two phrases and two sections of the sonata exposition. But this overlap corresponds to an equivalent anomaly in the *hypermeter*, as indicated by the "4 = 1" marking in Ex. 10a. This annotation indicates that m. 32 is approached prospectively as a "4" bar (hypermetrically weak) but is subsequently revealed *also* to be a "1" bar (hypermetrically strong). To understand what this means, let us begin with an experiment: As you listen to or imagine Haydn's version of the excerpt (Ex. 10A), conduct the four-bar hypermeter as labeled in the example, but when you get to m. 32, please disregard the numbers in the example and continue the established 1–2–3–4 pattern (with m. 33 as a "1," m. 34 as a "2," etc.). How did that version feel after m. 32?

Hearing m. 32 as a "4" bar feels right in a certain sense – it completes the four-bar hypermeter begun in m. 29 – but as the passage continues, this interpretations feels like "swimming upstream" since m. 32 immediately seems to assert itself as a hyperdownbeat, owing to the following signals:

(1) the inception of the half-note rhythmic duration, a long note value relative to the surrounding quarters and eighths (MPR 5a);
(2) the inception of the forte dynamic (MPR 5b);
(3) the inception of a new accompanimental pattern involving tutti orchestration and repeated quarters in the bass (MPR 5d, amplified by MPR 6); and
(4) the inception of the tonic pedal (MPRs 5e and 5f, amplified by MPR 6).

In Ex. 10, the label "4 = 1" indicates a hypermetrical **reinterpretation** at this juncture, or a moment when a listener abandons the old hypermetrical counting and **entrains** with the new one that supplants it. Hypermetrical reinterpretations – which commonly take the forms of 2 = 1, 3 = 1, or 4 = 1 – usually occur in conjunction with phrase overlap and are the most common way an established hypermeter can be changed.

It should be noted that a hypermetrical reinterpretation usually constitutes a violation of MPR 10, the rule that "prefer[s] duple over triple relationships between metrical levels." A logical consequence of such duple bias is a preference for hypermetrical regularity. Since Ex. 10a opens with a hypermetrical structure that favors odd bars as stronger than even ones, a duple bias will prefer to continue this arrangement, alternating strong odd bars with weaker even ones. The reinterpretation in m. 32, which switches to hearing even bars as stronger than odd ones, is therefore a violation of this preference. Since MPR 10 encourages a principle of hypermetrical inertia or conservatism – preferring where possible to continue following an established hypermeter – a hypermetrical reinterpretation requires sufficiently strong countervening signals to wrest listeners from the old hypermeter and to encourage *entrainment* with a new one.

How would you count the hypermeter in Ex. 11? Although it is an eight-bar phrase, is it not organized as a regular 1–2–3–4, 1–2–3–4. Which MPRs are involved with establishing a hypermeter at the outset? Once a hypermeter is established, if there is an anomaly somewhere, which MPRs are involved? *Hint: listen for a hypermetrical reinterpretation, and pay special attention to the lower three parts.*

Ex. 11: Haydn, String Quartet in F, op. 77, no. 2 (i)

A close listening to the phrase reveals its organization as a four-bar unit (mm. 1–4) plus a five-bar unit (mm. 4–8); m. 4 thus stands as the overlap between the two parts of the phrase. Several metrical signals establish m. 4 as a 4 = 1 hypermetrical reinterpretation, such as:

(1) the inception of a new accompaniment pattern (MPR 5d);
(2) the introduction of a new melodic motive, which is imitated in the following measure (MPR 11); and

(3) the greater harmonic stability of the tonic chord in m. 4 over the neighboring chord in the following measure (MPR 9).

Other Hypermetrical Manipulations

Hypermetrical reinterpretation, discussed in the previous section, is but one method of manipulating hypermeter and, as we have seen, this device prompts listeners to abandon the original hypermeter and to entrain with a new one. But other manipulations leave the original hypermeter more or less intact:

Ex. 12 Haydn, String Quartet in E♭Major, op. 71, no. 3 (i)

The opening of Haydn's Vivace involves some peculiar musical math: a parallel period comprising a four-bar antecedent phrase and four-bar consequent phrase somehow manages to span twelve measures (mm. 3–14). This is the case because appended to each phrase is two bars of "extra" material – or "chuckling 'asides'" (Rothstein 1989, 88) – as indicated by the parentheses in Ex. 12. Several factors encourage hearing these two-bar units as "extra" or "parenthetical":

(1) they are extraneous to the parallel-period structure, since their omission would result in a prototypical parallel period (i.e., mm. 3–6 followed directly by mm. 9–12);
(2) they are texturally and dynamically marked, since their unison writing in piano dynamic distinguishes these bars from the parallel period's main discourse; and

(3) they expand the preceding cadences both gesturally (by echoing the three-note "chuckling" figures) and harmonically (by arpeggiating the cadential harmony).

Thus, while in one sense the parallel period is heard as lasting twelve bars (its literal duration), it also seems to last only eight, as if the fourth hyperbeat of each hypermeasure were expanded with a kind of composed fermata: 1–2–3–4, 1–2–3–4. The effect could be compared to a taxi that drives for four minutes, waits at a traffic light for two, and then repeats the process of driving and waiting; twelve minutes will have elapsed but only a distance equivalent to eight minutes-worth of driving will have been traversed. The four-bar hypermeter has been stretched, even distended, but (arguably) not broken. That said, some music theorists prefer the more neutral term **phrase rhythm** to refer to such expansions of a musical pacing, reserving "meter" and "hypermeter" for phenomena based more strictly on regular, equally spaced beats as an underlying basis of measurement, like the equal units on a ruler. (Such theorists might point out that a taxi's meter continues to run even while the cab is stopped at a red light.)

Yet another form of metrical play involves the conspicuous manipulation of motivic parallelism (MPR 1). As a preliminary step in understanding its possible impact on hypermeter, consider these settings of the "three little maids" motive in the following excerpt from Gilbert and Sullivan's *Mikado*:

Ex. 13 Gilbert and Sullivan, *The Mikado*, "Three Little Maids from School Are We"

a. Opening tutti

b. Later tutti

The original "three little maids" statements that proceed from weak beats to strong (arrival meter) are juxtaposed against later statements that proceed from strong to weak (departure meter). The same motive, or group, is thus placed in opposite metrical contexts, a charming violation of MPR 1. (Lest any listener miss the distinction, the orchestration of Ex. 13b emphasizes the motive's changed metrical context, since a triangle sounds on each downbeat.)

The final analysis examines essentially the same device, only at the hypermetrical level, in the opening movement of Beethoven's first "Razumovsky" quartet (shown in Ex. 14). The piece opens with four successive statements of a four-bar motive, labeled with brackets in Ex. 14a. Hearing the cello part in isolation, some listeners may tend to interpret the motive in terms of arrival meter: the bars with moving notes seem to be upbeat gestures to the long notes on their respective following downbeats. But hearing the cello solo in context, most listeners will tend to hear in terms of departure meter, with a four-bar hypermeter commencing in m. 1 that lines up congruently with the four statements of the four-bar motive (see Ex. 14a). That the fourth bar of each statement is a whole note suggests a sense of "stopping" that emphasizes the boundary between discrete statements of the figure, at least in mm. 1–16. (A lesser sense of "stopping" occurs with the dotted halves in the second bars of each statement, which lightly partition the motive into two halves.) Note, however, a few factors that rub lightly against the hypermeter, including the aforementioned placement of long notes on hyperbeats 2 and 4 (violating MPR 5a) and the placement of the motive's longest slur on hyperbeat 2 (violating MPR 5c). Yet more arresting is the harmonic rhythm: after the conspicuously static initial tonic, the change to the long V^{4}_{3} harmony on such a weak position – the middle of m. 7, a subdivision of hyperbeat 3 – is a striking syncopation against the hypermeter (violating MPR 5f).

Beethoven bolsters this metrical interpretation of the motive during the transition, when it returns in fragmented form in beginning in m. 38 (see Ex. 14b). One again, the context overrides MPR 5a to establish the quarter notes as falling in strong measures and the longer notes in weak ones. Clear hyperdownbeats at the four-bar level occur in mm. 30 and 34, preparing for another hyperdownbeat as the fragmented motive returns in m. 38.

Since the movement lacks an expositional repeat, the opening of the development (shown in Ex. 14c) will at first seem like a repetition of the opening until things go "awry" in m. 107. This moment of disorientation ("oh, is this actually the development?") corresponds with a passage of hypermetrical confusion, since several MPRs are in conflict in mm. 107–111. The established, four-bar hypermeter, which predicts m. 107 as a hyperdownbeat, is supported by the passing of the cello's eighth-note figure around the ensemble beginning in that measure (MPR 11, favoring the first statement as strongest, amplified by MPR 6 since the first statement occurs in the bass). That same hearing is also supported by harmonic stability (MPR 9, favoring the tonic $^{6}_{4}$ in m. 107 over the unstable harmony in m. 108) and by duple bias (MPR 10, which prefers hypermetrical regularity). Yet other factors point to a shift to a hypermeter with even bars strong, such as the cello's relatively long note in m. 108 (MPR 5a, amplified by MPR 6) and the *sforzandi* in m. 110 (MPR 4, also amplified by MPR 6). Simply put, mm. 107–111 are so riddled with conflicting hypermetrical cues that hypermeter may seem to be in abeyance pending future, clarifying events.

Such clarification arrives in m. 112, a decisive hyperdownbeat at the four-bar level, as per several metrical cues:

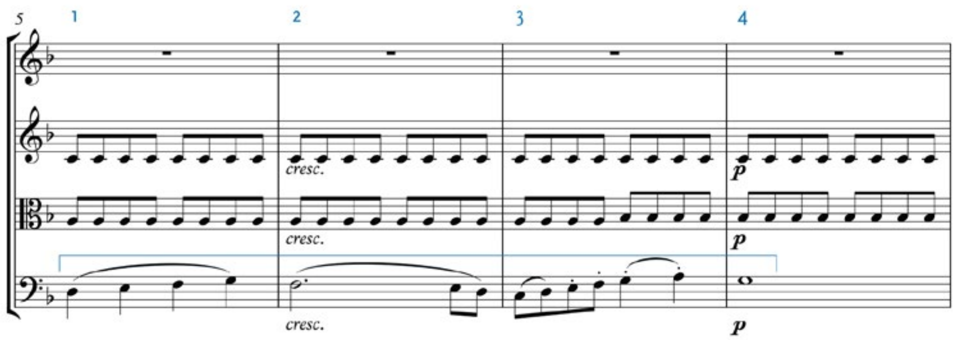
(1) the inception of four-bar-long harmonies in mm. 112 and 116 (MPR 5f);
(2) the inception of the piano dynamic in m. 112 (MPR 5b);
(3) the inception of an eighth-note accompanimental pattern (MPR 5d; also MPR 1, since it is parallel to previous inceptions of the same figure on hyperdownbeats, as in mm. 1 and 103);
(4) the inception of a long note in the first violin (MPR 5a); and
(5) the inception of the cello's triplets in m. 114, which are imitated by the first violin in m. 115 (MPR 11 favors the cello's statement, which supports hearing even measures as strong).

Once a hyperdownbeat is established in m. 112, the passage in mm. 107–111 is recognized retroactively as a hypermetrical transition, that is, an ambiguous passage during which hypermeter gradually switches strong bars from odd to even or vice versa (Temperley 2008).

But there is more to be said about the newfound clarity in m. 112: Unlike the outset of the movement, in which statements of the main motive had commenced on strong hyperdownbeats, the establishment of a hyperdownbeat in m. 112 falls on the second bar of the violin's motivic statement. The violin's motive is retroactively understood to have commenced on a hyperbeat 4 (m. 111), and the viola's subsequent statement follows suit (commencing on a "4" bar in m. 115, with a hyperdownbeat falling on the motive's second measure). The treatment of the motive has thus shifted from *departure* meter (with motives moving from strong to weak, framed by hypermeasures) to *arrival* meter (with motives moving from weak to strong, straddling hypermeasures).

Beethoven's gambit here is the prominent, seemingly willful violation of MPR 1. Although this rule prefers for parallel statements of a single motive to receive parallel status, the preponderance of metrical signals in m. 112 compels a reorientation, and the motive formerly heard as commencing on hyperdownbeats is now understood to commence on hyperbeats 4. In so doing, Beethoven takes advantage of a property of the motive that we noted earlier: The opening of the movement had aligned the motive's longest notes with hypermetrically weak positions, creating a subtle syncopation as per MPR 5a; but the realignment of the motive beginning in m. 112 reverses this, placing the longer notes on stronger metrical positions. At the expense of delightfully violating MPR 1, Beethoven thus resolves certain tension established at the outset.

Ex. 14 Beethoven Quartet in F Major ("Razumovsky"), op. 59, no. 3 (i)
a. Opening


5
1
2
3
4
cresc.
cresc.
cresc.
p
p
p


9
1
2
3
4
p


13
1
2
3
4
cresc.
cresc.
cresc.
cresc.

b. Transition

c. Development

This example underscores an important point: That a single tune can appear in various hypermetrical contexts over the course a movement means that MPR 1 is not absolute. Listeners who are over-wedded to hearing group beginnings as signals of strong metrical positions (as per departure meter) may miss out on Beethoven's game in this movement. The conceptual distinction between *grouping* and *meter* thus has a valuable musical payoff. Cultivating flexible listening habits, whereby groups (such as phrases or motives) may be heard to begin or end on any hyperbeat, allows us to experience the metrical play more fully.

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ACCENT: a quality that marks a musical event for consciousness (relative to other, unmarked events). Lerdahl and Jackendoff 1983 categorize accents into three distinct types: (1) *phenomenal*, an accent conferred on a beat that is stressed on the musical surface, such as by a leap to a high note or the inception of a new dynamic; (2) *structural*, an accent conferred upon beat coinciding with an important formal juncture, such as a cadence; and (3) *metrical*, an accent conferred upon a beat interpreted by a listener as occupying a relatively high status at a given level of metrical structure as modeled in a dot diagram.

ARRIVAL METER: A phrase rhythm in which groups begin on relatively weak metrical positions and end on (or arrive at) relatively strong ones; such groups may be described as end-accented or as being out-of-phase with the metrical structure. The opposite arrangement, *departure meter*, denotes a phrase rhythm in which groups begin on (or depart from) relatively strong metrical positions and end on relatively weak ones; such groups are beginning-accented and are in-phase (or congruent) with the metrical structure. The terms "arrival" and "departure" meter were developed by Andrew Wilson (personal communication).

DEPARTURE METER: See *arrival meter.*

DURATIONAL REDUCTION: A method of analysis that renotates music using proportionally smaller note values. Typically the measures notated in a durational reduction represent hypermeasures in the original score. This term was coined in Schachter 1998 [1980].

ENTRAINMENT: The psychological state of synchrony between a given pulse stream and listener's internal, subconscious counting. At a juncture of hypermetrical reinterpretation, a listener may cease entrainment with the original hypermeter in favor of entraining with the new one that supplants it.

ELISION: A juncture in which material basic to a normalized version of a phrase has been deleted. Generally occurs at a juncture between two phrases, whereby the anticipated ending of one phrase is suppressed and replaced, via phrase overlap, with the beginning of the next. Such junctures may involve a *hypermetrical reinterpretation*.

GROUP: A segment of musical material that is complete at some level of structure (e.g., motive, phrase, theme, exposition, or complete movement).

HYPERBEAT: See *hypermeter*.

HYPERMEASURE: See *hypermeter*.

HYPERMETER: Levels of meter higher than the notated bars (*see meter*). In the same way that beats are organized hierarchically into bars, *hyperbeats* are similarly organized into *hypermeasures*.

METER: Qualities of a composition that allow listeners to mentally organize musical time into regular patterns of strong and weak beats at various levels of hierarchy. Qualities of a musical passage will encourage competent listeners to infer a particular metrical structure; in ambiguous passages, more than one metrical structure may be plausible. In musical scores, the time signature and bar lines indicate a certain level of metrical hierarchy said to be "the meter" of a composition. See also *hypermeter*.

METRICAL PREFERENCE RULES (MPRs): Formulations developed in Lerdahl and Jackendoff 1983 used to model the cognitive process of inferring relatively strong and weak beats at a given level of metrical hierarchy.

PHRASE OVERLAP: A juncture in which the end of one phrase coincides with the beginning of the next one. See also *phrase overlap* and *reinterpretation*.

PHRASE RHYTHM: A category referring broadly to the pacing of musical phrases, including the relationship between hypermeter and phrase (grouping) structure and various techniques for manipulating a basic phrase structure through composed expansions and contractions. This term was coined in Rothstein 1989.

REINTERPRETATION: A technique of hypermetrical manipulation whereby an event falling (prospectively) on a relatively weak beat is made to sound like a metrical "1" (e.g. 2 = 1, 3 = 1, or 4 = 1). Usually occurs in connection with *elision* and *phrase overlap*.