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Generalizing Syncopation: Contour, Duration, and Weight

DAPHNE LEONG

This study defines syncopation as the contradiction, though not overturning, of a dominant metric structure by rhythmic stresses and proposes three tools for its modeling. First, a contour model of metric structure accommodates non-isochronous and other meters, offering a straightforward way to depict syncopated events within a metric hierarchy. Second, a categorical distinction between syncopes and offbeats, motivated by historical accounts of syncopation, characterizes the duration and resulting intensity of syncopated events. Third, a spiral model of displaced metric weight represents the degree of contradiction of the dominant meter and its relation to syncopation, providing a framework within which varying accounts of syncopation can be depicted and compared. The tools are used to examine syncopation in pieces by Bartók, Schoenberg, Herbie Hancock, Wagner, Billie Holiday, and Beethoven.

Syncopation is normally defined as the contradiction, though not overturning, of a dominant metric structure by rhythmic stresses. Inherent within the definition of syncopation are at least three questions: How does one conceptualize the "dominant metric structure"? How does one characterize the "rhythmic stresses"? And how does one describe the "contradiction"?

I suggest that existing answers to these questions can be profitably supplemented. First, despite the clear presence of syncopation in non-isochronous meters, existing literature treats syncopation in almost exclusively isochronous contexts. (Isochronous meters are those with nominally equally-spaced pulses; non-isochronous meters are those with unequally-spaced pulses.[1]) Second, although durational distinctions produce different varieties of syncopation, these distinctions are frequently overlooked. Third, despite the wide variance in existing concepts of syncopation— "conflict" with the meter; "suppression" of the beat; "displacement" of "events," "beats," or metric "levels" or "layers"[2]—such conceptual discrepancies frequently remain unreconciled.

I propose three simple tools for addressing these questions. First, a contour model of metric structure accommodates non-isochronous and other meters, offering a straightforward way to depict syncopated events within a metric hierarchy. Second, a categorical distinction between syncopes and offbeats, motivated by historical accounts of syncopation, characterizes the duration and resulting intensity of syncopated events.

Thanks are due to Keith Waters, Harald Krebs, Matthew Bribitzer-Stull, Scott Murphy, and Elissa Guralnick for many helpful comments on earlier versions of this article.

[1] John Roeder (2004) analyzes syncopation in a work in non-isochronous meters, but does so by extracting isochronous pulse streams and identifying syncopation in relation to these streams.

[2] Lerdahl and Jackendoff 1996, 283–84; Hasty 1997, 152–54; Temperley 1999; *The New Grove Dictionary of Music and Musicians,* 2nd ed., s.v. "syncopation"; Yeston 1976, 152; and Krebs 2003, 33; respectively.

Third, a spiral model of displaced metric weight represents the degree of contradiction of the dominant meter and its relation to syncopation, providing a framework within which varying accounts of syncopation can be depicted and compared. I describe these as "simple tools" because they function not as prescriptive analytical methods but as relatively neutral tools, able to serve different analytical interpretations and to facilitate further exploration of these interpretations.

Example 1, from the third movement of Bartók's Fifth String Quartet, shows how these tools work. The metric structure of Example 1a can be represented by the dot diagram below the score, an adaptation of those devised by Fred Lerdahl and Ray Jackendoff (1996, 19). The diagram depicts pulse levels in a metric hierarchy ordered from fast to slow (high to low). Numbers on the left indicate durations between pulses on a given level, measured in terms of a chosen basic duration, here the eighth note.[3] In this example the top level is that of the eighth note; moving downwards, we have 2+2+2+3 eighth notes, 4+2+3 eighths, and so on. The entire pulse hierarchy, or PH, is summarized at the bottom of the example in a list of its interpulse durations, from fast levels to slow, separated by back slashes.

For our purposes, pulse hierarchies must be well-formed; that is, pulses occurring on any given level must also occur on all higher levels.[4] PHs must also be periodic at the measure level, meaning that a PH must form a repeating pattern at the measure level or some meaningful variant of it. PHs may be isochronous or non-isochronous. The PH in Example 1a is non-isochronous because it contains levels whose pulses are not evenly spaced, for example, the 2+2+2+3 level. PHs may change in the course of a piece.[5]

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[3] The basic duration is selected for analytical convenience; its choice is not tied to any preferred pulse level such as the tactus.

[4] This definition of well-formedness relates to Yeston's (1976, 78), Krebs's (2003, 29–30), and Cohn's (1992, 7–9) notions of metric consonance. See also Metrical Well-Formedness Rule 2 in Lerdahl and Jackendoff 1996 (69). There are many metric situations in which well-formedness does not hold—polymeter being one example—but since such situations tend to represent not a single meter, in the generally accepted sense of meter, but more than one, they are better modeled as the combination of more than one well-formed PH.

[5] I do not place other constraints, such as maximal evenness, isochronicity on the fastest continuous layer, or even measured durations, on the structure of the PH. World-music genres provide ample examples countering such constraints. The Bulgarian dance *Jove Male Mome* has six beats that articulate the PH 3+4+2+2+3+4\18 and not 3\18, as would be required by maximal evenness. The danced version of the Norwegian *springar* features three beats in constant but complex proportional relations to one another, with beat proportions, such as 38:33:29, varying from region to region. The measure lengths are isochronous but neither the beats nor their subdivisions are isochronous. (See Code 2005; Hopkins transcribes a telespringar performance with beats in the ratios 18:15:10 [1986, 194–196].) The Romanian *doina* as studied by Béla Bartók articulates a consistent PH, 1\2+2+2+2\4+4\8, whose unit duration fluctuates so freely that it justifies an unmeasured interpretation of the PH, that is, one in which exact durations between unit pulses are left undefined. (See Bartók 1914. An unmeasured conception of meter also occurs in Berry 1976 and Hasty 1997.) These and other examples lead me to interpret the aforementioned "constraints" as stylistic indicators.

PHs are established and maintained by musical events. In Example 1a, the 9-eighth-note level is defined visually by bar lines and aurally by the repetition of the melodic pattern and the agogic accent beginning this pattern. This measure level divides into 4+5 eighth notes, the fifth eighth note of the bar punctuated here by the cello's long *arco* duration and by the first violin's written-out sixteenth-note turn (and also immediately preceding this excerpt by a "walking bass line," mm. 21–23). The 4+2+3 level is that of the notated time signature, corroborated by the first violin's slurs beginning these groupings as well as by the context of the movement as a whole. The initial half-note duration further divides into two quarter notes, via the first violin's downward leap.[6] The construction of this (or any) PH is an interpretive act, dependent first on the analyst's criteria for PHs, second on the musical surface and its context, and third on the analyst's hearing of that musical surface.

Given an analytically-determined PH, I translate its dot diagram into a metric contour, which one can read simply by following the bottom "edge" of the dot diagram. As shown just above the dot diagram, the contour model assigns 0 to the measure level or downbeat, 1 to the next strongest level of pulses, and so on to faster pulse levels. If pulse levels slower than the measure are present, the model labels them successively as –1, –2, –3, and so on. The result is a simple numerical representation of the relative metric strengths of various positions in the measure(s).[7]

Using this model, one can easily identify any event's relative metric strength in the hierarchy. In Example 1a, m. 25, the lower strings' chords all articulate level-4 pulses, weak relative to pulses on levels 0 to 3.[8] In m. 24, the cello's *forte arco* note stresses a level-1 pulse, weak relative to the downbeat. In general, the greater the level number, the weaker the position in the metric hierarchy and (if the position is stressed) the greater the conflict with the established meter.

Although these events in Example 1a stress weak positions in the metric hierarchy, traditionally they would not be considered syncopated. This is because, historically, syncopation has a more restricted meaning, being limited to attacks on weak beats that

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[6] This PH and many non-isochronous PHs used by Bartók are malleable. For example, as suggested by the levels of this PH 1\2+2+2+3\4+2+3\4+5\9, the measure can be felt in four beats (with a longer last beat), or in three unequal beats. The secondary stress in the uneven triple meter is felt on the second beat, but could, in other circumstances, be felt on the third beat. Such PHs are easily shaped by compositional or performative emphases.

[7] This model adapts theories of contour advanced by Friedmann 1985, Morris 1987, Marvin and Laprade 1987, Marvin 1991, and others. Huron and Ommen, whose 2006 article appeared as this paper was being completed, also label the contour of metric structure, using 1 to identify the downbeat. My formulation is more general than theirs, in that it applies to a wider variety of metric structures and extends to levels larger than that of the measure.

[8] "t" represents offbeats, to be defined shortly.

a) mm. 24–25 offbeats (t)

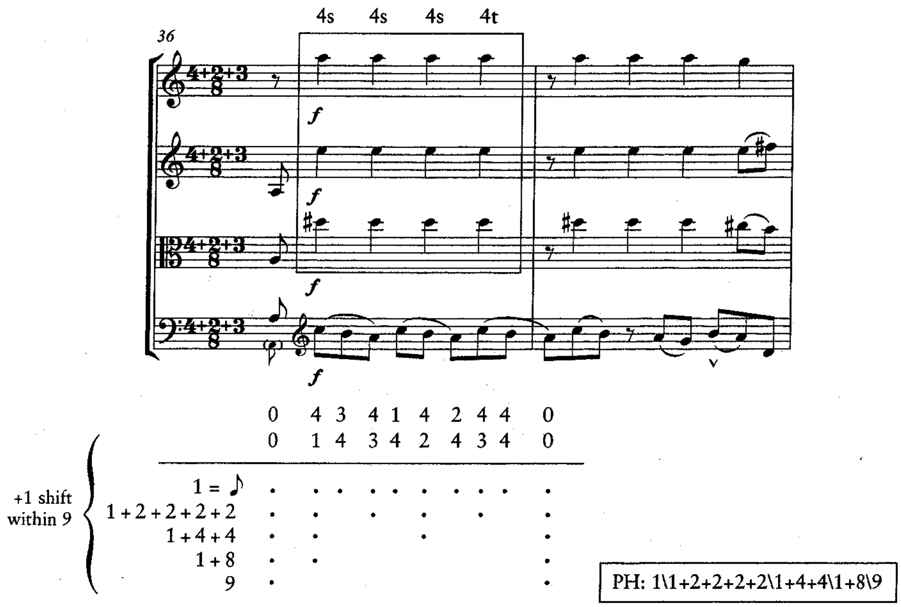
PH: 1\2+2+2+3\4+2+3\4+5\9

b) mm. 24–25 offbeats changed to syncopes (s)

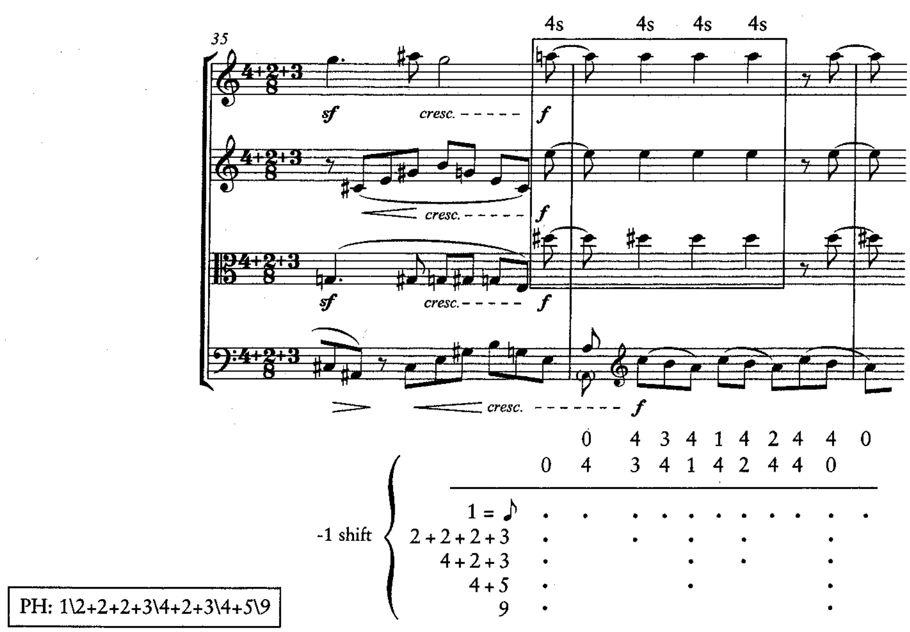
EXAMPLE 1

Bartók, Fifth String Quartet (mvt. III): PHs, metric contours, offbeats and syncopes, displacement

c) mm. 36–37 syncopes (s)



d) recomposition of mm. 36–37 syncopes (s)



EXAMPLE 1
(cont'd)

sustain over following strong beats. According to Riemann, "A syncope arises when a weaker beat is tied together with its following strong beat in a single note." Rameau's 1722 harmony treatise and Rousseau's 1768 dictionary of music contain similar descriptions. Rameau states that "when a note begins on another beat [other than the strong beat]... and half its value is heard on the following strong beat, the ear is disturbed and we say the note is syncopated." And Rousseau defines "syncope" as "sustention through the strong beat of a tone begun on the weak beat." (The sustention need not be literal; both Rameau and Rousseau describe cases that involve restruck notes or harmonies.)[9]

This criterion of weak-strong sustention has disappeared from current theoretical treatments of syncopation. The requirement that an articulated weaker beat be followed by an unarticulated stronger beat can be found in empirical literature on syncopation and is implied by theories that conceptualize syncopation in terms of displaced pulse layers. However, the more restrictive condition that the weak-beat event *sustain* through the following stronger beat is at most hinted at, in theories that associate syncopation with "durational accents."[10]

Taking this traditional aspect of syncopation into account will allow us to recognize and make meaningful distinctions among different types of syncopation. To distinguish the traditional type of syncopation from stressed events that occur on weak beats without being sustained, I will call the sustained events "syncopes," following historical usage, and the others "offbeats." Examples 1a and 1b (adapted from Example 1a) illustrate this distinction. The lower strings in Example 1a articulate offbeats, abbreviated "t." In contrast, the lower strings in Example 1b—which occur in the same metric context and articulate the same points in the measure—express syncopes, labeled "s." The distinction rests on whether, as in Example 1a, events do not sustain over a stronger metric pulse, or, as in Example 1b, they do.[11] Offbeats and syncopes will be labeled with their level in the metric contour, here 4, followed by their identity as offbeats (t) or syncopes (s).

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[9] "Wird ein leichter Zeitwert mit dem ihm folgenden schweren in eine Note zusammengezogen, so entsteht eine Synkope" (Riemann 1903, 88); "dès qu'une Notte commence dans un autre temps, & que la moitié de sa valeur se fait entendre dans le *Temps bon* suivant, cela heurte l'oreille, & l'on dit pour lors qu'elle est *Syncopée*" (Rameau 1965, 296, translated Gossett 1971, 314); "Prolongement sur le Tems fort d'un Son commencé sur le Tems foible" (Rousseau 1768, 467). The discussions of syncopation are found in Riemann 1903, 87–101; Rameau 1965, 296–299; and Rousseau 1768, 467–468.

[10] For the three categories of literature mentioned here, see, first, Johnson-Laird 1991, 94–95; Simpson and Huron 1993, 89; and Huron and Ommen 2006, 212; second, Yeston 1976, 152 and Krebs 2003, 33–34; and third, Lester 1986, 18 and Krebs 2003, 33. Huron and Ommen mention and show weak-strong sustention but do not require it.

[11] The fourth quarter note in Example 1b is labeled "t" and not "s" because it does not sustain over the downbeat, which would be the next stronger metric pulse.

The distinction between syncopes and offbeats is not trivial: syncopes tend to express a stronger sense of shifted meter than do offbeats. The syncopes of Example 1b challenge the established $\frac{4+2+3}{8}$ meter more strongly than do the offbeats of Example 1a. Harald Krebs hypothesizes that the greater intensity of syncopes results in part from clearer auditory streaming (2003, 59, 262).

Example 1c, occurring about ten measures after Example 1a, presents an even stronger sense of shifted meter than Examples 1a and 1b. First let us place Example 1c in its larger context. The quartet, from the beginning of the movement until the entrance of this passage, has essentially articulated the PH of Example 1a. It stops articulating that original PH after the initial downbeat of Example 1c and does not articulate it again until m. 42.

In this context, it behooves us to interpret Example 1c in terms of entrainment—that is, in terms of a listener's entrainment, or attentional synchronization, to the periodicities of musical events (London 2004, 6). Such entrainment can sustain a PH in the absence of supporting events and even in the face of conflicting phenomena. (Since syncopation gains its effect from a felt distance between meter and rhythmic surface, entrainment is crucial to the phenomenon of syncopation.) Given the basically consistent articulation of the preceding PH, Example 1c is thus experienced, to some degree, in the context of that entrained (but now literally absent) PH.

In relation to that PH, the upper strings of Example 1c express syncopes, labeled "s," since, just as in Example 1b, their events sustain over a stronger metric pulse.[12] But in the absence of events continuing the original meter, the syncopes of Example 1c present a stronger sense of shifted meter. Setting aside the question of the cello's articulations for the moment,[13] one can interpret this shift in three ways. First, one can regard Example 1c as simply shifting the entire original PH 1\2+2+2+3\4+2+3\4+5\9 by one eighth note "later" in the measure. The ongoing sense of the notated downbeat, however—not strongly articulated here, but so strongly and consistently articulated to this point that one continues to feel it—argues against this interpretation. Second, one can understand elements of *two* PHs to be in conflict: the shifted PH as just described and the downbeat level of the original PH.[14] However, music-psychological literature suggests that one

[12] Again, the fourth quarter note in Example 1c is labeled "4t" and not "4s" because it does not sustain over the downbeat, which would be the next stronger metric pulse.

[13] The cello counterpoints the upper strings by beginning a PH of its own, 3\9. This creates a "grouping dissonance" (following Krebs 2003) with the upper strings, and since the cello is subsidiary to the upper strings in this passage, and since, as will be argued later, grouping dissonances differ from syncopation proper, I leave aside discussion of the cello line here.

[14] I thank Yonatan Malin for suggesting this interpretation.

cannot attend to multiple PHs simultaneously. Third (my preferred interpretation), one can consider only part of the original PH—most of its levels except the downbeat level—to have shifted, producing a sort of 4/4 meter that begins with a hiccup. The resulting PH 1\1+2+2+2+2\1+4+4\1+8\9 is shown under the example.[15]

The three explanations of Example 1c just presented all rely on displacement, a concept frequently associated with syncopation. I model the relative metric weight of displaced objects by placing them on a displacement continuum according to the degree to which they challenge the dominant meter. As shown in Example 2a, in relation to a given meter PH1, the continuum progresses gradually from no displacement, to displacement of stresses, events, and metric structure in varying degrees, to a complete switch to a new meter, PH2.[16] Displaced metric weight increases as one moves from left to right on the continuum; displacement of phenomena occurs towards the left side of the continuum and displacement of metric structure towards the right.

Again, while the structure of the continuum is objective, the location of a particular musical passage on it is not, depending on myriad factors. These include attributes affecting metric determination—music-structural features such as harmonic rhythm, performative variables such as dynamic levels, cognitive considerations such as preferences for one musical parameter over another—as well as those influencing *changing* metric determination—considerations such as the extent of the listener's previous entrainment—since we are primarily concerned with how strongly the passage articulates some new PH in relation to an established PH. It is beyond the scope of this article to theorize metric determination, and the factors are too many and too complex for any passage to be located definitively on the continuum. The analyses in this article therefore locate excerpts on the continuum in conformity with my hearing.

The lower strings in Example 1a do not offer any real challenge to the established meter; one does not even feel that the events themselves are somehow displaced from

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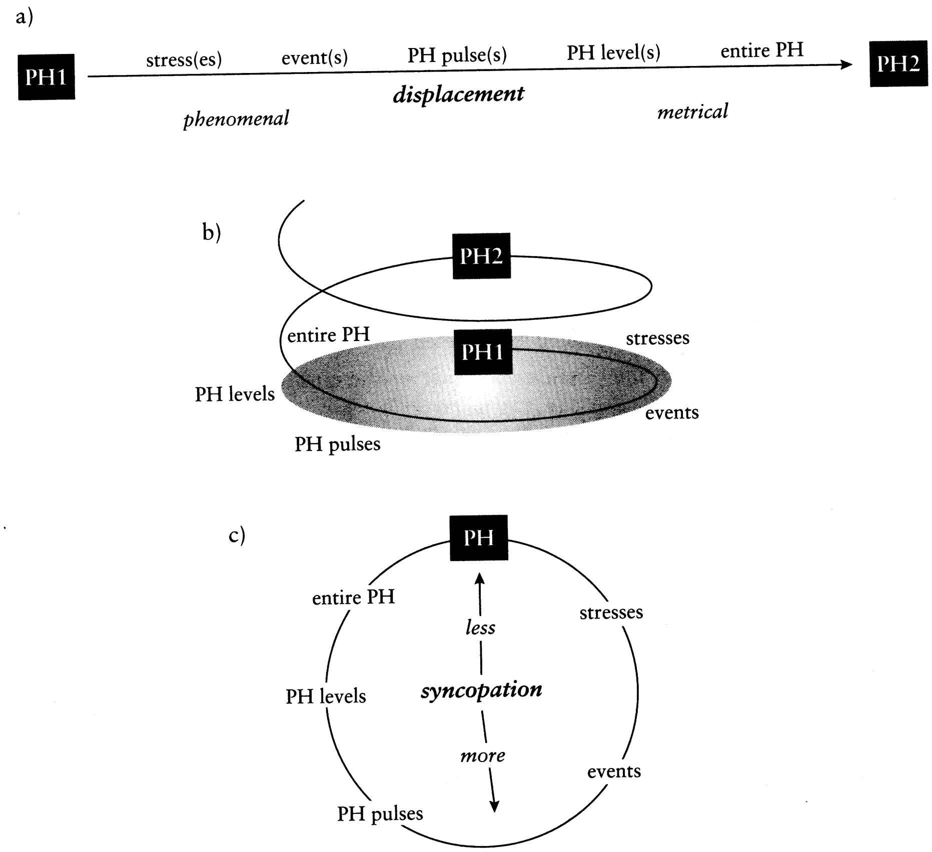
[15] This interpretation violates Justin London's (2004, 103–6, 130–31) and Fred Lerdahl's (2001, 285–97) non-adjacency criterion for meter by duplicating the "1" (the eighth-note hiccup) on multiple metric levels. (The non-adjacency criterion requires that successive pulses on a level be separated by at least one pulse on the next faster level. The Bulgarian dance *Rŭchenitsa*, with its PH 1\2+2+3\4+3\7, provides a straightforward counterexample: the 3 of the 2+2+3 level repeats on the 4+3 level [Personal correspondence with Timothy Rice, January 2001].) But if the listener's sense of the notated downbeat does continue, if the unison *forte* attacks of the upper three strings do produce a sense of metric weight, and if, as London asserts (2004, 50), we cannot attend to multiple PHs simultaneously, then the PH I have posited, 1\1+2+2+2+2\1+4+4\1+8\9, provides the obvious solution. This particular PH occurs with notable force in the first movement of Bartók's Sonata for Two Pianos and Percussion, where it structures the *Allegro molto* theme at three rates of speed simultaneously: at 1 = eighth note, 1 = quarter note, and 1 = measure (see Leong 1999, 66–71). The original PH that I posit for Example 1a, 1\2+2+2+3\4+2+3\4+5\9, also disobeys the non-adjacency criterion.

[16] Compare to Hatten's separation of displacement dissonance into three categories including "rhythmic dissonance" and "metric dissonance" (2002, 277, 280); see also Samarotto 2000, 3.3–3.4.



EXAMPLE 2
Displacement continuum

normative positions. Rather, the lower strings' *forte* chords stress normally unstressed points in the PH, each thereby displacing surface stress from its normal location one eighth note earlier.[17] This interpretation locates Example 1a on the "stress" portion of the displacement continuum.

Example 1c, by contrast, shifts metrical levels. According to my interpretation, each level of the previously established PH, with the exception of the notated downbeat, shifts by +1 to articulate a somewhat off-kilter new PH. Example 1c therefore falls on the "PH-level" portion of the displacement continuum.

[17] It is simplest to interpret the displacement in this way, as displacement by one eighth note later, because of the established PH and the hegemony of the melodic voice.

The two sides of the continuum neatly represent oppositions occurring in longstanding theoretical formulations of metric change: its left and right sides respectively model Andrew Imbrie's (1973) conservative and radical listeners, Pieter van den Toorn's double edge of displacement and motivic metric identity (1987, 74–76), and, in more general terms, the interpretation of displaced objects as figure or ground. The continuum's two sides also illustrate subtle differences between accounts of syncopation such as those of Christopher Hasty and Harald Krebs. Hasty views syncopation as a suppression or omission of the established beat, felt nevertheless as a "virtual beat" (1997, 152–54). Krebs describes syncopation in terms of the conflict between a metrical pulse layer and an antimetrical layer that is displaced relative to the metrical layer (2003, 33). Hasty's formulation falls clearly on the phenomenal side of the continuum, while Krebs's model suggests a preference for the metrical side.[18]

A distinction between the *scope* and the *metric weight* of displaced objects is helpful here. By "scope" I mean the extent of the displaced object: whether it is a single element, a layer of elements in the Krebsian sense, or multiple such layers. By "metric weight" I refer to the strength with which a displaced object articulates a PH: this strength varies from phenomenal stresses (created by dynamics, articulation, and so on), to events (when an articulated event as a whole seems to have moved out of its normative metric position), to felt metric structure *per se*. Scope functions as input to metric weight; displacements of greater scope, such as multiple aligned layers, tend to carry greater metric weight. But the two are not equivalent. In scope, Examples 1a and 1c both shift layers, but in my interpretation of metric weight, Example 1a displaces stresses while Example 1c displaces PH levels.

This distinction can alleviate some ambiguity in discourse about rhythmic displacement. As mentioned at the beginning of this article, writers refer to displaced objects variously as "a layer of motion," "each beat in a measured pattern," or individual "events."[19] The first designation indicates scope, while the second and third indicate both scope and metric weight.[20]

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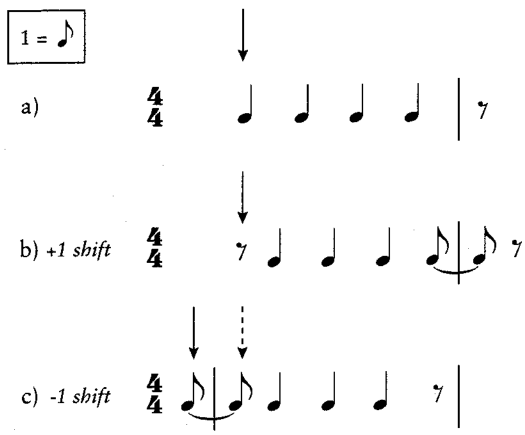
[18] I say "suggests" because Krebs's "antimetrical layers" may or may not carry metrical weight. They are defined only as "series of regularly recurring pulses" (2003, 23), and although their "antimetrical" designation puts them in opposition to "metrical layers," Krebs does not specify if the opposition is one of degree or kind. Examples 1a and 1c, for instance, would both involve displaced antimetrical layers in Krebs's terminology, although in my terminology the first displaces phenomenal stresses and the second metrical PH levels.

[19] Krebs 2003, 33; *The New Grove Dictionary of Music and Musicians*, 2nd ed., s.v. "syncopation"; Temperley 1999. Temperley models syncopation in rock in terms of displaced events, positing cognitive representations that normalize such events.

[20] The association of syncopation, in scope, with layers may originate in the earliest music-theoretic usage. In the fourteenth-century *ars nova*, syncopation denoted the breaking up of a chain of "perfect" units by the insertion



EXAMPLE 3
Direction of shift and Ito's "focal impulses"

My displacement continuum ranges across the spectrum of metric weights, while also accommodating the entire spectrum of scopes. In focusing on metric weight, the continuum highlights the primary factor contributing to the intensity of syncopation. In disentangling weight and scope, and in allowing the full range of each, the continuum allows each variety of syncopation represented by different writers on the topic a place or places. The displacement continuum can thus accommodate, distinguish among, and interpret these different varieties of syncopation.

As mentioned earlier, myriad factors contribute to the metric weight of displaced objects. I mention two primarily rhythmic factors here. First, as discussed earlier, syncopes have more metric weight than offbeats, other factors being equal. Second, the direction—"earlier" or "later"—in which a listener perceives displacement can influence the weight of the displaced objects. As has become standard, I indicate the amount and direction of displacement in terms of a chosen basic duration, with + and – indicating displacement "later" and "earlier" in the measure respectively. Example 3a presents four quarter notes, which are displaced by +1 eighth note in Example 3b and by –1 eighth note in Example 3c.

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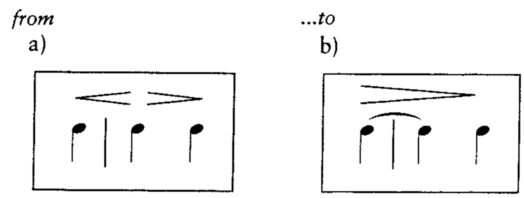
of smaller note values; Jehan des Murs [1321] was probably the first to describe this practice (1998, 268). This use of the term reflects the etymology of "syncope," from the Greek "to cut" in the sense of breaking apart. Today, the layer definition of syncopation finds its strongest form in Krebs 2003, Yeston 1976, and the "shadow" meter of Wallace Berry (1976, 375).



EXAMPLE 4
Syncope: shift of dynamic highpoint (after Riemann 1884, 52)

A shift "earlier" tends to carry more weight than a shift "later."[21] Compare Example 1d to Example 1c. In Example 1d, the upper strings' syncopes are shifted earlier relative to the previously established meter, whereas in Example 1c they are shifted later. In Example 1c, as discussed previously, I hear only the faster levels of the PH and not the downbeat, shifting later. In Example 1d, the shift earlier seems to override the previously established downbeat, so that the entire PH, including the downbeat, shifts.

Sources as varied as John Ito's theory of performance impulse and Riemann's concept of *Verschiebung der Dynamik* support this correspondence between direction of shift and metric weight. Ito's theory postulates "focal impulses" (isotonic physical contractions) occurring on strong beats. As shown by the arrow in Example 3b, when pulse articulations are *delayed* by "late" syncopated events, focal impulses nevertheless occur on time in the expected locations. When, as in Example 3c, pulses are *anticipated* by "early" syncopated events, the focal impulse may shift to the early attack point; a secondary muscular contraction may then occur at the usual pulse location (Ito 2004, I: 116–19).

Riemann's *Verschiebung der Dynamik* (Example 4), which can be interpreted as part of a theory of performance (Caplin 1985), parallels the latter case. The syncope in Example 4b shifts the dynamic highpoint from its normal position in Example 4a. Riemann describes the situation as "a displacement of the dynamics, in which the dynamic climax, which is absorbed by the long note stretching over the barline, is completely given up as such and the whole motive shaded as begin-stressed."[22]

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[21] Writers do speak of shifts in either direction, but tend either to privilege one arbitrarily, or to differentiate between the two only cursorily. See, for example, Krebs 2003, 35, who privileges + transformations; and Kirnberger 1968, 192–193 and Hlawiczka 1971, who describe shifts in both directions. Temperley 1999 suggests that the direction of the transformation may be stylistically constrained.

[22] "eine...Verschiebung der Dynamik..., indem die von der über den Taktstrich reichenden Länge absorbirte dynamische Hauptnote als solche ganz aufgegeben und das ganze Motiv als anbetont schattirt wird" (Riemann 1884, 52); the translation is my adaptation of Caplin 1985, 10.

I determine the direction of displacement according to a rough "principle of efficiency." That is, given a displaced object X', I posit a prototype X and displacement D that make sense in the musical context and that require the least amount of work to transform X into X'. For instance, it is more efficient to interpret Example 3c as a –1 shift from Example 3a, rather than as a +7 shift (where the metric placement of the entire pattern of four quarter notes is concerned).

I model syncopation with displacement, rather than with notions of "disagreement," "suppression," and so on, for three reasons. First, as stated earlier, a model of syncopation incorporating displaced objects of varying scopes and metric weights accommodates the different varieties of syncopation modeled by other approaches. Second, a displacement model of syncopation reflects the structure inherent in the historical notion of syncopation; syncopes are easily understood as durations displaced from normative onbeat placements. Strings of equal-duration syncopes exemplify Krebs's "displacement dissonances"; syncopation as historically defined relates less clearly to Krebs's "grouping dissonances" such as polymeter, cross-rhythms, and so on.[23] (Thus in discussion of passages that contain grouping as well as displacement dissonance—Example 1c, for instance—I focus on the latter because of its closer ties to historical syncopation.) Third, syncopation features stresses, events, or pulses in unexpected locations, often coupled with their absence from expected locations. The metaphorical notion of displacement—whether implying moving or merely copying—provides a logical explanation for such situations. Finally, the displacement view of syncopation is essentially a transformational view, in line with the now common association of intervals with transformations spearheaded by David Lewin (1987).

Having characterized a displacement continuum and the location of musical passages on it, I now relate this continuum to syncopation. If the essence of syncopation indeed lies in the contradiction between the rhythmic surface and the prevailing metric structure, then syncopation at its most intense occurs, not at the ends of the continuum in Example 2a, where the listener's perceptions conform more closely to PH1 or PH2, but in the middle, where both rhythmic surface and underlying metric structure are clearly defined and in greatest tension with one another. More precisely, the strongest syncopation occurs just before the "tipping point" between PH1 and PH2—when PH1 just barely retains its authority against a strongly conflicting rhythmic surface.

Strictly speaking, syncopation occurs only when PH1 is "in control," that is, on the left side of the continuum. Metric conflict rather than syncopation occurs when PH1

[23] Krebs's displacement dissonances consist of misaligned metric layers moving at equal rates; his grouping dissonances comprise superimposed metric layers moving at noncongruent rates (2003, 31–33). Krebs borrows the terms displacement and grouping dissonance from Kaminsky 1989, 27.

is more weakly present, on the right side of the continuum. But, as indicated by the unidirectional arrow in the example, we experience displacement against the backdrop of PH1 throughout the continuum; PH1 is not overturned entirely until we reach the PH2 point at the end of the arrow. Thus, in this continuous rather than discrete model, syncopation more broadly construed occurs to greater or lesser degrees along the length of the continuum.

To portray these gradations of syncopation, Example 2b loops the displacement continuum around into a spiral, in which established PHs line up vertically. Progression along the spiral in an upward direction indicates displacement of increasingly greater metric weight against the originating PH, as well as progression from one PH to another (PH1 to PH2 shown here). It does not indicate constantly increasing syncopation; rather, syncopation increases as one moves towards the "front" side of the spiral.

Example 2c provides a bird's eye view of this spiral to show its structure more clearly. The least syncopation occurs at the top of the circle or the back of the spiral (as visually represented on the page), where metric structure goes unchallenged. The greatest syncopation occurs on the opposite side of the circle or spiral, where PH and contradictory rhythmic surface are almost evenly balanced, skewed slightly in favor of the original PH.

* * *

To demonstrate the efficacy of the tools I have presented, I apply them to six musical works of widely varying styles. Each analysis or group of analyses focuses on one of the three questions I have raised. The first example, by Bartók, demonstrates how PHs and metric contours facilitate the analysis of syncopation in non-isochronous meters. The second, by Schoenberg, shows how differentiating between syncopes and offbeats reveals heretofore unnoticed structural processes. The last four examples, by Herbie Hancock, Wagner, Billie Holiday, and Beethoven, illustrate how the displacement spiral enables the types and intensities of syncopation in individual passages to be characterized and thereby compared.

1. PHs and Metric Contours

Bartók: Fifth String Quartet, III

The third movement of Bartók's Fifth String Quartet features intriguingly fluid use of non-isochronous meters. Syncopation is usually difficult to analyze in such contexts, but PHs and metric contours will allow me to show how the movement employs increasing use of syncopation as a dramatic strategy. The process is both a cumulative and a parallel one: within the scherzo-trio-scherzo da capo form, syncopation intensifies within each scherzo, as well as from the first to the second scherzo.[24]

Bartók notates the meter of this movement as $\frac{4+2+3}{8}$. Examples 5 and 6 sample the chronological unfolding of syncopation in the two scherzi of the movement. Scherzo 1 appears in Examples 5a–d and analogous passages from Scherzo 2 in Examples 6a–d. Each scherzo is in ABA' form. We will look at Scherzo 1 first.

As shown in Example 5a, the movement opens by establishing its basic PH, 4+2+3\4+5\9 (1 = eighth note). (This basic metric contour is given at the top of Example 5 for reference.) The 4+5 level is supported by registral change, pitch contour in the upper-voice undulating figure (m. 3 ff.), and the "walking bass" (in mm. 10–11, not shown).[25]

In the scherzo's B section (Example 5b), 4+2+3 subdivides into 2+2+2+3, as discussed earlier. This B theme introduces an accompaniment in the lower strings that articulates level-4 offbeats. In addition, on the last quarter note of m. 25, the accent and longer duration, combined with the violins' local pitch minima, suggest the conflicting PH 4+3+2\9.

As demonstrated earlier in Example 1, the subsequent passage (Example 5c) ups the syncopation ante. The upper strings again articulate the same level-4 locations in the measure, but now as syncopes rather than merely offbeats. The syncopes force the listener to reevaluate the PH; as shown by dot diagrams above the score, levels of the hierarchy seem to shift by +1 within the prevailing measure, from 2+2+2+3\4+5\9 to 1+2+2+2+2\1+4+4\9. The cello underlines the +1 shift by articulating 3\9 shifted by +1 from the notated downbeat.

After further intensifying the syncopation, Bartók brings back A material (not shown) and its original PH 4+2+3\4+5\9. Then, as shown in Example 5d, he winds down the first scherzo, by introducing a gentler level of syncopation than in the previous examples—level 1, first as an offbeat (1t), then as a syncope (1s).

We will now look at what happens in Scherzo 2 in analogous places. When the scherzo returns after the trio (Example 6a), it reintroduces the basic PH 4+5\9 (shown by dots under m. 2), articulated by agogic and pitch-contour stresses.[26] However, the scherzo leaves the basic 4+2+3 level unarticulated until the entrance of *pizzicati* in m. 3, and they, along with the pitch contour, articulate not 4+2+3 but 4+3+2, again shown

[24] This analysis examines the scherzi only; for an examination of the trio in the context of the movement see Leong 2008 and Leong 2000.

[25] In this passage, one can hear 6+3 instead of 4+5 due to a harmonic shift on the last dotted quarter. (See footnote 6.) However, in the larger context of the movement 4+5 is a more plausible choice.

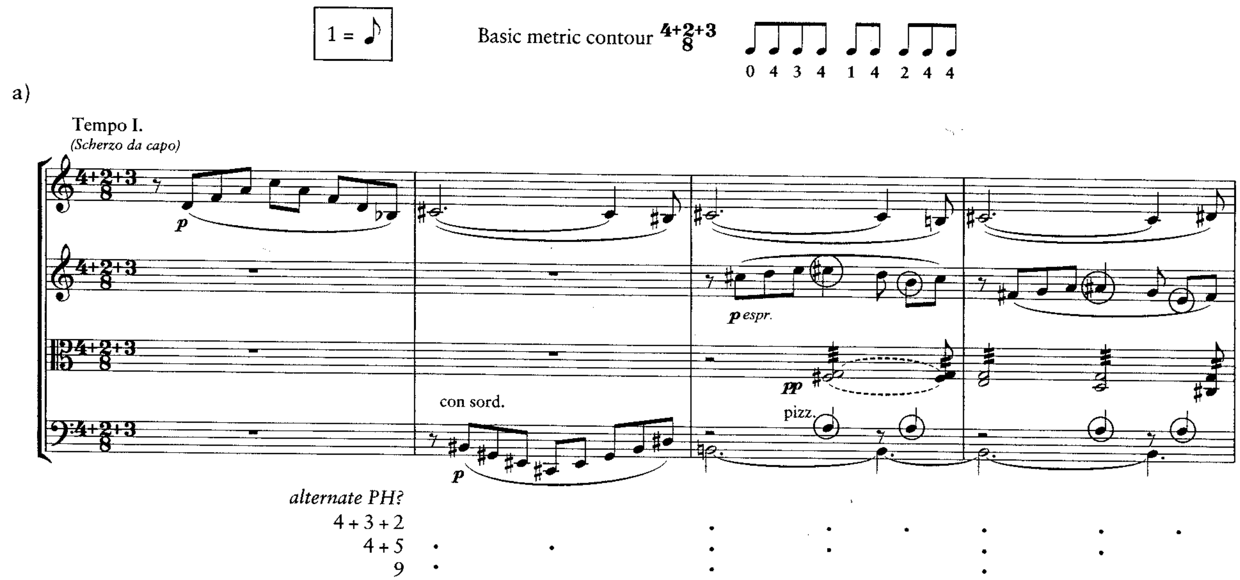
[26] This binary subdivision of the measure flows smoothly from the trio's basic PH 5+5\10.

EXAMPLE 5

Bartók, Fifth String Quartet (mvt. III), showing increasing syncopation within Scherzo 1 c)

d)

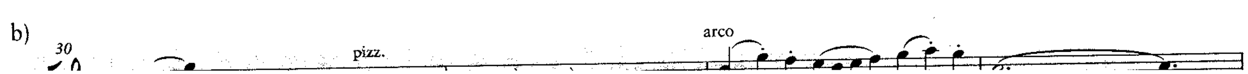
EXAMPLE 5
(cont'd.)



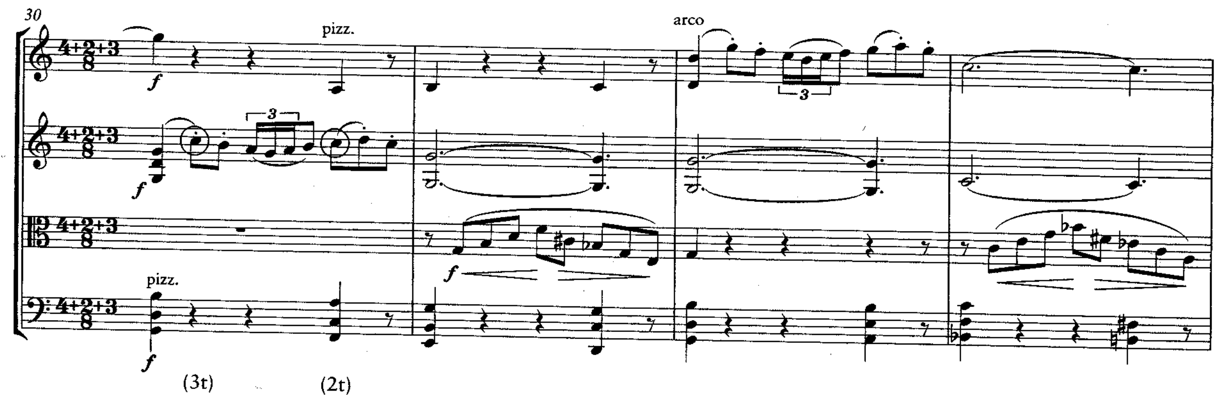
EXAMPLE 6

Bartók, Fifth String Quartet (mvt. III), showing increasing syncopation within Scherzo 2

String Quartet No. 5, SZ102 by Bela Bartok



b)



c)

EXAMPLE 6
(cont'd)

EXAMPLE 6
(cont'd)

by dots.[27] (The sustained bass line and hence lack of bass support make this PH sound rather tentative.) This tentative alternate PH, resulting from the shift of the third pulse an eighth note later in the measure, has been hinted at several times in the first scherzo, for instance in Example 5b.

Bartók then brings us back to metric home base, strongly reestablishing the original 4+2+3 PH (not shown), before gradually intensifying the syncopation through the second scherzo. The increasing syncopation is initially less intense than in corresponding places in the first scherzo. Compare Examples 5b and 6b. In Example 6b, the inversion of the B theme creates a pitch contour in which the high C's emphasize offbeats 3 and 2; offbeat 2 is supported by an accompanimental *pizzicato* chord. I have placed the offbeat labels in parentheses because the sense of being off the beat is fairly subtle.

From this point the syncopation ramps up quickly, so that Example 6c brings back the metric shift found in Example 5c, now as accompaniment to a new voice in the second violin. This new voice injects new metric-rhythmic complexities into the situation, switching between the shifted 3\9 of the cello, the quarter-note beat of the upper strings (m. 42), and its own motivic transformations (m. 43).

Further rhythmic intensification is again followed by a return to A material (not shown), but this return, unlike that in the first scherzo, is relatively ambiguous melodically and metrically. In particular, although it articulates the downbeat clearly, it features the intermediate levels of the PH only occasionally and subtly. The subsequent passage, Example 6d, continues the sense of metric incompleteness: it now presents level-1 and -2 beats clearly, in conjunction with the opening's characteristic undulating motive and *pizzicati*, but it hardly articulates the downbeat. In a harmonic corollary to this metric situation, Bartók accents the dominant in m. 84 but leaves it dangling.[28]

Example 6e, which directly follows the passage in Example 6d, supplies a strong downbeat, but this downbeat is compromised by the *slargando* change in tempo, the deceptive harmony, and the apparent articulation of the wrong PH (4+3+2 rather than 4+2+3).[29] The downbeat of m. 88, an inconclusive "snap" *pizzicato*, and the ensuing *diminuendo* continue the uncertainty. Only in the movement's final two measures are the offbeats 1t and 2t restated (from mm. 81–85), along with their associated dominant harmony, and clearly resolved to the downbeat and tonic harmony.

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[27] Bartók's beaming also supports this interpretation. See also Example 6e.

[28] In his essay on this quartet, Bartók labels this movement as being in C-sharp (1935, 414).

[29] This "wrong" PH is articulated by the pitch contour and indicated by the beaming; the reader is reminded that it has occurred previously in passages such as that shown in Example 6a.

My use of PHs and their representation as metric contours reveals the intensification of syncopation in this movement, accomplished through moves from offbeats to syncopes, from the dominant PH to alternate ones, and from lesser to greater metric ambiguity—all within a mobile architecture of non-isochronous meters.

2. Syncopes and Offbeats

Schoenberg: Sechs kleine Klavierstücke, op. 19 no. 4

Charles Morrison (1992) has written convincingly of syncopation as motive in this little piece without, however, addressing its relation to pitch, or the question of offbeats. I shall briefly examine two aspects of syncopation in the piece—offbeats, and syncopes in relation to motivic pitch structure—and their convergence.

I parse the piece into three phrases, shown in Example 7. Each phrase slows at its end; chords fill out the texture at boundary points. The final phrase synthesizes material from the first two phrases; I shall not discuss these pitch relationships here.[30]

The piece contains four short punctuating chords, shown in ovals at mm. 2, 8, 11, and 12. Example 8a shows the notated durations of the chords, their dynamics, and their levels in the 2/4 metric contour. (The piece's basic metric contour is shown at the bottom of the example for reference.) As the piece unfolds, the chords increase in duration (and dynamic), and make their way to deeper levels of the metric hierarchy.

At the same time, Schoenberg sets up syncopes on metric levels 2 and 1. The boxes in Example 7 mark the cadence of phrase 1 (m. 4), the opening of phrase 2 (m. 6), and the cadence of phrase 3 (mm. 11, 12). Within each box there are two levels of motion: an initial melodic voice that articulates a syncope on level 2 (2s) and a following voice that expresses a syncope or offbeat on level 1 (1s or 1t).

Example 8b summarizes features of the syncopated passages in these three locations. Since I will be discussing melodic-rhythmic closure in these locations, I first define what constitutes such closure. F–F♯ and A♯/B♭–B have been established as primary pitch-class pairs in earlier pieces of the op. 19 set.[31] Pairings of these pitch classes and, in particular, directed motion within such pairs, therefore tends to create a sense of melodic closure. Rhythmic closure occurs when syncopes or offbeats "resolve" to strong-beat articulations.

In Example 8b, the first two examples, at *piano–pianissimo* dynamics, evade melodic and rhythmic closure. Measures 4–5 articulate an intermediate cadence: melodic

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[30] See Morris 1993 (209–12) for his discussion of pitch, set-class, and contour relationships in the piece.

[31] See, for example, James Baker's discussion of op. 19 no. 1 (1990, 181, 187, 190).

motion stops on A♯, holds over the barline, and begins anew with B♮ in the next phrase. Measures 6–7 oscillate between F♯ and F♮ (overlaid with G), sustain over the barline, and trail off into a rubato-like passage. (A♯–B lies underneath, pianissimo.)

The last two examples, at *forte–fortissississimo* dynamics, repeat, intensify, and eventually resolve the pitch motion and syncopes of the first two examples. In mm. 11–12, F–F♯ moves decisively to a downbeat G, and in mm. 12–13, B♭ moves emphatically to a downbeat B♮. Thus both passages resolve their level-2 syncopes and their associated pitches clearly.

As shown on Example 7, in phrases 1 and 2 the oval offbeat chords and the boxed <2s, 1s> syncope patterns do not intersect. But by the end of the piece, level 1 in the boxes, previously the site of gentle syncopes, has been taken over by the increasingly brash oval offbeat chords. The trajectory of these offbeat chords—ever louder, longer, and stronger in metric level—concludes with the final motion to m. 13's downbeat. Thus, both threads of syncopation—the melodic syncopes and the punctuating offbeats, representing different textures, levels, and types of syncopation, and associated with characteristic pitch motives—converge on the final *fortississimo* downbeat thrust.

Distinguishing between offbeats and syncopes allows us to recognize the confluence of the offbeat and syncope trajectories, the joining of which lends the final B♮ attack its peculiar power.

3. The Displacement Spiral

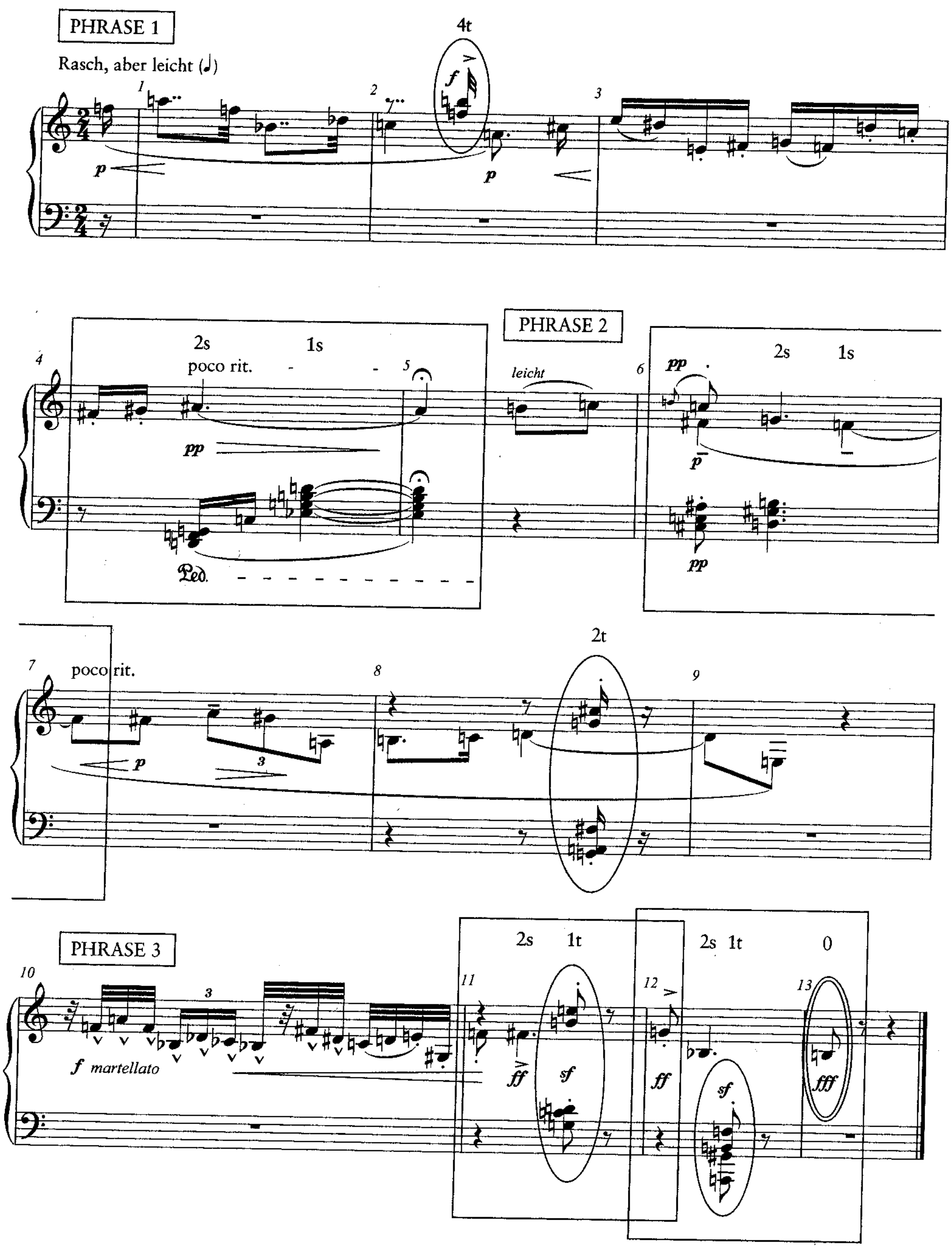
The displacement spiral will help us to discern four different gradations of displacement—each metrically weightier than the previous—in the following excerpts. After discussing the passages individually, I shall invoke the displacement spiral explicitly to interpret and compare the ways in which these passages are syncopated.

Hancock: "Madness" (alternate take), solo [32]

The opening of Herbie Hancock's solo in "Madness" (alternate take) demonstrates the progressive displacement of motivic elements. Example 9 presents the solo's opening motivic transformations.[33] As shown on the right of the example, statements of the motive become successively higher and shorter. On the left, arrows show how Hancock gradually pulls the motive's elements earlier in the measure; labels on the arrows indicate

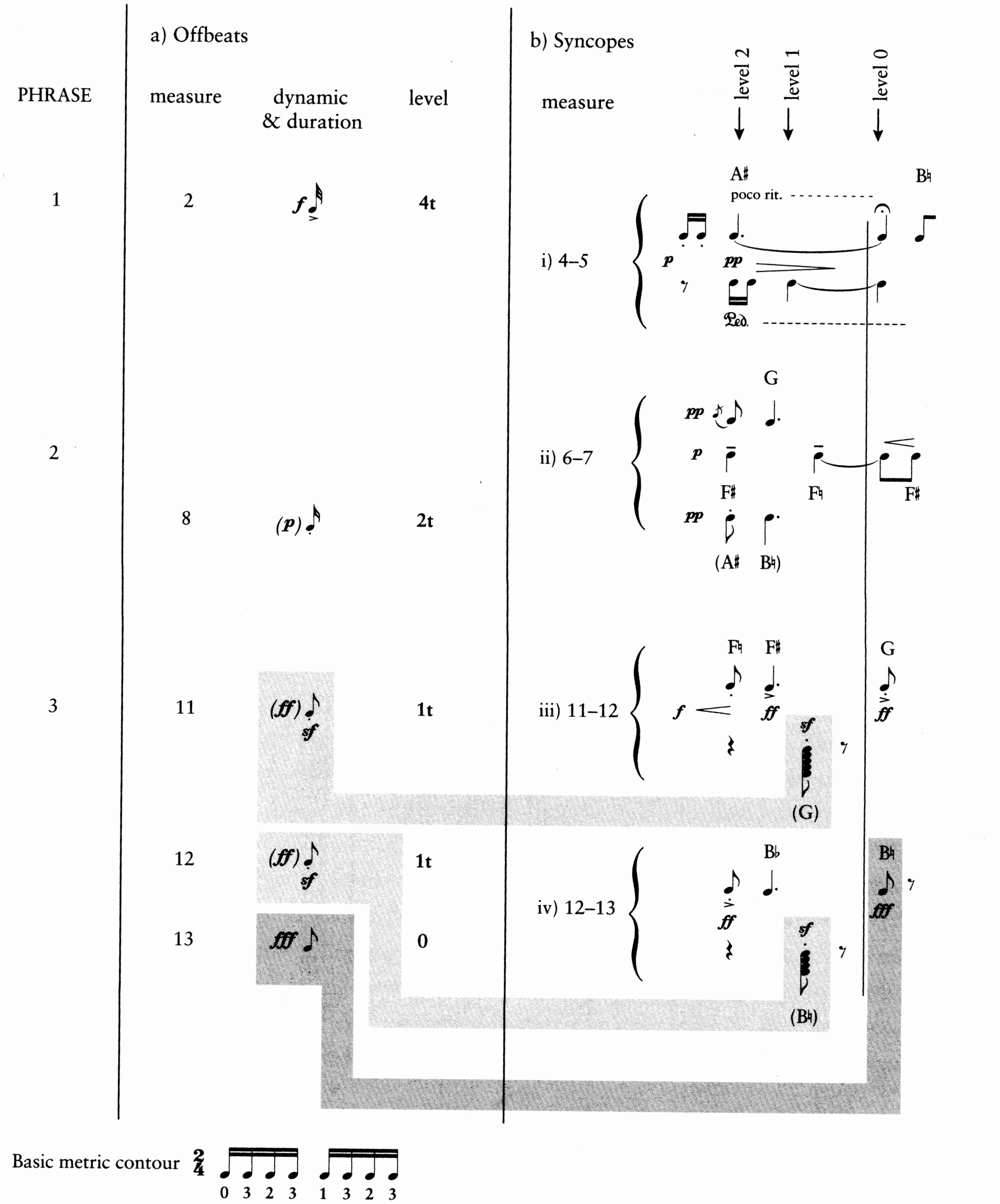
[32] Herbie Hancock's piano solo in "Madness (alternate take)," in Miles Davis, *Nefertiti*, Legacy 65681, 1998 (remaster of Columbia 9594, 1967). Ron Carter (bass) and Tony Williams (drums) accompany Hancock.

[33] I thank Keith Waters for the use of his transcription, from which this example is adapted. See also Waters 1996, which treats metric displacement in Hancock's piano solos.

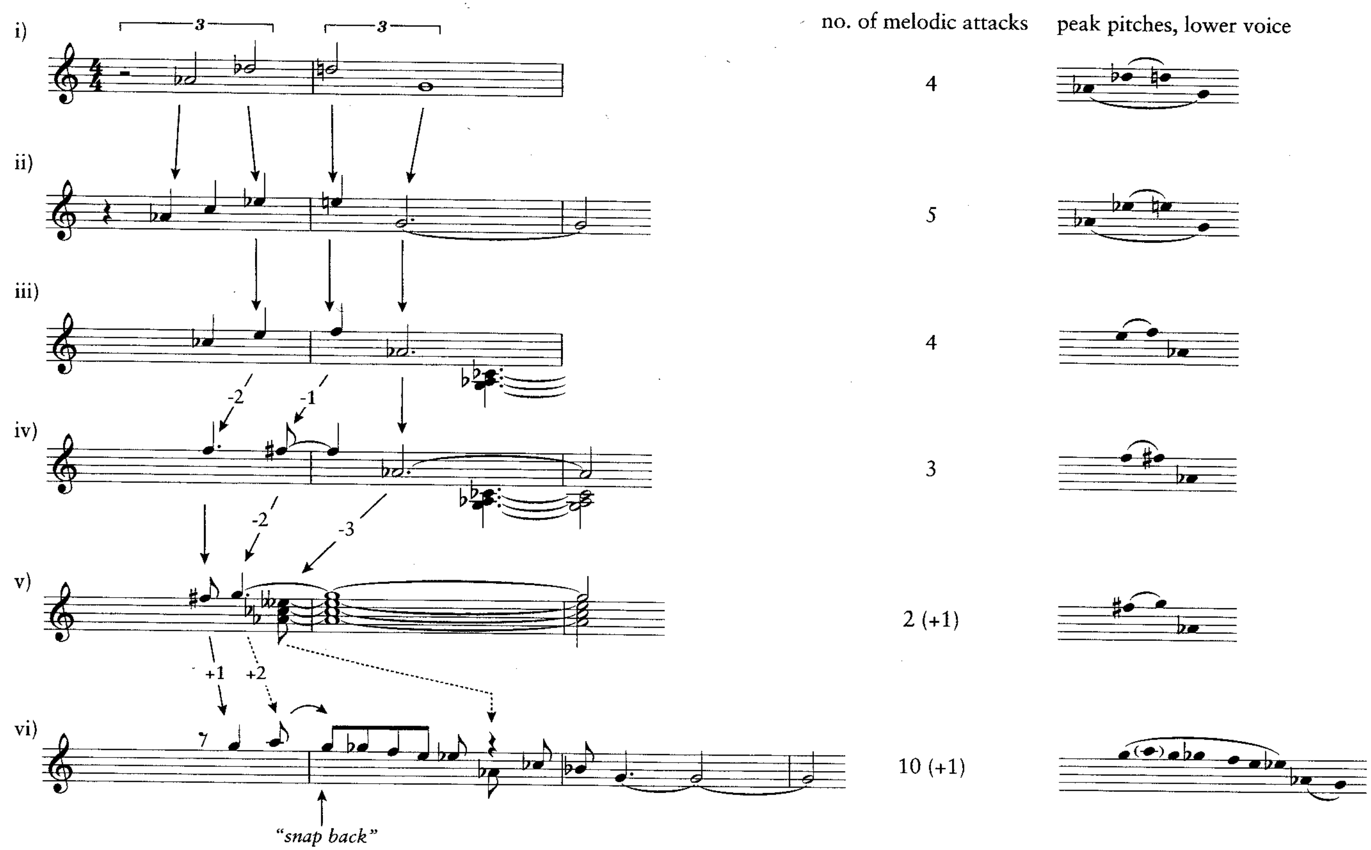


EXAMPLE 7

Schoenberg, Sechs kleine Klavierstücke, op.19 no.4: offbeats and syncopes



EXAMPLE 8
Offbeats and syncopes in Schoenberg, Sechs kleine Klavierstücke, op.19 no.4



EXAMPLE 9

Hancock, "Madness" (alternate take), piano solo: displacement of motivic elements

(adapted from transcription by Keith Waters; rhythmic values are approximate) the direction and size of the displacement in eighth notes. As Hancock pulls the elements to earlier metric positions, he elongates them, resulting in syncopes rather than offbeats. The effect is that of an elastic band being pulled back.

In statement vi of the motive, Hancock slightly eases the tension on the elastic by decreasing the pull, shifting the motive's two peak pitches later in the measure. The highest point in statement vi—to continue the pattern of statements iv and v—should be an A♭, should be a syncope, and should continue the lengthening of the motive's top pitch. It is none of these things, leading instead to the following downbeat's G. The gradual ascent of motivic statements i–v finally reaches its goal pitch G here on the downbeat, and Hancock then lets the elastic snap back. The tension created up to this point by the successive shortening of the motive releases, in a rush of eighth notes that brings the pitch level back down to that of the first two motivic statements.[34] Hancock's solo thus displaces events in a dynamic process of motivic transformation.

Wagner: Parsifal, *opening*

The Communion theme that opens *Parsifal* displaces events relative to a posited prototype. Of this theme, David Lewin writes, "Contour, dynamics, and *floating-versus-beating metrics* spotlight the climactic *Leittonwechsel* from A♭ major to C minor, and the return to A♭ major by *Leittonwechsel*."[35] (For the *Leittonwechsel*, see Example 10, adapted from Lewin's article.)

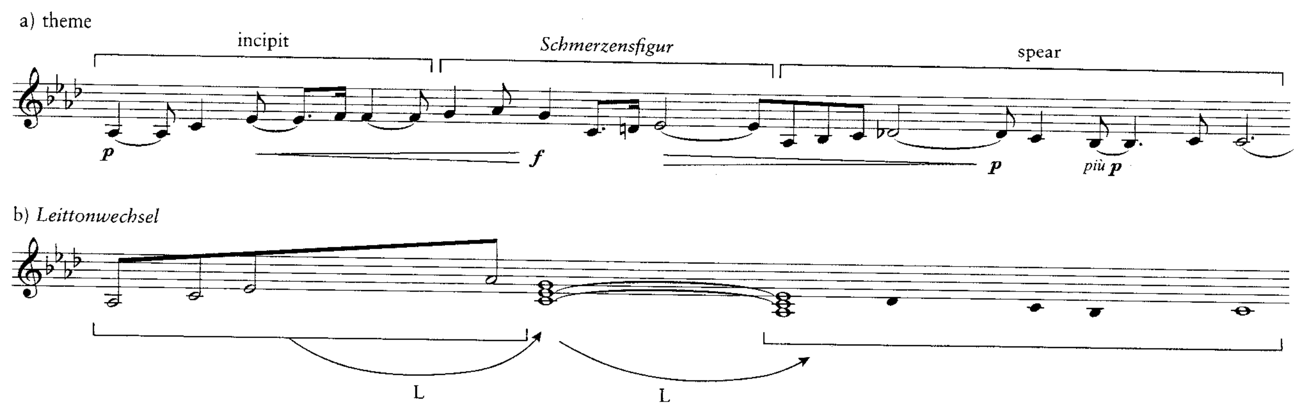
Example 11b shows the theme. The theme's *floating-versus-beating metrics* result in mm. 1–2 from syncopations that almost completely evade the quarter-note tactus, in mm. 3–4 from the clear downbeat and articulation of the half note beat, and in m. 5 from further syncopations.

Above the theme, in Example 11a, I have simplified Wagner's floating metrics to beating ones. Other reductions are possible, especially for m. 5. I have chosen to reduce m. 5 in this way for the following reasons: 1) in relation to Wagner's immediately-following harmonization of the theme, this reduction places consonant melodic pitches on each strong beat;[36] 2) the C pick-up to m. 6 is clearly an anticipation, and the preceding C and B♭ can be heard in parallel to the closing C's as "anticipations;" and 3) this reading

[34] The pitch level reached is that of motivic statement ii. Statement i seems somewhat independent of the process in statements ii–v: its peak pitches are separated by a whole tone rather than a semitone from the following statement, and the number of its attacks lies outside the gradual decrease of melodic attacks in statements ii–v.

[35] Lewin 1992, 55; emphasis (other than "*Leittonwechsel*") mine.

[36] In m. 13 (parallel to m. 5), Wagner harmonizes the melody with ii^7 and V^7 on the downbeat and third beat of the measure respectively.



EXAMPLE 10
Wagner, "Communion" theme from *Parsifal*, Act I, mm. 1–6
(adapted from Lewin 1992, 56)

EXAMPLE 11

Wagner, "Communion" theme from *Parsifal*, Act I, mm. 1–6: displacement of events from prototype maintains the basic quarter–quarter–half measure rhythm of the second portion of the phrase.

Below the theme, Example 11c provides the theme's framework PH (the 4/4 meter). The arrows in Example 11c show the displacement from the metric contour of my onbeat version to the metric contour of Wagner's syncopated one. In mm. 1–2, two waves of arrows move progressively from deep and long to shallow and short. The two waves build to a crest, crashing down on the downbeat of m. 3 and the A♭ major / C minor *Leittonwechsel*. From the downbeat of m. 3, the built-up energy dissipates: in Examples 11a–11b one sees that motion changes from a prototypical long–short–short within each measure, to short–short–long; pitches descend; and dynamics decrease.

However, it appears that the momentum built up by the waves of the first two measures requires more than the reversed directions of mm. 3–4 to subside. The dot diagram shows that m. 5 provides a counter-wave—an undertow that begins on the surface and moves progressively deeper, in the opposite direction from the waves of mm. 1–2. The pushing-forward of the beginning waves subsides in the pushing-backwards of the closing wave.[37]

The dominant meter of this passage remains ambiguous until the beating metrics arrive in m. 3. The tempo and expressive performing indications *sehr langsam* and *sehr ausdrucksvoll*, the elasticity of many conductors' interpretations, and the irregular rhythmic surface all contribute to this sense of metric uncertainty. One can even hear the opening two measures in a latent 3/8 meter, as shown in Example 11d. The listener hears the opening duration, expects its reproduction at (•), then backtracks to hear the same duration reproduced up to the downbeat of m. 3, creating a 3/8 meter.[38]

Once the listener hears m. 3, however, the meter is clear, and the entire theme can be understood in that context. The foregoing analysis is thus partly retrospective; it assumes the listener's knowledge of m. 3 and following or of the general metric framework of the prelude. (In the prelude alone, the theme occurs multiple times and the listener is afforded many opportunities to hear it in its 4/4 metric framework.) One can liken my interpretation to a retrospective understanding of a tonally ambiguous opening in a work that quickly establishes its tonality. The Communion theme in *Parsifal*, then, shows displacement of events from an understood metric background.

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[37] Although aspects of my analysis resemble Fred Lerdahl's (2001, 285–97) treatment of metrical attraction, our approaches differ significantly: Lerdahl models "the attractions between beats, rather than between events" (290), and allows for only one direction of attraction, from earlier to later.

[38] I thank Meredith Metzger for suggesting this reading.

Holiday: "What is this Thing Called Love?"[39]

In her 1945 recording of Cole Porter's song "What is this Thing Called Love?" Billie Holiday displaces her vocal phrases relative to the beat of the band, articulating, on a hidden level, an independent tempo and associated metric grid. This discussion borrows the findings of Hao and Rachel Huang (1995) and places them in the context of our exploration of displacement.

Billie Holiday is known for the unique quality of her "back phrasing," a characteristic rhythmic technique in which she lags (often quite far) behind the beat. In "What is this Thing Called Love?" Holiday's back phrasing creates a continuous stream of irregular syncopes that invests her vocal with great fluidity and rhythmic interest, and yet, despite its flexibility, conveys an unmistakable rhythmic logic. Huang and Huang explain this logic by positing an independent tempo for Holiday's line.

Example 12 provides the opening of Huang and Huang's transcription of this recording. The transcription locates Holiday's sung line spatially in relation to the band's beat and the standard lead sheet version of the tune. The note values and dotted bar lines of Holiday's line are transcribed at quarter = MM 138, while those of the reference tune below are notated at the band's basic tempo of quarter = MM 116. White "bar lines" in Holiday's part cross-reference the band's bar lines; parenthesized rests show that Holiday pauses between vocal phrases to reorient herself behind the band. (Holiday's putative MM 138 pulse continues through the parenthesized rests.) Every note of Holiday's vocal articulates a syncope in relation to the band's meter.

One cannot transcribe Holiday's line both accurately and logically at the band's tempo: one must either use overly complex rhythmic notation at odds with the song's basic meter, or "normalize" Holiday's rhythmic liberties. If one considers Holiday's line at the faster hypothesized tempo, however, it fits quite naturally into the basic pulse and metric framework. This "straight" transcription takes some of the swing out of Holiday's line, but in recompense it offers a cogent explanation for the sense of structure within it.

As Huang and Huang mention, Holiday's 1941 recording of "All of Me" provides an even clearer example of this phenomenon.[40] Although the band plays at approximately MM 108, Holiday can be tracked at quite a strict MM 152. Lester Young, Holiday's friend and collaborator, also plays on this recording. His rhythmic freedom is often

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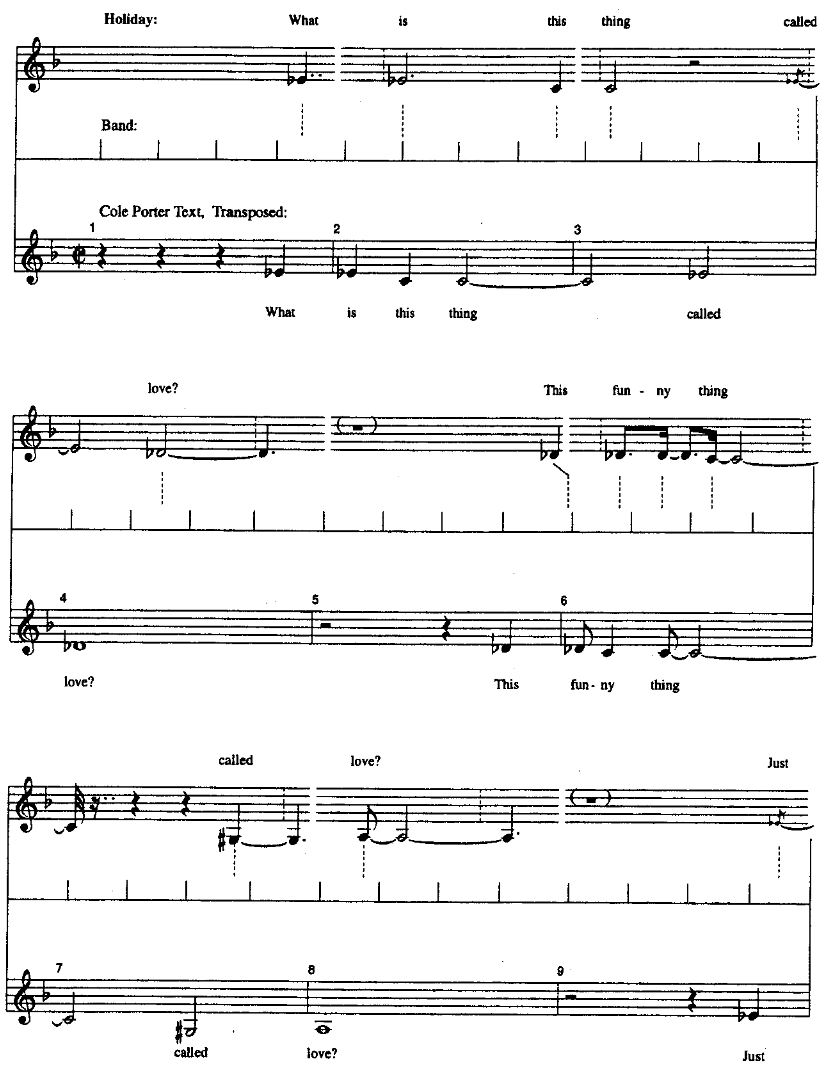
[39] Billie Holiday, "What is this Thing Called Love?" with Bob Haggart and his Orchestra, in *Billie Holiday: The Complete Decca Recordings*. MCA Records GRD2-601, 1991 (remaster of Decca 23565, 1945).

[40] Billie Holiday, "All of Me," with Eddie Heywood and his Orchestra, in *The Chronological Billie Holiday 1940–1942*. Classics Records 680, 1993 (remaster of Okeh 6214, 1941). See Folio and Weisberg 2006 for analysis of timing in three of Holiday's recordings of "All of Me."



EXAMPLE 12

Holiday, "What is this Thing Called Love?": back phrasing and hidden independent tempo (adapted from Huang and Huang 1995, 189)

compared to Holiday's, but his playing on this tune cannot be interpreted in an alternate tempo as Holiday's singing can: Holiday's "shadow" tempo seems unique to her.

Holiday's displacements never threaten the band's tempo and meter. Her hidden tempo simply structures the location of her displacements in a way that feels at once free and intrinsically logical, and that expresses a syncopation of the most sophisticated kind. Her vocal line thus displaces events concealing a nascent metric structure.

Beethoven: String Quartet in B-flat major, op. 18 no. 6, III

The scherzo of Beethoven's String Quartet, op. 18 no. 6, displaces not only events, but a listener's sense of the metric structure itself. Example 13 shows the opening of the movement. Syncopation occurs in several ways in this passage, contradicting Beethoven's notated 3/4 meter. The top voices clearly articulate quarter-note pitch durations and 3/4 meter by pattern repetition. Locating the downbeat, however, proves tricky. As shown in Example 13a, *sforzando* markings attest to a shift "earlier" by one eighth note from the notated meter. As shown in Example 13b, alignment of harmonic content with the cello downbeats suggests a shift "later" by one eighth note from the barline.

The lower voices both clarify and complicate the metric situation. As shown in Example 13c, their downbeats occur at the notated barline, but their rhythmic and harmonic patterning (as well as Beethoven's beaming throughout the passage) generally suggest 6/8 meter.

This 6/8 hearing of the lower voices, in which tonic and dominant harmony alternate in dotted-quarter-note durations, breaks down at m. 3, where hearing the second half of the measure as dominant anticipates the dominant harmony of the half cadence in m. 4.[41] Therefore I interpret the surface harmonic rhythm of the passage as shown by Example 13d and by Roman numerals immediately below the score: in the first three measures, tonic harmony lasts through the measure (rearticulated by the cello's B♭s on beat 3), and changes on the last eighth of the measure (underlined by the violins' *sforzandi*). This pattern results in a 3/4 meter and a harmonic rhythm that accords with the cadential move to ii^6 in m. 3 and with the passage as a whole up to m. 6.

The most striking feature of this passage is the way that it plays with listeners' perceptions. The upper voices bluff us into hearing their *sforzandi* as downbeats.[42] (Recall that shifts "earlier" in the measure have a greater tendency to create metric weight than those "later" in the measure.) When the actual downbeat arrives at the cadence in m. 4, we are suddenly forced to reevaluate everything that we have already heard—but the upper voices immediately insist again on their *sforzando* meter, and we are once again thrown off balance. We are never allowed to gain solid metric footing, and the quick tempo contributes to keeping us off balance. In this example, displaced meter impersonates the "real" meter, in a game of mistaken identity.

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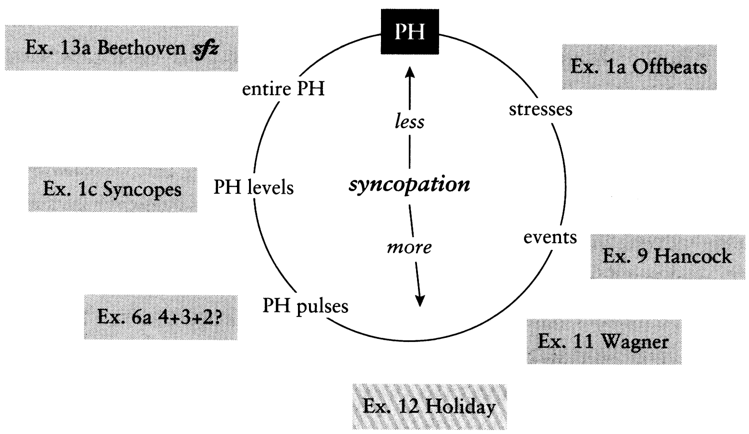
[41] The 6/8 tonic-dominant hearing of the lower voices also creates a sing-song-y harmonic rhythm at odds with what I believe to be the rhythmic character of the viola and cello, as well as with Beethoven's notated 3/4 meter.

[42] This interpretation privileges melodic/dynamic stress over harmonic stress. A more harmonically-oriented hearing would give less credence to the *sforzando* melodic accents. Krebs, for instance, hears the notated downbeat "quite clearly presented within the opening measures of the Scherzo" (2006, 39–45). See Krebs 2006 for a rhythmic analysis of the entire scherzo and its relation to compositional sketches.

EXAMPLE 13

Beethoven, String Quartet in B-flat major, op. 18 no. 6 (mvt. III), mm. 1–8: displaced meter



EXAMPLE 14
Location on displacement spiral

The types of displacement occurring in these four passages, by Hancock, Wagner, Holiday, and Beethoven, differ strikingly. Let us consider where these excerpts, and some of our opening examples by Bartók, fall on the displacement spiral. As shown in Example 14, the lower strings' offbeat chords in Example 1a displace stresses but not much more. Herbie Hancock's solo in Example 9 successively shifts motivic elements or events. The opening theme in Wagner's *Parsifal* shifts events relative to an imagined prototype that only gradually coalesces. Holiday's vocal line displaces events relative to the band's beat, creating a hidden independent tempo and associated meter. Bartók's returning scherzo in Example 6a displaces a PH pulse to suggest a new PH 4+3+2\9. The syncopes in Example 1c imply the shift of most levels of the established PH. The *sforzandi* of the Beethoven string quartet articulate an entire shifted PH, although the listener continues to be reminded of the primary PH by the harmonic rhythm.

Very roughly speaking, the seven passages in the order listed here trace a path clockwise around the displacement spiral. The passages' locations on the spiral indicate the relative weight of their displaced objects: whether these objects function as figure on the ground of the initial PH, or work towards the establishment of a new PH. Greater distance clockwise from the original PH corresponds to greater rhythmic-metric conflict with that PH. For instance, Examples 1c and 13a, being most distant clockwise from their original PH, express the greatest metric conflict with it.

Intensity of rhythmic-metric conflict need not correspond to intensity of syncopation. As established earlier, the highest degree of syncopation occurs on the front side of the spiral, where the original meter retains its primacy but displaced objects challenge it to the utmost. Thus, although Example 13a expresses the greatest metric conflict with its original PH, falling farthest in clockwise distance from it, its new PH overbalances the original PH to an extent that syncopation (contradiction without overturning of a dominant metric structure) is not maximized. In this sense, both Examples 13a and 1a, symmetrical around the vertical axis of the circle, present minimal syncopation, the former favoring its new PH very strongly, and the latter weighting its original PH heavily. In contrast, Example 12 produces the greatest tension between a potential new PH and the original one. Holiday's back phrasing, in its smooth acquiescence to the dominant pulse yet subversive definition of its own tempo, produces a syncopation virtuosic in its subtlety and depth, one that occupies the position of greatest syncopation on the spiral in the context of the excerpts discussed here.

My use of the displacement spiral allows us to differentiate among different "flavors" of syncopation according to the proportions of the ingredients—the metric weights of the displaced objects and of the primary meter relative to one another, as interpreted by the analyst. In its separation of metric weight from scope, the spiral draws attention to the primary factor, weight, while permitting consideration of displacements of varying scopes. The model's three-dimensional linearity creates a metaphorical space in which syncopation can be roughly quantified and qualified, and syncopated passages compared.

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I began this article with three questions about the components of syncopation—its metric context, its rhythmic stresses, and its "contradiction"—and three ways in which existing answers to these questions could be supplemented. By introducing three new tools—a contour model of metric structure, a distinction between syncopes and offbeats, and a graded spiral of displaced metric weight—I hope to have contributed to fuller answers to these questions and to a more generalized account of syncopation.

The metric contour allows us to represent relative metric strengths in any metric hierarchy with ease and, since such hierarchies include non-isochronous as well as isochronous meters, to analyze syncopation in these broader metric contexts. The syncope-offbeat distinction lets us retain historical conceptions of syncopation, differentiate between narrower and broader uses of the term, and observe both strands of the phenomenon. The displacement spiral, based on a continuum of relative metric weights, helps us explore and differentiate among displaced objects spanning the full range of metric weights *and* scopes, characterize the types and intensities of resulting syncopation, and interpret differences among existing theoretical approaches to syncopation and metric change. The simplicity and flexibility of all three of these tools facilitate their application in a wide variety of metric contexts, styles, and repertoires.

My use of these tools in pieces by Bartók, Schoenberg, Hancock, Wagner, Holiday, and Beethoven illuminated the workings of syncopation in these passages. I traced intensifying syncopation through the fluctuations of non-isochronous meters in the scherzo movement of Bartók's Fifth String Quartet; followed syncope and offbeat trajectories to their convergence and resolution on the final downbeat of Schoenberg's *Klavierstück*, op. 19 no. 4; and gauged the types and intensities of syncopation created by the elastic pull-back and release of motivic elements in Hancock's solo in "Madness," by the waves of forward and backward displacements in the Communion theme of Wagner's *Parsifal,* by the underground tempo of Holiday's back phrasing in "What is this Thing Called Love?" and by the metric impostors in the opening of the third movement of Beethoven's String Quartet, op. 18 no. 6.

As demonstrated here, the tools of metric contour, syncope-offbeat distinction, and displacement spiral let us examine syncopation in a wider variety of manifestations, in broader contexts, with greater ease, clarity, and precision, and with deeper historical awareness than heretofore. The tools are merely that—tools, not methods, at the service of a theorist's conception of metric structure and interpretation of metric weight. But in their modeling of contour, duration, and weight, they permit the construction of a generalized theory of syncopation, one that provides a fuller picture of how rhythmic stresses contradict a dominant metric structure—of how, in short, music is syncopated.

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