

## Phrase Rhythm in Standard Jazz Repertoire: A Taxonomy and Corpus Study

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### SECTION I: INTRODUCTION

One aspect of standard jazz repertoire that distinguishes it from traditional Western concert music is its hypermetric regularity.<sup>1</sup> While regular hypermetric structures are certainly common in Classical and Romantic music (many would even consider them a standard feature), deviations from that regularity are also common. Indeed, one could easily argue that they are expected.<sup>2</sup> On the other hand, four- and eight-bar hypermeasures are ubiquitous in jazz standards. Even before the advent of bebop, Theodor Adorno censures jazz for the limitations of its rhythmic structure, claiming that for all of its stylized syncopations, “[t]he eight-bar period, and even the four-bar half period are maintained, their authority unchallenged.”<sup>3</sup> Modern scholars have been less critical on this point while still seeing fit to address it.<sup>4</sup> See, for example, Steven Strunk’s observations on the topic.

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<sup>1</sup> For the purposes of this study, we define standard jazz repertoire broadly as compositions written by North American and British songbook composers, bandleaders, and jazz musicians between the years 1920 and 1959.

<sup>2</sup> See, for example, William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer, 1989); David Temperley, “Hypermetric Transitions,” *Music Theory Spectrum* 30, no. 2 (2008): 305–25; or Samuel Ng, “Phrase Rhythm as Form in Classical Instrumental Music,” *Music Theory Spectrum* 34 no. 1 (2012): 51–77.

<sup>3</sup> Theodore Adorno, “On Jazz” [orig. 1937], in *Essays on Music* (Los Angeles: University of California Press, 2002), 471.

<sup>4</sup> Steven Strunk, “Early Bop Harmony: A Layered Approach,” *Journal of Jazz Studies* 6 (1979): 4–53; Henry Martin, “Jazz Harmony: A Syntactic Background,” *Annual Review of Jazz Studies* 4 (1988): 14; Allen Forte, *The American Popular Ballad of the Golden Era* (Princeton University Press, 1995): 36–41; Keith Waters, “Blurring the Barline: Metric Displacement in the Piano Solos of Herbie Hancock,” *Annual Review of Jazz Studies* 8 (1996): 22–23; Laurent Cugny, *Analyser le Jazz* (Paris: Outre Measure, 2009): 279; Stefan Love, “An Approach to Phrase Rhythm in Jazz,” *Journal of Jazz Studies* 8 (2012): 4–32; and Joe Mulholland and Tom Hojnacki, *The Berklee Book of Jazz Harmony* (Berklee Press, 2013): 13–18.

The rhythm of bop harmony at the foreground level is virtually always duple at each division or subdivision: the duration of most chords is two, four, six, or eight beats; phrases are two, four, six, or eight measures long; compositions (choruses) are usually twelve, sixteen, or thirty-two measures long. The utter simplicity and rigidity of these rhythmic structures highlights the complexity and subtlety of the jazz rhythmic nuances and syncopations which proliferate against the basic duple pulse.<sup>5</sup>

Strunk, like Adorno, recognizes the pervasive metric and formal symmetry that characterizes standard jazz repertoire. However, Strunk's opinion is the inverse of Adorno's in that he recognizes how such metric regularity offers a background against which players can showcase more subtle rhythmic effects. He goes on to observe how this regularity creates larger-scale metric relationships, noting "that background rhythm will bear a strong resemblance to foreground rhythm, particularly in such a limited, strongly duple context."<sup>6</sup> Keith Waters runs further with this idea, literally projecting the properties of simple quadruple time onto even larger formal segments.

[T]he Strong-Weak-Strong-Weak metric patternings of the 4/4 measure inflate to larger levels: at a 4-measure level the downbeats of the first and third measures receive greater metric weight than downbeats of the second and fourth measures; at an 8-measure level the downbeats of the first and fifth measure are strong in relation to the downbeats of the weaker third and seventh measures.<sup>7</sup>

Waters goes on to explain how quadruple hypermeter plays out across thirty-two measure AABA song forms, claiming that each "eight-measure segment is therefore represented by one hyperbeat," and in so doing, he demonstrates how a tune's entire form can represent a single quadruple measure. While jazz standards can take forms other than the AABA variety (such as ABAB' or ABAC), the greater bulk of that repertoire does consist of thirty-two measure tunes. At the very least, the majority of jazz standards do consist of sections of either eight or sixteen measures. Of course, standard jazz repertoire does have compositions whose measures do not readily group this way (i.e., the six-measure A sections of Karl Suessdorf and John Blackburn's "Moonlight in Vermont"). However, those exceptions are fairly rare compared to the hypermetric irregularities encountered in traditional Western concert music. In other words, deviations from hypermetric regularity in jazz are not nearly as common as those in traditional concert

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<sup>5</sup> Strunk, "Early Bop Harmony," 6.

<sup>6</sup> Ibid.

<sup>7</sup> Waters, "Blurring the Barline," 22.

repertoires, and people who appreciate jazz (i.e., experienced listeners) expect to hear regular duple and quadruple hypermetric structures fairly consistently when they listen to jazz standards.

While both duple and quadruple hypermeasures are eminently perceivable, the latter appeal to a somewhat greater sensitivity of hearing as they reflect a more complex hierarchy of beat strengths. That is, duple hypermeter comprises alternating strong and weak beats ( $| S W | S W |$ ), while quadruple hypermeter recognizes differences in strength between alternating strong and weak beats ( $| S W | s w |$ ). Given how pervasive the eight-bar section and the four-bar phrase are in jazz repertoire, we prefer to recognize quadruple groupings. For these reasons—the hierarchy and the quadruple-ness observed by Waters, above—our study works with quadruple hypermeter throughout.

Another element of standard jazz repertoire that is nearly as ubiquitous as its hypermetric structure is the  $II \rightarrow V \rightarrow I$  progression (hereafter “cycle”).<sup>8</sup> Jerry Coker notes that “about 70 to 100 percent” of the harmonies in a standard may consist of them.<sup>9</sup> In general, while the harmonic content of a standard can consist of nothing but cycles at various levels of transposition creating numerous tonicizations, most standards fall well short of the 100% mark. Broze and Shanahan employed a corpus of jazz standards to examine the prevalence of the cycle, and found that the  $II \rightarrow V$  “half cycle” accounts for roughly 20% of all chord-to-chord connections.<sup>10</sup> In the reduced corpus used in this study (which employs only pieces conforming to criteria discussed below), they account for 21.2% of all possible chord-to-chord connections. Example 1 presents two- and four-measure cycles.<sup>11</sup> In its normative form the cycle takes the proportion of harmonic

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<sup>8</sup> Martin, “Jazz Harmony,” which presents a model of jazz harmony based on an extended falling-fifths interval cycle and specifies several variations on those motions, anticipates this article in a general way.

<sup>9</sup> Jerry Coker, *The Jazz Idiom* (Upper Saddle River, NJ: Prentice Hall, 1975): 32.

<sup>10</sup> Yuri Broze and Daniel Shanahan, “Diachronic Changes in Jazz Harmony: A Cognitive Perspective,” *Music Perception* 31, no.1 (2013): 32–45. Of course, even a corpus entirely saturated with half cycles, with 100% of its harmonic activity involving  $II \rightarrow V$  motion, could only boast that 50% of its chord-to-chord connections were  $II \rightarrow V$  at some level of transposition. The other 50% would involve resolutions from dominants to the pre-dominants at the onsets of other half cycles. Using an adjusted metric, a more generous approach would simply double a given value, making the result roughly 40%.

<sup>11</sup> While cycles of other lengths do occur, they are not as common. See, however, four-beat cycles (which are discussed below) in Hoagy Carmichael and Johnny Mercer’s “Skylark” (*The Real Book* vol. 3, 267), or Richard Rodgers and Lorenz Hart’s “I Didn’t Know What Time it Was” (*The Real Book* vol. 3, 117). A rare eight-bar cycle occurs across the first section of Al Jolson, Buddy De Sylva, and Vincent Rose’s “Avalon” (*The Real Book* vol. 2, 13).

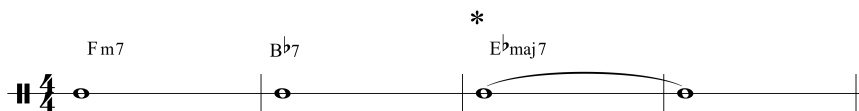
durations 1+1+2, with the tonic—or more accurately, the tonicized chord—lasting as long as the pre-dominant and dominant combined.<sup>12</sup>

Example 1. Jazz cycles.

A: Two-bar cycle.



B: Four-bar cycle.



In order to understand the relationship between cycles and hypermeasures, it is useful to apply the notion of “structural accent.” Lerdahl and Jackendoff explain structural accents as events that “initiate and terminate arcs of tonal motion,” creating “points of gravity” or “pillars of tonal organization” at the phrase level and above.<sup>13</sup> Of course, the term “phrase” is inherently ambiguous.<sup>14</sup> However, we may all agree that a phrase is a musical statement that comes to some degree of melodic and harmonic closure, typically after four to eight measures. In jazz repertoire, phrases tend to span a tune’s four- or eight-bar units. For this reason, we will refer to hypermeasures instead of phrases—primarily of four- and eight-bar lengths. When we adopt the notion of structural accent to jazz, we begin to understand how points of local, relative stability (that is, ‘micro-pillars’ of tonal organization) occur across hypermeasures when cycles are in play. Asterisks in Example 1 mark the structural accents of two- and four-bar cycles,

<sup>12</sup> Many authors have presented the cycle this way, rather than as a succession of chords of equal duration. See Jerry Coker, *Patterns for Jazz* (Lebanon, IN: Studio P/R Inc., 1970), 91ff.; and *The Jazz Idiom*, 33; John Mehegan, *Improvising Jazz Piano* (Logan, IA: Amsco Publishing, 1985), 93–96; Scott Reeves, *Creative Jazz Improvisation*, (Upper Saddle River, NJ: Prentice Hall, 1989), 43ff.; Barrie Nettles and Richard Graf, *The Chord Scale Theory & Jazz Harmony* (Weihergarten-Mainz, Germany: Advance Music, 1996), 36–37; Mullholand and Hojnacki, *Berklee Book*, 32–34; David Liebman, *A Chromatic Approach to Jazz Harmony and Melody*. (Weihergarten-Mainz, Germany: Advance Music, 2001): 17–23; and Dariusz Terefenko, *Jazz Theory: From Basic to Advanced* (New York: Routledge, 2014), 65–67.

<sup>13</sup> Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, MA: MIT Press, 1983): 30.

<sup>14</sup> See, for example William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer, 1989): 3–15.

which occur halfway through at the resolution to what would be, at the very least, a local tonic harmony.

With such consistent structural accentuation and durational proportions, the cycle encapsulates a familiar sequence of functions and presents an instantly recognizable gestalt despite the endless variations it can endure through transpositions, chord substitutions and surface-level rhythmic embellishment. The cycle pervades jazz repertoire, and has done so at least since the advent of bebop in the early 1940s. Cycles have become so rooted in jazz's harmonic language that popular songs are frequently retrofitted to incorporate them as they become standards. See Example 2, which allows us to compare the published sheet music for Jerome Kern's "Yesterdays" (1933) to that of a lead sheet from *The Real Book* vol. 1, a popular fake book first printed (illegally) in 1975.<sup>15</sup> Both examples present the first four measures of the song's chorus. Aside from the metric difference, note that the resolutions from subdominant to tonic in Kern's score have been changed to cycles in *The Real Book*.<sup>16</sup> Adjustments of this sort are common in fake book renderings. They reflect modern players' preference for the cycle and help maintain a remarkable consistency in the harmonic language of straight-ahead jazz.

Example 2. Jerome Kern and Otto Harbach, "Yesterdays," mm. 1–4 of chorus, two ways.

A. An early published score (1933).

The musical score for "Yesterdays" (1933) is presented in 3/4 time. It consists of a vocal line and a piano accompaniment. The vocal line has lyrics "Yes - ter - days, Yes - ter - days,". The piano accompaniment includes chords Dm and Gm6. The score shows the first four measures of the chorus.

B. *The Real Book* vol. 1, p. 473.

The musical score for "Yesterdays" from *The Real Book* vol. 1 is presented in 4/4 time. It consists of a vocal line. The vocal line has lyrics "Yes - ter - days, Yes - ter - days,". The piano accompaniment includes chords Dm7, Em7(b5), A7(b9), and Dm7. The score shows the first four measures of the chorus.

<sup>15</sup> Jerome Kern, "Yesterdays," (New York: T. B. Harms Company, 1933); *The Real Book*, 5<sup>th</sup> ed., illegal fake book, No credits.

<sup>16</sup> Or, hear Artie Shaw's 1939 performance of the standard (among the first successful recordings of the tune), which does not incorporate cycles at the onset of the chorus. See *The Complete Artie Shaw, Vol. 1 1938–1939* phonograph, RCA-AXM2-5527, 1976.

We assume that experienced listeners of jazz music are familiar with cycles (and  $II \rightarrow V$  half cycles) and sensitive to various levels of hypermeter. Such is the point of departure for our investigation into the interaction of these components. We present a study of phrase rhythm, which concerns relationships between grouping and meter. In doing so, we hope to contribute to a growing number of valuable studies of phrase rhythm in jazz. Most notable among these studies is Waters (1996), as well as Stefan Love's more recent body of work on the subject.<sup>17</sup> These previous studies have focused upon interactions between improvised melodic groupings and meter (including hypermeter). This article differs from those in that the groupings with which it is primarily concerned are harmonic. Furthermore, while the relationships discussed below may certainly arise in improvised accompaniment, we are primarily concerned with underlying compositional frameworks.

Section II explains our selection of resources, as well as the research methodology concerning our corpus study. Section III discusses how cycles interact with the strong and weak beats of quadruple hypermeasures of two, four, and eight bars in length, but focuses mainly on the latter two because they are far more common. Section IV investigates different variations that cycles may undergo across hypermeasures. Statistical data gathered from a corpus of 688 jazz standards reveals how common each type of interaction actually is. Corpus data is particularly relevant to Sections III and IV, and we hope that it affords scholars a more complete understanding of phrase rhythm in the vehicles that improvising jazz musicians use in their performances. Section V features analyses of three standards, and Section VI provides a brief conclusion.

## SECTION II: RESOURCES AND METHODOLOGY

Example 2 touches upon one of the problems with description and analysis of standard jazz repertoire. That problem concerns pinning down exactly what the harmonic structure of a tune actually is. An original recording of a jazz musician's composition is a reasonably accurate resource with which to start, though it is still not a foregone conclusion that subsequent recordings of the composition

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<sup>17</sup> In addition to "An Approach to Phrase Rhythm in Jazz," see Stefan Love, "On Phrase Rhythm in Jazz" (Ph.D. diss., Eastman School of Music, 2011) and "Subliminal Dissonance or 'Consonance?' Two Views of Jazz Meter," *Music Theory Spectrum* 35, no. 1 (2013): 48–61. See also Steve Larson, "Rhythmic Displacement in the Music of Bill Evans" in *Structure and Meaning in Tonal Music: Festschrift in Honor of Carl Schachter* (Hillsdale, NY: Pendragon Press, 2006), 103–122.

by other musicians will adhere exactly to the original.<sup>18</sup> Compositions written for theater or film—which constitute a significant amount of standard jazz repertoire—are yet another matter. Often, these composers did not even do their own orchestration or arranging for the productions in which their tunes first appeared. Furthermore, there are often numerous versions of sheet music for the more popular hits, and one cannot simply assume that any of those scores were penned or even approved by the original songwriter.<sup>19</sup>

While published sheet music, Broadway scores (if available), and sound recordings are all valuable resources, most examples in Sections III, IV, and V of this study are taken from the lead sheets of fake books.<sup>20</sup> With respect to accuracy, fake books are no less problematic than the other resources discussed above. But for better or for worse, the majority of today's jazz musicians learn repertoire from these books.<sup>21</sup> We wish to clarify that we do not intend for any score excerpt to represent a definitive version of a standard. Nor do we wish to dismiss or undervalue the significant amount of variation that occurs in performances, despite what may appear on a tune's lead sheet. We refer to lead sheets because they simply represent readily available instances of the processes described below. The bulk of our musical examples come from printed volumes of *The Real Book*, as these have been the most popular fake books on the market for decades. In this way, our examples come as close as they can to representing our shared understanding of jazz repertoire, although in truth, they only reflect our most popular—and as such, our generally preferred—arrangements.

While most of the examples below are renderings from fake books, we used a subset of a previously used corpus for the statistical component of this study in order to investigate the prominence of specific patterns across a large number of compositions. Our corpus comes from the application "iRealB," a resource widely

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<sup>18</sup> Compare, for example, the histories of recordings of Benny Golson's "Stablemates," or Dave Brubeck's "In Your Own Sweet Way" discussed in Keith Salley, "Ordered Step Motives in Jazz Standards," *Journal of Jazz Studies* 8, no. 2 (2012): 114–136.

<sup>19</sup> In addition to David Farneth, "Sources Required to Make a Critical Edition of an American Musical," *Revista de Musicologia* 16, no. 2 (1993): 51–60, see also Tony Thomas, *Music for the Movies* (New York: Tantivy Press, 1973): 1–39. Biographies of American songbook composers are often informative on conditions that problematize the issue of *Urtext* in this repertoire. See Edward Jablonski, *Harold Arlen: Happy with the Blues* (Garden City, NY: Doubleday & Co., 1961); Richard Rodgers, *Musical Stages: An Autobiography* (Cambridge, MA: Da Capo Press, 1975), Gerald Bordman *Jerome Kern: His Life and Music* (New York: Oxford University Press, 1980); or Laurence Bergreen, *As Thousands Cheer: The Life of Irving Berlin* (New York: Penguin, 1990).

<sup>20</sup> All examples have been re-notated to assure consistency of style.

<sup>21</sup> For a discussion of how this came to be, see Barry Kernfeld, *The Story of Fake Books: Bootlegging Songs to Musicians* (Lanham, MD: Scarecrow Press, 2006).

used by practicing and performing jazz musicians today. This application provides an accompanying web forum, in which musicians can upload and share playlists consisting of lead sheets. Our corpus was constructed from a playlist entitled “1200 Jazz Standards”.<sup>22</sup> In a previous study, Shanahan and Broze validated the “iRealB” charts against a list of fake books, and found that about 3.8% of the corpus contained chords not found in any fake book, whereas 2.3% of the sampled chords were omitted in the “iRealB” forum.<sup>23</sup> This gave a 93.9% accuracy of the chords represented in the corpus when compared to fake books commonly in use. Having decided that the “iRealB” corpus provides a reasonably accurate and ecologically valid selection of pieces currently in practice, we decided to use this dataset to further examine many of the points about hypermetric structures and cycles in jazz standards. The pieces in this corpus were converted into the `**kern` format for use in processing with the Humdrum Toolkit, as well as with Broze and Shanahan’s `jazzparser` scripts.<sup>24</sup>

To limit the corpus study to pieces likely to exhibit traditional hypermetric groupings, we primarily examined pieces whose measure count was divisible by eight. We did, however, allow twelve-measure tunes because of the numerous blues compositions in standard jazz repertoire. Additionally, we only allowed compositions from 1920 to 1959. This gave us a corpus of 688 jazz standards, reduced from the original “iRealB” corpus of 1188 pieces. This reduced dataset contains an appreciable cross-section of composers who were jazz musicians (as opposed to American Songbook composers), with Thelonious Monk being the most commonly represented, followed by Duke Ellington and Charlie Parker. See Figure 1.

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<sup>22</sup> This playlist has since grown to more than 1300 pieces, but this work uses the corpus from the original Shanahan and Broze 2012/2013 studies.

<sup>23</sup> Daniel Shanahan and Yuri Broze, “A Diachronic Analysis of Harmonic Schemata in Jazz,” in *The Proceedings of the International Conference on Music Perception and Cognition* (Thessaloniki, Greece, 2012): 909–917.

<sup>24</sup> David Huron, *The Humdrum Toolkit: Reference Manual* (Menlo Park, California: Center for Computer Assisted Research in the Humanities, 1995). Yuri Broze and Daniel Shanahan, “Diachronic Changes in Jazz Harmony: A Cognitive Perspective,” in *Music Perception: An Interdisciplinary Journal* 31, no. 1 (2013): 32–45.



Figure 1. The ten most commonly represented composers in the corpus of 688 standards.

Thelonious Monk	30
Duke Ellington	26
Charlie Parker	25
Cole Porter	24
George Gershwin	21
Irving Berlin	18
Jerome Kern	14
Richard Rodgers	14
Harold Arlen	13
Jimmy Van Heusen	10

Before searching through our corpus, we had to specify our terms. It was not enough to define a cycle as a  $II \rightarrow V \rightarrow I$  progression that can occur at any level of transposition. We had to broaden our criteria to find harmonic progressions that contained minor, minor 7, or minor 7<sup>b5</sup> chords that then proceeded to a dominant 7<sup>th</sup> chord (including  $b9$ ,  $\#9$ ,  $\#11$ , alt., etc.) by root motion of an ascending perfect fourth.<sup>25</sup> Likewise, potential tonics could be maj6, maj7, m7 or even m(maj)7 (a minor triad with a major seventh). Once we constructed this heuristic in such a way that flexible yet accurate searching was possible, the task became one of simple pattern-matching. We were then able to examine the prevalence of each pattern as it applied to multiple hypermetric situations by searching for specific placement within pieces. For instance, in order to look at four-measure units that fall within a regular four-bar hypermeasure, we would look for progressions beginning on mm. 1, 5, 9, 13, *etc.* to exclude irrelevant examples.

### SECTION III: CYCLE LENGTH, STRENGTH, AND ACCENTUATION

Observing the interaction of cycles and hypermeasures, it quickly becomes evident that cycles are generally constrained to begin at divisions of a measure or hypermeasure equal to half the length of that cycle. We refer to this as hypermetric constraint. According to hypermetric constraint, two-bar cycles can begin at the downbeat of any measure, within a section, but are not likely to begin on any other beat of a measure. To most experienced jazz musicians, this would seem so obvious as to be overlooked, but the relationship also plays out at other metric levels that are not as obvious. For example, four-bar cycles are only likely to initiate at mm. 1, 3, 5, and 7 within an eight-bar section, and four-beat cycles are only likely to begin on beats 1 and 3 of a four-beat measure (four-beat cycles are

<sup>25</sup> Broze and Shanahan's jazzparser script (2013) allows for the distinction to be made between root motion and bass motion, but for the purposes of this study, we looked solely at root motion.

the only normally occurring cycles that do not always begin on a measure's downbeat.)<sup>26</sup>

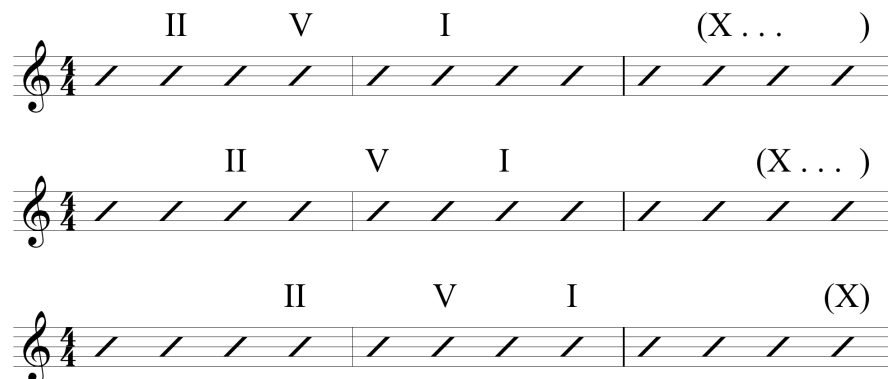
Taking the two-bar cycle as a point of departure, readers should already be familiar with the setting in Example 3A. Here, the cycle initiates on the downbeat of a measure and reaches structural accentuation on the following downbeat. We maintain that two-bar cycles are constrained by hypermeter to do so. Settings suggested in Example 3B are non-existent in standard jazz repertoire. They do not begin at divisions within two-, four-, or eight-bar quadruple hypermeter that are equal to half the length of the cycle.

Example 3. Settings of two-bar cycles.

A. Standard setting.



B. Implausible settings.

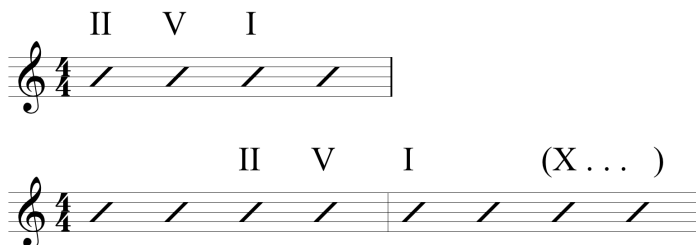


Four-beat cycles are similarly constrained. Cycles of this length will generally only occur at divisions of a measure (i.e., four beats) equal to two beats. The diagrams in Example 4A illustrate. We have found no instances of four-beat cycles beginning on beats 2 or 4. These unlikely settings are represented in Example 4B.

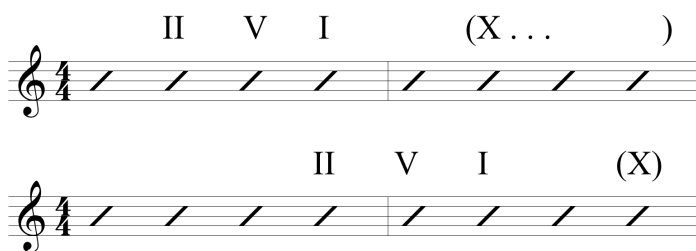
<sup>26</sup> In a four-beat cycle, II and V each last a single beat, and the tonic spans two beats. These cycles do not typically occur in triple-meter because harmonies generally do not move faster than one chord per measure in those meters (and certainly not faster than one chord per beat). However, two-bar cycles—where II and V occupy a single measure—occasionally occur in triple meter. See mm. 15–16 of Dave Brubeck's "It's a Raggy Waltz" (*The Real Book* vol. 1, 242).

Example 4. Settings of four-beat cycles.

A. Standard settings.



B. Implausible settings.



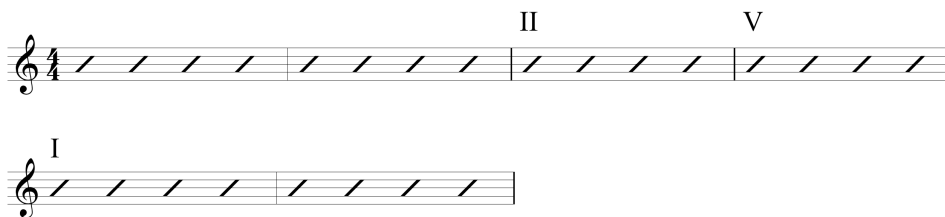
At the level of the four-bar cycle, hypermetric constraint limits cycles to begin at odd-numbered measures within any section that exhibits idiomatic hypermetric regularity. This places four-bar cycle beginnings at divisions within a four- or eight-bar section equal to two measures. Example 5 illustrates.

Example 5. Standard Settings of four-bar cycles.

A. Across a single four-bar hypermeasure.



B. Spanning two four-bar hypermeasures.



There are, however, some violations of hypermetric constraint at the four-bar level in two relatively popular standards where one or more cycles are ‘off-kilter.’ See Example 6A. In this bebop standard, a cycle in  $A\flat$  major that purports—by

its initial harmonic rhythm—to span four bars begins at m. 2 while its structural accent occurs at m. 4.<sup>27</sup> The strength of the four-bar hypermeasure truncates the cycle, and the pattern of falling-fifth harmonic motions continues onto m. 5. Note that this establishes A $\flat$  major rather weakly. The complete cycle in C major across mm. 6–7 does not violate hypermetric constraint, and is notably stronger.<sup>28</sup> Two similar violations occur in Example 6B. Off-kilter cycles in A minor and C major create tonal ambiguity at the onset of the tune—an ambiguity that is eliminated across mm. 9–12 (not shown) with a complete four-bar cycle in C major. In both of these compositions, off-kilter cycles establish keys only weakly, and arguably are able to violate hypermetrical constraint by dint of falling-fifth sequencing with standard linear intervallic patterning. Furthermore, both compositions clarify tonality at later points through the use of cycles that do not violate hypermetric constraint.

Example 6. Off-kilter three-bar cycles.

A. Jerome Kern and Oscar Hammerstein II, “All the Things You Are,” mm. 1–8, *The New Real Book*, p. 4.

B. Bart Howard, “Fly Me to the Moon (In Other Words),” mm. 1–8, *Jazz Fakebook*, p. 119.

<sup>27</sup> Off-kilter cycles occur in analogous places in this song’s A’ and A” sections as well. In each instance, ensuing cycles that do not violate hypermetric constraint soon establish stronger tonalities.

<sup>28</sup> Curiously, *The New Real Book* also gives alternate harmonic changes of Em7→A7 at m. 3. This tritone substitution for Bbm7→Eb7 would strengthen the resolution to A $\flat$  major by creating a two-bar cycle that does not violate hypermetric constraint.

From one perspective, hypermetric constraint places a stylistic limitation on where cycles can begin. From another perspective, it places that same limitation on where the structural accents (i.e., tonics) of cycles can fall. Either way, this suggests that there may be a relationship between cycle length and the duration of hyperbeats. That relationship would limit cycles to begin (or reach structural accentuation) squarely on hyperbeats, especially in environments where cycles of the same length predominate. The implications are that prominent or recurrent two-bar cycles would invite—or even focus—expectation and hearing at the level of the four-bar hypermeasure, where each real measure constitutes a single hyperbeat. Similarly, prominent or recurrent four-bar cycles would do so at the level of the eight-bar hypermeasure, where each hyperbeat consists of two real measures. Prominent or recurrent four-beat cycles would do the same at the level of the two-bar hypermeasure, where each hyperbeat is two real beats long.

Figure 2 illustrates standard settings of cycles from four beats to four measures discussed above. It shows each of them in the two contexts in which they are likely to arise, given the conditions of hypermetric constraint. Cycles in the “weak” column reach structural accentuation on relatively weak hyperbeats 2 and 4. Cycles in the “strong” column reach structural accentuation on relatively strong hyperbeats 1 and 3.

Figure 2. Strong and weak cycles at four-bar, two-bar, and four-beat levels.

	Weak	Strong
Four-Bar Cycle	<p>  II   V   I   I  </p> <p>1 2</p> <p>  II   V   I   I  </p> <p>3 4</p>	<p>      II   V  </p> <p>1 2</p> <p>  I   I   II   V  </p> <p>3 4</p> <p>  I   I  </p> <p>1</p>
Two-Bar Cycle	<p>  II V   I   II V   I  </p> <p>1 2 3 4</p>	<p>        II V  </p> <p>1 2 3 4</p> <p>  I   II V   I   II V  </p> <p>1 2 3 4</p>
Four-Beat Cycle	<p>  II V I   II V I  </p> <p>1 2 3 4</p>	<p>  II V   I II V   I  </p> <p>1 2 3 4 1</p>

The relative strengths of cycles are also preserved when cycles are not prominent or recurrent enough to encourage a new hypermetric parsing. Within a four-bar hypemeasure, a strong four-bar cycle will reach structural accentuation on the strongest hyperbeat while a weak four-bar cycle will accentuate the second strongest. Furthermore, when the relationship is reversed and a cycle is much shorter than the established length of the hypermeasure, a strong two-bar cycle will accentuate hyperbeats of an eight-bar hypermeasure while the structural accent of a weak cycle will fall between hyperbeats.<sup>29</sup> Four-beat cycles are generally fleeting—occurring within and accentuating the weaker sections of hypermetric contexts previously established. They rarely establish their own hypermetric contexts. The diagrams in this table apply to cyclic activity shown in Examples 7 through 10.

Example 7. Weak two-bar cycles and end-accented four-bar hypermeasures, Michel Legrand, Alan Bergman, and Marilyn Bergman, “What Are You Doing for the Rest of Your Life,” mm. 17–24, *The Real Book* vol.1, p.457.

The musical notation for Example 7 consists of two staves in 4/4 time. The first staff shows measures 17 through 20. Above the staff, brackets group the measures into two four-bar hypermeasures. The first hypermeasure (measures 17-20) has chords Bm7, E7, A maj7, and Bm7. The second hypermeasure (measures 21-24) has chords E7, A maj7, Bm7, and E7. The second staff shows measures 21 through 24. Above the staff, brackets group the measures into two four-bar hypermeasures. The first hypermeasure (measures 21-24) has chords Abm7, D7b9, Gbmaj7, and Gm7. The second hypermeasure (measures 25-28) has chords C7b9, Fmaj7, Gm7, and C7b9. The notation includes various note values and rests, with some notes beamed together.

If cyclic strength is determined by the hypermetric placement of the structural accent, then in many cases, it is useful to qualify hypermeasures by the strengths of the cycles that occur there. In the spirit of David Temperley and Stefan Love, who discuss beginning- and end-accented phrases, we introduce beginning- and end-accented hypermeasures.<sup>30</sup> Strong cycles create the former, as structural accents will fall on hyperbeats 1 and 3. Conversely, weak cycles will create the latter, as structural accents will fall on weak hyperbeats 2 and 4. Example 7 shows weak two-measure cycles and end-accented four-bar hypermeasures as they occur

<sup>29</sup> However, even when eight-bar hypermeter is sufficiently established, a two-bar cycle will tend to refocus hearing at the level the four-bar hypermeasure, given the replication of II→V→I patterning with an increase in harmonic rhythm and the structural accents they forecast.

<sup>30</sup> See David Temperley, “End-Accented Phrases: An Analytical Exploration,” *Journal of Music Theory* 47, no. 1 (2003): 125–154 and Stefan Love, “On Phrase Rhythm in Jazz” (especially Chapter 2). Each author establishes different criteria for accentuation than those discussed in this article.

in the B section of “What Are You Doing for the Rest of Your Life.” Examples such as these, featuring more than one weak two-bar cycle in a row (often with melodic sequences) are not uncommon, happening 142 times in 69 pieces in our dataset.

In the two excerpts of Example 8, strong two-bar cycles create beginning-accentuation. In standard jazz repertoire, strong two-bar cycles are more common than weak ones even though they often render passages out of phase as harmonic groupings anticipate strong hyperbeats and melodic beginnings. This reveals yet another notable difference between jazz and traditional Western concert music. In the latter, melodies are typically situated well within phrases and hypermeasures—allowing, of course, for melodic beginnings that begin a little before (or possibly after) a phrase’s structural downbeat. Harmonic groupings may certainly cross boundaries of phrases or hypermeasures, but not to the degree encountered in standard jazz repertoire shown in Example 8 (or in Example 9, below).<sup>31</sup> In “Lament,” for instance, melodic groupings (bracketed below the staff) align perfectly well within four-bar hypermeasures, despite significant harmonic misalignment. “Afternoon in Paris” shows us that even when harmony and melody are both out of phase with respect to phrase hypermetric boundaries, harmony can easily be further askew.

Example 8. Strong two-bar cycles and beginning-accented four-bar hypermeasures.

A. J. J. Johnson, “Lament,” mm. 1–8, *The Real Book* vol.1, p. 257.

B. John Lewis, “Afternoon in Paris,” mm. 1–4, *The Real Book* vol. 1, p. 10.

<sup>31</sup> For a discussion of how this occurs in concert music, see Poundie Burstein, “The Half Cadence and Other Such Slippery Events,” *Music Theory Spectrum* 36, no.2 (2014): 203–227.

As it seems that alignments like those in Example 8 are more common than those in Example 7, jazz and Western art music are alike in that beginning-accented phrases predominate.<sup>32</sup> However, the way successions of strong cycles create beginning-accentuation in hypermeasures—with harmonic groupings crossing hypermetric boundaries—reveals one of jazz’s distinctive structural features. Curiously, these misalignments between harmony and hypermeter do not obscure formal boundaries; instead, they seem to provide performances with the drive necessary to sustain numerous repetitions of short forms with predictable sections within them. Such misalignments invite comparison to enjambment in metered poetry.

Example 9. Strong four-bar cycle and a beginning-accented eight-bar hypermeasure, Miles Davis (Chuck Wayne), “Solar,” mm. 1–8, *The Colorado Cookbook*, p.207.

The musical notation for Example 9 consists of two staves in 4/4 time. The first staff contains measures 1 through 4. Above the staff, the chords are labeled: Cm7 above measure 1, Gm7 above measure 3, and C7(#9) above measure 4. A bracket spans measures 1 through 4. The second staff contains measures 5 through 8. Above the staff, the chords are labeled: Fmaj7 above measure 5, Fm7 above measure 6, and Bb7(#9) above measure 8. A bracket spans measures 5 through 8. A larger bracket spans measures 1 through 8, indicating an eight-bar hypermeasure.

As discussed above with respect to hypermetric constraint, prominent and recurrent two-bar cycles encourage hearing at the level of the four-bar hypermeasure, and are either strong or weak depending on whether their structural accents fall on strong or weak hyperbeats, respectively. Four-bar cycles have the same criteria for strength, but due to their slower harmonic rhythm, they encourage hearing at the level of the eight-bar hypermeasure. In this way, strong four-bar cycles will reach accentuation on the first and fifth measures of an eight-bar section. Weak four-bar cycles will do so at the third and seventh. In Example 9, the structural accent of a strong four-bar cycle in F major falls on a hypermetric downbeat and creates beginning accentuation, even though harmonic groupings are out of phase with four-bar hypermeasures and melodic groupings by two measures.<sup>33</sup>

<sup>32</sup> See Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, MA: The MIT Press, 1983), and David Temperley, “End-Accented Phrases.”

<sup>33</sup> While many readers will know this composition as Miles Davis’s “Solar,” evidence clearly demonstrates that Chuck Wayne’s “Sonny” (1946) predates Davis’s “Solar” by seventeen years. Both tunes are virtually identical with respect to harmony and melody. See <http://blogs.loc.gov/music/2012/07/chuck-wayne-sonny-solar/> (accessed January 27, 2015).



Example 10. Weak four-bar cycles and an end-accented eight-bar hypermeasure, Ray Noble, “Cherokee,” mm. 33–48, *The Real Book* vol.1, p.78.

The musical notation for Example 10 consists of four staves, each representing a four-bar cycle. The first staff has chords C#m7, F#7, and Bmaj7. The second staff has Bm7, E7, and Amaj7. The third staff has Am7, D7, and Gmaj7. The fourth staff has Gm7, C7, Cm7, and F+7. The melody is written in 4/4 time and features a sequence of eighth and quarter notes, with some measures containing ties or slurs.

Weak four-bar cycles in Example 10 divide eight-bar hypermeasures in half and align fairly well with melodic groupings. Here, the hypermeasures are end-accented. Cycles of this type are common in B sections, where they can contrast with strong cycles and beginning-accented hypermeasures in A sections. When they do occur, they often create sequential passages. Both harmonic and melodic sequences occur in Example 10, as an eight-bar melodic pattern sounds in sequence over a four-bar harmonic pattern that repeats at the interval of a descending whole step.

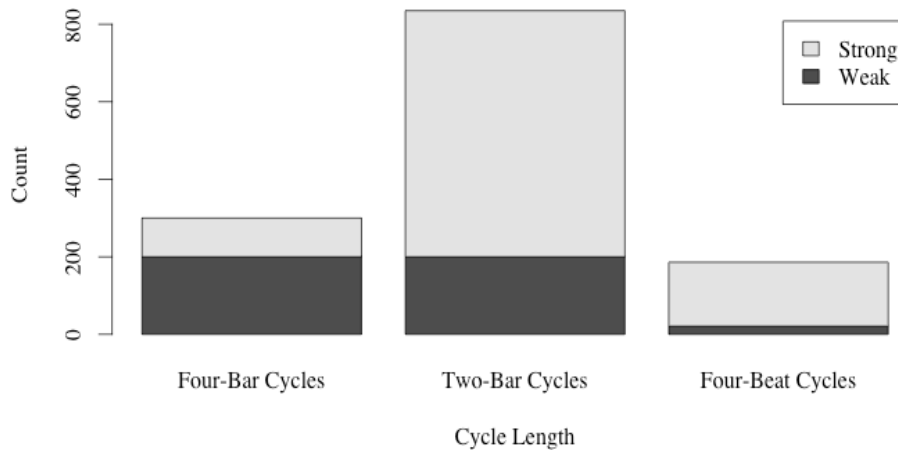
Figure 3 reveals an interesting relationship between cycle length and cycle strength.<sup>34</sup> It seems as though the gap between occurrences of weak and strong cycles becomes more pronounced in jazz as the length of hypermetric units decreases. Weak four-bar cycles are twice as common as strong four-bar cycles. However, strong two-bar cycles are significantly more common than weak two-bar cycles, outnumbering them by a factor of 3 to 1. In fact, they occur almost as much as all other cycle types combined. The gap is even more pronounced at the

Davis is cited in the example caption because melodic rhythms in *Colorado Cookbook* correspond more closely to Davis's 1963 recording.

<sup>34</sup> Search criteria for Figure 3 do not account for tritone substitutions, substitutions by diatonic third (such as VI or III for I), or for substitutions of dominant seventh chord types (such as V/V for II or I<sup>(b7)</sup> for I). These are discussed below. The jazzparser does not recognize cycles that extend across the end of a form and its beginning upon repetition (often called “turnarounds” or “turnbacks”).

level of the four-beat cycle, where the ratio between strong and weak in terms of total instances and number of pieces is nearly 8 to 1.

Figure 3. Comparing the prominence of strong and weak cycles at four-bar, two-bar, and four-beat levels.



	Weak	Strong
Four-bar	200 instances in 104 pieces (15.1% of corpus)	100 instances in 51 pieces (7.4% of corpus)
Two-bar	200 instances in 109 pieces (15.8% of corpus)	635 instances in 284 pieces (41.2% of corpus)
Four-beat	21 instances in 10 pieces (1.4% of corpus)	165 instances in 79 pieces (11.5% of corpus)

Readers may be surprised that the numbers in Figure 3 are not larger. After all, cyclic motion accounts for a significant amount of harmonic activity in standard jazz. The reason for this is that data in Figure 3 represent fairly limited occurrences of “pure” cycles. Such pure cycles are analogous to those represented in Example 1: the pre-dominant harmony is a minor seventh chord, and the tonic has a duration of half of the cycle’s length. In standard jazz repertoire, however, all cycles are not so pure. The section that follows introduces several common

variations of the cycle—variations that may alter a chord's quality, extend or eclipse the length of a tonic, or even interrupt a tonic's arrival altogether.<sup>35</sup>

#### SECTION IV: SOME COMMON VARIATIONS OF THE CYCLE

So far, we have primarily addressed the interaction of strong and weak two- and four-bar cycles with four- and eight-bar hypermeasures. But harmonic rhythm in jazz is not always as simple as the foregoing might suggest, and hypermeasures are not so evenly or consistently accented. Beyond traditional harmonic substitutions by diatonic third or tritone, composers and performers can do a number of things to direct and redirect harmonic energies across and within hypermeasures, things that still engage listeners with the rhythmic and harmonic expectations established through the motion of cycles. This section discusses some—but certainly not all—of those things.

The first variation involves embellishing the second half of a tonic's sounding space with another harmony. An embellishing harmony can sometimes be a local V7, particularly when the local tonic will be the supertonic in a cycle immediately following. Embellishing harmonies often prolong tonic by dint of some amount of common tones with the tonic chord. In such cases, harmonies built on local  $\hat{4}$  or  $\hat{6}$  (such as  $\flat VI$  maj7, V7/II, IV maj7) are typical, as they will retain  $\hat{1}$ . See Example 11, where  $E\flat$  maj7 embellishes a  $B\flat$  maj7 tonic at m. 2, and  $C\flat$  maj7 embellishes  $G\flat$  major at m. 4.

Example 11. Embellishment of the tonic's sounding space through movement to IVdom7 and IVmaj7, Dave Brubeck, "In Your Own Sweet Way," mm. 3–6, *The Real Book* vol. 1, p. 232.



Although extension is not especially common, it is another relatively simple variation. It involves an addition of time to the end of a cycle by extending

<sup>35</sup> We did search for cycles of the strengths and lengths specified in Figure 3 using two other sets of criteria. The first did not specify the length of tonic, which allowed for instances of extension or eclipse mentioned above. However, this search could not differentiate a cycle with a minor tonic from a descending sequence of half cycles with no change in harmonic rhythm (e.g.,  $Dm7 \rightarrow G7 \rightarrow Cm7 \rightarrow F7$ ). To avoid this problem, another search allowed only major tonics. In both of these alternate searches, the results were proportionately comparable—although the relative prominence of strong two-bar cycles was even more pronounced.

(usually doubling) a tonic's sounding space. In Example 12, the local tonic undergoing extension concludes the third in a series of strong two-bar cycles. Extensions usually allow a cycle to last through the final hyperbeat of a hypermeasure, and often do so in order to allow the initiation of a weak cycle at the next hypermetric downbeat. Extension does not apply to four-bar cycles in any lead sheets we have encountered.

Extensions may also occur on turnarounds (also called 'turnbacks'), which are strong cycles that begin either at the very end of a composition or at the end of a section (such as the B of an ABAC form) that precedes a return to opening material. The structural accent of a turnaround falls at the onset of the section that follows. In such cases, the extension can serve as an adjustment to compensate for a difference in phrase rhythm between the end of one section and the beginning of another. In single-section tunes such as "Solar" (the beginning of which is shown in Example 9), a one-bar turnaround at m. 12 connects the final measure with the beginning as the form repeats. The strong four-bar cycle beginning at m. 3 follows an extended tonic across mm. 1–2, which is itself set up in the final measure of the form by II→V motion in C minor. In this way, the final measure of the tune initiates a two-measure cycle that gets extended at the onset of the form's repetition.

Example 12. Extension of the tonic's sounding space, Howard Dietz and Arthur Schwartz, "Alone Together," mm. 1–8, *The Real Book* vol.1, p.19.

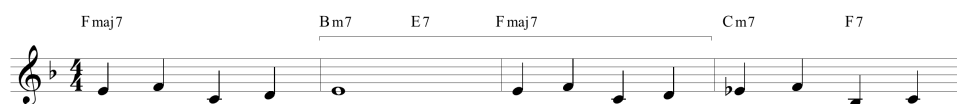
The musical notation for Example 12 consists of two staves in 4/4 time. The first staff shows measures 1 through 4. Measure 1 has a Dm chord and a quarter note G. Measure 2 has an Em7(b5) chord and a half note G. Measure 3 has an A7(b9) chord and a half note A. Measure 4 has a Dm chord and a half note D. The second staff shows measures 5 through 8. Measure 5 has a Dm chord and a quarter note G. Measure 6 has an Am7(b5) chord and a half note G. Measure 7 has a D7(b9) chord and a half note A. Measure 8 has a Gm chord and a half note D. The notation includes various note values, rests, and ties, illustrating the extension of the tonic's sounding space.

Cycles can also feature deceptive motion, where the root of the third chord is either a half or whole step above the root of V. It is important to note that the structural accent in many of these cases is not always perceived as a submediant. In Example 13A, the first half of a cycle is transposed in order to arrive at the established global tonic Fmaj7 deceptively.<sup>36</sup> The traditional deceptive motion in Example 13B, however, is more typical.

<sup>36</sup> Deceptive resolution also occurs across mm. 3–6 of Tadd Dameron's "Lady Bird" (*The Real Book* vol. 1, 256), with the progression Fm7→Bb7→Cmaj7 as a strong, four-bar cycle.

Example 13. Deceptive resolutions within cycles.

A. Victor Schertzinger and Johnny Mercer, "I Remember You," mm. 1–4, *The Real Book* vol.2, p.169.



B. Richard Rodgers and Lorenz Hart, "I Didn't Know What Time it Was," mm. 5–8, *The Real Book* vol.3, p.117.



The next two variations involve substituting dominant seventh chord types for tonic or supertonic chords. Example 14A shows a substitution of the former, which is common in blues forms. Example 14B illustrates the latter, and also features an embellishment of the F minor tonic's sounding space with motion to the submediant. Although the G7b9 in Example 14B is a secondary dominant, it still fulfills a function that is ultimately pre-dominant. That is, it plays the same role as a supertonic harmony in the cycle. Similarly, while the Bb7 in Example 14A is of a dominant seventh chord type, it is still the structural accent of the cycle and functions as a local tonic. Progressions like this one highlight the hierarchical nature of harmony in standard jazz repertoire. At a more global level, Bb7 fulfills a subdominant function within a blues form—where IV often takes a dominant chord quality. But it is also a locally tonicized chord, and so it plays the role of tonic within its cycle.

Example 14. Substitutions of a dominant seventh chord type within a cycle.

A. Charlie Parker, "Au Privave," mm. 4–5, *The Real Book* vol. 1, p. 32.



B. George Shearing, "Lullaby of Birdland," mm. 1–4, *Jazz Fakebook*, p. 234.



Overlap occurs when another cycle begins where the second half of a tonic's sounding space should be. Normatively, the second cycle in an overlap is shorter

than the first by half.<sup>37</sup> As a result, an increase in cycle strength occurs (see Example 15). Overlaps may occur at any point in a form, but they are especially common in turnarounds. In such cases, a strong two-bar cycle typically overlaps a weak four-bar cycle to tonicize the first measure of a following section, which is often the recurrence of an initial A section upon a form's repetition. This is what happens in Example 15. Here, the turnaround also results in an extended cycle. While extensions do occur, cycle lengths are not likely to increase over the course of an overlap—that is, a four-bar cycle is not likely to succeed a two-bar cycle in overlap (we have found no examples in fake books.) Such an arrangement would violate hypermetric constraint, explained at the beginning of Section II, above.

Example 15: Overlap, Bernie Miller “Bernie’s Tune,” mm. 29–2, *The New Real Book*, p.17.



Another variation that affects cycle length is interruption, which occurs when a cycle begins where a listener would expect to hear the structural accent of a cycle that has already begun. Interruptions therefore create II→V half cycles. Consider Example 16, where the purported two-bar cycle in D major that initiates the phrase is interrupted by a two-bar cycle in E♭ major.<sup>38</sup> Interruptions are quite common, and they are not as constrained with respect to cycle lengths as overlaps are.

Example 16. Interruption, John Coltrane “Moment’s Notice,” mm. 23–26, *The New Real Book* vol. 2, p. 211.f.



<sup>37</sup> Although such an arrangement is possible, we have found no instances in published fake books where cycle length decreases by more than one half (as, for example, where a weak four-beat cycle overlaps a weak four-bar cycle).

<sup>38</sup> Many would recognize this as mm. 1–4 of the “head” proper, as this section marks the beginning of the composition’s form upon repetition. However, the caption for Example 16 recognizes the 22-measure introduction, as provided in *The New Real Book*.

Figure 4. Interruptions of strong and weak two- and four-bar cycles.

Initial cycle strength (purported)	Succession of (purported) cycle lengths	Prominence in the corpus	Prominence by type
Weak	2-bar→2-bar	471 instances in 205 pieces	Full: 276 instances in 153 pieces
			Half: 169 instances in 88 pieces
			Dominant: 26 instances in 16 pieces
Weak	4-bar→4-bar	140 instances in 82 pieces	Full: 76 instances in 55 pieces
			Half: 60 instances in 35 pieces
			Dominant: 4 instances in 2 pieces
Weak	4-bar→2-bar	36 instances in 31 pieces	Full: 8 instances in 4 pieces
			Half: 28 instances in 27 pieces
			Dominant: 0 instances
Weak	2-bar→4-bar	6 instances in 6 pieces	Full: 0 instances
			Half: 1 instance in 1 piece
			Dominant: 5 instances in 5 pieces
Strong	2-bar→2-bar	368 instances in 148 pieces	Full: 147 instances in 74 pieces
			Half: 203 instances in 98 pieces
			Dominant: 18 instances in 10 pieces
Strong	4-bar→4-bar	140 instances in 88 pieces	Full: 52 instances in 30 pieces
			Half: 87 instances in 69 pieces
			Dominant: 1 instance in 1 piece
Strong	4-bar→2-bar	32 instances in 17 pieces	Full: 10 instances in 5 pieces
			Half: 22 instances in 13 pieces
			Dominant: 0 instances
Strong	2-bar→4-bar	196 instances in 117 pieces	Full: 88 instances in 59 pieces

Figure 4 catalogues and diagrams interruptions in terms of the purported strength of the initial cycle and the sequence of (purported) cycle durations.<sup>39</sup> Furthermore, the “Prominence by type” column breaks down each type of interruption in terms of how or whether the interrupting cycle reaches structural accentuation. A “full” cycle concludes on a major or minor tonic. In a “dominant” cycle, a dominant seventh chord type substitutes for a major or minor tonic with the same root.<sup>40</sup> Data for “half” cycles refer to progressions where an interrupting cycle is also interrupted. Figure 4 does not account for cycles where tritone

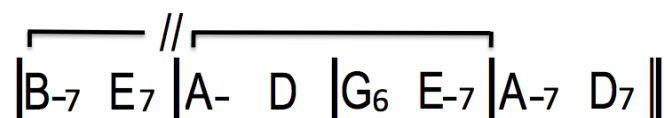
<sup>39</sup> As the initial cycle is interrupted, it will only last one half of its purported length.

<sup>40</sup> We did not search for instances where V of an interrupting cycle resolves to a dominant seventh at other levels of transposition (such as Dm7→G7→B♭7).

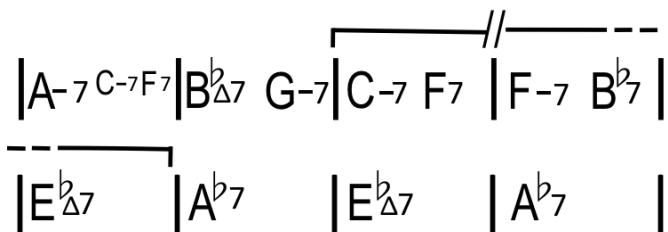
substitutions occur, or for substitutions of the dominant seventh chord type for pre-dominant chords. Finally, because of the limitations of the jazzparser scripting, we could not account for interruptions involving turnarounds that connect a tune's ending with its beginning. Figure 4 data is therefore under-representative regarding the extent to which these events occur.

Example 17. Interruption of purportedly weak two-bar cycles by full two-bar cycles.

A. Aligned interruption. Jimmy Van Heusen and Johnny Burke, "But Beautiful," mm. 29–32, *iReal Pro* "1200 Jazz Standards," iRb54.



B. Parallel interruption. Tadd Dameron and Carl Sigman, "If You Could See Me Now," mm. 21–28, *iReal Pro* "1200 Jazz Standards," iRb482.



The most common pattern by far involves the interruption of a purportedly weak two-bar cycle by another two-bar cycle that resolves to a tonic. In a four-bar hypermeasure, this pattern would start at either hyperbeat 1 or 3, as the interrupted cycle would have reached structural accentuation on either weak hyperbeat 2 or 4. Example 17 provides instances of each, as they appear in our corpus database. Example 17A shows what is perhaps the most common setting of this pattern, where the final four-bar hypermeasure of a tune consists of cyclic motion to the last strong hyperbeat and is followed by a turnaround. Situations such as these, where falling-fifth root motion is maintained, are still interruptions, even though arrival of the third harmony does not diminish the forward motion generated by the initial cycle to the degree that a structural accent would. We call these "aligned interruptions," and while they are the weakest form of interruption, they are nonetheless quite common. In Example 17B, another common setting, the pattern begins at the end of a B section and the interrupting cycle reaches structural accentuation at the onset of the third and final A section. Here, the initial harmony of the interrupting cycle shares a root with the dominant chord of the interrupted cycle. We call this a parallel interruption. Both



aligned and parallel interruptions are common in other hypermetric contexts as well.

Both of the excerpts of Example 17 feature interruptions with no change in harmonic rhythm. That is, the purported length of the initial cycle is the same as the actual length of the interrupting cycle. When such interruptions occur, a change in cycle strength will necessarily take place. However, when the harmonic rhythm increases by a factor of two—that is, when the purported length of the initial cycle is twice as long as that of the interrupting cycle—no change in cycle strength will occur. Similarly, when the harmonic rhythm decreases by a factor of two, no change in cycle strength will occur either. We have not encountered any interruptions with differences in harmonic rhythm greater than a factor of two.

We would like to briefly discuss a few of the more unusual or anomalous interruptions revealed by Figure 4. Again, while our research to this point has revealed that certain combinations of cycles are rare or non-existent in fake books, that may not be the case in performance, as players can vary harmonic structure significantly. But after searching hundreds of standards, our descriptive findings may reveal to some degree what are generally preferred patterns, and in this way they may serve prescriptive—or even proscriptive—purposes. That is, in addition to showing what is obviously popular, our data may reveal what has been overdone. In doing so, they may indirectly suggest what could come across sounding somewhat new.

The interruption of a purportedly weak four-bar cycle by a two-bar cycle with a major tonic registers only eight results in four different pieces. Such an arrangement would span a four-bar hypermeasure in a way that readers might find somewhat familiar ( $| \text{II} \quad | \text{V} \quad | \text{II V} | \text{I} \quad |$ ), allowing, of course, for cycles to occur in different keys. In three of the four compositions, this pattern occurs at the end of two or more A sections, with one of the A sections occurring at the end of the tune.<sup>41</sup> In the only other composition, the pattern occurred at the end of a B section in an AABA form. From this we may infer that when the pattern does occur, it fulfills the formal function of closing at some level of structure. One reason that this pattern is not especially common may be that its eventual resolution to global tonic falls on the final measure, a weak hyperbeat 4 (of a four-bar hypermeasure). It may very well be that earlier arrangements—particularly of American songbook compositions—place tonic resolutions in this

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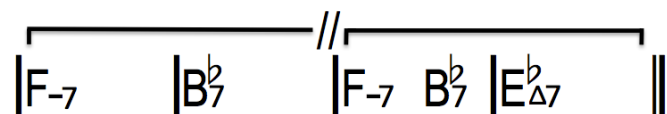
<sup>41</sup> The compositions in which this pattern occurs multiple times at A section endings are Ella Fitzgerald and Al Feldman's "A Tisket, a Tasket," Vernon Duke, John LaTouche, and Ted Fetter's "Taking a Chance on Love," and "On the Sunny Side of the Street" by Jimmy McHugh and Dorothy Fields. George and Ira Gershwin's "For You, For Me, For Evermore" is exceptional.

position. However, for the purposes of modern jazz performance, it is considerably more common to encounter arrangements that place resolutions to tonic one measure earlier within a section. This not only places the tonic in a stronger hypermetric position, but it leaves the final measure open for performers and arrangers to include a turnaround.

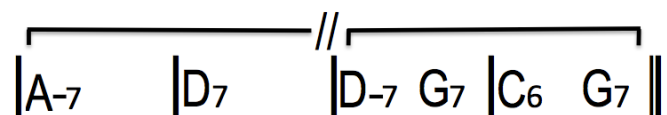
Moreover, the four compositions in our corpus that do feature this pattern demonstrate interruption at only two different levels of transposition. In two of the compositions, the interrupting cycle occurs at  $T_0$ , effectively prolonging—rather than denying—the resolution to the initially implied tonic. The two other compositions feature parallel interruptions, defined above. Example 18A and B illustrate both types, respectively, as they occur in our corpus database for this pattern.

Example 18. Interruptions of purportedly weak four-bar cycles by two-bar cycles.

A. Prolonging interruption. Ella Fitzgerald and Al Feldman, “A Tisket, A Tasket,” mm. 29–32, *iReal Pro* “1200 Jazz Standards,” iRb1071.



B. Parallel interruption. Jimmy McHugh and Dorothy Fields, “On the Sunny Side of the Street,” mm. 29–32, *iReal Pro* “1200 Jazz Standards,” iRb787.

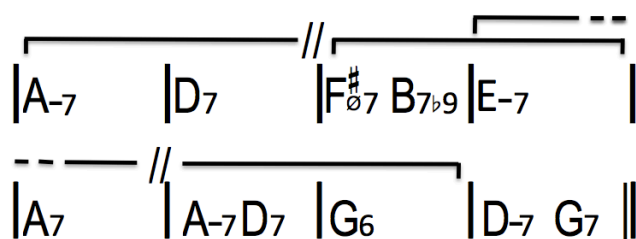


Readers may find it even more surprising that in none of these instances did the interrupting two-bar cycle resolve to a minor tonic. Often, when such a pattern begins to occur, the harmony that would appear to be a minor tonic (i.e.,  $Cm7$ ) actually initiates another two-bar cycle (e.g.,  $|E^b_m7|A^b_7|Dm7G_7|Cm7F_7|$ ), resulting in an additional aligned interruption (discussed above). This happens in 22 of the 23 occurrences of this pattern. The exceptional occurrence is shown below in Example 19. Here, the ostensible tonic at m. 28 also initiates an aligned interruption, but that cycle purports to be four bars long.<sup>42</sup> However, the cycle starting at m. 28 violates hypermetric constraint, and so it would be especially weak if it actually were to cadence on D major at m. 30. Instead, the  $Am7$  harmony at m. 30 instantiates a parallel interruption by

<sup>42</sup> Because the cycle beginning at m. 27 is interrupted by an aligned cycle twice as long (thereby preserving the harmonic rhythm of a full cycle), no caesura marking is used.

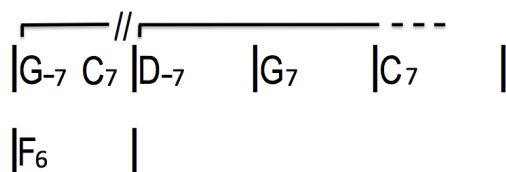
initiating a two-bar cycle in the global tonic and reaching structural accentuation on a relatively strong hyperbeat.

Example 19. Interruption of purportedly weak four-bar cycle by full cycle with minor tonic. John Klenner and Sam Lewis, "Just Friends," mm. 25–32, *iReal Pro* "1200 Jazz Standards," iRb499.



Another result of Figure 4 that merits discussion involves the interruption of a purportedly weak two-bar cycle by a four-bar cycle. No arrangements occurred where the interrupting cycle reached conclusion on a major or minor tonic.<sup>43</sup> Since the four-bar cycle in such a succession would violate hypermetric constraint (beginning between two-measure hyperbeats), this is not surprising. In all instances where a purported four-measure cycle does interrupt a weak two-bar cycle (five occurrences in only five compositions), the interrupted cycle occurs on the first hyperbeat of a four-bar hypermeasure, and within the last four measures of a section. Moreover, each interrupting cycle lasts only three measures, and concludes with a dominant chord that leads to a tonic at the onset of a new section. As the dominant harmony that ostensibly serves as structural accent falls in a hypermetrically weak place and serves no tonic function, the interrupting cycle becomes less identifiable as a cycle *per se* as the passage continues. See Example 20.

Example 20. Interruption of purportedly weak two-bar cycle. Charles Trenet and Jack Lawrence "Beyond the Sea," mm. 9–13, *iReal Pro* "1200 Jazz Standards," iRb208.



<sup>43</sup> The sole occurrence where the interrupting cycle encounters its own interruption is illustrated in Example 19.

## SECTION V: ANALYSES

This section applies the terminology and distinctions discussed above to analyses of three complete standards. Example 21 is “Like Someone in Love” by Jimmy Van Heusen and Johnny Burke. Here, the majority of cycles are strong. This lead sheet from *The New Real Book* vol. 1 gives optional chord changes at m. 6, and the choices have quite different phrase-rhythmic implications. Performers who opt for the parenthetical changes will create a succession of strong two-bar cycles that begins at m. 4 and lasts until m. 12. Those who choose to play G7 will engage a weak four-bar cycle that starts at m. 5. This cycle actually interrupts the strong cycle that begins at m. 4, but it will be an aligned interruption with an increase in cycle length, allowing the Dm7 to function as the tonic of one cycle and as the pre-dominant of another. A performance that opts for G7 will also undergo an overlap at m. 8, where strong two-bar cycles get back on track. An extended cycle begins at m. 10, where the local tonic lasts an additional bar to complete the four-bar hypermeasure. The extension invites listeners to expect a weak cycle to follow at the onset of the next four-bar hypermeasure. Weak cyclic motion does follow, though a strong four-bar cycle interrupts (with no change in cycle length), crossing the two halves of the form. This is a “parallel interruption,” as discussed above (Example 17B). Motion from Cmaj7 to Am7 across mm. 17–18 (as well as across mm. 1–2) constitutes a form of tonic embellishment with a passing V/Vi.

As the second half of the form is a variation of the first, it also features a succession of strong two-bar cycles. Listeners can understand the harmonies at m. 28 as connectors between cycles. However, the cycle that begins at m. 26 invites comparison to the extended cycle at m. 10, and so listeners may interpret that cycle as extended, with embellishment of tonic space. Across the final four-bar hypermeasure of the tune, a strong two-bar cycle interrupts a weak one. Within the turnaround that follows, the motion from Cmaj7 to Am across mm. 1–2 prolongs the global tonic, and in this way, we may hear the turnaround across mm. 32–2 as an extended cycle that nonetheless resonates deeply with the strong four-bar cycle sounding across mm. 15–18. Cycles play out in interesting ways across the thirty-two-measure ABAB’ form of this composition. As the majority of cycles are of the two-bar variety, it is more appropriate to appreciate their accentuation across four-bar hypermeasures. The result is a common structure of eight discrete four-bar hypermeasures. A pattern emerges from this perspective. The first hypermeasure of each eight-bar section—that is, hypermeasures 1 (mm. 1–4), 3 (mm. 9–12), 5 (mm. 17–20), and 7 (mm. 25–28)—is beginning-accented, at least to the extent that their downbeats carry structural accents, and strong cycles predominate. Even-numbered hypermeasures tend to contrast. Weak

cycles begin hypermeasures 4 and 8, the hypermeasures that conclude the tune's second and fourth sections (in fact, mm. 13–16 have no structural accent.) Furthermore, both of these cycles are interrupted without a change in harmonic rhythm, which necessarily results in the change in cycle strength that endows ensuing hypermeasures with beginning-accentuation.

Example 21: Johnny Burke and Jimmy Van Heusen, "Like Someone in Love," *New Real Book* vol. 1, p. 187.

The musical score for "Like Someone in Love" is presented in 4/4 time, spanning 32 measures. The score is annotated with harmonic changes and structural cycle labels. The annotations are as follows:

- Measures 1-4:** strong: extended (C maj7, E7/B, A m7, A m7/G, D7/F#, F9(#11), Em7, A7 //)
- Measures 5-8:** weak: aligned interrupting (D m7); strong: deceptive (F#m7, B7) (G7, C maj7); strong: overlapping (G m7, C7 //)
- Measures 9-12:** strong: extended (F maj7, B m7, E7, A maj7 //)
- Measures 13-16:** weak (A m7); strong: parallel interrupting, embellished (D7, D m7, G7 //)
- Measures 17-20:** strong: extended (C maj7, E7/B, A m7, A m7/G, D7/F#, F9(#11), Em7, A7 //)
- Measures 21-24:** weak: aligned interrupting (D m7); strong: deceptive (F#m7, B7) (G7, C maj7); strong: overlapping (G m7, C7 //)
- Measures 25-28:** strong (F maj7, B m7, E7, A maj7, D7, D#dim7)
- Measures 29-32:** weak (Em7, A7 //); strong: aligned interrupting (D m7, G7, C maj7); strong (turnaround) (D m7, G7 //)

The strengths of hypermeasures 2 (mm. 5–8) and 6 (mm. 21–24) lie somewhere between the extremes of the strong and weak hypermeasures described

above. As they begin with structural accents, they evoke beginning-accentuation. But if accompanists elect to play G7 at mm. 6 and 22, the initial Dm7 tonics are also the first chords of aligned interruptions. In this way, they create weak four-bar cycles that detract significantly from the effect of beginning accentuation. This choice results in a pattern of alternating strong and weak cycles on hypermetric downbeats across the tune's form. Accompanists who choose F#m7→B7 will initiate strong cycles with deceptive resolutions at these places. Doing so will preserve strong cyclic patterning across the tune's A sections and reserve weak cycles for the conclusions of the contrasting sections. Either way, "Like Someone in Love" exhibits compelling patterns of cyclic strength across its form.

Example 22 presents Frank Loesser's "Slow Boat to China," a thirty-two-bar song in ABAC form where the majority of cycles are strong and two measures long. Three such cycles sound in succession across mm. 6–11, and the second and third of them involve deceptive resolutions. The deceptive resolution to Bbmaj7 at m. 11 helps create a succession of harmonies across mm. 9–12 that implies a four-bar cycle. In other words, an aligned interruption would occur at m. 9, where the Cm7 functions as tonic of a strong two-bar cycle as well as the supertonic of a weak four-bar cycle. The missing ingredient of this is an F7 at m. 10. Still, the progression invites that comparison, and it is worth observing how the deceptive resolution across mm. 10–11 allows a pair of strong two-bar cycles to align in such a way that they suggest a weak four-bar cycle. The G7 at m. 12 is an embellishment of Bb major's tonic space, created by passing motion through Ab7 to the submediant-as-V7/II.

The strong 4-bar cycle that crosses halves of the tune encounters an overlapping two-bar cycle at m. 18. Several other strong two-bar cycles occur in the second half, but the final five measures warrant a close look. While a strong two-bar cycle beginning at m. 28 delivers its structural accent at the beginning of the final four-bar hypermeasure, this accent is compromised in two interesting ways. In the first place, a chord of dominant seventh quality substitutes for Cm7. But at the same time, this C7 substitutes for the supertonic and initiates a weak four-bar cycle. In this way, the passage has an aligned interruption with a substitution of dominant seventh chord quality.

As in Example 21, the predominance of two-bar cycles encourages hearing and expectation at the level of the four-bar hypermeasure. Across the form of "Slow Boat to China," the majority of these two-bar cycles (62.5% of them) accentuate hyperbeat 3. Furthermore, the majority of those cycles (60%) do so with deceptive resolutions. This is what makes mm. 9–12 so compelling. The evocation here of a weak four-bar cycle by means of a deceptive two-bar cycle (described above) has repercussions that play out in the last section of the tune. A strong two-bar cycle in C minor leads out of the second A section (mm. 24–25),

and listeners might reasonably expect a repeat of mm. 9–12 to follow across mm. 25–28. Although B♭maj7 does sound at m. 27, these passages are not analogous. Instead, another two-bar cycle in C minor begins at m. 28 that sets up a four-bar cycle in the global tonic across the last hypermeasure of the tune. While the deceptive resolution across mm. 10–11 weakens the arrival of tonic, the final eight-measure section of the tune represents an attempt to arrive at the tonic directly (i.e., not deceptively) by way of a full cycle before the conclusion of the final hypermeasure. In other words, it is significant that mm. 9–12 evoke a weak four-bar cycle in the global tonic, but it is important that a clear arrival on B♭ through standard cyclic motion does not occur until later.

Example 22. Frank Loesser, “Slow Boat to China,” *The Colorado Cookbook*, p. 200.

The musical score for "Slow Boat to China" is presented in 4/4 time. The key signature has two flats (B-flat major). The score is divided into measures 1 through 29. Above the staff, various chords and harmonic annotations are provided for specific measures or groups of measures.

**Measures 1-4:** B♭maj7, strong Dm7(♯5), G7, Bdim7, Cm7, D♭dim7.

**Measures 5-8:** B♭maj7/D, strong: deceptive Am7(♯5), D7(♯9), E♭maj7, strong Dm7b5, G7.

**Measures 9-12:** Cm7, strong: deceptive Em7(♯5), A7(♯9), B♭maj7, A♯7(♯11), G7.

**Measures 13-16:** C7, strong: embellished Cm7, F9.

**Measures 17-20:** B♭maj7, strong: overlapping Dm7(♯5), G7, Cm7, D♭dim7.

**Measures 21-24:** B♭maj7/D, strong: deceptive Am7(♯5), D7(♯9), E♭maj7, strong Dm7(♯5), G7.

**Measures 25-28:** Cm7, A♯7(♯11), B♭maj7, strong Dm7(♯5), G7.

**Measures 29:** weak: aligned interrupting, sub. dom7 (II) C7, F7, B♭maj7.

Our final analysis considers Howard Dietz's and Arthur Schwartz's "Alone Together" (Example 23). One notable characteristic of this tune is its fourteen-measure A sections, which disallow consistent four-bar hypermeasures. The final two sections of the tune are each eight measures in length, and this results in a forty-four-measure AABA' form. Within the A sections, the preponderance of two-bar cycles invites hearing at the level of the four-bar hypermeasure (with the exception of the two-bar extensions across mm. 13–14 and 27–28). Strong two-bar cycles create beginning-accented four-bar hypermeasures across the first 8 measures. The cycle that begins at m. 6 is extended by an extra measure to last the duration of its hypermeasure, and this allows cycle strength to change at the onset of the next four-bar hypermeasure. While a weak cycle does begin at m. 9, a strong two-bar cycle interrupts one measure later, with a dominant seventh chord type substituting for the last two beats of tonic at m. 11. At m. 12, an overlapping II→V in the global tonic establishes an expectation for a strong two-bar cycle. Instead, A7 resolves to the parallel major tonic. Another strong two-bar cycle initiates the turnaround at the actual end of the first A section (m. 14), continuing a series of strong two-bar cycles that began at m. 10. This series of consecutive cycles of the same strength and length will last for another nine measures as A repeats. At the end of the second A section, an additional measure of tonic extends the cycle to m. 28.<sup>44</sup>

After a pair of elongated A sections whose preponderance of strong two-bar cycles does little to encourage hearing above the level of the four-bar hypermeasure, the B section provides relief in its hypermetric regularity and contrast in the strength and length of its cycles. Here, a pair of weak four-bar cycles sound in sequence. This particular arrangement of weak four-bar cycles, where the second cycle sounds a whole step lower than the first below a sequential melody, is common.<sup>45</sup> The substitution of a dominant seventh chord type for a tonic-functioning chord at m. 35 resonates with mm. 11 and 25 of the A sections, and an overlapping strong two-bar cycle at m. 36 sets up a return to A material. Strong two-bar cycles continue across the final, truncated A section. This section's final cycle (m. 42) actually comprises two layers of substitution. At the first layer, the initial harmony of a D-minor cycle (Em7b5) has been substituted

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<sup>44</sup> Given cycle lengths in the A sections, we assume a hypermeter in which one measure equals one hyperbeat. Measures 13–14 and 27–28 constitute duple hypermeasures.

<sup>45</sup> In addition to the bridge of Ray Noble's "Cherokee" (Example 10), numerous standards feature bridges with weak four-bar cycles in sequence by descending whole step, including Dizzy Gillespie's "A Night in Tunisia," Matt Dennis and Earl Brent's "Angel Eyes," Bronislaw Kaper and Francis Webster's "Invitation," Duke Ellington's "It Don't Mean a Thing," and John Coltrane's "Lazy Bird," (*The Real Book* vol. 1, pp. 7, 24, 234, 241, and 259).



with a dominant seventh chord type (E7). At another layer, that harmony has been replaced by its tritone substitute.

Example 23. Arthur Schwartz and Howard Dietz, "Alone Together," *Real Book* vol.1, p.19.

The musical score for "Alone Together" is presented in staff notation with harmonic analysis. The key signature is one flat (Bb), and the time signature is 4/4. The score is divided into measures, with measure numbers 9, 13, 29, 33, 37, and 41 indicated. Above the staff, various chord types and strengths are labeled, often with brackets indicating their duration or relationship to the melody. The analysis includes:

- Measures 1-8: Dm, strong Em7(b5), A7(b9), Dm, strong Em7(b5), A7(b9).
- Measures 9-12: strong Dm, strong: extended Am7(b5), D7(b9), Gm, Gm7.
- Measures 13-16: weak Bm7, E7, strong: interrupting, sub dom.7 (I) Gm7, C7, F, F7, strong Em7(b5), A7.
- Measures 17-20: 1. Dmaj7, strong Em7(b5), A7, extended 2. Dmaj7.
- Measures 21-28: weak Am7(b5), D7(b9), Gm7.
- Measures 29-32: weak: sub. dom7 (I) Gm7(b5), C7(b9), F, F7, strong: overlapping Em7(b5), A7.
- Measures 33-36: Dm, strong Em7(b5), A7(b9), Dm, strong Em7(b5), A7(b9).
- Measures 37-40: Dm7, strong: sub. dom7 (II) tts Bb7, A7, Dm7, strong Em7(b5), A7.

"Alone Together" exemplifies many of the ideas with which this article is concerned. Every measure of its relatively long form is involved with cyclic motion. While it does make some use of interruption, extension, and overlap, the cycle strengths are fairly consistent throughout each section. Most notable are the contrasts of cycle strength and length between the A and B sections. While strong two-bar cycles occur across the A section, cycles in the B sections are of the weak four-bar variety.

This in itself reveals another difference between traditional Western art music and jazz. In discussing formal function in art music, Caplin (1998) describes

transitional passages such as the contrasting middles of small ternaries and the beginning of a small binary's second part as "loose-knit." In direct contrast to tight-knit organization, loose organization is characterized by "tonal instability, evasion or omission of cadence, diversity of melodic-motivic material," and "asymmetrical phrase groupings."<sup>46</sup> Given that bridges are typically considered to be transitional passages—and the melodic and harmonic sequences in this bridge certainly do convey this quality—one might expect to encounter more loose-knit organization there than in the A sections.<sup>47</sup> However, the opposite is the case in this B section (and in those of many other standards in AABA or AABC form). In the B section of "Alone Together," both harmony and melody are in close alignment with hypermeasures. Cadences are regular, phrase groupings are perfectly symmetrical, and melodic-motivic material is fairly limited. In the first two A sections, however, strong cyclic motion renders harmony out of phase with respect to metric and melodic groupings. Furthermore, cycles in numerous keys, along with extensions, interruptions, and asymmetrical phrase groupings contribute significantly to loose-knit organization across mm. 1–28.

#### SECTION VI: CONCLUSION

We certainly hope that the above provides some new ways of thinking about Strunk's comments on jazz's rhythmic "subtlety" and "nuance" standing in relief of its metric regularity. We also hope that the above illustrates how interesting harmonic patterns can be as they interact with such stable metric patterns. Given that they are both so prevalent in standard jazz repertoire, it is encouraging to know that such variety can result from relatively simple principles and processes. While our research to this point has revealed that certain combinations of cycles are common, rare, or non-existent, such statistics may not pertain to every performer, as individual players can alter the phrase rhythm of lead sheets significantly. However, when players do reharmonize, they will often create phrase rhythms that can still be described by the ideas offered here.

We also hope that readers will find it fruitful to apply the ideas above in jazz pedagogy. When students recognize the highly enjambed phrase-rhythmic structure across mm. 1–11 of Harry Warren and Mack Gordon's "There Will Never Be Another You," they may be more inclined to construct a solo whose

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<sup>46</sup> See William E. Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (New York: Oxford University Press, 1998): 17 and 71–93.

<sup>47</sup> See, for example, Steve Larson, "What Makes a Good Bridge?" *Tijdschrift voor Muziektheorie* 8, no. 1 (2003): 1–15, which discusses the transitional nature of B sections in considerable depth.

phrases align with those of the tune's melody, eschewing the series of local  $II \rightarrow V \rightarrow I$  patterns for the  $I \rightarrow II \rightarrow V$  patterns within four-bar segments where  $II$  and  $V$  are in *different* keys than the tonic. At the very least, we can consider how improvised jazz melody—which often approaches cycles as discrete units—will differ from a tune's original melody, which often does not.

It may also be illuminating to use these ideas in comparing divergent harmonizations of the same composition, or with respect to underlying counterpoint, encompassing the longer-range linear connections that Schenkerian analyses reveal. Or, one could delve deeper into issues of formal function, such as how tight- and loose-knit organization could apply to jazz repertoire. Then, of course, one may choose to investigate how common successions of cycles and their variations change within the corpus over time. At present, the value in this research is that it draws our attention to an aspect of standard jazz repertoire that is perceivable, yet largely ignored in analytical or critical literature. And, as mentioned earlier, we hope that our descriptive findings reveal generally preferred arrangements, and in this way they may serve prescriptive—or even proscriptive—purposes.

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