Dovetailing in John Adams's "Chain to the Rhythm"

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Minimalist composers have used the overlapping technique of musical "dovetailing" since the 1970s. Dovetailing can be thought of as a method of connecting neighboring formal sections of a work, allowing smooth transitions through an overlap of preceding and subsequent musical material. Dovetailed transitions begin with the appearance of new motives during a passage that otherwise exhibits block and textural subtractive processes—a block subtractive process involves a gradual removal of notes from a pattern, while a textural subtractive process entails a reduction of instruments playing collectively. The closing stage of a dovetailed transition is signaled by the exclusion of earlier motives.

John Adams's compositional style bears affinity for dovetailing in his instrumental works from his most recent compositional period. Dovetailing is a signature technique of Adams's compositional style; examining this technique sheds light on the process of creating smooth transitions and their influence on formal structure and the growth of gradual processes. Adams's "Chain to the Rhythm" from Naive and Sentimental Music (1997–98) illustrates remarkably lucid instances of dovetailing, and because its processes are comparable to other instrumental works by the composer, it will serve as a representative model.

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1 His affinity for dovetailing may be explained by the progression of Adams's works, which reveals a move from harmonically-conceived structures to more contrapuntally-based textures. See Alexander Sanchez-Bechar, "Counterpoint and Polyphony in the Recent Instrumental Works of John Adams," PhD diss., Florida State University, 2008, 1.

2 At the time of composition, Adams considered Naive and Sentimental Music his symphonic magnum opus. The title of this work stems from the German poet Friedrich Schiller's 1795 celebrated essay titled Über Naive und Sentimentalische Dichtung ("On Naive and Sentimental Poetry"). Adams believes Schiller's dichotomy between "naive"—driven by intuition, the senses and uncompromised by self-analysis—and "sentimental"—motivated by con-
The first part of this study will provide some background to the term "dovetailing" and detail the various ways musical closure can give way to a new dovetailed section. It will also examine ways in which recurring motives can be modified to allow for such a process. I will elaborate on additive and subtractive processes and general modifications such as transposition, beat-class transposition, and inversion. The second part will illustrate different models for dovetailing and demonstrate an interrelation between formal sections and dovetailed transitional passages. The final part will consider a recurring "Adamsian" set class, the minor seventh chord, which serves as a signal for new formal sections, and will compare dovetailed passages in terms of duration and opening gestures.

Figure 1. Dovetailing in Carpentry

The term dovetailing stems from carpentry as a method of interlocking two pieces of wood (see Figure 1). This metaphor seems useful in describing overlapping formal sections of a musical work. Given the flexibility of its application to music, scholars have used the term rather freely to refer to transitions of musical processes that bear some overlap. In attempting to describe Adams's smooth connections, I will at times equate dovetailing as a general method of overlapping formal sections where one texture subsides while another emerges. In other instances, dovetailing will parallel the interlocking technique originating from serious thought—offers a novel way of looking at the creative process. In this work, Adams strives to compose with a "naive" state of mind. "Chain to the Rhythm" musically evokes the "naive" through a "chain of events that culminates in [a] fast, virtuoso surge of orchestral energy." See John Adams, "Naive and Sentimental Music," accessed September 19, 2013, http://www.earbox.com/orchestra/naive-and-sentimental-music.

3 Catherine Ann Pellegrino has noted the importance of this commonly occurring pitch collection in Adams's oeuvre. See Pellegrino, "Aspects of Closure in the Music of John Adams," Perspectives of New Music 40 (2002): 60.
woodworking, where a variety of textures engage in subtractive and additive processes.

In regards to music, Daniel Warburton defines dovetailing as a smooth transition between two superimposed processes. According to Warburton, the overall form and moment-to-moment content of early minimal pieces formed part of the same phenomenon he refers to as process; thus, the end of a process points toward the end of a formal section. As the process comes to a close a new process emerges, thereby giving way to a new formal section. Minimal works commonly feature superimposed sections to obtain smooth connections, or they may employ a splicing technique where one process abruptly gives way to another—a stark contrast to dovetailing.

Other scholars have used the term dovetailing to represent slightly different musical events. Douglas Green employed the term in a tonal context to describe a smooth connection between the last two sections found in ternary form. Example 1 reproduces Green's example 8–6, featuring musical dovetailing. This excerpt is taken from Schumann's Romance, Op. 28, No. 2. According to Green, dovetailing creates a conflict of tonal structure and design in order to make the connection of parts two and three more subtle than by having a dominant–tonic progression in the original key mark the restatement of the A section. In this passage, the return of the initial theme appears on measure 18, while the tonic harmony is delayed until measure 19. For Green, dovetailing calls for the interaction of the main theme and its supporting harmony. The left hand texture on measure 18 is identical to the opening measures of this piece—except for the low C#.

In the realm of meter and rhythm, Harald Krebs associates dovetailing with an indirect dissonance, which he describes as an intermediate state of all metrical dissonance to consonance successions. According to Krebs, a metrical dissonance, caused by the superimposition of...
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tion of different rhythms or the displacement of two equal rhythms, cannot be resolved abruptly. While conflicting rhythms eventually subside, metrical dissonance may be weakly hinted for a brief span and not immediately forgotten by the listener. In this intermediate stage, metrical dissonance is “conceptually maintained.”

**Example 1.** Dovetailing in Schumann's *Romance*, Op. 28, No. 2

Writings on the study of instrumentation and orchestration cite the technique of dovetailing as a way of dividing a musical line between two or more instruments to help “create the effect of a continuous line.” Most often, the musical line is exchanged on the tactus or attack point of a beat with a single-note overlap. Splitting the musical line as such, especially during fast and demanding musical passages, eases playability and improves tuning. It can also be employed to create a melody whose range is too wide to be performed by a single instrument, or when the composer wishes to change timbres within a musical phrase. When performed by instruments of the same family, the outcome is a seamless transfer of melody.

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Clearly, the notion of dovetailing differs for Blatter, Green, Krebs, and Warburton, yet apart from the technique used in orchestration, each scholar agrees in some way that it entails a smooth and/or overlapping transition—whether rhythmic or within the pitch domain—between two sections.

While the topic of dovetailing centers on the overlapping of textures, not all overlapping situations present the process of dovetailing. New patterns emerge throughout Adams's work without marking new formal beginnings. The insertion of these patterns may consist of a textural additive process or simply a contrast to previous music while remaining in the same formal section. Musical closure must be experienced in order to create bona fide new formal beginnings.

Catherine Ann Pellegrino defines three types of musical constructions that contribute towards a sense of closure in Adams's works: (1) tonal patterns, (2) formal aspects, and (3) rhetorical elements.\(^{11}\) The first category pertains to the completion of tonal patterns or processes. When a musical process such as a palindrome is set in motion, the realization of its full cycle encloses a large musical area under a single process that clearly delineates a beginning and end point. The second category considers formal aspects of closure. It requires the cooperation of the other categories in order to work, in part because musical form defined by phrase and cadential structure in traditional tonality, are either absent or reinvented in Adams's music to suit his own style. Pellegrino purports that the last category—rhetorical elements—is the strongest of the three because it can project closure independently of the other two. Rhetorical elements of closure include stylistic conventions—such as dominant-tonic reiterations in classical style sonata form—that help us understand the direction of the music, or an engagement of excess, whose music is "moving beyond the ranges of dynamics, tempo, register, or orchestration that have been utilized throughout the musical work."\(^{12}\) The opposite effect, whereby closure is generated by a fading away of dynamics, musical patterns, and textures, achieves closure in much the same manner.

In "Chain to the Rhythm" and other more recent orchestral works by Adams, formal aspects of closure cannot be said to be the \textit{modus operandi} because there are no returning sections as understood with tra-

\(^{12}\) Ibid., 166.
ditional formal types. Instead, closure is established primarily through rhetorical means of simultaneous beginning-end processes that are at odds with one another. It is perceived through various means, acting either alone or in combination: a waning of textures, a gradual removal of notes, a reduction in dynamics, and a decrease in rhythmic activity (transforming contrapuntal textures to homophonic ones). Unlike typical classical-style conventions of closure that revolve around the resolution of the dominant, formal beginnings in Adams's works sound more stable than other parts because they reinforce a particular bass note or set class. Furthermore, the process of a new beginning engages the entire ensemble through additive structures, rather than simply one or few musical motives.

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13 I wonder whether Adams's dovetailing technique (and perhaps even the title of his movement "Chain to the Rhythm") is loosely influenced by Witold Lutosławski's writings and compositions on what he called chain form, which has been described as "a permanent overlapping of independent musical (thematic, textual) strands or chains"; See Stanislaw Bedkowski and Stanislaw Hrabia, *Witold Lutosławski: A Bio-Bibliography* (Westport: Greenwood Press, 2001), 9. John Adams and Lutosławski have both shared a friendship with Esa-Pekka Salonen, who was the conductor of the Los Angeles Philharmonic Orchestra until 2009. Moreover, both of these composers have worked at length with the Los Angeles Philharmonic Orchestra during Salonen's tenure: Adams dedicated "Chain to the Rhythm" to Salonen, and years later he premiered *The Dharma at Big Sur* with this fine orchestra, and Lutosławski premiered his Symphony No. 4 with the Los Angeles Philharmonic Orchestra and also composed his *Fanfare for the Los Angeles Philharmonic*. On the other hand, the term has been used by Russian musicians such as Sergey Slonimsky to signify the "constant unifying of all kinds and themes" so that 'none of them gives way to a new one, but develops and transforms itself along with the emergence of new thematic material." See Irina Nikolaeva, "On the Types of Chain Connections in the Late Music of Lutosławski: Some Remarks on Chain 1 for Chamber Ensemble and Chain 3 for Orchestra," in *Lutosławski Studies*, ed. Zbigniew Skorwoni (New York: Oxford University Press, 2001), 306, who cites, in translated form, Sergey Slonimsky's book *Simfonii Prokofieva* (Leningrad: Muzyka, 1964), 16. Nicolas Slonimsky, Sergey's uncle, was one of the most influential figures in Adams's career as a composer. Thus, it is unclear whether Adams derived the title "chain" from Lutosławski, Slonimsky, or neither influence. An unusual enigma arises in the fact that Adams does not reference either composer as possible inspiration yet Adams is known to be quite forthright when discussing his music in interviews. In my estimation, it seems more likely that Adams introduced the metaphor of a chain to describe some of the rhythmic connections between formal sections I discuss in this paper. Furthermore, Adams's approach to overlapping textures is different enough from Lutosławski's (or other composers) concept of chain form to merit individual attention.
Figure 2. Representative Pattern Modifications in "Chain to the Rhythm"

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Adams's unique approach to dovetailing is tied to the ways in which he alters motives and repetitive patterns, such as reiterating fragments and ostinati. The current discussion of dovetailing will assess the types of modifications that are employed for the effect of a smooth transition between sections. The musical excerpts in Figure 2 are representative of the types of alterations found in Adams's dovetailed transitions. This illustration elaborates on Warburton's notion of block additive and subtractive processes, but I also include other modifications such as inversion, beat- and pitch-class transposition.

In Figure 2, the modifications add a note/chord or group of notes, and remove a note/chord or group of notes, comprise Warburton's block additive and subtractive processes (see modifications 1a, 1b, 2a, and 2b). To maintain a gradual additive process, the number of notes that Adams adds to a pattern is almost always less than four. Notes can also be inserted within a musical pattern, as in internal expansion (modification 1c). Likewise, note removal may occur either at boundary points or within a given pattern. The next modification, which changes a note or group of notes, is called free variation (modification 3). The musical excerpt provided in this category resembles transposition, but closer inspection shows that the two patterns share the same ascending contour but form different set classes. Also, the first pattern spans seven semitones, while the second pattern spans eleven semitones. The excerpt shows only one scenario for free variation, but this category clearly encompasses myriad possibilities. Transposition and inversion (modifications 4 and 5) are sometimes tonal, thereby maintaining a particular mode, and at other times real, thereby keeping the same set class. Adams frequently employs tonal transpositions within sections and real transpositions to outline formal boundaries. Beat transposition is described as a type of rhythmic displacement by Warburton (modification 6). It conveys the repetition of a musical pattern at a specific time interval, which is

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14 Gretchen Horlacher identifies two types of repetitive patterns: reiterating fragments and ostinati. See Gretchen Horlacher, “The Rhythms of Reiteration: Formal Development in Stravinsky’s Ostinati.” Music Theory Spectrum 14, no. 2 (1992): 180. Reiterating fragments differ from ostinati in that they are separated by rests and can be modified. Horlacher’s use of the term fragment accords with Adams’s own description for the motivic patterns found in this movement: “Small fragments of rhythmic cells are moved back and forth among a variety of harmonic areas.” See Adams, “Naive and Sentimental Music.”
expressed as $t_n$-time transposition by $n$ beats. In modification 6, the vibraphone plays a pattern three times. If the beat divisions are interpreted to be the length of an eighth-note, the second statement is offset from the first by seven eighth-notes or $t_n$, and the third group of notes is related to the second group by $t_n$. These distances can also be conveyed with beat-classes in mod5 space to reflect the 5/8 meter.

Figure 3 graphically shows how a smooth transition between two sections can be realized through dovetailing. Playing on the title of Adams's movement, "Chain to the Rhythms," I will refer to the formal sections as links and the chain connections, which delineate formal sections, as link connections. Dovetailing can be realized by temporarily dropping the lower voices of a texture at the end of a formal section. The return of these lower voices signals the beginning of a new link. First, the lower instruments gradually drop out through the second modification category (remove a note/group of notes), or simply fade away. The higher instruments maintain their textures from link 1 as the lower instruments begin a new texture that eventually develops through an additive process. Soon after, musical layers and dynamics are gradually built through a textural additive process. When the higher instruments begin their second link, the textures from the lower instruments have already increased in dynamics. This necessitates a louder dynamic level for the higher instruments at their beginning of link 2.

Figure 3: Dovetailing in Link Connection 1

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16 My illustration expands on Warburton's Example 12 found on page 159. Warburton's ascribes the terms fade out and fade in place of block subtractive/additive processes. My adaptation incorporates block and textural additive processes and introduces the concept of links.
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Figure 4 includes a textural diagram of measures 48–90 (circa 1'44"–3'09" on the original Nonesuch recording 79636-2) from "Chain to the Rhythm." The musical notes in each box represent some sound, whereas the absence of those notes denotes silence. This diagram clearly shows a textural subtractive process by the gradual removal of instruments, and a textural additive process by the gradual accumulation thereof. Block subtractive processes decrease rhythmic and melodic activity in the oboes and basses.

The textural diagram uses several shadings or markings to distinguish the function of the textures. Patterns marked by grey cells begin the process of closure, but they do not act as the final bearers of an ending process. These motivic patterns present contrasting material that operates as a precursor to the concluding material. The bassoon parts substitute their contrapuntal texture in favor of a more subdued homophonic texture, while the oboes engage in a block subtractive process via a pattern reduction to a single repeated pitch. Patterns shown with black cells represent the ending process of musical lines that halt either before formal overlap emerges or during the process of dovetailing. Patterns marked by dotted cells illustrate the accumulation of new textures from link 2. Cells with non-shaded musical notes consist of musical patterns that do not show a direct influence from preceding or subsequent repetitive patterns, and hence are either extraneous to dovetailing or deliberately employed to make the transition less apparent. Last, cells marked with vertical stripes highlight the formal beginning of a section, which I will explain shortly.

Figure 4 demonstrates how dovetailing can be thought of as having two stages. The first is characterized by the introduction of new musical material, while the second part is defined by the removal of preceding musical material. In this manner, we can establish the length and describe the procedure for overlap. Figure 4 shows how dovetailing begins in measure 65 (or 2'21" on the recording) and ends in measure 74 (2'38"). Every instrumental line that is sounding in these measures takes part in the dovetailing process. Characteristic features of this example include the early entry of the cello part and the persistent trumpet line that ends in measure 74. In this example, dovetailing enables a thinning and rebuilding of textures without a complete loss of rhythmic momentum. The effect of starting and stopping or of moving abruptly to a new section is replaced by a gradual process in which dynamics and instruments are reduced at the end of a link and slowly brought back at the onset of a new link.
While a sense of transition is natural to the dovetailing process, there comes a point in which the function of a transition is no longer the most salient factor. As anterior textures subside, the consolidation of new material gains momentum and leads the way to a new formal beginning. Various musical factors support the beginning of a new formal section. In the first link connection, I have marked the formal beginning of link 2 in measure 68 (227") for several reasons. First, the contrabass, after a break of 16 measures, begins a new pattern in measure 68. The sonority at this point is significant; utilizing Timothy A. Johnson's chord preference rules (C-PR)—designed specifically to examine Adams's harmonic vocabulary with a hierarchical approach—yields a root-position minor seventh chord. Pellegrino considers the minor seventh chord a characteristic pitch-class set that Adams uses as a building block for tonal structures. We can interpret these tonal structures through a centricity supported by the minor seventh chord, with emphasis on its root stated in the bass part. Second, the horns, which are an important component of link 1, reach their high point in measure 65, and then drop out in measure 67. The horns' absence enables the growth of new musical textures and makes their entrance in measure 89 (306") more discernable. Third, only two instruments from link 1 continue past measure 68: a trumpet part that is not notated in the score (but can be heard in the Nonesuch recording), and a bass drum that remains partly neutral to forming motivic unity within either link because it is an instrument of indefinite pitch and its rhythm does not conform to the motives of one formal section over another.

17 Timothy A. Johnson, "Harmonic Vocabulary in the Music of John Adams: A Hierarchical Approach," *Journal of Music Theory* 37, no. 1 (1993): 130. My choice for chordal segmentation focuses on link 2 material. Pertinent to this passage are Johnson's C-PR1—complete triads and seventh chords are preferred sonorities in Adams's music—and C-PR2—"if more than one complete chord is possible, the lowest sounding pitch in that time span identifies the root, if this pitch is the root of an allowable (diatonic) chord." (130). John Roeder's analyses of Reich's *New York Counterpoint* and *Six Pianos* also favor lowest pitches as tonics, or at least chord roots. See Roeder, "Beat-Class Modulation in Steve Reich's Music," 278–83.


19 As this work was commissioned and recorded by the Los Angeles Philharmonic under the direction of Salonen, one could only imagine a close supervision by Adams over any additions not appearing in the score.
Figure 4. Textural Diagram of Link Connection 1
The closing gestures from the oboes and also the bassoons are shown in Examples 2(a) and (b), respectively. As early as in measure 44 ("32"), the oboes begin their two-note reiterating fragment; it is unlike previous motives in its stubbornness to change and develop into a larger pattern. The focus of the oboes is on the P4 interval that emphasizes the note E and foreshadows the pitch center that helps define the next formal section. This closing pattern undergoes several modifications: first, the interval of the fourth expands to a new pattern (B–F♯), and second, a note is dropped before vanishing several measures later. Next, the bassoons prepare for the transition by releasing their scalar ascending motive to adopt an accompanimental, triadic figure of sixteenth notes.

**Example 2:** Closing Gestures in Link 1. (a) reductive pattern modifications in oboes (b) scalar to homophonic reduction in bassoons

(a)

(b)

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A textual diagram of the second link connection, shown in Figure 5 (starting on 3'26"), illustrates a varied approach to dovetailing. Figure
5 reuses the markings from Figure 4 to depict the function of repetitive patterns. The grey cells that begin the process of closure are portrayed by the bassoon parts, which substitute their contrapuntal texture in favor of a homophonic texture. Additionally, the trombones and horns replace the \textit{vii}-\textit{i}i\textsubscript{7} accompaniment and their sustained chords with a more active chordal texture before approaching the new section. The role between higher and lower instruments in activating a new formal section is not clearly defined as in the first link connection; thus instruments of any range can begin new link material. Textural and block subtractive processes continue to play a key role in concluding the formal section, yet the opening textures display a more sudden shift and faster pickup due to their close proximity. The effect created is a more elusive transition whereby dovetailing is harder to perceive since it does not materialize to the extent seen earlier. In link connection 1 dovetailing spans ten measures, whereas in link connection 2, dovetailing spans only four measures. Naturally, instrument parts are still brought in through the use of a textural additive process.

Tonal and rhetorical factors create a sense of formal closure in link connection 2. The lowest tone from the previous link connection conspicuously returns in measure 122 (4'07\textquotedbl"). Reassuming the role of pitch center, the low E\textsubscript{b} creates stability found in link connection 1. The rhetorical function of these measures entails a maximalism of dynamics and intensification of textures.\textsuperscript{20} The timpani and bass drum strike forcefully and repeatedly until the end of measure 123. The timpani’s repeated E\textsubscript{b} (coupled with D\textsuperscript{#} in the brass) creates a strong dissonance through its juxtaposition of the low E\textsubscript{b} in the contrabass and bass clarinets. Concurrent with this clash of the minor second, various woodwind and string instruments abruptly begin a new reiterating fragment in measure 122. The bass E in this link connection now coincides with the beginning of dovetailing, rather than the formal beginning of link 3. After this moment the contrapuntal textures used to complete the previous section have faded away and new patterns are free to emerge. The formal beginning of link 3 occurs in measure 124 (4'10\textquotedbl") with the unwavering chordal arrival of the piano and sampler parts. Their stationary

\textsuperscript{20}Michel Delville and Andrew Norris use the term “maximalism” to describe a means to push the limits of musical excess through myriad ways, such as extremes of register, rhythmic structure, polyphonic textures, and instrumental virtuosity. By extension, the intensification of dynamics, orchestration, chromaticism, and dissonance could also be considered. See Michel Delville and Andrew Norris, “Disciplined Excess: The Minimalist/Maximalist Interface in Frank Zappa and Captain Beefheart,” \textit{Interval(les} 1, no. 1 (2004): 3–15.
Figure 5: Textural Diagram of Link Connection 2
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Texture is inherently different from patterns heard in earlier measures, and thus helps disconnect the sections effectively. The entrance of these instruments is supported by the woodwinds in the same measure; they display an offbeat, chord-like accompaniment against the foreground musical lines, which exhibit faster rhythmic figures. Moreover, the same Em7 chord that helped generate the earlier beginning reappears in measure 124 (examine the bass part together with the piano, sampler, and woodwinds, and two measures later the seventh emerges in the violas). The trumpet and trombone parts in measures 124–126 contain material that resembles the end of link 2, yet this pattern takes on a new character in these measures, so it will be considered as part of link 3. The end of link 2 occurs in measure 125, where the percussion 1 line ends and its texture thereafter serves an accompanimental role.

Example 3. Opening gestures in Link 3

![Example 3](image)

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Example 3 shows Adams’s gradual process of building textures in the opening of link 3. This passage is representative of other formal beginnings in “Chain to the Rhythm.” Motivic patterns begin independently in a canonic fashion to heighten the audibility of each texture. The violins initiate the process of growth followed by the pedal in the low strings. Their complementary hocket technique generates a per-
ceived meter that diverges from the written meter in the former link. The piano and flute sampler emerge next, introducing the sonority based on E that pairs with the low strings and marks a formal link beginning. The violas, which unfold shortly thereafter, emphasize the seventh of the recurring Em7 chord that marks the beginning of this link and the previous one. The last entry introduces the first violins with a pattern of descending intervallic fifths doubled with parallel thirds.

Following the textural additive process in Example 3, the reiterating musical fragments undergo a series of modifications emblematic to Adams's musical style. Some reiterating fragments continue the process of pattern building through block additive processes: the first violins expand in length internally by one note, and the violas periodically expand at the beginning or end of their segment. A concurrent block subtractive process occurs in the second violins with the removal of their first harmony from each two-chord grouping. The life span of these operating patterns seldom reaches the next link connection. Instead, one by one these patterns gradually dissolve and give way to patterns that signal closing gestures before moving to a new formal section.

The third link connection, shown as Example 4 (4'50"–5'11"), features the same type of interlocking technique encountered in Figure 5; musically it resembles the dovetailed joints characteristic of woodworking. Low range instruments continue to bear an important role in grounding the Em7 recurring harmonic structure. This link connection bears similarity to the first link connection—Figure 4—in several respects: both begin dovetailing with the cello and both dovetailed passages last ten measures. However, the gestural effect of maximization is effectively reversed; closure at the end of this new link connection is produced through what Pellegrino refers to as a "type of rhetorical convention [that] involves an ending in which tension, dynamics, and rhythm all decrease in intensity, fading away into oblivion." All the instruments decrease in volume or drop out during the dovetailed transition, and the intensity of rhythm is reduced by the gradual removal of instrumental lines. The formal beginning of link 4 is established in measure 155 through a state of repose conveyed by the repeating Em7 chord and the emerging patterns germinate quickly through the result of a textural additive process—one where most opening textures coincide with the formal beginning. This new formal opening is highlighted by a double barline, which makes the change in meter and the entry of numerous instrument choirs visually discernible.

EXAMPLE 4. Dovetailing Link Connection 3
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The Em’ tonic sonority in measure 155 is now reinforced by chordal doubling set in motion by the activated lines. The rebuilding of textures in this link is reminiscent of former links in their use of block and textural additive processes.

**Example 5. Pattern Modification between Two Links**

![Example 5. Pattern Modification between Two Links](image)

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The fourth link connection (measures 195–206 or audio 6’24”–6’44”) resembles the previous three in its use of textural additive and subtractive processes, its visual cue of the double barline on the score, and its opening pitch class collection; however, notable differences can be observed. New link material that Adams establishes in the bass and cello parts (measures 199 and 202) is temporarily omitted before the formal beginning of link 5 in measure 207. Example 5 shows this new motivic material as it occurs towards the end of link 4 in the cello *divisi* parts (measures 202–203), and then soon after the beginning of formal link 5 in measures 209-210. The two excerpts in Example 5 resemble each other because they form part of the same four-note pattern. A series of modifications, such as *add a group of notes*, and changes in the recurrence of patterns, is apparent in link 4. A different set of modifications appear at the beginning of link—transposition of the original pattern (T₁₀ maps E onto D and F♯ onto E) and a note change within the pattern from F♯ to F♮. The metric modulation visually alters the meter and the notation while aurally continuing the same pattern accordingly, enabling the prospect for faster rhythms to spring forth soon thereafter. The illustration belonging to link 4 ends in measure 206 in order to thin textures and project the opening sonority of this new section; then the pattern restarts the same thread in modified form in
measure 209. In this scenario, it is the absence of the cello and bass that marks a new link, as well as the stability of the new opening sonority, a root-position minor seventh chord, now transposed to pitch class B. The remaining new patterns maintain their overall flow as they cross formal link 5. Adams's approach to dovetailing in this fourth link connection differs from links 1 through 3 in that all patterns that belong to link 4 end by measure 206 before formal link 5 begins. In other words, formal link 5 occurs after the preceding musical material has been removed.

The fifth and final link connection (measure 284 or 8’21") does not exhibit the use of dovetailing; nevertheless, examining this connection proves useful in evaluating the prerequisites for dovetailing. The use of double barlines, which previously signaled two earlier link entrances, appears again to mark a new section visually. The triplet pattern seen in Example 5 is reprocessed to connect the final two sections of this movement, but unlike subsequent patterns that fade away at the onset of a new section, this pattern continues for a significant period of time. Thus, even though there is a motivic connection that can be traced across links, some of the needed components previously encountered during the dovetailing process are absent, such as textural and block additive processes, as well as the gradual increase of dynamics at the beginning of new sections. When the formal beginning arrives in measure 284, all textures and dynamics have already reached the climax of the movement, creating a sudden increase of textural and dynamic parameters.

**Figure 6. Arch Map of Chain to the Rhythm**

<table>
<thead>
<tr>
<th>Measures</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<table>
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<tr>
<th>Beginning &amp; End Points</th>
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<th>123−125</th>
<th>148−157</th>
<th>195−206</th>
<th>284</th>
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</thead>
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<td>m. 124</td>
<td>m. 155</td>
<td>m. 207</td>
<td>m. 284</td>
</tr>
<tr>
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<td>61</td>
<td>36</td>
<td>59</td>
<td>89</td>
</tr>
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<td>4</td>
<td>10</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Initial Sonorities</td>
<td>Em</td>
<td>Em'</td>
<td>Em'</td>
<td>Br'</td>
<td>E</td>
</tr>
</tbody>
</table>

An arch map of "Chain to the Rhythm," shown in Figure 6, displays dovetailing beginning and end points, as well as their duration, formal link beginnings, length of each link, and initial sonorities. There are six links; the final and longest of the six contains a coda. The first four link connections demonstrate dovetailing, and the last is fused with the triplet pattern from Example 5. One of the most intriguing factors
about Adams's dovetailing in this work is that the length of a dovetailed transition is proportional to the length of a link. Link 3, which is the shortest link, displays the shortest dovetailed passage for a length of 4 measures, while link 5, which is the longest overlapped link, displays dovetailing for a length of 12 measures. Links 2 and 4 are roughly the same length, as are their respective dovetailed sections. The arch map reveals links becoming shorter in the first half of the movement and longer in the second half. The fact that the shortest links are in the middle of the work and longer links are at the boundaries creates a rough symmetry to the overall form.

I have previously alluded to the importance of the minor seventh chord as a form-defining element in this piece. I interpret the seventh chords at the beginning of these links as stable sonorities, perhaps even dissonant tonics. In art and popular repertoire ranging from the turn of the twentieth century onwards, Daniel Harrison refers to these chords as colored triads, which consist of major or minor triads with major or minor sevenths. "This gives the chord mass greater perceived depth as well as thickness."22 In minimal music, pitches are organized into tonal schemes in a manner compatible with Harrison's words; thus, in some cases, dissonant sevenths do not alter tonic function. Paraphrasing Roy Travis, Harrison confirms that "a tonic can sound like anything as long as it plays the appropriate role in the piece, even if it does not have the natural resonance of traditional tonal tonics."23 Harrison's tonic colored triads include various chord types such as major-major, major-minor, and minor-minor. Root position minor seventh chords mark the beginning of all dovetailed transitions. The first, second, and third transitions begin with Em7, and the fourth one projects an initial Bm7 sonority. These link beginnings call attention to a quasi-tonic-dominant relationship. A macro-resolution of dominant-to-tonic centers appears towards the end of the work, where lower pitched instruments play a drawn out E natural minor scale (measures 295–306). The overpowering presence of E is also apparent throughout the growth of links 2, 3, 4, and 6.

I have shown how block and textural processes, through pattern modifications, dynamics (gestural highs and lows), and centricity become part of the dovetailing process in "Chain to the Rhythm."


23 Harrison quotes Roy Travis's "Towards a New Concept of Tonality?" *Journal of Music Theory* 3, no. 2 (1959): 263.
Tonal centricity often plays a crucial, form-defining role in Adams's works, and "Chain to the Rhythm" is not exceptional in this regard. Tonal centers are apparent in Adams's pieces, at least as far back as *Common Tones in Simple Time* (1979–1980, revised 1986). In this early work centricity is aided by the preservation of common tones maintained throughout the opening sections, while the eschewal of common tones is associated with a transitional, impelling force that brings forth a new section. In his operas, such as *Nixon in China* (1985–1987), the more stable sonorities correspond with a dramatic break in the opera. Centricity can also be observed in other instrumental works, including *Lollapalooza* (1995), *Road Movies* (1995), and *Hallelujah Junction* (1996).

Each dovetailing occurrence in "Chain to the Rhythm" is notable and distinct. The first instance is characterized by an early entrance of its formal link, which is marked by the return of the bass. In fact, finding the mean of each dovetailed passage—by adding the first and last measures of the dovetailed passage and dividing by two—shows that the first formal link is the only one to begin before its mean. As it is the first transition, Adams may have wished for a longer preparation for the new section. The second dovetailed entry reveals a sudden change of patterns without the need of block additive processes. It is the shortest dovetailed passage since it prepares a way for the shortest and least developed section of the piece, link 3. The third dovetailing connection bears the proportions of the first, but, like the second link connection, its formal link beginning appears near the end of the dovetailed section. The fourth link connection is notable in that formal link 5 begins a measure after dovetailing has ended. Yet despite the surface differences that exist between link connections, Adams's approach shows a proportional sameness that persists at a more structural level of form.

An in-depth analysis of Adams's dovetailing technique in "Chain to the Rhythm" provides a representative model for the study of Adams's other works, particularly his instrumental works from his more recent compositional period. Reflecting on Adams's oeuvre, dovetailing is regularly integrated into various formal constructs. Consider, for instance, *Lollapalooza*, which predates *Naive and Sentimental Music* by three years. Adams fuses the formal sections through dovetailing to form a loosely-based three-part formal design driven by various

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transformations of the onomatopoetic musical motive based from the title of the work—Adams transforms the syllabic length and normal emphasis of the word Lollapalooza into the musical motive C–C–C–Eb–C.\textsuperscript{25} Notwithstanding the obvious differences that exist between Lollapalooza and “Chain to the Rhythm” in the domain of formal structure, the method of closure between sections and the treatment of dovetailing is remarkably consistent. The same kinds of block and textural additive modifications are encountered in the repetitive patterns to enable the gradual unfolding of a new section.\textsuperscript{26} The first dovetailed section (measures 85–92) is of comparable length to those passages presented in “Chain to the Rhythm”; furthermore, the sonority articulated by the strings (beginning in measure 93) to support the form of the new section duplicates the use of a root–position minor seventh chord.

An examination of Adams’s method for employing dovetailing also serves as a window into the music of other minimalist composers. Steve Reich has integrated dovetailing in his music since the 1970s, especially including works as Six Pianos, Music for 18 Musicians, and his Octet.\textsuperscript{27} Reich’s approach to dovetailing is often formed by gradually removing low-register instruments and reintroducing them with new material while they overlap with former textures from high-register instruments, a technique akin to what I discussed in Adams’s link connection 1 from “Chain to the Rhythm.” Reich also provides a sense of

\begin{footnotesize}
\textsuperscript{25} For further detail on the structure of this work, refer to Sanchez-Behar (2008).
\textsuperscript{26} A handful of prominent reiterating fragments from Lollapalooza have been cataloged by Michael Buchler. See Michael Buchler, “The Sonic Illusion of Melodic Consistency in Recent Minimalist Composition,” Proceedings of the 9th International Conference on Music Perception and Cognition (2006): 697–701. Following Adams’s suit, Buchler takes an imaginative approach of ascribing names or short phrases to the repeating patterns according to their character or their onomatopoetic potentialities. In the opening of the work, the bass clarinet and bassoons introduce the “one-bar blues” motive, containing syncopations and notes from the blues scale. A second motive entitled “how are you?” gradually unfolds from measure 7 in the oboes and clarinets. And a third motive identified as “I am just fine, thank you” germinates with the piccolo part and is doubled by the Eb clarinet and the piano in measure 12. Tracking the course of these motives is essential because they play a crucial role during the process of dovetailing. One noteworthy pattern not included in Buchler’s article helps to generate the first instance of dovetailing. This pattern occurs in the trumpet and flute parts in measure 85, and subsequently imitated by the piano in measure 90.
\textsuperscript{27} Warburton, “A Working Terminology for Minimal Music,” 156.
\end{footnotesize}
transition between overlapped sections through beat-class modulation, which creates "large-scale contrast, progression, and return."\textsuperscript{28}

My primary objective for this study has focused on one of Adams's signature techniques: creating seamless transitions between formal sections by means of interwoven repetitive minimalist patterns. Analytical inquiry of Adams's "Chain to the Rhythm" elucidates his own brand of dovetailing and informs motivic, harmonic, proportional, and formal aspects of his works. With regard to motivic patterns during the point of formal overlap, we observed closing gestures through block and textural processes commonly used in the minimalist style. Harmonic factors through minor seventh chords attribute a quality of being grounded and enabling new links to form gradually. Last, proportional factors of dovetailing durations had a direct impact in the size of a formal section. I hope to have shown how these aspects considered jointly through the lens of dovetailing bear considerable ramifications on the formal features of the work. As music listeners we often devote our greatest attention to initial and closing moments. Adams's rich dovetailed tapestries offer an opportunity of perceiving two joint processes as one.

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