For centuries, compositional instructions for writing canons have drawn attention to the particular dux-comes and comes-dux relations shown in Figure 1. First, compose musical material to span the first time interval of the canon (TIC 1) in the dux. Copy this material into the comes, often transposed, one time interval of the canon later (TIC 2). Then, compose a counterpoint to the comes for the dux part during TIC 2. As far back as 1667, Christopher Simpson described this process, concluding with the vague recommendation to continue this method “to what length or shortness you please.” Using only these guidelines, a fragmented melody seems likely, and it is hard to imagine creating a larger-scale canonic organization.

Over the last twenty years a number of articles have introduced methods that can inform larger-scale thinking about the composition and analysis of canons. These articles have focused primarily on the dux part, and particularly the melodic intervals separating notes one time inter-

* I wish to acknowledge David Lewin’s participation in the early stages of developing the concept of canonic threads. There will never be anywhere better to take a fledgling idea than into David’s office, where his musicianship, ideas, enthusiasm, humor, and his pen’s red ink, seemed to flow without end. David Cohen also offered many excellent suggestions that influenced the formation of my ideas. More recently, this essay benefited from the careful readings and comments of Andrew Mead, Ramon Satyendra, Lewis Lockwood, and the anonymous reviewers for Gamut.


val of the canon apart. In this article, I consider the organizational potential for a set of canonic patterns that are new to the theoretical literature about canons. I call these patterns canonic threads. Canonic threads provide a simple method for determining what note will sound a given number of time intervals of the canon away. When threads are present in a canon, they offer a valuable analytic approach that at times complements, and at other times operates apart from our common forms of analysis that focus on topics such as voice leading and harmonic progression.

Canonic threads pair the traditional connection between dux and comes upon which canonic hearing depends (the dux part for the space of one TIC, and the comes part in the following TIC) with a radically different relationship between the comes and dux, now between a comes in one TIC and the dux in the following TIC. Figure 2 provides the model of a single
canonic thread. Each arrow connects the material one time interval of the canon apart, which is here presented as one measure. We can connect the skipped passages from Figure 2 (e.g., the dux for TIC 2) to form a second thread. Figure 3 maps two threads within a canonic passage: the first with solid-lined arrows, and the second with broken-lined arrows. At the beginning of a canonic passage, the parenthesized number 1 in the comes will not sound because the comes does not enter until the second TIC. Zigzagging arrows, which naturally could be drawn between the dux and comes of any canon, only determine a thread when a definite organizational principle exists between the TIC notes that they connect. Before turning to these organizational principles I will address the concept of TIC note.

A TIC note is a single note that represents a canonic part (or, on rare occasions, a non-canonic accompanying part) for the length of one time interval of the canon. For example, if the TIC is two measures, a single TIC note would represent two measures of the dux or comes. A TIC note tends to be the first chord tone that sounds during a particular time interval of the canon. By this definition, it is common to find TIC notes exactly on a downbeat. However, if a non-harmonic tone such as a suspension occurs at the beginning of a TIC, the TIC note generally is the note of resolution that ensues. On rare occasions a TIC note can be a non-chord tone, as long as it is the first note consonant with the bass. In the sections to come, the challenges of choosing TIC notes that belong to canonic threads will be discussed as they arise in the context of each canon. The term thread note designates a TIC note that belongs to a thread.

There are two different organizational types of threads. In the first type, the thread notes change by a repeated single interval. This type of thread can be further classified by the interval that separates the TIC notes: in a repeated-note thread, the thread notes “change” by unison; in a stepwise thread, the thread notes change by second; and finally, in a skipped-note thread, the
thread notes change by a single larger interval (either a third, fourth, fifth, etc.). The second type of thread is an arpeggiation thread. In this thread, notes change by more than one interval (e.g., thirds and fourths) in order to arpeggiate a single chord. The sample TIC notes C–F–A–C–F would comprise an arpeggiation thread. Both organizational types follow familiar ordering techniques. Whether or not a piece is canonic, composers and listeners depend on repeated notes, stepwise passages, and arpeggiation to provide materials for composition. By finding these patterns in canonic threads, we are further exploring the organizational capacity of familiar musical phenomena as well as deriving a powerful means for predicting the long-range path of some canons.

We can visually simplify the zigzagging layout of a canonic thread by arranging the thread notes on a single staff as in Figure 4. D1 denotes the TIC note from the dux at the first TIC; C2 denotes the TIC note from the comes at the second TIC; and so forth. In general, the thread that begins with the first TIC note of the dux will be called Thread 1. Figure 5 arranges two simultaneous threads on two staves. As noted before, C1 is parenthesized because C2 is the first TIC note in the comes.
A further step in simplifying the arrangement of thread notes can be to place the pitches of the thread graph into some close registral position. Although it is not always necessary, an arrangement of the thread notes into close registral position can be useful to focus attention on how the TIC notes are organized. The notes C–D–E, for example, could be separated by intervals of an ascending second and a descending seventh. Only when these notes are arranged in close registral position does the stepwise thread become visually apparent. The registral reductions in Figure 6 reveal repeated, stepwise, and arpeggiated notes. Quarter notes represent each TIC.
I will develop the concept of canonic threads using Bach’s Goldberg Variations and Brahms’s Variations on a Theme by Schumann, op. 9, as focus pieces. Both of these works have multiple canonic variations. The variations with canonic threads are listed in Figure 7. The study of these variations demonstrates how the organizational patterns found in threads offer predictability for longer-range compositional planning and can be adapted easily to diverse situations. What is more, the organizational simplicity of threads provides a counterbalance to the complexities inherent in canonic compositions.

BRAHMS, Variations on a Theme by Schumann: No. 8

Variation 8 is the first of the canonic variations in Brahms’s Op. 9; it is reproduced in Figure 8. The canonic interval is the octave or double octave below, depending on whether the upper or lower notes of the left-hand tremolo are chosen for the comes. The TIC notes are all chord tones on the downbeats of the odd-numbered measures. The variation’s surprisingly

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3 Measure 3 is an interesting case, because the A in the dux is part of a cadential $\frac{5}{4}$ chord and moves down on the following beat to a $\text{G}\#$ which is part of a $\frac{5}{4}$ chord. In the construction of this canon, however, the dux A in the $\text{F}\#\text{G}$ chord nevertheless enjoys a certain priority for the schema of Figure 8, because the link between mm. 1 and 3 is that both downbeats include the notes $\text{F}\#\text{A}–\text{C}\#$. It is secondary for this canonic schema that in m. 3 the notes occur in a second-inversion chord that is part of a cadential structure.
FIGURE 8. Brahms, *Variations on a Theme by Schumann*, op. 9:
Variation 8, canon at the octave/double octave
**FIGURE 8.** [continuation]

**FIGURE 9.** Brahms, Variation 8: *dux* pattern

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>17</th>
<th>19</th>
<th>21</th>
<th>23</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIC:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
</tbody>
</table>

**Intervallc Change:**

-3 +3 -3 +3 -3 +3 -3 +3 -3 -3 -3 -3

**Form:**

A  B (=inversion of A)  A'
pedestrian pattern of TIC notes is shown in Figure 9, with each two-measure TIC represented by one quarter note, and brackets marking off the ternary form divisions in the dux. All the consecutive pairs of notes are related by thirds.\textsuperscript{4} While the similarity of the outer sections (bracketed) is not surprising considering the ABA' form of the theme, the inverted nature of the middle section is remarkable.

To determine if there is a thread, we must go a step further and consider the TIC notes in the comes, and in particular those that alternate with every other one of the dux’s TIC notes. Figure 10 arranges these alternating dux and comes notes. In a sense, the thread lacks even the pedestrian excitement of the dux pattern in Figure 9. The thread is made up entirely of the note C\#. A registral reduction of the type shown in Figure 6a establishes this as a repeated-note thread. Because the canon is at the octave, it is a given that a dux C\# will lead to a comes C\#, one TIC later. It would not, however, be a given that the comes C\# will be followed by a dux C\# at the following TIC, except that Schumann’s melody repeats the C\# every four measures as shown in Figure 11 at the start of each system. In Figure 10, the line that marks the repeated-note thread does not extend to m. 25, because the final TIC note in the dux sounds an F\# rather than a C\#.

This F\# is the only TIC note that is not imitated by the comes, because the variation ends here.

\textsuperscript{4} My article “Canonic Patterns: Reframing the Puzzle” refers to the prevalence of thirds between adjacent TIC notes in the dux. This Brahms variation is another example of that interval’s frequency.
The workings of this canon largely rely on the simplicity of Schumann’s melody. Of course, even with such a humble thread pattern, a canon will invariably test the ear with a myriad of metric and harmonic complexities. The repeated-note thread is a logical outgrowth of the three repeated C#s that initiate Schumann’s melody. However the most stunning relationship is between the thread notes and Brahms’s accompanimental figure. A match between the thread and the left-hand tremolo figure is shown in Figure 12. The top part of the figure organizes the alternating dux and comes notes from the thread onto a single staff. The comes notes of the

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5 Schumann provides a substantial hint that the melody can be treated canonically. The opening three upper-voice Cs are imitated in the lower staff in mm. 3–4. Schumann adjusts the texture in m. 4 to five voices at least in part to repeat this Cs motive in an inner voice. Even the accompanying tenor voice from mm. 1–2 is repeated from mm. 3–4, now in the soprano.
thread are an octave higher than those in Figure 10 because they correspond to the upper notes of the left-hand tremolo. Figure 12’s lower staff reproduces the opening measure of the *comes* (m. 3) with its two sextuplet groupings of C♭ in the left hand. These repeated C♭s closely match the twelve repeated C♭s that comprise Thread 1 of the variation. The first measure of the eccentric left-hand figuration pattern provides a miniature presentation of the canonic thread over the entire variation. And this astonishing relationship between accompanimental figuration and canonic thread is also found later in Variation 15, which is analyzed at the end of this article.

The role of a simple pattern as a backbone for the canonic composition is also evidenced by the TIC notes that occur in the *dux* every four measures starting with m. 3. If Brahms had appropriated the Schumann theme exactly for his own canonic *dux*, the downbeat notes would be A in m. 3, A in m. 7, C♭ in m. 11, E in m. 15, A in m. 19, and A in m. 23. The top staff in Figure 13 marks with asterisks where Brahms changes the expected note from Schumann’s theme. Brahms changes the note at m. 11 from Schumann’s C♭ to an E, and he inflects the note at m. 15 from the theme’s E♭ to an E♮. These adjustments result in a series of three shorter threads, each corresponding to one section. Zigzagging lines between the staffs mark repeated-note threads; a repeated-A thread, a repeated-E thread (with chromatic inflection introduced by the *dux*’s E♭ in

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**Figure 12.** Relation between left-hand figuration and repeated-note thread (in original register)

*D* = *dux*, *C* = *comes*
m. 15), and another repeated-A thread (now with chromatic inflection introduced in m. 25 by the comes!). Of course, threads on the notes A and E will assure imperfect consonances with the repeated-C♯ thread. Figure 14 portrays, after registral reduction, the C♯ thread on the upper staff, and the A and E threads on the lower staff. Brahms’s arrangement of the canonic frame with all imperfect consonances eliminates the trap of parallel perfect consonances. Given the constant thirds between threads, Brahms’s primary means of pitch experimentation for the thread notes is limited to chromatic inflection.

The simple contrapuntal frame in this variation is well suited for the large-scale harmonic motions in the theme. Figure 15 arranges the Schumann theme to highlight the harmonic divisions of each section. The A section progresses from tonic to mediant harmony. The B section progresses from the mediant to the minor dominant. Then, the A' section, instead of starting and ending on the tonic, begins with a wondrous vii⁰⁷/iv, and ends as expected on the tonic. The notes of Brahms’s canonic thread reflect the theme’s reliance on tonic, mediant, and dominant
**Figure 15.** Harmonic divisions of Schumann’s theme

**Figure 16.** Brahms, Variation 8: harmonic progressions related to thread notes

Measure: 1 3 5 7 9 11 13 15 17 19 21 23 25
harmonies. Figure 16 shows how each pairing of thread notes can fit into two different third-related chords. In the example, each TIC is represented by a quarter note. The top-staff C# thread is presented as three whole notes, which indicate the phrasing of the dux part (eight-measure phrases). The bottom-staff threads are notated with quarter notes to preserve chromatic inflections, and to show that the first phrase in the comes overlaps the second phrase in the dux. The notes A and C# can belong to either an F# or A triad. The notes E (or E#) and C# can belong to either an A or C# triad.

**Bach, Goldberg Variations: No. 6**

Bach’s sixth Goldberg variation, shown in Figure 17, is a canon at the second. The threads in this variation are not as beholden to a dux pattern as were the threads of Brahms’s Variation 8. As in the Brahms, however, the canonic interval determines the basic movement between successive thread notes—now by ascending seconds. The score in Figure 17 arranges the dux and comes on separate staves. The repeats have been deleted so that the eight-measure phrases can be aligned.

Bach’s thirty-two measure theme is divided into four, eight-measure phrases. Each phrase has a different harmonic path. The first and last chords of each phrase are as follows:

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Harmony</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I to I</td>
</tr>
<tr>
<td>2</td>
<td>I to V</td>
</tr>
<tr>
<td>3</td>
<td>V to vi</td>
</tr>
<tr>
<td>4</td>
<td>ii to I</td>
</tr>
</tbody>
</table>

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6 One of the most interesting aspects of this variation is the persistence of 6\(^4\) harmony. When the notes A and C# occur in a 6\(^4\) chord, it is clear that they are functioning as part of a cadential figure. In a very important sense then, the chords are better described as V\(^6\)(C\(^3\)) or V\(^6\)(C\(^3\))/III than as I or III. For our present canonic purposes, however, it is more relevant to focus on the spelling of the chord.

7 The vii\(^o\)/iv chord does not occur in the canonic variation. However, the A\(_5\), which grounds this chord, sneaks into the A-thread at m. 25 of the variation. Here, A\(_5\) is the raised third of the tonic chord, a stability that counters the fleeting A\(_5\) of the theme.
FIGURE 17. Bach, *Goldberg Variations*: Variation 6, canon at the second
FIGURE 17. [continuation]
Canonic threads provide a simple tool for recognizing which notes will arrive a given number of TICs in the future (in this case, eight TICS or measures).

Because the TIC is one measure, the thread has the possibility to rise one pitch per measure. The opening G in the *dux* is obliged, by virtue of the canon, to be imitated in the *comes* by an A. Although the *comes* of m. 2 need not hold any claim on m. 3, the *dux* of the Bach variation continues a “stepwise ascent” to B in m. 3. The pitch actually descends a seventh, but a registral reduction makes the stepwise connection obvious.\(^8\) The *dux* B is predictably imitated by the *comes* C in m. 4. The *dux* in m. 5 continues the scale by providing the D, again reaching into a lower octave than the previous *comes* note. The sixth note of the scale follows canonically (*comes*, m. 6). To complete the pattern through an entire octave, a listener aware of the procedure would expect F♯ and G to sound in the *dux* and *comes*, respectively, in mm. 7–8. Instead, it is surprising to hear these voices sound the notes A and B, which do not belong to this thread.\(^9\) The F♯ and G do occur, however: they are in the accompanying voice, and even in the low octave that follows the thread’s earlier registral pattern. The low G of m. 8 is also doubled by the *dux*. The thread in Bach’s canonic variation has escaped from the fabric of the canonic voices. The “accompaniment” seems actually designed to be included in the patterned structure created by the canonic parts.

\(^8\) This is partly due to the need to control the register of the upper two voices. The high B that is avoided in m. 3 is the highest note of the variation, and only occurs once. This note is saved for the *comes* part of m. 18. Octave transfers, with regard to canon, are discussed by Jean-Philippe Rameau. He observes that, in his vocal canons, there will be points where the vocal range will be exceeded, necessitating the singer to sing an octave lower than written. See Rameau, *Traité de l’harmonie réduite à ses principes naturels* (Paris, 1722), reprinted in vol. 1 of *The Complete Theoretical Writings of Jean-Philippe Rameau* (1683–1764), ed. Erwin R. Jacobi ([s.l.]: American Institute of Musicology, 1967–72): “Lorsque la Voix ne peut former l’Octave à l’endroit marqué d’un A, il n’y a qu’à prendre l’Unisson de la Notte précédente” (361). See also the translation by Philip Gossett as *Treatise on Harmony* (New York: Dover, 1971): “When the voice cannot form the octave at the place marked A, we need only take the unison of the preceding note instead” (370).

\(^9\) These notes generate a third thread that will not be discussed here.
The octave thread between mm. 1–8, shown in the top staff of Figure 18, spells a G-major scale, registrally shifted through three descending octaves. This scale is possible because the opening phrase is eight measures long, providing a perfect fit between the number of measures/TICs and the number of notes in an octave. Since the first eight measures of the Goldberg theme begin and end on a tonic chord, a complete scale in the thread is a logical compositional choice. The first eight measures of this canon are unambiguously in G major. Thread 2 is shown in the bottom staff of Figure 18. Each of its notes during this phrase is a third below or a sixth above the Thread-1 note of the same measure. Interestingly, in mm. 1–8 Thread 2 does not intrinsically project G-major structures. Thread 2 is missing a note in m. 1 (necessarily, since the comes does not enter in m. 1), and also a note in m. 8. The stepwise pattern suggests that the note E would have sounded in both of these measures, and an X notehead indicates both extensions to the pattern. Of course, these Es (perhaps suggesting E minor) would disrupt the tonal organization of the Goldberg theme. For this reason, it is only by what I will call endpoint omission that this phrase can begin and end on tonic harmony.

Because threads are comprised of simple patterns, their organizational power and span can pertain even when notes are missing from the dux and comes. Thread 1 during mm. 1–8 extends an octave, even though its final two notes are heard in the accompaniment. In Thread 2,
the endpoint omission of Es allows the phrase to begin and end on the desired tonic harmony. While these endpoints are not relevant to mm. 1–8 we will see that they play a role later in the variation.

Let us now consider the second eight measures of Variation 6. The theme poses a challenge to using threads in these measures because it dictates that the phrase must begin with tonic harmony and end with dominant harmony. Chord movement up a fifth, over eight measures, rules out an octave thread of the type seen in the first phrase. We might expect this to lead to considerable differences between the phrases, but the threads of both phrases are astonishingly similar. This similarity relies on the fact that Thread 2 of the second phrase, like Thread 2 of the first phrase, is not required to begin with G. It can also begin with an omitted tone. As in the first phrase, an omitted E extends the stepwise ascent. Therefore, in mm. 9–16, the chord movement can be understood as a seventh (E to D) rather than a fifth (G to D). The thread’s ambitus is only one note smaller in phrase two than in phrase one.

Figure 19 aligns the threads of the first and second phrases. Their similarity is readily apparent. The first five measures of each phrase begin with Thread 1 moving from G to D and Thread 2 moving from an omitted E to B. In mm. 9–12, Thread 1’s “ascent” is flavored by chromaticism. In addition to this change, there are registral differences between the two phrases.\(^{10}\)

The main change to note names is made toward the end of the second phrase, as a direct response to the new harmonic conditions. Phrase two only completes a pitch-class ascent of a

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\(^{10}\) Although the Thread-1 notes for phrase two, determined by the downbeat notes, ascend by second through m. 15 without any registral reduction, within each of the first four measures there is an octave leap (G\(_3\) to G\(_4\) in the dux of m. 9, A\(_3\) to A\(_4\) in the comes of m. 10, B\(_3\) to B\(_4\) in the dux of m. 11, and C\(#4\) to C\(_5\) in the comes of m. 12). As a result there is a descending seventh across each barline (e.g., G\(_4\) in m. 9 to A\(_3\) in m. 10); this actually intensifies the thread leaps of a descending seventh that occurred in the first phrase, once every two measures.
seventh. What I will call a delay technique stretches the seven pitches over eight measures. At m. 13, Thread 1’s D is held for two measures instead of one. The tied D at m. 14 is somewhat unusual in this variation because it is not a dissonant suspension. The note D is the first of the dux’s chord tones in both m. 13 and m. 14. This pair of Ds is imitated in the comes with two downbeat Es in mm. 14–15. The move from a two-measure dux D to a two-measure comes E creates an overlap of both notes in m. 14 because this canon’s TIC is one measure. Therefore it takes three measures, not two, for the thread to move from D to E.\(^\text{11}\)

\(^{11}\) Interestingly, this same delay technique occurs at the end of phrase one going into phrase two, but it is not tied to either of phrase one’s previously established threads. The delayed ascent from the dux A to comes B occurs in mm. 7–9 just as Thread 1 breaks into the accompanying voice and Thread 2 omits the endpoint E.
In m. 14, the dux’s D does not continue Thread 2 by step. By treating this D as part of Thread 1 along with the comes note E, Thread 1’s ascent from D to E is slowed. A similar delay occurs in Thread 2 when we imply B in m. 14. This note is actually heard in the dux, but because it is the second rather than the first chord tone it is placed in parentheses. It then takes three measures (mm. 13–15) for Thread 2 to move the single step from B to C#. The vertical interval between each pair of thread notes is an imperfect consonance with the exception of m. 14, which has both a third and a fourth between thread notes. The delay technique here guarantees that the D/F# thread pair arrives at m. 16, exactly where the Goldberg theme dictates that a perfect authentic cadence on the dominant should conclude the second phrase.

The seventh spanned in Thread 1 is easily heard because all of the notes from G to F# are played. In Thread 2, however, there is no note sounded in the initial measure. Figure 19 shows that the omitted first note of Thread 2 (marked with an X notehead) allows the phrase to proceed I–V, rather than straying into an undesired vi–V progression. By a combination of the delay technique (repeating one note in each thread) and omitting the first pitch of Thread 2, Bach is able to rely on threads to structure the second phrase of this variation.

The second half of Variation 6 (mm. 17–32) has threads that are, once again, remarkably similar to those that have structured what has already been heard. In phrases three and four, as in phrases one and two, the harmonic borders of the Goldberg theme are determining factors in Bach’s choice of threads, and in his manipulations of these threads. The third phrase must begin on a V chord and end on a vi chord. Because the threads can ascend at a maximum of one note-name per measure, it would take nine measures for the TIC notes to ascend from two chord tones in the V chord to the same chord tones in the vi chord. For this reason, threads for a progression
from V to vi would seem to be at odds with a theme that mandates an eight-measure phrase. Figure 20 shows the nine-measure ascent from the V chord’s third and fifth to the vi chord’s third and fifth. Unfortunately, there is no way to speed up a thread ascent.

A solution to this problem is suggested by adjusting the chord degrees found in the starting and ending harmonies. Figure 21 shows that this offers the possibility of a seven-measure ascent. The thread notes in the first measure provide the third and the fifth of the dominant chord. The final measure of the ascent now contains the root and third of the submediant. The combination of this adjustment—which I will call a chord-member shift—with the delay technique allows Bach to move from V to vi over the required eight measures.

Figure 22 shows that the threads in the first five measures of phrases one and three are related by second. Therefore, it seems appropriate to point out the close imitation (even if not exactly a canon) between the two halves of the variation. Measure 6 is a pivot for the phrase, as the delay technique causes two of the note-names now to be the same. Only the F remains a

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12 The third and fifth of the vi chord are also present in the second measure of the ascent, but this is not anywhere near the length that Bach needs to complete his eight-measure phrase.
second above the corresponding thread note in phrase one. The letter-names are identical for the final two measures. However, phrase three need not omit the final pitch E in Thread 2, because this phrase ends with the submediant. In a sense, the cadence on vi completes the disrupted thread in the first phrase, providing the previously missing pitch.

The composition of the fourth phrase’s canonic frame (mm. 25–32) does not require any new thread techniques. This phrase begins on a ii chord and ends on the tonic; the difference between these chords is an ascending seventh. The delay technique makes this an easy interval between chord roots to accommodate in eight measures. The fourth phrase’s Thread-1 ascent from A to G is nearly the same pitch ascent as is heard in Thread 1 of the third phrase. Both of these threads are arranged on a single staff in Figure 23. They differ from each other in a couple of ways. The accidentals in phrase three prepare a cadence in E minor and are unnecessary in the
**FIGURE 24.** Bach, *Goldberg Variations*: starting and ending harmonies of each phrase

<table>
<thead>
<tr>
<th>Phrase Number</th>
<th>Starting Harmony</th>
<th>Ending Harmony</th>
<th>Harmonic Change from Start to End of Phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>I</td>
<td>up an octave</td>
</tr>
<tr>
<td>2</td>
<td>I</td>
<td>V</td>
<td>up a fifth</td>
</tr>
<tr>
<td>3</td>
<td>V</td>
<td>vi</td>
<td>up a ninth</td>
</tr>
<tr>
<td>4</td>
<td>ii</td>
<td>I</td>
<td>up a seventh</td>
</tr>
</tbody>
</table>

final phrase. In addition, the third phrase’s Thread 1 overlaps two notes during the delay technique.

Figure 24 compares the registral reductions of both threads in phrases three and four (with the Thread 1s of Figure 23 reproduced on the middle staff) with the Thread 2s above and below. The figure reveals a close relationship between the Thread 2s: in the third phrase, Thread 2 (bottom staff) primarily supplies the notes a third under the A–G thread (middle staff), whereas in the fourth phrase, Thread 2 (top staff) primarily supplies the notes a third above the A–G thread. Remarkably, the two phrases are related by invertible counterpoint. The vertical intervals for each phrase are identical. The two phrases’ threads are also transpositionally related by a sixth.

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13 The third at the beginning of phrase three is parenthesized because it is missing from the music. In m. 17, the *comes* has yet to enter.
As we have seen, each of the four phrases in this variation traverses its own harmonic space. Figure 25 lists the harmonic change traversed from the start to end of each phrase as an ascending interval. Given the diverse harmonic contingencies for each phrase, Bach maintains startling consistency in each phrase’s threads. He never strays far from Thread 1 of his first phrase, which ascends the pitches of a G scale. Indeed, Thread 1 of each succeeding phrase seems to embellish the previous one. Figure 26 documents the Thread-1 transformations, abstracted from register and chromaticism. Each phrase’s Thread 1 is itself a variation of the preceding phrase. The complete thread graph is provided in Figure 27.
BRAHMS, VARIATIONS ON A THEME BY SCHUMANN: NO. 14

Variation 14 of Brahms’s *Variations on a Theme by Schumann* is also a canon at the second; it is presented in Figure 28. The TIC here is two measures, and it coincides with the harmonic rhythm (one chord per two measures). The *dux* of Variation 14 begins with the opening melodic C♯ of Schumann’s theme. As in the Bach canon at the second, the melodic link between the two voices at the opening can be heard very easily. In fact, a performer will have to make a special effort to convey the first thread note C♯ resolving down to B in m. 3, rather than moving up to the second thread note (D in the upper voice).

The third thread note, from the *dux* in m. 5, is an E♭ (the downbeat F♯ is clearly an accented passing tone). Similarly, in m. 7, the *comes* F♯ is the consonant TIC note which extends the thread. Figure 29 shows the first four notes of Thread 1. As at the beginning of Bach’s Variation 6, an initial stepwise ascent is followed by a descending seventh leap. In Brahms’s variation, the leap also prevents the augmented second that would have sounded if D ascended to E♯.

In the *Goldberg Variations*, the threads were closely connected to the phrase structure of the original theme. In Brahms’s variation this relationship also exists, but it is not immediately clear. The A section of Schumann’s theme is an eight-measure modulating period. The four-measure antecedent begins on tonic and ends with an imperfect authentic cadence in the starting key; the consequent begins on tonic and concludes with a perfect authentic cadence in the mediant. Two measures of Brahms’s Variation 14 are equal to one measure of Schumann’s theme. Therefore we would expect the mediant at mm. 15–16. The mediant arrives in the variation one TIC earlier, in mm. 13–14. This discrepancy is a response to a particular difficulty that the Schumann theme poses for a canonic treatment at the second. In the theme, many of the
FIGURE 28. Brahms, *Variations on a Theme by Schumann*, op. 9: Variation 14, canon at the second
harmonies that bridge the phrase boundaries are the same. The concluding measure of the antecedent phrase (m. 4 of the theme) sounds the tonic, as does the first measure of the consequent (m. 5 of the theme). The B section begins (m. 9 of the theme) with the same mediant chord that ended the A section (m. 8). In a canon at the second, because the dux is constantly ascending to the following comes by step, it is particularly tricky to present the same harmony twice in a row. This problem is compounded when a stepwise thread is present, meaning that the pitch of the comes typically ascends to the following dux by step.
Brahms handles this difficulty by means of a phrase overlap. The fourth TIC note (mm. 7–8) provides the space both to end the antecedent phrase on the tonic and to initiate the consequent phrase.\(^{14}\) This solves the dilemma of harmonic repetition in adjacent TICs. The phrase overlap, as shown in Figure 30, condenses the expected sixteen-measure section to fourteen measures. Thread 2 can be extended backwards to m. 1 with A as an endpoint omission. This A, marked with an \(\text{X}\) notehead, also has an important audible role. The left-hand arpeggiation from mm. 1–2 reaches up to this hypothetical starting pitch for Thread 2. In addition, the last melodic note of the preceding variation sounds this A, as shown in Figure 31.

\(^{14}\) The introduction of the notes A\(^\#\) and E in the accompaniment, during m. 8 of the variation, propels the F\(^\#\) chord onward as a major-minor seventh chord and prevents the harmonic closure in m. 7 from overwhelming the restatement of the opening melodic motive.
If Thread 2 ascended each TIC by step, then the dux’s note in m. 7 would be D. This pitch would interfere with the necessary arrival of tonic harmony. A new type of delay technique avoids this arrival by slowing the TIC notes in mm. 5–9. Brahms’s variation does not hold a single pitch in the same canonic voice as Bach did in his Variation 6. Instead, a pitch is held between the comes and the dux one TIC later. Thread 2 has a comes C♭ in m. 5 and a dux C♭ in m. 7. In Thread 1, an F♯ is held between mm. 7 and 9, again occurring first in the comes and then in the dux. The delay technique creates the A section’s only perfect consonance between the threads, in m. 7. These TIC-note repetitions prevent m. 5’s C♯ and E♭ from ascending to D and F♯ until m. 9. This is the correct position for these notes, as dictated by the theme’s harmonic progression. Brahms’s delay technique takes advantage of the fact that the comes need not be imitated by the dux at the interval of the canon. While the comes-dux relationship is a vital feature of canonic threads, the delay technique can momentarily suspend this relationship by repeating a pitch without disrupting the thread.

In the Schumann theme, the B section begins on III, which is the same chord that ends the A section. Again we would expect a phrase overlap to bind the sections and this is indeed the case. The mediant arrival in mm. 13–14 serves two functions. The dux marks the initiating function of m. 13 by returning to the familiar C♯–D–C♭ motive which opened both phrase segments of the A section. As a result, Brahms leaves m. 11’s upper-register, leading-tone G♯ unresolved.

Figure 32 presents a thread graph for the entire variation. The vertical intervals between the B section’s thread notes are striking because, other than in m. 13, they are all fourths. One

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15 This open fifth was also found in the right hand at the parallel point in the theme (m. 5).
16 The double bar in the score indicates the beginning of the B section, rather than the conclusion of the A section.
might expect the B section’s parallel first-inversion chords to continue in mm. 19 and 21 with first-inversion B and C# chords, respectively. A number of compositional considerations stand in the way of this simple path. Although the theme’s B section cadences on a C#-minor chord, if Variation 14 moves to a C#-minor chord through a series of parallel first-inversion chords, there will be no cadence. Altering the final harmony to major permits a half cadence to end the section only if the chord is in root position. The stepwise thread pattern begun in m. 13 would lead to a G# dux note in m. 21. However, the dux part rests for mm. 21–22, which is the first time that it does not sound a note for an entire TIC. This endpoint omission is not the result of a note disruptive to the desired harmony; G# is a chord tone within the C# chord. However, the rest is required to prevent an undesired doubling when the G# is imitated by the comes voice. If the B section ends with a G# in the dux, an upper-voice, comes A# will follow at the beginning of the A’ section. Given that the A’ section begins with the distinctive vii°/iv chord found in the theme, the bass will sound an A#. This note is a tendency tone, and is best avoided by the comes. The

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17 A first-inversion C#-major chord also would not work, because it would create an augmented second from D to E# in the bass. Remarkably, the root-position C# chord allows the C#–D–C# motive that opened the dux to be heard in the bass at the end of the B section: C# in m. 17, D in m. 19, and C# in m. 21.

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theme’s harmonic contingencies demand that the A♯-thread note escapes into the accompanying voice (marked “A” in m. 23 of Figure 32) rather than sounding in the dux or comes. The endpoint omission of G♯ in the preceding TIC prevents this A♯ doubling, and also clears the texture so that the dux alone can begin the A’ section, much as it had begun the previous A section.

The Thread-2 note at m. 13 deserves more attention. Originally, when considering just the A section, the TIC note was simply E. While this E was the first chord tone in the TIC, it was not heard in a parallel location to the dux’s previous TIC note. In m. 11’s dux, the first chord tone is on the downbeat (an E), whereas in m. 13’s comes, the first chord tone is not heard until the third beat. The downbeat F♯ in m. 13 is not a chord tone, but it attains an organizational presence in the thread because it is parallel to m. 11’s thread note; and while it is not a chord tone, it connects the thread notes from the A and B section so that they proceed seamlessly by step. For this reason, Figure 32 provides both E and F♯ for m. 13’s Thread-2 note. The F♯ is stemmed because of its linking role. The leftward pointing arrow from the unstemmed E indicates that it refers back to the A section.

In the A’ section, the presence of a thread depends on choosing notes that are not the usual first chord tones of the TIC. Admittedly, there is a bit of circular reasoning, in that a thread note is chosen in these cases because it belongs to an expected thread. However, the TIC note is once again consonant with the bass, and the atypical choice is based on the desire to maintain a parallel note choice for a dux and its imitating comes. In m. 25, the downbeat suspension resolves to the TIC-note B (a chord tone) on the third beat. When this figure is transposed to the comes in m. 27, we would expect the downbeat D to also be a suspension, and to resolve to C♯. But D is, in fact, the chord tone—a member of an E major-minor seventh chord—whereas C♯ is not. Nonetheless, the clear parallelism between these TICs, as well as the expected stepwise
progression (given the previously established thread), makes C the controlling TIC note. In addition, C is consonant above the bass E, even though it is not a chord tone.

The registral reduction in Figure 33 makes Thread 2’s continuous ascent very clear, as well as the predominance of vertical thirds between threads in the A and A’ section, and the continuous fourths in the B section. There is only a single break to Thread 1, occurring before m. 13. The lack of resolution of the leading-tone G in m. 11 is intriguing, and no G moves to A in either thread until the very end of the variation.

In the A’ section, six TICs are exactly the amount of time that it takes to ascend from the root and third of the first chord (A♭7) to the root and third of the final chord (F# minor). The canonic voices for the A’ section feature an ascending thread that is very audible. Figure 34
shows the canonic voices with the thread notes circled. The *comes* A♯ in m. 23 and the *dux* F♯ in m. 34 (both parenthesized) are not actually heard in the canonic voices, but they are notes that are consonant with the bass and that extend the stepwise threads to the endpoints of the phrase. Unlike the threads of the A section, no delay technique is employed here. As a result, the ascent in the A' section finishes what the A section did not, resolving the G♯ and ascending all the way to the note A.

Although the threads support the chords at the beginning and end of the section, the six TICs (with basically one harmony per TIC) do not provide enough time for the eight-chord progression of Schumann’s theme. We have seen that in the variation’s A section, Brahms squeezed the eight chords of the theme into seven TICs by overlapping the end of the antecedent phrase with the beginning of the consequent phrase (both with tonic chords). In the A' section, overlap is not possible because the theme’s antecedent ends on III, and the consequent begins on I. This is one factor that probably leads Brahms to treat the A' section of Variation 14 more radically than the A section. By shortening the third phrase to six TICs, Brahms follows the same principle as Bach did in the first phrase of the Goldberg variation at the second: he ascends one step per TIC while emphasizing that the beginning and ending harmonies of the A' section of Schumann’s theme have chord roots a sixth apart (A♯ to F♯).

The shortening of the A' section and the absence of thread interruptions (*inter alia*) prevent the section from being heard as divided into two clear phrases, as in the theme. However, it is remarkable that—with only one exception—the A' section’s thread notes in Variation 14 are members of each of the harmonies in the corresponding section of Schumann’s theme (mm. 17–24). Figure 35 displays this overall agreement between the theme’s harmonies (listed above the staff) and the thread notes (on the staff). The one chord that cannot be supported by the thread...
notes is the theme’s tonic chord of m. 21 (circled in the figure). Therefore, this harmony must be left out at this point of the canonic variation. The accompanying voice of Variation 14 mediates as well as it can between the thread notes and the theme’s harmonies. There is a sense that the accompaniment tries to maintain a semblance of the theme’s harmonic goals, sometimes despite the exigencies of the ascending harmonic threads. But the lack of support for the tonic chord midway through the A’ section forces Brahms to abandon other elements of the theme’s harmonic progression. During this delicate compositional balancing act, neither the thread nor the harmony gains complete control.

In Figure 35, the bottom line of Roman numerals and figured bass provides the actual chords arpeggiated by the accompanying voice in the third phrase of the variation. The first two chords agree with the chords suggested by the thread, and the chords in the theme. In contrast, the accompaniment of Variation 14’s m. 27 (the third TIC of the phrase) presents a striking discordance between these features. The accompaniment presents a V/III chord. This is the same harmony that occurs three chords into this section of Schumann’s theme (m. 19). However, the thread notes above this accompaniment include a C♯, which suggests III instead of V/III. The difference between thread notes and actual chords can be thought of as a peculiar sort of elision, required because the number of chords in the theme’s third phrase is more than the number of
TICs that Brahms allows himself in this variation canon. At one level, of course, the C♯ in m. 27 is a passing tone between the downbeat D and the next measure’s B. However, by focusing entirely on the chords suggested by the accompaniment, and ignoring the contradictory notes of the thread, one misses an important aspect of how the canonic voices fit with the theme, and how the theme’s harmonies are expressed in subtle ways.

There is some discordance between the elements of m. 29 in Variation 14, but it is not nearly as radical as what was just discussed in m. 27. In m. 29, the accompaniment begins with ii⁷, as opposed to the iv⁶ that the theme and other variations have accustomed the listener to hear prior to the dominant. In mm. 31 and 33 of the variation, the thread notes, the variation’s harmony, and the theme’s harmony realign, first on the dominant and then the tonic. As if to emphasize this concordance of factors, the accompanying voice reaches over the comes in order to supply the missing Thread-1 note, F♯, in m. 33.

**Bach, Goldberg Variations: No. 9**

Bach’s ninth Goldberg variation (reproduced in Figure 36) is a canon at the descending third. Each half of the variation is eight measures, rather than the usual sixteen. As a result, one measure of the variation represents two measures of the theme. The TIC is one measure. There are two threads over the first eight measures, but I will discuss only Thread 1 here. Figure 37 shows the Thread-1 notes in a registral reduction. The delay technique slows the progress of the descending third chain at mm. 2–3.

The first eight measures of Variation 9 (which correspond to the first sixteen measures of the theme) must move from tonic to dominant. If there were no delay, the chain of thirds would end on B in m. 8. Obviously, the D that occurs as a result of the delay fits better with the dominant chord required at the midpoint of the variation. The first two staves of Figure 38 align
**FIGURE 36.** Bach, *Goldberg Variations*, Variation 9: canon at the third
Thread 1 with the Goldberg theme’s bass line. Each quarter note in the figure corresponds to one measure of the score. The delay allows the first three thread notes to be consonant with the expected bass at the beginning of each TIC (notes 1, 3, and 5 in the bass-line theme). If the thread had descended to E at TIC 3, it would have been dissonant against an expected B in the bass.

Although this thinking may have entered into an early stage of this variation’s compositional planning, it is the structure of the descending-third thread, not the bass-line theme, that is prioritized. The arrows between the second and third staves of Figure 38 show how the accompanying bass voice skews the expected bass-line theme. The first two bass notes are G and F♯, as expected; but after that point, both the rhythm and ordering of the second stave’s notes are sacrificed. The numbers labeling each arrow show where the theme’s notes appear in the variation’s bass line (bottom staff).
FIGURE 39. Brahms, Variations on a Theme by Schumann, op. 9: Variation 15, canon at the sixth
FIGURE 39. [continuation]
FIGURE 39. [continuation]
BRAHMS, **VARIATIONS ON A THEME BY SCHUMANN**: NO. 15

Variation 15 of Brahms’s *Variations on a Theme by Schumann* (given as Figure 39) is a canon at the twentieth below. For the present discussion, it will be treated as a canon at the sixth below (in inversion, a third above). The dux of Variation 15 is divided into three eight-measure canonic phrases that correspond to the ternary-form sections.\(^\text{18}\) Figure 40 graphs the Thread-1 notes of the A section. The relationship between these notes cannot be explained entirely by descending sixths/ascending thirds, although this interval is common, occurring between all *dux-comes* pairs, and between the m. 4 *comes* and m. 5 *dux* (i.e., in one of three instances of a *comes-dux* interval). Figure 41 provides a registral reduction of Figure 40’s pitches, on a single staff. This arrangement of notes makes it clear that there is an organizational principle controlling the thread notes of the A section, but the organization is not that of TIC notes related by a single interval. Specifically, an arpeggiation controls the TIC notes of this phrase.

An arpeggiated thread needs to be manipulated in order to come out on the same note after eight TICs. Arpeggiating a triad through two octaves requires seven TICs and arpeggiating a seventh chord the same distance requires nine TICs as shown in Figure 42a and b respectively. Brahms’s arpeggiated thread lasts exactly eight measures because the first octave arpeggiates a triad and the second octave arpeggiates a seventh chord. The insertion of the seventh in m. 6 accomplishes the same result as the delay technique of repeating a note, but for an arpeggiation. I will call this the *inserted-seventh delay*.

As in the other canons, Variation 15 has a second thread that interacts with Thread 1. Both A-section threads are shown in Figure 43, in a registral reduction. The delay techniques are marked with slurs. Thread 2 is an arpeggiation through the G♭-major triad. An implied G♭ is

\(^{18}\) A final pair of non-canonic measures concludes the variation.
shown in m. 1, as the obvious extension of the pattern that follows. A low G♭ (F♯) concludes the preceding variation, so the note is nearby, as also was the case when Variation 14’s Thread 2 opened with an implied A (see again Figures 30 and 31). Thread 2 does not have an inserted-seventh delay to extend the arpeggiation by a measure. Instead it uses the familiar repeated-note delay technique in mm. 5–6.
Despite slight harmonic movement in the first phrase, one senses a wash of G♭ triads throughout the passage. The identities of non-G♭ chords are not nearly as important in themselves as is their leading quickly back to new G♭ chords. Instead of hearing the second-inversion chords of mm. 2 and 3 as resolving to a more structural root-position chord in the second half of m. 3, the listener has more of a sense that the tonic second-inversion chord slips into a tonic first-inversion chord in m. 4. The V/Ⅴ, even though it is prominently placed at the end of the antecedent phrase (m. 4, beats 4–6), does not assert itself much more than as a neighbor chord to the surrounding first-inversion tonic harmonies. The thread notes’ insistence on the G♭-major harmony overwhelms the other chords of the passage.

A fascinating aspect of this variation is that the opening notes seem to be generated from the arpeggiation thread (or perhaps vice-versa). Figure 44 aligns the notes of m. 1’s first three beats below Thread 1 of the first phrase. The opening notes nearly perfectly trace the Thread-1 notes. The only Thread-1 note omitted from these opening beats is the inserted seventh, F♭. There was a similar relation between thread and keyboard figuration in Variation 8 (see again Figure 12), but there the figuration of the comes—as opposed to the figuration of the accompanying voice—was involved.
The B section’s two threads are shown in Figure 45. As in the first phrase, they both are based on an arpeggiated thread. The arpeggiation of the second phrase has B♭ as a root. Given Schumann’s theme, one expects the second phrase to emphasize the mediant; what is surprising here is that the B♭ supports a major-minor seventh chord, rather than a plain minor triad. Therefore, threads in both the A and B sections arpeggiate major-minor seventh chords. As with the A section, the thread structure of the B section is closely anticipated in the accompanying voice of the first three beats of the phrase. Figure 46 demonstrates this relationship.
The vertical intervals between thread notes in mm. 15 and 16 are seconds. After the consecutive thirds of mm. 10–14, these seconds are quite striking, as is the disruption of the B♭ seventh-chord thread by the note E♭ in m. 16. These features are all integral to the transition from the B section to the A' section by a circle-of-fifths progression. Figure 47 shows the thread notes of mm. 15–18 in their correct register. The dux notes are reproduced on the upper staff and the comes notes on the lower staff. The threads are shown by the diagonal lines: Thread-1 notes are connected by solid lines, and Thread-2 notes are connected by dashed lines. The thread notes in mm. 15 and 16 are all members of the accompaniment’s chords; these notes offer the root and seventh of the III and VI chords. Because the chordal seventh is in the bass for each measure, both chords are in third inversion.\(^\text{19}\)

\(^{19}\) Brahms makes a few significant changes to canonic notes that are not thread notes during mm. 15 and 16, in order to simplify the voice leading and preserve a circle-of-fifths progression. In m. 15, the comes leap is an augmented fourth (A♭ to D♭). In m. 14, however, the dux leap was a diminished fifth (F to C♭), not an augmented fourth. The change in the comes (i.e., spelling the second note of the leap as D♭, not E♭) stresses the lowering of the third in the B♭ chord (D♭ to D♭). In m. 16, a more drastic change is made in the comes part. The comes leaps down a diminished fifth (D♭ to G♭), instead of a fourth as the dux part does in m. 15 (B♭ to F). The G in the comes of m. 16 fits the desired E♭ harmony, whereas the strictly imitative A♭ would not belong to the chord.
The Schumann theme and its canonic variations have reinforced the fact that the opening of the A’ section tends to stray from—rather than embrace—the tonic. Therefore, it is a surprise that the thread notes in m. 17 of Figure 47 are G♭ and B♭, the root and third of the tonic chord. It is particularly curious to find that the root of the tonic chord opens the section, because even the A section of this variation did not open with a root-position tonic harmony. The only reason one might expect to find the G♭/B♭ thread pair is that the arpeggiated threads of the A section also began with these notes (although an important difference there is that the G♭ was implied).

The tonic implications of the thread at m. 17 are not matched by the accompanying voice, however, creating one of the most expressive moments of the work. The arpeggiation in m. 17 is of a II/7 chord. The supertonic seventh chord includes only one of the thread notes, G♭, as a chord tone (the seventh). The B♭, despite its consonance with the bass G♭, has only a tenuous relation to the A♭ chord (as its ninth). It is more meaningful to regard the B♭ as an anticipation of the harmony of the following measure, than to consider the B♭ as a chordal ninth. The anticipa-

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20 Only Variations 6 and 13, both non-canonic, reprise the material from the first theme over a tonic harmony.
21 The closest low G♭ is found as an F♯ in the preceding variation.
22 Brahms also used a ii/7 chord at approximately the same point in the form in Variation 14 (m. 14).
tion label is particularly compelling given that in this variation, the *comes*, and not the *dux*, presents the closest approximation of the Schumann theme. Given that the key is now G♭ major rather than F♯ minor, the *comes* melody begins on D♭ rather than the typical C♯. One has the disorienting sense that the *dux* of Variation 15 is an anticipation, not just to the *comes* but to Schumann’s original theme.

Apart from the harmony of m. 17, the A’ section (mm. 17–24) is nearly identical to the A section (mm. 1–8). The arpeggiated thread on a G♭ triad returns with a single insertion of the chord’s seventh, F♭. Surprisingly, all of the insistence on G♭ in the thread notes does not translate into a “strong” root-position tonic chord. In this sense, m. 17 is a microcosm of the lack of union between thread notes and harmonies. A “strong” root-position tonic only arrives outside the bounds of Variation 15’s canon, in the non-canonic last measure (m. 26). The G♭ chord is not prepared by a cadence, however. Instead, the music seems to give up on achieving a strong cadence in the final three measures, leaving the tonic harmony to materialize following a common-tone diminished seventh chord.

Figure 48 arranges the threads of all three sections together. The barlines show where the *dux* begins each section. The threads arpeggiate the tonic and mediant chords as shown beneath the staves. The only note that does not belong in one of the arpeggations is the E♭ at the end of
the second phrase. Canonic threads play a crucial role in the transformation of Schumann’s theme into Brahms’s canonic variation.

It is particularly interesting that both variation sets discussed in this article present a compendium of canonic threads, rather than one or two isolated examples. Bach’s set methodically presents threads organized by four different intervals, grouped between Variations 6 and 11, as shown in Figure 7. Given that the interval of the canon is so closely tied to the thread organization, it is not surprising that the canon at the second (Variation 6) has an ascending stepwise thread, and the canon at the third (Variation 9) has a thread by descending thirds. We might expect to find threads at the fourth and fifth in the canons at the fourth and fifth (Variations 12 and 15, respectively). Surprisingly, Variation 11—which is not one of the canonic variations per se, but which does include two slightly veiled canonic passages (mm. 1–4 and 5–8)—presents an ascending-fourth thread and descending-fifth thread, whereas Variations 12 and 15, which are each inversion canons, have no threads.

The intervals that organize the threads in Brahms’s set also increase throughout the set. Rather than start with a stepwise thread, Brahms’s first canon has a repeated-note thread. The next thread in the set is by ascending second (Variation 14). Instead of following this with a thread organized simply by thirds, Variation 15 is a tour-de-force that organizes the threads by arpeggiation. We find a methodical progression of thread practices in Brahms’s set that equals the one found in the Goldberg Variations.

Threads are a critical tool in the analysis of canons, providing a relatively straightforward foundation based on familiar musical phenomena, such as repeated notes or scalar passages. Although they follow a simple premise, threads defy many norms about how notes are
connected. Consecutive thread notes leap from voice to voice, often from one register to another. They can skip over one or more measures of intervening notes, and at times they flout traditional voice leading. For all of these reasons, we should not expect to hear canonic threads the way we would hear other musical lines. This can be uncomfortable, given our usual preference for musical ideas that can be heard in accepted ways. But these variations provide evidence that our understanding of musical direction and musical possibility can also benefit from looking outside of our traditional approaches.
ABSTRACT

This article introduces the concept of canonic threads: patterns made of alternating dux and comes notes, in which the notes are separated by the time interval of the canon. Canonic threads are developed using as focus pieces Bach’s Goldberg Variations and Brahms’s Variations on a Theme by Schumann, op. 9. Both sets present a compendium of canonic threads, and demonstrate how threads can integrate a theme’s harmonic and phrase-structural constraints into a variation with strict canonic form. The article also considers various techniques that allow an underlying template of canonic threads to function over a wide range of harmonic and metric possibilities.
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