



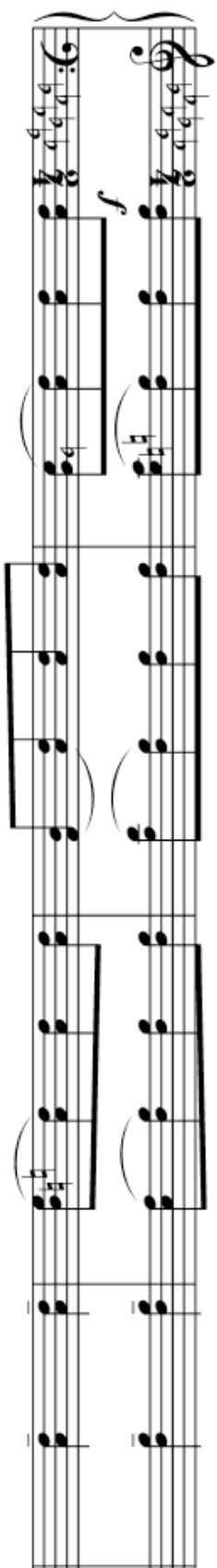
MTO 13.3 Examples: Murphy, Considering Network Recursion and Bartók’s “Fourths”

(Note: audio, video, and other interactive examples are only available online)
<http://www.mtosmt.org/issues/mto.07.13.3/mto.07.13.3.murphy.php>

Table 1.

		Categories of Match between Network and Hyper-Network				
		1	2	3	4	5
Buchler’s Arguments	1	×	×			
	2	×	×	×		
	3	×	×	×	×	
	4	×	×	×	×	
	5	×	×	×	×	×

a. Bartók, "Fourths," mm. 1-4



b. Analysis

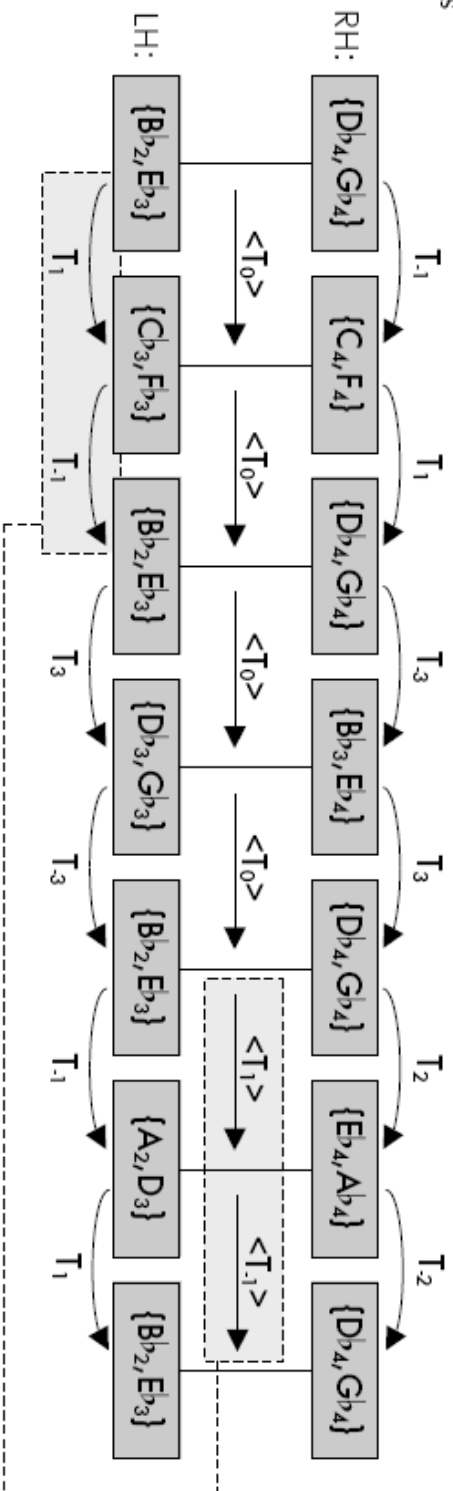


Figure 1.

a. Measures 1-4, reduction (after Parks and Alegant)

Diagram showing the reduction of notes in measures 1-4. The notes are grouped into five categories: c1, c2, c3, c4, and c5. The notation includes a treble clef and a bass clef, with notes represented by circles on the staff lines.

b. Analysis

Diagram showing the analysis of transformations between sets of notes. The Right Hand (RH) and Left Hand (LH) are analyzed using transformations T_0 , T_1 , T_2 , and T_4 . The transformations are represented by arrows between sets of notes.

RH: $\{D^b_4, G^b_4\}$ $\{C_4, F_4\}$ $\{B^b_3, E^b_4\}$ $\{E^b_4, A^b_4\}$ $\{D^b_4, G^b_4\}$

LH: $\{B^b_2, E^b_3\}$ $\{C^b_3, F^b_3\}$ $\{D^b_3, G^b_3\}$ $\{A_2, D_3\}$ $\{B^b_2, E^b_3\}$

Transformations: $\langle T_0 \rangle$, $\langle T_1 \rangle$

c. Measures 1-2.1, left hand

Diagram showing the left hand part of measures 1-2.1. The notes are grouped into two categories: T_0 and T_1 . The notation includes a bass clef and notes represented by circles on the staff lines.

Figure 2.

a. Measures 9-16

Figure 3a shows a musical score for measures 9-16. The score is written in a grand staff (treble and bass clefs) with a key signature of two flats and a 2/4 time signature. The music features a complex rhythmic pattern with many beamed notes. Annotations include:
 - A large grey arrow labeled $\langle T_1 \rangle$ spanning measures 9-10.
 - A large grey arrow labeled $\langle T_1 \rangle$ spanning measures 11-12.
 - A large grey arrow labeled $\langle T_{(3)} \rangle$ spanning measures 13-14.
 - A large grey arrow labeled $\langle T_3 \rangle$ spanning measures 15-16.
 - Smaller grey arrows labeled $\langle T_1 \rangle$ are placed above measures 9, 10, 11, 12, 13, 14, 15, and 16.
 - Dynamic markings sf (sforzando) are present above measures 9, 10, 11, 12, 13, 14, and 15.
 - Measure numbers 9, 10, 11, 12, 13, 14, 15, and 16 are indicated at the bottom of the staff.

b. Measures 1-2, 1, right hand

Figure 3b shows a musical score for measures 1-2, 1, right hand. The score is written in a single staff with a key signature of two flats and a 2/4 time signature. Annotations include:
 - A grey arrow labeled T_1 spanning measures 1 and 2.
 - A grey arrow labeled T_1 spanning measure 1.
 - A grey arrow labeled T_1 spanning measure 2.

c. Measures 1-2, 2, right hand, reduction

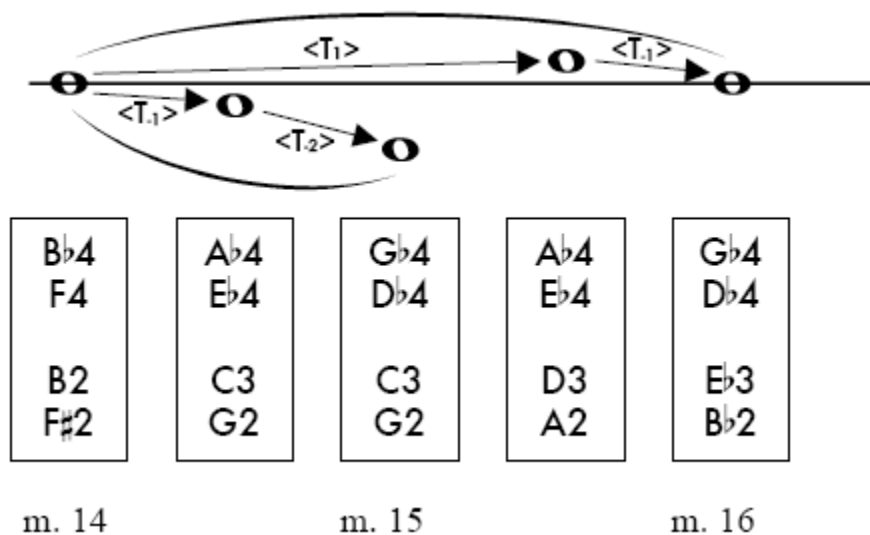
Figure 3c shows a musical score for measures 1-2, 2, right hand, reduction. The score is written in a single staff with a key signature of two flats and a 2/4 time signature. Annotations include:
 - A grey arrow labeled T_1 spanning measures 1 and 2.
 - A grey arrow labeled T_2 spanning measures 1 and 2.

d. Measures 1-3, 1, right hand

Figure 3d shows a musical score for measures 1-3, 1, right hand. The score is written in a single staff with a key signature of two flats and a 2/4 time signature. Annotations include:
 - A grey arrow labeled T_1 spanning measures 1 and 2.
 - A grey arrow labeled T_1 spanning measure 1.
 - A grey arrow labeled T_1 spanning measure 2.
 - A grey arrow labeled T_3 spanning measures 1 and 3.
 - A grey arrow labeled T_3 spanning measure 3.

Figure 3.

Figure 4. Visualization of two different “mirrors” in mm. 14–16



a. Measures 24-34

Musical score for measures 24-34. The top staff is marked *mp* and the bottom staff is marked *d*. A box labeled "m. 1.1" is connected to the first measure. Annotations include T_5 and T_7 with arrows indicating transformations between measures. A large bracket spans measures 29-34. Below the score, pc-space analysis is shown:

- pc-space: $\langle T_{10} \rangle$
- pc-space: $\langle T_2 \rangle$ or $\langle T_{12} \rangle$
- pc-space: $\langle T_2 \rangle$
- pc-space: $\langle T_2 \rangle$ or $\langle T_{12} \rangle$

A box at the bottom right contains the following values:

mm.
42.4
46.2

b. Measures 3-4.1, left hand

Musical score for measures 3-4.1, left hand. Annotations include T_2 with arrows indicating transformations between measures. A dashed box highlights a section of the score.

Figure 5.

a. Measures 42.4-50

Version a of the musical score for measures 42.4-50. It features a piano part in the left hand and a vocal line in the right hand. The piano part begins with a *pp* dynamic and consists of a series of chords. The vocal line starts with a *f* dynamic and includes a trill-like figure. A large oval highlights the piano accompaniment. A trill-like figure in the vocal line is boxed and labeled $T_{(0)}$. A dynamic marking $<T_{(0)}> f$ is placed below the vocal line.

b. Measures 42.4-50, with *ossia* ending

Version b of the musical score for measures 42.4-50, including an *ossia* ending. The piano part is identical to version a. The vocal line includes an *ossia* ending, which is a trill-like figure. A large oval highlights the piano accompaniment. The trill-like figure in the vocal line is boxed and labeled $T_{(0)}$. A dynamic marking $<T_{(2)}> f$ is placed below the vocal line. A trill-like figure in the piano part is boxed and labeled $T_{(2)}$.

c. Measures 42.4-50, with recomposed ending

Version c of the musical score for measures 42.4-50, featuring a recomposed ending. The piano part is identical to version a. The vocal line includes a recomposed ending, which is a trill-like figure. A large oval highlights the piano accompaniment. The trill-like figure in the vocal line is boxed and labeled $T_{(0)}$. A dynamic marking $<T_{(0)}> f$ is placed below the vocal line. A trill-like figure in the piano part is boxed and labeled $T_{(0)}$.

Figure 6.

Figure 7. Summary of matches between hyper-networks in “Fourths” and networks in mm. 1–4

The image displays a musical score for the piece "Fourths" in 4/4 time, featuring a treble and bass clef. The score is annotated with several grey boxes containing text and arrows, indicating matches between hyper-networks in the piece and networks in measures 1-4. The annotations are as follows:

- mm. 9-16 (middleground):** A large box spanning measures 9 to 16, with arrows pointing to the corresponding musical notation.
- mm. 17-21, 22-25:** A box spanning measures 17-21 and 22-25, with arrows pointing to the corresponding musical notation.
- mm. 43-50:** A box spanning measures 43-50, with arrows pointing to the corresponding musical notation.
- mm. 26-46 (in pc-space) (but only if A-D were Ab-D^b):** A box spanning measures 26-46, with arrows pointing to the corresponding musical notation.
- mm. 1-4, 5-8:** A box spanning measures 1-4 and 5-8, with arrows pointing to the corresponding musical notation.

The score includes dynamic markings such as *f* (forte) and *p* (piano), and a key signature of three flats (B-flat, E-flat, A-flat). The notation shows various chordal textures and melodic lines across the staves.

Figure 8. Bartók, “March,” mm. 39.4–41.1

The musical score for Figure 8 is in 4/4 time and features a piano with a *cresc.* marking. The score is divided into two systems. The first system shows the piano part with a treble clef and a bass clef. The treble staff contains a melodic line with triplet markings (3) and a *cresc.* marking. The bass staff contains a bass line with triplet markings (3). Arched lines labeled T_2 connect the two staves, indicating tritone transpositions. Below the bass staff, a T_4 marking indicates a tetratone transposition. The second system continues the melodic and bass lines, with T_2 markings above the treble staff and T_4 markings below the bass staff. The piece concludes with a final chord in the bass staff.

Figure 9. Bartók, “Minor Seconds, Major Sevenths,” mm. 1–8

The musical score for Figure 9 is in 4/4 time and features a piano with a *p* marking. The score is divided into three systems. The first system shows the piano part with a treble clef and a bass clef. The treble staff contains a melodic line with a *p* marking and a *(sempre simile)* marking. The bass staff contains a bass line. Arched lines labeled T_3 connect the two staves, indicating tritone transpositions. The second system continues the melodic and bass lines, with T_3 markings above the treble staff and T_3 markings below the bass staff. The third system shows the final chord in the treble staff, with a T_3 marking above it and a $\langle T_3 \rangle$ marking below the bass staff. The piece concludes with a final chord in the treble staff.

Figure 10. Projecting the paradigmatic to the syntagmatic

a. "Fourths," recomposition of conclusion

A musical score in 2/4 time, key of B-flat major, marked *f*. The right hand plays a series of chords: a triad of B-flat, D-flat, and F (first measure), followed by a triad of B-flat, D-flat, and F (second measure), then a triad of B-flat, D-flat, and F (third measure), and finally a triad of B-flat, D-flat, and F (fourth measure). The left hand plays a series of chords: a triad of B-flat, D-flat, and F (first measure), followed by a triad of B-flat, D-flat, and F (second measure), then a triad of B-flat, D-flat, and F (third measure), and finally a triad of B-flat, D-flat, and F (fourth measure). A box highlights the first three measures of the left hand.

b. Bartók's original

A musical score in 2/4 time, key of B-flat major, marked *f*. The right hand plays a series of chords: a triad of B-flat, D-flat, and F (first measure), followed by a triad of B-flat, D-flat, and F (second measure), then a triad of B-flat, D-flat, and F (third measure), and finally a triad of B-flat, D-flat, and F (fourth measure). The left hand plays a series of chords: a triad of B-flat, D-flat, and F (first measure), followed by a triad of B-flat, D-flat, and F (second measure), then a triad of B-flat, D-flat, and F (third measure), and finally a triad of B-flat, D-flat, and F (fourth measure). A box highlights the first three measures of the left hand. A vertical arrow labeled T_2 (paradigmatic) points from the box in (a) to the box in (b).

c. m. 3, right hand

A musical score in 2/4 time, key of B-flat major, showing the right hand in measure 3. The notes are B-flat, D-flat, and F. A horizontal arrow labeled T_2 (syntagmatic) points to the right above the notes.