

# Symmetry in the First Movement of Martin Bresnick's Piano Trio

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Symmetry is nature's favored process of construction. From the smallest electron or the wings of a butterfly to the formation of the Andromeda Galaxy, symmetry is a governing force of existence. Symmetry creates unity and balance and, more subjectively, beauty. These same properties are often the goals and guideposts to which nearly all art aspires. Perhaps symmetry is so alluring because it is innate and manifest in every molecule of all that we encounter. By imitation, we can share in the same creative process that created us.

The use of symmetry in music on a practical level creates balance and cohesion, yet its higher virtue lies in engaging universals through emulating organic processes of life and matter on earth as well as in the heavens. Martin Bresnick's music often exhibits a high degree of symmetry and structural complexity. The first movement of his Piano Trio, composed in 1988, provides a striking example of these characteristics.

Before delving into an analysis, it will be helpful to grasp some elements of the general structure and layout of the movement. The music fits neatly into eight groups of eight measures (the last group actually contains nine measures; this one is an extension but consists only of a whole note D). Each eight-measure phrase is divided in half (see Figure 1).

## Figure 1

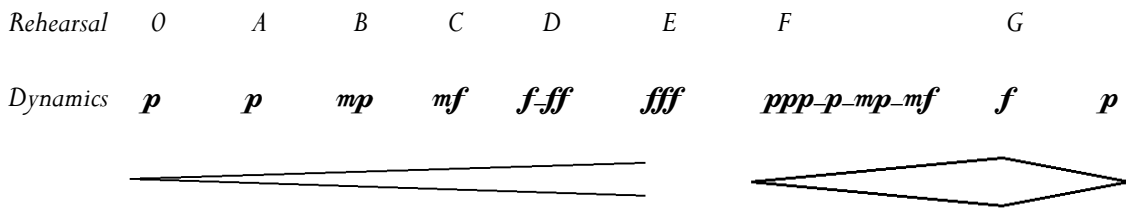
Scansion of entire movement

	$T_6$ Center							
<i>Rehearsal</i>	0	A	B	C	D	E	F	G
	1	2	3	4	5	6	7	8
<i>Scansion</i>	(4 + 4)	(4 + 4)	(4 + 4)	(4 + 4)	(4 + 4)	(4 + 4)	(4 + 4)	(4 + 5)
	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(9)

The dynamic scheme illuminates the form of the movement. The volume steadily rises through the first five phrases and reaches a climax on the downbeat of the sixth at rehearsal E. At rehearsal F, the music begins pianissimo and then mimics in abbreviated form the crescendo that occurred throughout the previous phrases. This second crescendo reaches its height in the last section and then diminishes steadily to the ending (see Figure 2).

**Figure 2**

Dynamic scheme of the movement



Now that the general form of the movement is clear, a more detailed description follows.

The first phrase is a presentation of eight pitches in eight measures forming set-class 8-26 [26E3815T]; it is partitioned in halves consisting of set-class 4-17 [26E3] (the so-called minor/major triad) and set-class 4-26 [815T]. The partition is apparent to the listener by the distinct registral gap and the shared descending contour of each tetrachord. The octave doubling of the first tone of the second tetrachord also highlights the division (see Example 1).

**Example 1**

The Opening of Martin Bresnick's Piano Trio

**1. Semplice, Inesorabile**

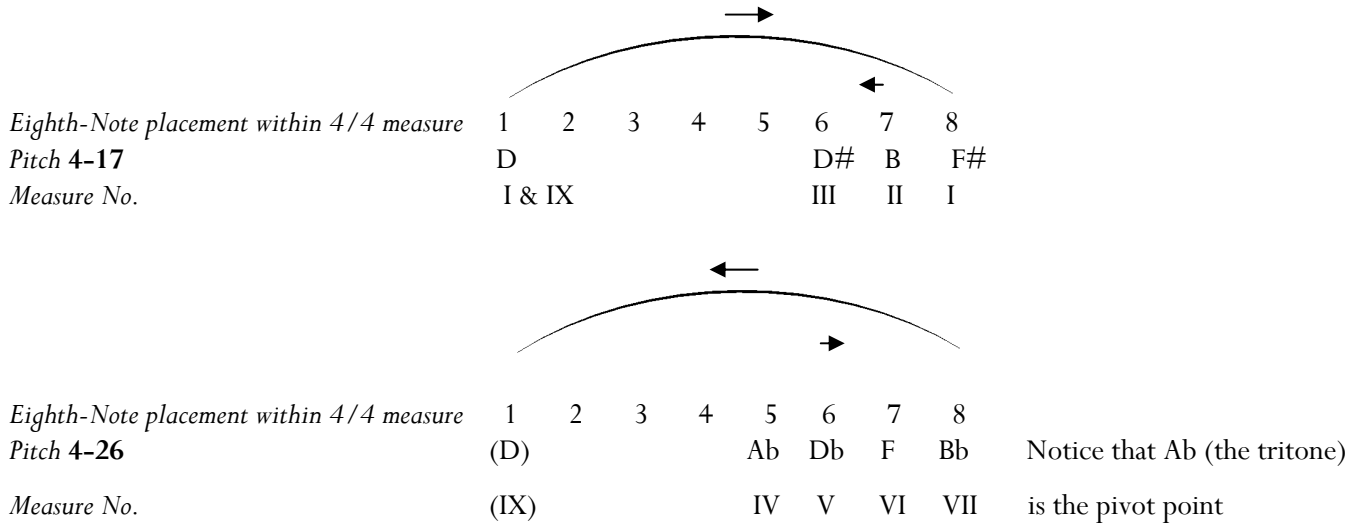
[A]

The time-span between each tone of the two tetrachords is also differentiated by rhythmic augmentation, adding another element to aid in hearing the partition: the tones of the 4-17 set are separated by seven eighth-note rests, while nine eighth-note rests separate the tones of the 4-26 set. Both are prime values in 4/4 meter, creating a unique displacement of tones. The pitches of the 4-17 set sound on the 1<sup>st</sup>, 8<sup>th</sup>, 7<sup>th</sup>, and 6<sup>th</sup> eighth-note beats of the measures, while the pitches of the 4-26 set continue to the 5<sup>th</sup> but then reverse order and sound on the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> eighth-note beats, which leads back to the downbeat of measure 9. Tones sound on beats 1, 8, 7, 6, 5, 6, 7, 8, 1—a palindrome, a form of patterning that is used throughout the movement (see Figure 3 and Example 1). This type of

structure evokes a Webernesque overlapping of compositional space and musical phrasing that functions throughout the movement.

### Figure 3

Rhythmic relations in measures 1-9



Comparable to the rhythmic patterning, the intervals employed in these first nine measures form a near palindromic alteration of minor sixths and perfect fifths with a tritone centerpiece. In this opening phrase the distances between tones in both time and space are governed by a congruent palindromic process. (See Figure 3 above, and Figure 4 below).

### Figure 4

Pattern of intervals in measures 1-9

<i>Pitches</i>	D	F#	F#	B	B	D#	D#	Ab	Ab	Db	Db	F	F	Bb	Bb	D
<i>Pitch interval</i>		8		7		8		5		7		8		7		(8)

On the downbeat of measure 9, phrase 2, all three instruments articulate D4. The cello begins a process by which pitches of 4-17 are added creating expanding arches of 1, 3, 5 and 7 tones. D is always at the rhythmic center, top of each arch, and the downbeat of each measure, while the rests between each cycle decrease proportionally. Again the process is palindromic, a common characteristic of Bresnick's music<sup>1</sup> (see Example 2 and Figure 5).

<sup>1</sup> For other examples of palindromic pitch structures in Bresnick's music see especially, among other works, *The Bucket Rider* (1992), and *String Quartet No. 2 "Bucephalus"* (1984) movement II.

## Example 2

The Second Phrase of Bresnick's Piano Trio; mm 9-17

**Figure 5**

Additive/subtractive palindromic pitch process related by retrograde-inversion in phrase 2

<i>Cycle</i>	1	2	3	4	5	6	7	8																										
<i>Cardinality</i>	1	3	5	7	9	7	5	3	1																									
<i>Vn.</i> pcs.	2 -----				2	6	E	3	8		1	5	T	2	T	5	1		5	T	2	T	5		T	2	T		2					
<i>Vc.</i>	2		6	2	6		E	6	2	6	E		3	E	6	2	6	E	3		8	3	E	6	2	-----								
<i>Pno.</i>	2		6	6		E	E		3				3		8				8					1		5			5		T	T		2

The cello's fourth cycle begins without pause. This meeting point is also pc 8 and therefore the departure from 4-17 to 4-26. Following the pattern, this cycle contains 9 tones from 4-26 but after the fourth tone (the last eighth-note beat in measure 12, the 4<sup>th</sup> measure of phrase 2) the cello and violin momentarily share the central D, as they have three times previously, but now switch roles. The cello sustains D while the violin takes the cello's process and inverts its pitches. This makes D the lowest tone in upside-down arches, and at the same time retrogrades its process of additive prime values by subtracting them, creating phrases of 7, 5, 3, and 1 pitch(es) until dissolving into its source (see Figure 5 above). These gestures of 7, 5, and 3 notes are in fact exact inversions of the analogous gestures from the first half of the phrase—plus, because each of the initial gestures (and, therefore, these as well) is internally symmetrical, this can be understood as a retrograde-inversion of the first half of the phrase.

Emphasizing the symmetrical and additive nature of each gesture, the piano doubles the entrances and exits of each cycle. During the cello's additive cycle, the piano doubles in unison, but at the entrance of the Ab pivot point, it doubles one octave below the cello, and at the exit, two octaves higher, maintaining the ordering and scoring of measures 4 through 8. In fact, comparing phrase 2 with phrase 1 reveals that the former is a variation of the latter.

The movement from unison to octave doubling of Ab (both above and below) at registral extremes and the reiteration of the set highlights the row, the partition, and the process, creating a guidepost for the listener (see Example 2 and Figure 5 above).

The third phrase (rehearsal B, measures 17-24) consists of symmetries and patterns similar to the two preceding sections. Here, a graphic display better illuminates the relationships (see Example 3).

### Example 3

Graphic illumination of the third phrase of Bresnick's Piano Trio; mm 17-24

The colored boxes highlight the role exchanges of the instruments related by pitch-class retrograde-addition. Notice how the surrounding tones emanate from the axis of pc 8. The phasing in and out of prime values is utilized again in the number of articulations: the blue boxes contain 1 articulation, purple 3, green 5 and red 7. As mentioned above, this section operates around two distinct centers: the actual center is the barline at the end of the fourth measure, the inversion between the violin and cello occurs right at that point, but the piano's center, occurring in the middle of the fifth measure is right of center.

The fourth phrase begins with similar inversional interchanges; but just after the midpoint, the set is transposed (see Example 4). The transposition is by tritone, which generates the following pitches: 0245789E. This transposition highlights the relationship between 8-26 and its complement (4-26). In this transposition, the pitches of 4-28 are held over from the original set, while the 4-26 set exchanges with the complement of the original transposition. In other words, the tones omitted from the original set, 4-26, replace the current 4-26. The first half of the movement utilizes 4-28 – what I will call 4-26A (158T), creating what I will call 8-26A. The tritone transposition causes 4-26A to be replaced by what I will call 4-26B (0479—the complement of the initial 8-26A), creating what I will call 8-26B.

Figure 6 highlights the inversional swaps between the violin and cello from measure 25 to 32 (see Example 4). Notice the shift in register after the transposition. The transposition does not disrupt the subtractive process nor

6  
 challenge the centrality of D; however it does add brightness, a change of color, and for the first time completes the 12-tone aggregate.

### Example 4

The fourth phrase of Bresnick's Piano Trio; mm 25-33



Figure 6

Pitch patterns and processes in the fourth phrase

Cardinality	3	5	7	9	7	5	3
				$T_6$			
Vn.	2 - - - - -	1 T 2 T 1	- - - - - 2 - - - -	8 E T 1 2 1 T E 8	- - - - - 2 - - - -	4 7 2 7 4 - - 2 - -	
Vc.	2	6 2 6 - - - - -	2 - - - -	T 1 E 2 E I T - - - - -	2 - - - - -	0 5 9 2 9 5 0 - - -	2 - -   5 2 5

As before, inversions function on a number of levels. Each cycle is inverted onto itself; this time the arches formed are more complex than those in rehearsal A, yet still position D at the center. The instruments mimic each other but in inversion, which, like the additive pitch process itself, is inverted around D (see Example 4 and Figure 6 above).

The downbeat of Phrase 5 is the exact center of the movement because it is the 33<sup>rd</sup> measure of 64 (counting the 65<sup>th</sup> as an extension, which makes the center the space of measure 33 instead of the point between measure 32 and 33). Measures 29-36 are the center of the movement and the center of the modulated passage. Some surface changes occur that differentiate it from the previous material. It is the first time the violin and cello double each other for more than a single tone or play similar material simultaneously. The violin also reaches its highest register. Moreover, it is the first time the piano plays chords or vertical sonorities. The harmonies the piano plays are inversional around the D sustained in the bass. The second and third chords are a pc-inversion (meaning contours are not controlled) of the first chord in each measure. In measure 37 a tritone transposition reinstates the original pitches. Emphasizing this, the piano descends in register and alters rhythm. Meanwhile, the violin and cello pursue a process of subtraction

utilizing palindromic pitch structures. The interval classes between each tone also form a palindrome (see Example 5 and Figures 7 and 8).

### Example 5

The fifth phrase of Bresnick's Piano Trio; mm 33-40

### Figure 7

Interval classes employed in the fifth phrase (measures 33-40)

Gesture	1	2	3	4	5	6
Interval Class	1, 3	2, 3	2, 3	1, 3	1, 3	2

### Figure 8

Patterns and processes in the fifth phrase

Cardinality	9	8
Ic	3 1 3 1 1 3 1 3	3 1 3 1 1 3 1 3
Gesture 1)	2 5 4 7 8 9 0 E   2	E 0 9 8 7 4 5 (2)

	7	6
	3 2 3 3 2 3	3 2 3 3 2 3
Gesture 2 & 3)	4 7 5 8 E 9   0	9 E 8 5 7 4

Entrance 3 T<sub>6</sub> to return to pc-set 8-26A

	5	4
	1 3 3 1	1 3 3 1
Gesture 4 & 5)	6 5 8 E   T	E 8 5 6

Entrance 5 doubling reduced to 1 octave.

	2	2
	2 2 2 2	
Gesture 6 & 7)	8 T   8 6	

Reductive pattern disrupted. Retrograde traded for inversion



On the downbeat of the first measure of the climactic phrase (measure 41), the piano initiates an additive pitch process around D, quadrupled in four octaves. One aspect that distinguishes this phrase from the others is the operation of multiple pitch centers. Utilizing the fact that both Ab and D are inversional axes in this incarnation of 8-26, the cycles of the strings spin around Ab while the pianos' pitches form around D. Although both remain faithful to their respective centers, the piano's pitches begin to form around Ab while still inside the D-generated tones (see Example 6 and Figure 9).

### Example 6

The sixth phrase of Bresnick's Piano Trio; mm 41-49

### Figure 9

The Piano's pitch organization in the sixth phrase

Pno.

$$1) \quad T | 2 | T$$

$$2) \quad 1 T | 2 | T 1$$

$$3) \quad 5 1 T | 2 | T 1 5$$

$$4) \quad 8 5 1 T | 2 | T 1 5 [ 8 ] 5 1 T 2 T ( 6 3 [ 8$$

$$6) \quad 8 T 3 6 | 2 | 6 3 T$$

$$8] 3 6) T | 2 | T 6 3 8$$

$$7) \quad T 1 5$$

$$5 1 T$$

While the piano pursues the process diagrammed above, the violin and cello proceed with palindromic swapping around Ab. After reaching D, the process alters and the instruments play simultaneously. The process is one of

imitative exchange in which one instrument plays the pitches just heard in the other. Only 3 pitches are exchanged at a time and the commencement of each exchange is partitioned by a meeting on each axis, pc 2, 8, 2, 8, respectively (see Figure 10).

### Figure 10

Pitch palindromes in the sixth phrase

Vn. 8 -----| T 1 8 1 T | 8 | 8 5 1 T (2) 6 3 E 8 | 5 1 T 2 6 3 E 8 |  
 Vc. 8 | 1 8 1 | 8 | 5 T 1 8 1 T 5 | 2 5 T 1 8 1 T (2) E 6 3 8 | 1 T 5 2 T 6 3 8 |

Ab remains the pitch center into the penultimate phrase where another transposition by tritone occurs. The movement toward and away from the tritone is a common feature of Bresnick's music<sup>2</sup>. Again, the strings exchange inversionally-related additive palindromic cycles, but this time in double stops with an Ab pitch center. Designing the pattern around Ab has two primary effects: it allows the absence of D until the last cycle, providing relief as well as emphasis upon its return, and it amplifies the tritone axis while generating tension that resolves in the following final phrase (see Example 7 and Figure 11).

### Example 7

The seventh phrase of Bresnick's Piano Trio; mm 49-57

### Figure 11

Double-stopped pitch patterns related by pc-inversion ( $I_4$ ) in the seventh phrase

Vn. (8) 8 4 ----- E 8 4 E ----- 7 E 8 4 E 7 ----- 2 7 E 8 4 E 7 2  
 4 8----- 4 4 8 4 ----- E 4 4 8 4 E ----- 7 E 4 4 8 4 E 7  
 Vc. (8) 8 0----- 0 8 0 0----- 5 0 8 0 0 5----- 9 5 0 8 0 0 5  
 0 8----- 5 0 8 5 ----- 9 5 0 9 5 9----- 2 9 5 0 9 5

<sup>2</sup> For more examples of large scale tritone axes in Bresnick's music see *Opere Della Musica Povera*, a collection of twelve compositions, each in a different pitch area, composed from 1990 to 1999. Each work begins and ends in the same specific pitch area with a tritone related central section. The 12 works as whole form six tritone related pairs. For example, the pitch structure of *The Bucket Rider* (1995) consists of motion from A to Eb back to A while its companion work, *Be Just!* (1995) has a pitch structure of Eb-A-Eb. See also *String Quartet No. 2 "Bucephalus"* (1984) and *String Quartet No. 3* (1992) especially movement I, among others.

The piano remains silent for 3 measures and then sounds a descending line in octaves of Ab, C, F, A, using the same pulse of 7 eighth-notes as at the very beginning of the movement. The significance of these pitches is that they form the same intervals as those in the opening of the movement but starting on Ab instead of D. The last octave-doubled tone, A, compresses into D that then drops down the octave directly onto the downbeat of the last phrase. In other words, the relationship between the piano tones of phrase 7 and the notes that begin phrase 8 is the same as the relationship between the first 4-17 and the Ab fulcrum from phrase 1. A relationship that was played out within a phrase now moderates the deployment of pitches between phrases.

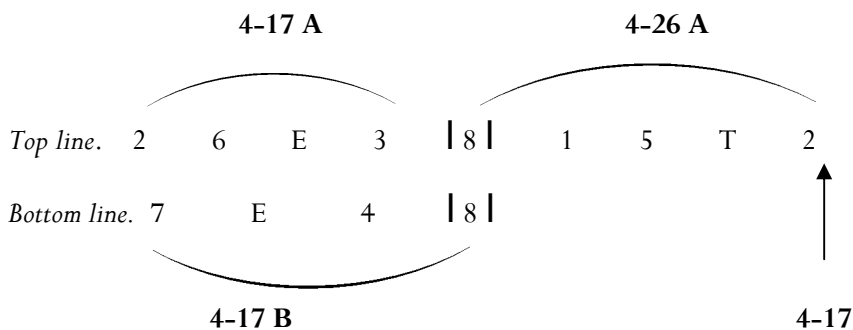
Beginning at measure 57, the violin and cello both play octave Ds; the right hand of the piano plays the exact 4-17 set from the opening, but now ascending. The left hand plays a transposition of the same pitches (4-17B, in fact), starting one-eighth note later, with each pitch separated by nine eighth notes. This rhythmic pattern causes both hands to align on the middle beat of the 4<sup>th</sup> measure on Ab and dissolves the left hand's line while the right hand continues its descent, using the same ordering as the opening 4-26 but two octaves lower (see Example 8 and Figure 12).

### Example 8

The eighth and final phrase of Bresnick's Piano Trio; mm 57-65

Figure 12

The piano's pitch configurations in the final phrase



Some readers may question the audibility of such symmetry and patterns. Knowledge of what is occurring while listening is not necessary for enjoyment, but perhaps enjoyment is increased when the listener realizes not the specifics of the patterns but that something deeper is occurring. The idea that they are present prompts a sense of awe or wonder, as if a veil has temporarily lifted to reveal something numeric and eternal. Bresnick's teacher and friend, György Ligeti, known for the structural rigor of his compositions postulated comparable thoughts. Ligeti's biographer Richard Steinitz poetically summarized Ligeti's thoughts this way:

Consider Bach's puzzle canons in *The Musical Offering* and Schumann's cryptic ciphers. Consider how Gothic stonemasons carved sculptures so far aloft that few mortals could see them. The miracles of colour and pattern in the rose windows created by medieval glaziers contain iconography whose detail is overwhelmed by the glory of the whole, although fully to appreciate their pictorial symbolism you need binoculars—invented long after the glass was installed. Whether for the greater glory of God or the inner satisfaction of the artist, unseen craft strengthens the visible achievement. . . . Means and ends are linked: the effort required intensifies the sense of supplication; the integrity of each anonymous strand authenticates the whole. (Steinitz, 149)

Emotions elicited when confronting art that embodies the inner mechanisms of existence are powerful, profound, and direct yet also illusive and aloof. Analysis of this music conjures ancient and alchemical symbolism, platonic forms, sacred symmetrical geometry, mandalas and polished crystal. Universally communicative constructions resonate with us because they represent the deeper structures that create all life and matter.

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