

2011

Rotational strategy in selected works by Béla Bartók

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ROTATIONAL STRATEGY IN SELECTED WORKS BY BÉLA BARTÓK

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Music

by
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December, 2011

Acknowledgements

There are many people I wish to express my gratitude to for their contributions to this project. I would first like to thank my committee members: to Dr. Jeffrey Perry, my advisor, for advancing my writing style and analytical understanding of the theoretical material contained both inside and outside of the scope of this project; to Dr. Robert Peck for his editorial and analytical insight; to Dr. Brett Boutwell for helping me to frame this project in its proper historical context; to Dr. Dinos Constantindes who aided in creation of the topic of this project by sharing his insight from a compositional standpoint of Bartók's *Music for Strings, Percussion, and Celesta*; and to Dr. Grover Waldrop, my Dean's representative, for his enthusiasm to participate in a project outside the scope of his normal research

I am also indebted to Dr. James Hepokoski for meeting with me to discuss Bartók's use of sonata form and convincing me that a rotational model would provide a superior approach to express formal structure.

Lastly, I would like to thank those who supported me throughout this process: to my Mom and Dad for their financial and emotional support throughout this process; to my sister, Laura, whose phone calls from England I always looked forward to and served as a much needed diversion from this project; to my friends Audrey Gamez and Kelli Peterson for their unending support in the form of threats that left success my only option; and to Highland Coffees for the gallons of green tea I consumed there over the years.

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ABSTRACT

While James Hepokoski and Warren Darcy regard rotational form as “an overriding structural principle, an *Urprinzip* that in the instrumental genres may control the progress of movements organized according to more familiar *Formenlehre* categories such as sonata form or rondo”, in the dissertation that follows I propose a framework for rotational analysis that is sufficient as a self-standing analytical structure. This step back from the more familiar *Formenlehre* is necessary in Bartók’s post-tonal repertoire to avoid confusion with the generic expectations that often accompany labels such as principal theme, subordinate theme, exposition, development, recapitulation, etc. Also, as rotational form is characterized by Hepokoski and Darcy as a rhetorical rather than tonal principle, it allows analysts to focus less on harmonic implication and more on the dense family of thematic/motivic relationships that lay at the core of Bartók’s repertoire.

I will apply rotational form to the first movements of Bartók’s String Quartet No. 4, Piano Sonata, and Sonata for Two Pianos and Percussion in order to illuminate new analytical interpretations otherwise obscured. The question here, although highly provocative, is not whether sonata form does or even can exist in this post-tonal repertoire, but rather what do we have to glean from a perspective that is not dependent on it? Relaxing the generic expectations of sonata rhetoric affords us a more complete and accurate perspective of foreground/background formal structure as well as narrative trajectory.

Chapter 1: Introduction

In the dissertation that follows, I will apply analytical techniques based on the concept of rotational form to selected instrumental works of Béla Bartók. The dissertation is divided into five chapters. Chapter one will serve to introduce and familiarize the reader with necessary concepts, literature, definitions, and relevant theoretical approaches to Bartók's oeuvre. Chapter two will discuss the process of teleological genesis in the Fourth String Quartet, I. Chapter three will treat the Piano Sonata, I, expressing it in terms of a rotational structure that owes more to a continuous variations movement than that of the sonata readings offered by Straus, Somfai, and Wilson. Chapter four will provide a rotational analysis of the *Sonata for Two Pianos and Percussion*, I, that highlights the movement in terms of its continuously unfolding processes. Chapter five will serve as a conclusion tying together the findings of the previous chapters.

What is Rotational Form?

James Hepokoski and Warren Darcy write, "Rotational structures are those that extend through musical space by recycling one or more times – with appropriate alterations and adjustments – a referential thematic pattern established as an ordered succession at the piece's outset."¹ They continue, "The central thing [about the rotational process] is an implied or actualized ordered sweep through a temporal sequence of thematic modules, along with the assumption that the most 'natural' or expected continuation of the layout's last module will be to lead to a relaunching of the initial module of the next, thus producing the characteristic spiral or

¹ Hepokoski, James and Warren Darcy. *Elements of Sonata Theory: Norms, Types, and Deformations in the Late Eighteenth-Century Sonata*. New York: Oxford University Press, 2006. 611.

circular effect.”² Example 1.1 is a schematic depiction of the most straightforward rotational scheme whereby an initial thematic pattern outlined in rotation 1 is repeated literally throughout rotations 2 and 3. Here, the letters (A B C D) are generic labels applied to designate the discrete themes encountered throughout the form.

Rotation 1	Rotation 2	Rotation 3
A B C D	A B C D	A B C D

Example 1.1: Rotational form in its simplest presentation

While Darcy regards rotational form as “an overriding structural principle, an *Urprinzip* that in the instrumental genres may control the progress of movements organized according to more familiar *Formenlehre* categories such as sonata form or rondo”,³ in the dissertation that follows I propose a framework for rotational analysis that is sufficient as a self-standing analytical structure. This step back from the more familiar *Formenlehre* is necessary in Bartók’s post-tonal repertoire to avoid confusion with the generic expectations that often accompany labels such as principal theme, subordinate theme, exposition, development, recapitulation, etc. Also, as rotational form is characterized by Hepokoski and Darcy as a rhetorical rather than tonal principle,⁴ it allows analysts to focus less on tonal implication and more on the dense family of thematic/motivic relationships that lay at the core of many of Bartók’s compositions.

² Ibid., 612.

³ Warren Darcy, “Rotational Form, Teleological Genesis, and Fantasy-Projection in the Slow Movement of Mahler’s Sixth Symphony,” *19th-Century Music* 24 (2001), 52.

⁴ Hepokoski and Darcy 2006, 612.

Rotational Form vs. Sonata Form

Hepokoski and Darcy take rotational idea to be a foundational axiom working behind every sonata including even those where it is not clearly present.⁵ Example 1.2 illustrates this notion of rotational form as an *Urprinzip* or governing structural principle behind sonata form depicting both unfolding simultaneously in the most simplistic formal scenario. The top level represents a rotational perspective where three rotations unfold, each containing a generic letter label (A B C D) that pertains the introduction of new motivic material. The lower represents a sonata perspective where Hepokoski and Darcy's Sonata Theory terminology is used to represent the four action spaces – P (primary theme), TR (transition), S (secondary theme), and C (closing zone) – extending across the traditional Exposition, Development, Recapitulation model of the traditional sonata plan.⁶

	Rotation 1	Rotation 2	Rotation 3
Rotational:	A B C D	A B C D	A B C D
Sonata:	P TR S C	P TR S C	P TR S C
	Exposition	Development	Recapitulation

Example 1.2. Sonata form and rotational form unfolding simultaneously

The formal scheme of all the works to be discussed below have been described by Bartók and generally understood by theorists in terms of a traditional sonata plan. Of the many lines of scholarship that underpin the rotational basis for analysis adopted in this dissertation, perhaps none is more fundamental than the implicit but often complex dialogue between rotational form and sonata form. In this dissertation I do not seek to define what is and what is not sonata-like

⁵ Ibid., 613

⁶ See Hokoski and Darcy 2006.

about given movements; rather, I attempt to highlight what insights can be garnered from an approach divorced of the generic expectations and harmonic implications implicit within such a form. Using rotation to unlock the problems of form in these movements eliminates much of the confusion inherent in attempts to apply sonata form to post-tonal music. A brief overview of such attempts appears below.

The Sonata Problem

Much of the confusion surrounding contemporary theories of post-tonal sonata form stems from the gradual de-emphasis of tonality and harmonic function over time towards a greater emphasis on thematic layout. As Straus words it, “Thematic contrast, which functioned originally as reinforcement for the underlying harmonic polarity, thus survived the demise of that polarity to become, in the nineteenth century, the principal determinant of sonata form.”⁷ In simplest terms, current theoretical consensus understands the eighteenth century sonata form as a two-part form governed by a tonal polarity that consists of movement away from an established tonic (typically to V in major or III in minor) followed by a subsequent return to the tonic. Several scholars including William Caplin, who treats sonata form with a “tour of keys model”,⁸ and Hepokoski and Darcy,⁹ who attribute specific formal functions to the various zones of action, attempt to de-emphasize the tonal polarity model of sonata while still working within it. As sonata form (and composers’ and pedagogues’ understanding of it) evolved throughout the nineteenth century, emphasis gradually shifted away from tonal polarity and towards thematic development. As tonality was eventually pushed past its breaking point throughout the twentieth

⁷ Straus, Joseph. *Remaking the Past: Musical Modernism and the Influence of the Tonal Tradition*. Cambridge, MA: Harvard University Press, 1990. 97.

⁸ Caplin, William. *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven*. New York: Oxford University Press, 1998. 195-208.

⁹ See Hepokoski and Darcy 2006.

century, accounts of the sonata were based even more squarely on thematic presentation, contrast, and development. This trend results in challenges for the twenty-first century analyst attempting to grapple with post-tonal sonata forms that are often based loosely around analogies to the previous tonal tradition. As Paul Wilson writes,

The attenuation of [harmonic] function in Bartók's music involves a reduction in the structural range and subtlety of harmonic events compared with those of tonal music. It limits our capacity to describe, using a circumscribed vocabulary of functional terms, the step-by-step process that within a given piece may connect two harmonic events that are separated by intervening music.¹⁰

In addition to the attenuation of harmonic function mentioned above by Wilson, confusion also exists surrounding the conception and use of the actual term “sonata form”. Rosen points out that the definition of sonata form originally advanced by Reicha, Marx, and Czerny in the 1820s and ‘40s were intended primarily as “a model for the production of new works,” and that it “does not work well for the eighteenth-century because it was never intended to.”¹¹ The disconnect between sonata form theory and sonata form practice widens further as we approach the twentieth-century and on. In the same discussion Rosen further elaborates a larger problem when he observes,

“...if a form ‘changes,’ it is not clear when it would be useful to consider it the same form, although changed, and when we must think of it as a new form

¹⁰ Wilson, Paul. *The Music of Béla Bartók*. New Haven: Yale University Press, 1992. 33.

¹¹ Rosen, Charles. *Sonata Forms*. New York: W. W. Norton and Company, 1980. 3.

altogether. This is not merely a philosophical quibble: there is no biological continuity among sonata forms, and there are many sonatas more closely related to concertos, arias, and even fugues than to other sonatas.”¹²

Although Rosen was writing specifically about the sonata forms of the late nineteenth century, his words are still just as applicable. That the analytical application of sonata form to the music of the twentieth century is wrought with problems is therefore not surprising; indeed, Hepokoski and Darcy begin the first chapter of their *Elements of Sonata Theory* by declaring, “There is no consensus regarding the manner in which sonata form in the decades around 1800 is to be grasped.”¹³ Relying on a rotational conception of Bartók’s self-described sonata forms permits us to set aside all such problems of theory and application and affords us with a means to more intuitively access each work’s unique attributes.¹⁴

Theoretical Approaches to Bartók’s Works

Below is a brief survey of the analytical approaches to Bartók’s works that will be drawn upon within part II of the dissertation. While Bartók, like many contemporary composers, leaned heavily upon thematic ordering to impart formal coherence to his compositions, analogies to tonal tradition are still present. According to Babbitt, “[Bartók] remained a “traditionalist”, in that he was unwilling to abandon completely the employment of generalized functional tonal relationships, existing prior to a given composition; yet he was aware of the hazards inherent in the use of a language overladen with connotations, in which the scarcely suggested is perceived

¹² Ibid.

¹³ Hepokoski and Darcy 2006, 3.

¹⁴ Such a perspective need not eliminate the possibility of sonata form. Should theorists wish to base their analysis around sonata form, understanding the movement’s rotational underpinnings will provide them with a solid foundation on which to base their discussions.

as the explicitly stated.”¹⁵ He later continues, “The effect of true harmonic progression is often achieved analogically rather than absolutely, through the transposition of a harmonically indefinite unit, where the harmonic relationship associated with the interval of transposition affects the harmonic relationship. This type of progression by transposition is one of tonal association rather than one of tonal function.”¹⁶ The challenge for scholars has been to discover new methods for adequately describing how these analogies are rooted in tradition while at the same time illustrating how they function independently from that tradition.

By extending the work of Heinrich Schenker, Felix Salzer throughout his *Structural Hearing*¹⁷ and Roy Travis who later elaborated on Salzer’s theories in several articles¹⁸ invite consideration of the ways in which Bartók could be regarded as an essentially tonal composer. Travis writes, “As one listens actively to a given composition, one senses that the various tones fulfill a variety of functions. One speaks of certain tones as ‘principal’; others are ‘dependent.’”¹⁹ The basis for these theories came from replacing Schenker’s focus on the tonic triad with a focus on a single sonority or interval that functions analogously to Schenker’s fundamental chord at the background level within individual movements.

Wilson’s theories of function in Bartók build off of these ideas by interpreting prominent melodic, motivic, or thematic starting notes (initiating tones) and similar pitches of termination (goal tones) as possessing tonic-like qualities.²⁰ Example 1.3a depicts m. 1 of Bartók’s Piano Sonata, first movement. As we will see throughout chapter 3, Bartók constructs nearly the entire composition around this single four-note ur-motive. In my Example 1.3b (a reproduction of

¹⁵ Babbitt, Milton. “The String Quartets of Béla Bartók.” *The Musical Quarterly* 35/3 (July, 1949). 379.

¹⁶ *Ibid.*, 380.

¹⁷ Salzer, Felix. *Structural Hearing: Tonal Coherence in Music*. 2nd ed. New York: Dover, 1962.

¹⁸ See for example Travis, Roy. “Tonal Coherence in the First Movement of Bartók’s Fourth String Quartet.” *Music Forum* 2 (1976): 298-371 and “Towards a New Concept of Tonality?” *Journal of Music Theory* 3 (1959): 257-284.

¹⁹ Travis 1959, 261.

²⁰ Wilson 1992, 35-6.

Wilson's Example 3.3), Wilson adopts an adapted Schenkerian style of analytical notation in order to highlight and connect various tones of initiation and termination. As in an actual Schenkerian graphic analysis, the larger note durations indicate greater structural significance. The ties are meant to link together specific iterations of the ur-motive. Here, Wilson utilizes the initiating and goal tones of the ur-motive to illustrate Bartók's initial tonal allusion to an E major/minor tonality and subsequent reinterpretation of it to a more generic E-centric major/minor thirds chain.

Wilson's identification of initiating and goal tones in the Piano Sonata and other works will be discussed in greater detail later in the dissertation. Example 1.3b serves to illustrate Bartók's use of the transposition of a motivic unit to mimic tonal relationships. These tones often serve as the guideposts that Bartók uses to support his tonal analogies.



Example 1.3a: Bartók's Piano Sonata first movement, m1. Ur-motive presented in its original form consisting of a distinct dotted eighth to sixteenth note rhythm and unfolding of a minor third (G#-B)

Considerable attention has been given to analysis using pitch-cells (an unordered collection of pitch-classes) as a means to unlock the generation of both local and global structures in Bartók's music. Perhaps the greatest line of scholarship focusing on pitch-cells can be found in the theoretical works of Perle, Treitler, and Antokoletz. Perle begins by introducing two four-note sets that he labels X and Y seen in Example 1.4.



Example 1.3b: Bartók's Piano Sonata first movement (mm. 1-46). The first part illustrates the initiating and goal tones of the ur-motive supporting an E major-minor tonality; the second part is a reduction of these events producing an E-centric chain of major/minor thirds. Reproduced from Wilson, 1992²¹



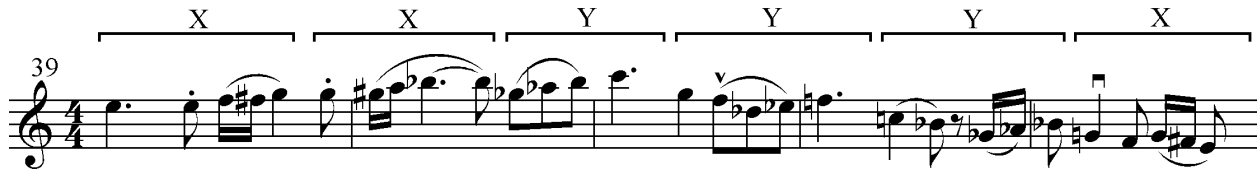
Example 1.4: Cells X and Y at their most common transposition level in Bartók's Fourth String Quartet.

We can see that set X is a segment of the chromatic scale (interval-1 cycle) and Y is a segment of the whole-tone scale (interval-2 cycle). According to Perle, the composing out of these two sets generates much of the musical material that forms all five movements of Bartók's Fourth Quartet. Perle writes, "The set marked Y (...) is invariably employed in some kind of conjunction with that marked X. The most direct relation is that of 'dominant' and 'tonic'."²² Perle's use of the terms dominant and tonic seems to indicate that these sets function as opposing poles rather than as subordinate and focal entities, respectively, in an overall tonal hierarchy.

²¹ Wilson 1992, 61.

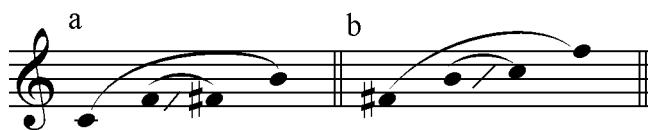
²² Ibid.

Though set X does frequently progress to set Y (a topic to be elaborated on later), this by no means sums up their entire relationship. Perle is quick to point out that “the free association of linear variants of both sets will sometimes result in a seemingly rhapsodic melodic line.”²³ An example of one such line is illustrated below in Example 1.5.



Example 1.5: Rhapsodic melodic line understood in terms of cells X and Y. Bartók’s String Quartet No. 4, I, first violin mm. 39-43.

Treitler uses Perle’s X and Y sets as a starting point and adds a third set that he identifies as set Z – a set composed of two tritone dyads joined by a semitone. This collection is recognizable as belonging to Forte’s set class 4-9 (0167), a common formation in the music of many post-tonal composers, including Schoenberg, Berg, Webern, and Stravinsky as well as Bartók.²⁴ Cell Z is illustrated below in Examples 1.6 in two different inversions of the same pitches. Of Bartók’s Fourth Quartet Treitler writes, “Much of its harmonic and melodic make-up can...be interpreted in terms of the relationships involving the x-, y-, and z-groups.”²⁵



Example 1.6: Treitler’s Z-cell in two inversions

²³ Ibid.,

²⁴ Forte Allen. *Structure of Atonal Music*. New Haven: Yale University Press, 1973.

²⁵ Treitler, Leo. Harmonic Procedure in the Fourth Quartet of Belá Bartók.” *Journal of Music Theory* 3/2 (Nov., 1959): 292-298.

The most comprehensive treatment of these three seminal sets can be found in the writings of Elliott Antokoletz, who explores and greatly elaborates upon the findings of Perle and Treitler.²⁶ The Fourth Quartet is particularly important to Antokoletz, who uses the work “as a basis for understanding the means by which tonality and progression are established in Bartók’s music.”²⁷ He later continues, “Of all of Bartók’s works, the *Fourth String Quartet* contains the most comprehensive and systematic interaction of symmetrical cells.”²⁸ Antokoletz’s contribution will be discussed further in chapter 2.

Considerable attention has been given to addressing issues of compositional proportion in Bartók’s oeuvre. Any discussion of Bartók seems incomplete without some mention of a few exemplary studies examining the proportional relationships that exist in his works. Ernő Lendvai highlights that several passages of Bartók’s pitch and rhythm structures unfold in terms of the Fibonacci sequence (1,1,2,3,5,8,13,21,34,etc.), Lucas sequence (1,3,4,7,11,18,29,47,etc), and Golden section.²⁹ Roy Howat discusses similar processes in Bartók’s work as they relate to symmetrical proportions. While certain estimations of these proportions are expected and frequently made when calculating the exact proportions, as we will see in chapter 4, Howat criticizes Lendvai for being too inaccurate with his proportional derivations of these properties.³⁰ The inexactitude of these calculations is often forgiven as our perceptions of the relative proportions remain intact despite slight mathematical inconsistency.

Several scholars have treated Bartók’s works specifically focusing on different aspects of rhythm. While Gretchen Horlacher illuminates hidden hypermetrical structure in Bartók’s

²⁶ Antokoletz, Elliott. “Principles of Pitch Organization in Bartok’s Fourth String Quartet.” Ph.D. Diss., City University of New York, 1975.

²⁷ Antokoletz, Elliot. *The Music of Béla Bartók: A Study of Tonality and Progression in Twentieth-Century Music*. Berkeley, CA: University of California Press, 1984. 67.

²⁸ Ibid., 109.

²⁹ See for example Lendvai, Ernő, *The Workshop of Bartók and Kodály*. Budapest: Editio Musica, 1983.

³⁰ Howat, Roy. “Masterworks (II): Sonata for Two Pianos and Percussion.” In *The Bartók Companion*, 315-330. Edited by Malcolm Gillies. London: Faber and Faber, 1993.

work,³¹ John Roeder focuses on streams of pulse set in motion by various metrical accents.³²

Daphne Leong takes a different approach in her work on rhythmic form in Bartók by introducing and applying operations that highlights the transformative relationships that exist among families of rhythmic cells. Due to Bartók's predilection for rarely repeating anything literally, regarding pitch or rhythm, the latter approach by Leong will become an important in the second part of the dissertation.

Understanding the Role of Rotation in Bartók's Works

Malcolm Gillies writes,

It is easy enough to pick out characteristics in most of [Bartók's] pieces to illustrate a variety of theories, but such an activity can become a travesty of the analytical process. The real challenge lies in providing a comprehensive illumination of the music, not mounting a 'fishing expedition' to justify a theory; it lies in explaining clearly the dynamic of formal and stylistic phenomena of a piece while neither erring on the side of undue normalization of features, thereby denying deviations and variations their potency, nor losing sight of that underlying dynamic through too exclusive a focus on aspects of deviation.³³

The approaches outlined above provide theorists with some powerful tools to unravel the problems of form in Bartók's works. While none of these approaches serve as an entirely

³¹ Horlacher, Gretchen G. "Bartók's 'Change of Time': Coming Unfixed." *Music Theory Online* 7/1 (Jan 2001).

³² Roeder, John. "Pulse Streams and Problems of Grouping and Metrical Dissonance in Bartók's 'With Drums and Pipes.'" *Music Theory Online* 7/1 (Jan 2001).

³³ Gillies, Malcolm. "Final Chamber Works." In *The Bartók Companion*, 331-348. Edited by Malcolm Gillies. London: Faber and Faber, 1993.13.

complete analysis of these movements, there is a danger for analysts in relying too heavily upon any one analytical technique. Part of this danger resides in Bartók's fondness for continuous variation. Motives introduced at the beginning of a given movement often return subsequently concealed or skewed through rhythmic, harmonic, and/or intervallic variation.

Bartók's motives tend therefore to be elastic. Successive presentations of these motives are linked through the persistence of one or more notable characteristics of the original providing at once a sense of unity and contrast. Babbitt writes, "Such a theme can, by alterations of relative durations, metrical placement, and dynamic emphasis, serve as the elaboration of almost any one of its component elements, without sacrificing its initial character. Then, rather than functioning as a fixed unit that is acted upon, such a theme can itself act as a generator, avoiding redundancy through continual variation, but creating, at the same time, continuous phases of association."³⁴ In the second movement of *Music for Strings, Percussion, and Celesta* Bartók uses a single two-note rhythmic eighth-quarter note motive that serves as a generator for much of the musical material for the rest of the movement. Due to its ubiquity throughout the movement, I will refer to this motive as α . Several manifestations of this ur-motive are illustrated below in Example 1.7a-d.

³⁴ Babbitt, Milton. "The String Quartets of Bartok." *The Musical Quarterly* 35/3 (July 1949): 377-385.

Example 1.7a: Initial statement of α motive, mm. 1-5. α motive initially stated as an eighth quarter rhythm featuring an ascending leap.

Example 1.7b: Variant of α motive, mm. 47-52. Here, the quarter note of α 's eighth-quarter note rhythm is elongated and the gesture combines ascending and descending leaps.

Example 1.7c: α motive, mm. 167-170. α motive, cello I, mm. 69-77. Similar in rhythmic proportion and contour to the previous example, this variant of α uses the eighth-quarter rhythm as the basis of an elaborate melodic line.

Example 1.7d: α motive, mm. 167-170. Here α is used as a closing gesture articulating only ascending leaps and then elaborated upon by having the leaps filled in with glissandi.

As motives combine to form themes, themes combine to form sections, and sections combine to create large-scale form, Bartók's tendency towards variation affects all levels of how we understand his compositions. Wilson writes,

This in turn has an impact on Bartók's approach to large-scale form, particularly in movements where he employs some type of sonata form. Development sections in these movements often lose their traditional role as spans of time reserved for thematic variation, and they instead become a quite different kind of event or experience. (...) Melodic variation can create immediate analytical problems

when one tries to decide how to interpret subdivisions within the largest sections of a given form.³⁵

Because of these difficulties, as well as others to be discussed, I have chosen to regard the following movements in terms of rotation. Such a strategy simultaneously allows for the exploration of this movement's similarities with the sonata while simultaneously allowing analysts to avoid being confined by the rhetorical expectations implicit within sonata form.

In Bartók's music, groups of like motives combine to form themes. In the works to be considered in this dissertation, functional spaces dominated by these motives/themes form discrete zones; a zone is said to be reactivated whenever the characteristics of an individual motive is evoked. In the chapters that follow, each distinct zone within a rotation will be represented by an uppercase letter (A, B, C, D). I will refer to a specific zone first with the number of the rotation that it occurs in and then by its respective letter – that is, zone 2C would refer specifically to the zone C of rotation 2. As zones themselves can be made up of smaller subzones, the subzones will be labeled in parentheses with a lowercase letter indicating its zone of origin and a number representing its place within the order of subzones – that is, zone 1A(a2) would refer specifically to the second subzone of zone 1A. By way of illustration, the brief overview given below presents the motives that comprise the various musical zones of the first movement of Bartók's Fifth String Quartet..

Examples 1.8a-e illustrates the motives that activate the various zones of this movement. Zone 1A(a1) (mm. 1-4) is initiated by a driving eighth note rhythm. As this is the first instance of this zone, the octaves on B \flat will be particularly important to identifying important form

³⁵ Wilson 1992, 3.

defining events. This is also a rather obvious technique that Bartók uses here to imply a tonal center around Bb.



Example 1.8a. Zone 1A(a1), mm. 1-3 all voices

Zone 1A(a2) (mm. 5-8) introduces a three-note ascending chromatic gesture followed by an elaborated version of a1 that employs the same eighth note rhythmic patterns followed by larger intervallic leaps seen in Example 1.8.



Example 1.8b. Zone 1A(a2), mm. 5-6 cello and viola

Zone 1A(a3) (mm. 8-23) is activated by chromatic turn figures that act as elaborated versions of a2.



Example 1.8c. Zone 1A(a3), m. 11 all voices

Zone 1B (mm. 25-36) is evoked by a metrically displaced triple meter effect created primarily through an eighth-quarter rhythm, bracketed in violin I in Example 1.8d. This zone is also characterized by a slightly slower tempo ($\text{♩} = 132$ and opposed to the $\text{♩} = 132\text{-}138$ tempo of zone A).³⁶

Tempo I. ($\text{♩} = 132$)
25

Example 1.8d. Metrically displaced triple meter in zone 1B, mm. 25-28

³⁶ This same eighth-quarter pattern is also prominently featured in Bartók's String Quartet No. 4, I, zone A and as the ur-motive of *Music for Strings, Percussion, and Celesta*, II.

Zone 1C is defined by an almost entirely stepwise lyrical melody. This lyrical character contrasts greatly with the preceding materials that were characterized by their driving rhythm and more static use of pitch material.

45 $\text{♩} = 112-108$

Example 1.8e. Zone 1C, m. 45 all voices

Once it is understood how the musical zones are individuated it is easy to illustrate how zones combine to create large-scale form. Example 1.9 depicts the entire movement as it unfolds across its three rotations. The background level represents only the barest details of thematic structure while the foreground level underscores how these zones are generated by smaller motivic groups.

	Rotation 1										Rotation 2										Rotation 3																							
Background: A											B										A'	C	A								(c)	B	A	$\frac{A}{A'}$	A		C	B		A	C	A		
Foreground: $a1 - a1/a2 - a2/a3$	$a3$	$(a1)$	$B(a2/a3)$	$a1$	C	$a1 - a2 - a1/c - a1/a2$	c	$B/a3$	$a3$	$\frac{A}{A'}$	$a1 - a2$	C	$B(a2/a3)$	$a1$	$C/a2$	$a1(c)$																												
Measure: 1	5	8	14	23	25		37	45	57		70	74	82	86	104	120	126		132	147	160	177	200																					

Example 1.9: Rotational analysis of Bartók's Fifth String Quartet, I

I label instances where two or more motives occur simultaneously as *synthesis*. This is graphically represented with the interacting motives separated by a forward slash (/). Examples

of this can be found throughout the Example 1.9. In m. 5 for example, the simultaneous presentation of motive a1 and a2 result in synthesis a1/a2. If these motives had instead occurred in successive oscillation – that is, as a horizontal alternation of these two motives rather than a vertical simultaneity – they would be labeled as *juxtaposition*. This is graphically represented with the interacting motives presented vertically; for example, $\frac{a1}{a2}$. The dashed lines are similar to those of Schenkerian analysis as they represent the continuation of an idea. When a motive or motives appear in parentheses, such as in mm. 25 and 147) these references in the music are either passing or fleeting – that is, they are strong enough to be audible yet do not displace the current zone. These foundational principles will be applied and extended throughout the following analyses.

Chapter 2: Teleological Genesis in the Fourth String Quartet, First Movement

Introduction

Perhaps the best definition of teleological genesis is provided by Warren Darcy, who writes,

It sometimes happens that a brief motivic gesture or hint planted in an early rotation grows larger in later rotations and is ultimately unfurled as the telos, or final structural goal, in the last rotation. Thus the successive rotations become a sort of generative matrix within which this telos is engendered, processed, nurtured, and brought to full presence. As a result of this process of “Teleological Genesis” the rotations may be construed – within the aesthetic of the time – as growing successively more “revelatory.”¹

Darcy makes the aside about “within the aesthetic of time” to remind us of the continuous spiral-like effect produced by the circularity of successive rotations. Although Darcy was writing specifically about the music of Mahler in the preceding quote, the substantial stylistic shift between Bartók and Mahler does not change how the process of teleological genesis unfolds across a rotational form. Rotation serves as the structural foundation for a movement while teleological genesis functions as a complementary strategy to create continuous motion towards some ultimate goal.

In the following chapter I will examine how the process of teleological genesis occurs as a rotational strategy in Bartók’s String Quartet No. 4, I. I will first focus on foreground-related

¹ Darcy, 2001, 52.

issues and subsequently broaden my focus to the background level, showing how the concept of teleological genesis governs the form and narrative structure of this movement.

Example 2.1 is a reproduction of Bartók's own analysis of this movement.² There is nothing particularly striking about Bartók's analysis of the movement as a sonata form other than his vague mention of a group of main themes rather than a single such theme, and his notion that the closing theme of the recapitulation expands into a coda. What is rather striking, however, is the lack of any mention of key relations. This makes the movement well suited to focus on its rotational underpinnings – that is, its progression of motivic/thematic ideas.

Movement 1. – The first movement is in the three sections of sonata form: exposition, development, recapitulation.

Structure of the exposition:

measures	1-13: main theme (group of main themes);
	14-29: transitory passage;
	30-43: secondary theme;
	44-48: closing theme, derived from a motive of the main theme (mm. 7 and 11-13).

Development: measures 49-92.

Structure of the recapitulation:

measures	93-104: main theme;
	104-119: transitory passage;
	119-126: secondary theme;
	126-161: closing theme, augmented to serve as a coda.

Example 2.1. Reproduction of Bartók's analysis of String Quartet No. 4, I

Bartók's description is representative, at least from a thematic standpoint, of what Hepokoski and Darcy would call a type 3 sonata.³ This is the most typically encountered sonata form where a principal theme in the tonic is followed by a secondary theme in a closely related

² Suchoff, Benjamin. ed. *Béla Bartók Essays*. London: Faber and Faber , 1993. 412.

³ As outlined in *Elements*


key (most normatively the dominant if the movement is in the major mode, the relative major if in minor), which is followed by a development, and then completed with a return to both the principal and secondary theme reinforcing the tonic. Rather than using the terms Exposition, Development, and Recapitulation, in the analysis that follows I will refer to these formal sections as rotations one, two, and three respectively. As outlined in the previous chapter, each area of new motivic development, or zone, is assigned a number to express the rotation to which it belongs and a letter to denote its specific location within that rotation (i.e Zone 1B indicates the second zone of rotation one). The brief overview of these zones and their respective labels presented below will be elaborated upon throughout the analysis.

Overview of Zones

Zone 1A is characterized by the successive entries of an eighth-quarter rhythmic figure that initially appears mostly as a rising gesture of major and minor seconds as illustrated in Example 2.2.



Example 2.2. Zone 1A, mm. 1-3 Violins I and II

Motive α , a motive generated within zone 1A, assumes a somewhat autonomous existence in this movement. It is a chromatic gesture based on the rhythmic figure . Its

notes of initiation and termination form a minor second creating a sense of unity with the eighth-quarter motive in zone A. While the initial appearance of α is rising then falling in m. 7 (Example 2.3a) it is quickly joined with its inversion in mm. 11-13 (Example 2.3b). Throughout zone 1A and much of the composition, α is used as a terminating gesture.

Example 2.3a and b: Motive α in m. 7 (Cello) and mm. 11-12 (all voices)

Zone 1B has several elements that simultaneously combine to activate it that are illustrated in Example 2.4. It is characterized by an ostinato figure accompanied by imitative entries of a melody with a wavelike contour. The pitch content of these melodies, which will be discussed in greater detail within the body of the chapter, is based primarily on the octatonic collections $\text{Oct}_{0,1}$ and $\text{Oct}_{1,2}$.⁴

⁴ In this labeling system originated by Joseph Straus, the numbers represent the lowest pitch-class semitone of the collection. See Straus, Joseph. *Introduction to Post-Tonal Theory*. New Jersey: Prentice Hall, 2000. 120-122.



Example 2.4. Zone 1B, mm. 14-16, all voices

Zone 1C is evoked most prominently through its flowing contrapuntal texture produced by rapidly ascending and descending scale gestures depicted in Example 2.5. The pitch content of these measures is actually quite complex (consisting of hybrid whole-tone/octatonic scales in the two violins and violas and an F Locrian scale in the cello) and will be discussed later in the analysis.

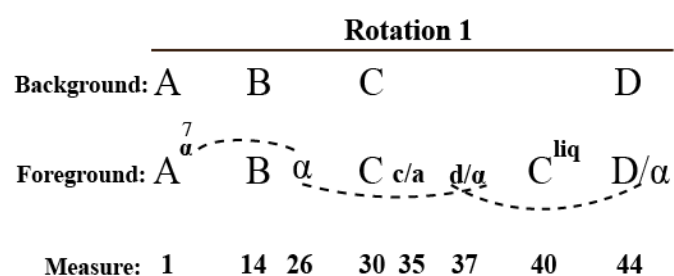
Example 2.5. Zone 1C, mm. 30-31 all voices

Zone 1D is defined by its *forte* driving eighth notes illustrated in Example 2.6. This texture contrasts significantly enough with all other materials to create a distinct zone. At the same time, on the foreground level, this rhythmic motive is also joined by elaborations of motive

α to form a synthesis. The combination of the steady eighth notes and α , which has already been used as a terminating gesture in zone A, gives this zone the character of a closing function.

Example 2.6. Zone 1D, mm. 44-45 all voices

Rotation One



Example 2.7. Bartók's Fourth Quartet, I, multilevel rotational diagram depicting background and foreground levels of the first rotation.

Example 2.7 is a multilevel rotational diagram that will be explained throughout this section on rotation one. As such, the reader may wish to return to this diagram to understand the events outlined in this rotation within the context that they unfold. The example illustrates that

despite a straightforward progression of zones at the background level (A B C D), the foreground level is much more elaborate. It is at this level that the generation and subsequent development of motive α occurs.

Zone 1A is only thirteen measures in duration and within this relatively short span introduces and elaborates α . Concerning the opening thirteen measures János Kárpáti writes, “The continuity is divided into relatively static blocks, and it is within these blocks, almost in micro-structures, that dynamism develops.”⁵ The dynamism that Kárpáti writes of lies in the tightly organized phrase structure of these opening measures; this pushes the action forward toward the initial utterance of α in m. 7 and its developed return in mm. 11-13. These measures are most convincingly parsed into two phrases – mm. 1-7 and mm. 8-13. Though the phrase structure is slightly skewed (2+2+3 rather than the typical symmetrical 2+2+4), the first of these phrases can be understood in terms of the classical sentence. As seen in Example 2.8a, mm. 1-4 form the initial presentation of a basic idea divided into two measure units functioning as statement and response respectively. These measures are followed by mm. 5-7 which provide a continuation phase through fragmentation, and the first appearance of α serving as the cadential idea in m. 7.⁶

This sense of dynamism also helps to introduce motive α organically. The previous measures lead logically to its first presentation in m. 7. The three quarter note rhythm is introduced in m. 2 in violin 1 and developed throughout in all voices, and the sixteenth note rhythm is heard in m. 5 in both violins. Example 2.8b and c highlight how motive α is alluded to

⁵ Kárpáti, János. *Bartók's String Quartets*, trans. By Fred Macnicol. Hungary: Franklin Printing House, Budapest, 1975. 212.

⁶ Caplin, William. *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven*. New York: Oxford University Press, 1998, 35-48.

in the composite rhythm in m. 5. The viola and violin 1 part form a literal reference to α while the cello and violin 2 showcase a slightly modified reference.

Allegro $\text{♩} = 110$

presentation (statement) (response) continuation (fragmentation) (cadential idea)

Example 2.8a. Sentence structure leading to the first, cadential appearance of motive α .

cello and vl.2 vla and vl.1

b: c:

Example 2.8b and c. Composite rhythm of viola and violin 1 in m. 5, forming the rhythmic profile of motive α ; composite rhythm of cello and violin 2 in mm. 4-5, forming a close variant of α .

While the remaining measures of zone 1A (mm. 8-13) are saturated with the X and Y cells mentioned in Chapter 1, musically the focus of these measures is on continuing the development of motive α . While mm. 8-10 serve as a varied restatement of the opening measures, Bartók develops α by pairing the cello and violin 2 against the viola and violin 1 (recalling the same pairing used in m. 5) with imitative entries in a dense contrapuntal texture at various levels of transposition and inversion.

Although Antokoletz's treatment of pitch cells in this movement is remarkably thorough, he seems to overlook the fact that the α motive is a linear manifestation of cell X. Example 2.9 illustrates three such progressions. The first example interprets the pitch material of α as a manifestation of cell X ($B\flat$ B C $D\flat$) leading very clearly to cell Y ($B\flat$ C D E) at the cadence in m. 7. The second example is an elaborated version of the first that forms the cadence in m. 13. The area of α development (mm. 11-13) comprises two forms of cell X: X_{10} ($B\flat$ B C $D\flat$) and X_2 ($C\sharp$ D $E\flat$ E).⁷ Bartók combines these two cells to create cell Y_{10} in m. 13 mirroring the cadence in m. 7. The third part of this example will be discussed shortly.

The image shows a musical score with four staves (treble and bass clefs) and a corresponding pitch cell diagram below. The score is divided into three measures: m. 7, m. 13, and m. 26. In m. 7, the first staff has a half note $B\flat$ and a half note B, both marked *sf*. The second staff has a half note C and a half note $D\flat$, both marked *sf*. The third staff has a half note D and a half note E, both marked *sf*. The fourth staff has a half note $B\flat$ and a half note B, both marked *sf*. A box labeled Y_{10} encloses the notes in m. 7. A box labeled X_{10} encloses the notes in m. 13. In m. 13, the first staff has a half note $B\flat$ and a half note B, both marked *sf*. The second staff has a half note C and a half note $D\flat$, both marked *sf*. The third staff has a half note D and a half note E, both marked *sf*. The fourth staff has a half note $B\flat$ and a half note B, both marked *sf*. In m. 26, the first staff has a half note $B\flat$ and a half note B, both marked *sf*. The second staff has a half note C and a half note $D\flat$, both marked *sf*. The third staff has a half note D and a half note E, both marked *sf*. The fourth staff has a half note $B\flat$ and a half note B, both marked *sf*. Below the score, a pitch cell diagram shows the sequence of notes: $B\flat$, B, C, $D\flat$, D, $E\flat$, E. A box labeled X_{10} encloses the first four notes ($B\flat$, B, C, $D\flat$). A box labeled X_1 encloses the last three notes (D, $E\flat$, E). A box labeled Y_{10} encloses the entire sequence of seven notes.

Example 2.9. Progression of cell x to cell y at cadence points in mm. 7, 13, and 26.

As soon as motive α seems about to fully assert itself it is quickly suppressed by the onset of zone 1B (14-30). Though Hasley Stevens believes the imitative entries of the haunting melody

⁷ To identify the specific levels of transposition of these cells I use pitch-class integer notation where $C\sharp$ equals 0, $C\flat$ equals 1, etc. See Straus 2000, 30-52.

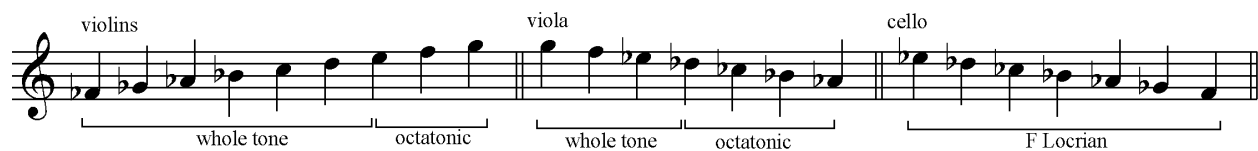
that characterizes this zone are variations of α ,⁸ they provide a significant enough contrast to suggest the start of a new zone. Another factor that creates the feeling of a new zone is Bartók's use of octatonic collections as the primary pitch material throughout this section. In the score one can easily trace Bartók's use of OCT_{0,1} in the second violin in mm. 15-24 and OCT_{1,2} in the first violin in mm. 17-26 and viola in mm. 18-26. OCT_{1,2} is also used in the cello from mm. 14-17 with the addition of D \sharp . The inclusion of this D \sharp becomes quite important later in the movement. While it undermines a purely octatonic reading of the passage, it anchors the cello in the G \sharp minor collection, which will have a prominent development later on. It is interesting to note that Bartók's use of X and Y cells – comprised respectively of semitones and whole tones – creates a parallel to the octatonic collection, itself a hybrid collection of alternating semitones and whole tones.

After the static blocks of zone 1A, the incessant ostinato and increasingly imitative texture of zone 1B effects a change in forward motion. This change, in addition to a newly derived pitch collection combined with a newly derived theme (both based on previously heard materials), does indeed provide an argument for hearing zone 1B as a “transitory passage,” as Bartók's analysis indicates. But these measures simply do not sound transitory. In fact, zone 1B ends with a resumption of the development of α in mm. 26-30 that starts in mm. 11-13 almost as if zone B never even occurred. Returning briefly to example 2.9c we can hear the cadence in m. 26 as a reworking of the cadences encountered in mm. 7 and 13.

Measures 28-30 liquidate motive α and thence lead to the onset of zone 1C (mm. 30-44). As illustrated in Example 2.10, Bartók again uses a hybrid whole tone/octatonic scale to construct the scale passages located in this section. While the new contrapuntal scale texture is

⁸ Stevens, Halsey. *The Life and Music of Béla Bartók*. 3rd edition prepared by Malcolm Gillies. New York: Oxford University Press, 1993. 187.

significant enough to mark this as a new zone, remnants of α still lurk under the surface. This is evinced by the clear references to motive α in mm. 30 and 32-33 in violin 1. α is then fragmented so that in mm. 32-34 only its tail is developed.



Example 2.10. Hybrid whole tone and octatonic scales used in the violin and violas and Bartók's use of F Locrian in mm. 30-31

Of Bartók's fourth quartet, Stevens writes, "It is a quartet almost without themes, with only motives and their development."⁹ The remaining measures of zone 1C provide us with excellent examples of what Stevens meant by this. Mm. 35-36 continue the scale passages of m. 31 in the viola and cello but occur simultaneously with the eighth-quarter gesture that characterized zone 1A in the violins. As zone 1C never came to a convincing close, the continuation of C materials creates a synthesis (labeled c/a in Example 2.7) at the foreground level. As discussed in Chapter 1, a synthesis is defined as the simultaneous presentation of two or more motives.

With the introduction of driving eighth notes in mm. 37-39, zone 1C sounds like it is leading to a close, but does not do so. Motive α once again tries to assert itself by interposing itself at will throughout these measures, but is unable to break free of the frenetic energy of zone C's motoric, ostinato eighth notes. Despite a tense feeling of energy gain in these measures, zone 1C does not actually culminate here and instead quickly shifts to a section that develops

⁹ Ibid., 186

fragments of α in mm. 40-43. As a result any of the driving character evoked in zone 1C by the preceding measures is liquidated as reflected in Example 2.7.



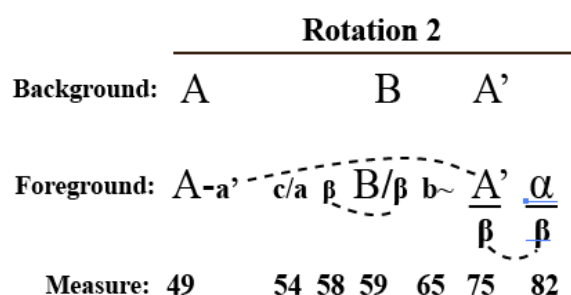
Example 2.11. Elaboration of eighth-quarter rhythm of zone 1A in violins 1 & 2, and further elaboration of the scale passages of zone 1C, creating synthesis c/a, mm. 35-36.

While these measures result in a temporary slowing of the momentum gathered in the previous section, Bartók returns quickly to the driving eighth-note anticipated in the previous section. This time these materials are strong enough and long enough in duration to perceive as a distinct zone initiating in m. 44 (refer to Example 2.6). Motive α is featured prominently in zone 1D although in an elaborated form. This manifestation of motive α borrows the figuration of m. 33 violin 1 and m. 40 cello to produce a hybrid of these structures. These references are strong enough to hear but are still too weak to truly establish independence for α . This results in a synthesis between in zone 1D labeled D/ α in Example 2.7.

The first rotation is primarily responsible for introducing α and to a lesser extent the development of α . While the motive is introduced and developed during the first rotation, it is undermined therein at every turn – cut short/interrupted by zone 1B, relegated to foreground figuration in zone 1C, and fragmented in zone 1D. The presentation of α and its persistent

struggle forms the *Grundgestalt* of the movement will shape how the two subsequent rotations unfold.

Rotation Two



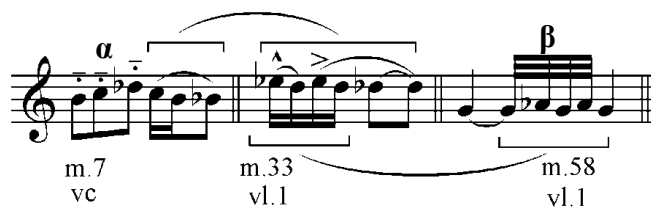
Example 2.12. Multileveled rotational analysis of Bartók's Fourth Quartet, I, rotation 2

Example 2.12 is a multileveled diagram that plots out the major events throughout the second rotation and will be referenced throughout this section. The initiation of rotation two is marked clearly in m. 49 by a quarter rest caesura followed by a slightly modified version of zone 1A heard a semitone lower. In m. 50 Bartók expands the ascending leap between the two-note gesture of zone 1A's eighth-quarter rhythm to an augmented ninth. In mm. 51-53 these leaps are filled in with glissandi. This mutation of the original zone A material, labeled a' in Example 2.12, will be the primary representation of zone A in this rotation.

As α has been constantly lurking in the background during the previous rotation, we would expect that it be would further elaborated upon in the developmental second rotation. As illustrated in Example 2.12, however, we can see that α is almost entirely absent until the very end (the only exceptions being passing references or, subsequent development of fragments of the original). In place of α , Bartók introduces a new motive (herein referred to as β) that is heard throughout this rotation.

As seen in Example 2.12, a synthesis is formed in mm. 54-58 of materials from zones C and A. This synthesis is reminiscent of the one previously mentioned that occurred in zone 1C in mm. 35-37 (refer to Example 2.11). In the second rotation, however, due to the brevity of the preceding zone 2A (only five measures in duration), the lack of a convincing cadence, and the continuation of A zone materials, this material forms a subzone in zone 2A. Beneath the surface there is a moment of passing reference to the α motive leading into m. 56 in the cello and violin 1.

Arguably the most structurally significant event of this rotation occurs at the cadence at the end of this zone in m. 58. While zone 1A closes with the development of α , zone 2A is instead brought to its close with the first occurrence of motive β . β is characterized by the rapid oscillation of two pitches a semitone apart and is present throughout the remainder of this rotation. While β functions as a recognizably distinct motive, it is actually distantly related to α . Example 2.13 illustrates α in its original form (heard in the cello in m. 7), a variant derived from a fragment of α heard in violin 1 in m. 33, and a further elaboration of that fragment heard as motive β in m. 58. β is thus heard as a sort of distant cousin or third generation relative to α . The subject of motivic genealogy is nearly an inescapable topic in the analysis of Bartók's music but it is also very nearly impossible to sort out thoroughly and objectively. As the focus here is on large-scale form rather than foreground motivic relationships, this is a topic for future exploration. For our purposes now it is only necessary, first, to understand the density of organic relationships that exist between Bartók's motives, and second, that we are able to link together references to the original motive and varied or evolved references of that original.



Example 2.13. The derivation of motive β from a developed fragment of motive α

As in the first rotation, zone A leads us to zone B. The difference is that the ostinato originally heard in 1B in the viola is now replaced with irregularly spaced utterances of β in the two violins creating synthesis B/ β in mm. 56-64 as illustrated in Example 2.12. The cello enters in m. 60 and is quickly answered with an inverted imitation by the viola a measure later. Through the use of similar melodies entering in imitation and the use of octatonic collections, zone 2B initially sounds like a relatively tame reinterpretation of zone 1B. The main difference between these two zones comes in mm. 65-74 as zone 2B breaks away from the more straightforward imitative entries that have characterized it thus far and begins to develop the materials in seemingly free variation. This expansion of zone 2B is perhaps necessary because of its relative lack of importance in the first rotation. In the first rotation, zone B was interrupted and functioned only as a digression from the more prominent materials; in the second rotation it becomes more of a focal point. As the materials of these measures are not heard elsewhere in the composition, once again zone B takes on the character of an interlude that interrupts the main focus of the movement.

Rather than following zone 2B with C and D material, Bartók returns to zone A materials in mm. 75-81. This is not a return to the eighth-quarter semitone motive of zone 1A but a return to the intervallic leap filled in with glissandi heard at the beginning of zone 2A. This relation to a

mutation of the original motive heard in rotation two forces us to understand this as an elaboration of zone 2A rather than the beginning of the third rotation. Throughout these measures zone A' materials are juxtaposed with the β motive. Example 2.14 illustrates mm. 74-79 and distinctly shows a measure-by-measure alternation of these two ideas.

Example 2.14. Juxtaposition of zone 2A materials with motive β , mm. 75-79

Up until this point in Rotation two, motive α , which had been prominently featured throughout the first rotation, has been almost completely absent (the only utterance came in passing in mm. 55-56). In final section of rotation two (mm. 82-92), α returns and participates in a struggle for dominance with β , creating the juxtaposition $\frac{\alpha}{\beta}$. János Kárpáti writes, “The two different kinds of material are almost ‘brutally’ confronted with each other: [α] or an occasional fragment of it breaks open and wedges its way into the closed blocks of [β].”¹⁰ This motivic battle, which is an idea that Bartók returns to in the third rotation, is illustrated in Example 2.15.

¹⁰ Kárpáti 1975, 214.

The musical score for Bartók's String Quartet No 4, I, mm. 87-90, is presented in two systems. The first system (mm. 87-88) shows the initial introduction of motives α and β. Motive α is a descending eighth-note scale, and motive β is an ascending eighth-note scale. The second system (mm. 89-90) shows the juxtaposition of these motives with various dynamics and articulations. The score includes dynamic markings such as *mf*, *sempre sf*, *p*, and *sf*, as well as articulation marks like accents and slurs. The notation is in 4/4 time and features four staves.

Example 2.15. Bartók's String Quartet No 4, I, the juxtaposition of α and β , mm. 87-90

The second rotation has served as an exemplary illustration of Bartók's strategy for a developmental second rotation. Though Bartók almost never repeats anything exactly, his choice of materials to elaborate upon in this rotation come more from mutations and fragments or variations of fragments from previously heard motives rather than direct development of any particular motive. This can be seen in the introduction of the seemingly new motive β which has a distinct profile but can be traced back to α , as well as in Bartók's choice to reinterpret the

original eighth-quarter semitone gesture of zone 1A as a large leap filled in with glissandi. While these materials are organically related, at the same time they provide substantial contrast to their first-rotation counterparts.

Rotation Three

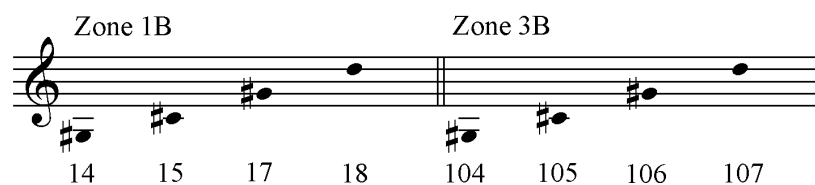
Rotation 3						
Background:	A	B	C	D	E	
Functional:	$\frac{A}{\alpha}$	B	α	C/A	D/ α	α
					$\frac{E}{\alpha}$	
Measure:	93	104	116	119	126	134 157

Example 2.16. Multileveled rotational analysis of Bartók's Fourth Quartet, I, rotation 3

Example 2.16 is a multileveled rotational diagram depicting the sequence of zones in the final rotation. Motive α is finally allowed assert itself in mm. 92-93 with the cello, viola, and violin 2 as Bartók presents the motive in three octaves. This statement of α leads into the third rotation at m. 93 where the materials from the opening measures of rotation one return at pitch. While at this point in the first rotation only the faintest hints of α were present, in the third rotation α is able to interpose itself at will. Motive α occurs in juxtaposition with the eighth-quarter gestures introduced in the movement's opening measure, creating juxtaposition $\frac{A}{\alpha}$ at the foreground level in mm. 93-99 as seen in Example 2.16. Bartók continues to play with listener expectations as he chooses to omit this prominent motive for the duration of the remaining measures of this zone. Perhaps most striking is the omission of α from the final cadence of this zone in m. 104. As the end of zone 1A was punctuated with the first development of α in mm. 11-13, we would expect at least some reference to this motive in the corresponding spot at the

end of 3A, but Bartók presents us instead only with a large leap filled in with glissandi, recalling zone 2A.

Despite the absence of the original ostinato that accompanied zone B in the first rotation, zone 3B (mm. 104-119) remains a relatively unaltered repetition of its counterpart. Bartók produces only slightly varied iterations of the original melodies from the same octatonic collections. As seen below in Example 2.17, the initiating tones of the imitative entries that comprise this zone also return in order. This is an uneventful, almost obligatory repetition of this zone which only serves to heighten our expectations for the return of α .



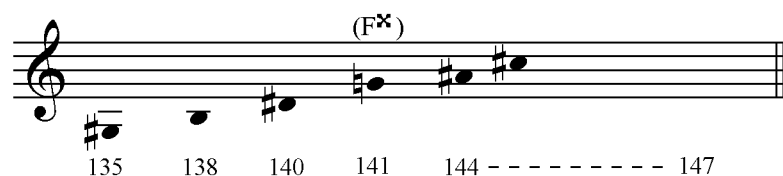
Example 2.17. Initiating tones of imitative entries of B material in rotations 1 and 3

Zone 3B closes with a section of α development (mm. 115-119) mirroring its counterpart zone 1B (mm. 26-30). As in the earlier passage, α is fragmented and developed through a chromatic ascent that propels us forward into zone 3C (mm. 119-126). Bartók chooses not to return to the flowing scale passages that originally characterized zone 1C but instead returns specifically to the subsection of zone 1C where C and A materials create a synthesis (see mm. 35-37). This material originally functioned as a subsection of zone 1C, subsequently returned in the second rotation as a subsection of zone 2A, and now appears here to represent the entirety of zone 3C.

3D/ α (mm. 126-134) functions more or less identically to its counterpart in the first rotation (mm. 44-48) driving the movement forward with its uninterrupted eighth notes and

fragmentation of α . This section is actually elongated rather than compressed like the other subsections of the third rotation; this may be Bartók's way of balancing the architecture of the movement, as D was omitted from Rotation two. This zone could easily mirror its function at the end of the first rotation and serve as the closing material of the movement. Bartók instead leads us seamlessly into a new section, zone E (mm. 134-161), where the driving eighth notes of zone D gradually fade away but the development of α continues. In Example 2.16 this section is labeled as the telos of the movement – the section where the initial seed that was planted in the first rotation reaches fruition. While up until now α has lurked beneath the surface and been the subject of continuous elaboration, generally in combination with other materials, in this zone it is finally able to rise above and eventually break free of references to zones A, B, C, and D.

Paradoxically, upon close inspection zone E, while deserving of its label as an independent zone due to its introduction of new configurations of material, is actually a simultaneous composing out of materials located within all previous zones. Perhaps the most striking of these references in zone 3E is the gradual unfurling in mm. 135-148 of a G^\sharp harmonic minor collection that (missing only its sixth scale degree) occurs in juxtaposition with various fragmentations and elaborations of α (see Example 2.16). Example 2.18 below is a reduction illustrating the introduction of tones forming this scale without interruption from motive α .



Example 2.18. Reduction illustrating the unfolding of the G^\sharp minor collection, mm. 135-147

This collection seems totally foreign among the interpolations of α . This is not, however, the first hint of G \sharp minor in this movement. This collection can be traced back to the beginning of zone 1B in the cello (mm. 14-18). While the raw materials are rearranged into something completely different Bartók manages to retain a fairly salient organic relationship with zone 1B. Other zones are represented here as well as can be seen in Example 2.19. The eighth-quarter gestures of zone A are featured prominently throughout mm. 146-148. Zone C is represented by the quarter notes originally found within 1C in mm. 33-34 in the cello and viola, as well as in the use of flowing scale gestures as in mm. 144-145. Zone D is also referenced clearly by the driving eighth notes originally encountered in mm. 44-47 that recur in mm. 148-151. This same passage, with its chromatic ascent, also recalls the close of both the close of zone 1B (mm. 28-30) and zone 2B (mm. 116-119).

Motive α has been a major contributing factor towards the generation of motives and zones but it has remained to a certain extent suppressed, submerged beneath the movement's surface, in the previous sections. The final measures of this movement (mm. 157-161) feature an entirely uninterrupted stream of entries of motive α , which here has finally reached untrammelled prominence and can no longer be restrained. With its teleological prophecy fulfilled, the movement ends with a highly satisfying final utterance of the α motive with all four voices in unison.

Example 2.19. Zone 3E as a simultaneous composing out of the materials from all preceding zones, mm. 142-148

Synthesis

Rotational form has guided us through the intricate formal nuances of this work. Although several influences of traditional sonata form have stood out, a reading that relies entirely on the sonata is far from the most aurally salient. Bartók casts sonata form as a process of constant retooling and creative innovation that pushes sonata well past its breaking point and into another realm altogether. Concerning the over-extension of sonata form as an explanatory tool into repertoires that are better explained otherwise, Darcy writes,

...this is a strategy that produces an immediate and inevitable neutralizing effect, one that simultaneously reduces the processes of extraordinarily complex and subtle compositions to all-too-familiar formal categories and suggests, once the shopworn labels are applied, that one need not inquire much further into questions of formal layout and the expressive significance of deviations from commonly held expectations.¹¹

By focusing on the rotational foundation through which the motivic zones unfold, we attain a more accurate view of formal structure and narrative trajectory.

Example 2.20 presents all three rotations in a linear perspective. This multileveled view, inspired by Schenkerian analytical techniques, allows us to track both the local and global relationships of motivic interactions throughout the movement. From here we can track how motive α is generated, developed, and ultimately achieves its teleological genesis.

	Rotation 1							Rotation 2					Rotation 3									
Background:	A	B	C				D	A	B	A'			A	B	C	D	E					
Foreground:	A ⁷ _α	B _α	C _{c/a}	d/a	C ^{liq}	D _α	A-a'	c/a	β	B/β	b~	A' _β	α _β	A _α	B _α	C/A	D _α	<div>telos</div> <div>E_α</div>				
Measure:	1	14	26	30	35	37	40	44	49	54	58	59	65	75	82	93	104	116	119	126	134	157

Example 2.20. Bartók's String Quartet No. 4, I, Rotations 1-3

While the first rotation is responsible for the generation of motive α , here the latter does not establish itself in a stable presentational form. It is, as we have seen, essentially undermined in every zone through its interruption by zone B and its subsequent fragmentation in zones C and

¹¹ Darcy 2001, 71.

D. This rotation serves to plant this idea in our ears and allow it to gestate through the next rotations. The second rotation is particularly interesting because of its lack of direct development of α . Instead it develops a counter-motive, β . While an organic derivation links β and α , it is clear that β exists entirely independent of α . A turning point in this movement starts in m. 82 where α and β clash in juxtaposition. As α reassembles itself and begins to reemerge as a prominent motive, a change occurs. This change is not so much in the development of α so much as it is of our perception of it. In the previous rotation, α was used mostly in the background within other zones. In the juxtaposition of α and β of the second rotation, α begins to establish itself almost as the focus of an independent zone, an alteration of the rotation initially laid down. It is here that we realize that the movement's focus on α is growing. Despite the fact that the third rotation revisits the first rotation in what is for Bartók a fairly straightforward manner, its introduction of zone E represents a significant contrast. It is within this zone, a zone that encapsulates the entire movement, that α is eventually able to triumph over all previous material.

Chapter 3: Continuous Variation and (Hyper)Rotation in the Piano Sonata, First Movement

Introduction

As mentioned in the previous chapter, focusing on sonata form in Bartók's post-tonal repertoire can often distract from the real compositional processes and individuality of a movement, leaving analysts and readers alike with more questions than answers. In the following chapter I offer a rotational analysis of Bartók's Piano Sonata, first movement to illustrate the effectiveness of rotation as an analytical tool and its superior utility as a formal model for Bartók's works. To do this, I will draw upon the scholarship of Wilson, Straus, and Somfai to create a more intuitive analysis based on a rotational perspective.

The formal complexities surrounding Bartók's Piano Sonata (1926) first movement are reflected by the divergent readings offered by various scholars. Straus¹ and Wilson² both hear the movement as a sonata form comprised of a two-theme exposition with major tonal and thematic conflicts occurring throughout the recapitulation. Somfai agrees that the movement is a sonata, but rejects the idea of a two-theme exposition in favor of a five-theme exposition where all themes are tightly related to two archetype motives.³ Lendvai disposes with sonata form altogether and believes that the form of the movement is the typical arch form frequently associated with Bartók. While each reading uniquely enhances our understanding of the work's formal structure, in the rotational analysis that follows, I build upon these readings to produce what I feel to be a more intuitive and accurate portrayal of the formal structure.

¹ Straus, Joseph. *Remaking the Past: Musical Modernism and the Influence of the Tonal Tradition*. Cambridge, MA: Harvard University Press, 1990. 107-113.

² Wilson 1992, 55-71

³ Somfai, László. "Analytical Notes on Bartók's Piano Year of 1926." *Musicologica Academiae Scientiarum Hungaricae* 1/4 (1984): 5-58. 40-48

In order to proceed it will first be necessary to briefly examine what characteristics create the zones within this movement. Part of the difference between Straus/Wilson's two-theme exposition and Somfai's five-theme reading resides in the multitude of interpretations of Bartók's motivic manipulation of a single motivic idea. This seed, the ur-motive of the movement, occurs within the first measure (See Example 3.1a). While manifestations of this motive are located throughout the movement, its original form is tied clearly to zone 1A (mm. 1-43). Straus, guided by this property, labels the first section, containing this motive, as theme group A and the remainder of the exposition, without it, as theme group B.

The problem with hearing this movement as having only two themes is that there are several sections within this relatively large (ninety-one measure versus forty-three measure) B section that are significant enough to be considered discrete sections. Somfai writes, "They are real themes, with real contrasts, with vigorous pianistic characters that are kept in the listener's mind."⁴ The characters that Somfai writes of are created through the motivic manipulation of the ur-motive herein to be referred to as α . The different shades of this single motivic idea signal the onset of five distinct zones within the first rotation.

While Somfai and I both agree that there are five distinct themes or zones in the first rotation – A (mm. 1-43), B (mm. 44-56), C (mm. 57-75), D (mm. 76-115), and E (mm. 116-134) – we disagree in our fundamental understanding of the motivic materials that Bartók uses to create these zones. Somfai argues that there are two distinct archetype motives from which the movement is built. These motives are depicted below as α and α' in Example 3.1.

⁴ Somfai 1984, 45.



Example 3.1: Somfai's two archetype motives

While both motives have an anacrusic effect, both outline an ascending minor third, and both initiate a straight eighth-note ostinato, Somfai denotes specific functions to these motives separately. He attributes the function of an articulatory signal to α and its rhythmic variants in the exposition heralding the onset of new themes – mm. 38-43 herald the arrival of the second theme (m. 44); mm. 69-72, the fourth theme (m. 76); mm. 110-111, the fifth theme (m. 116) – or being inserted at a major point within a theme – as mm. 87-88 divide the fourth theme. This is the element also which, when inverted at bar 135, initiates the movement's development.⁵ There are several problems with this reading. With the return of motive α and the opening ostinato material, mm. 38-43 function more to recall the opening of the movement than herald the second theme. While Wilson labels this section as a transitional passage, he also understands it as relating backwards creating a rounded binary structure that is common in Bartók's works.⁶

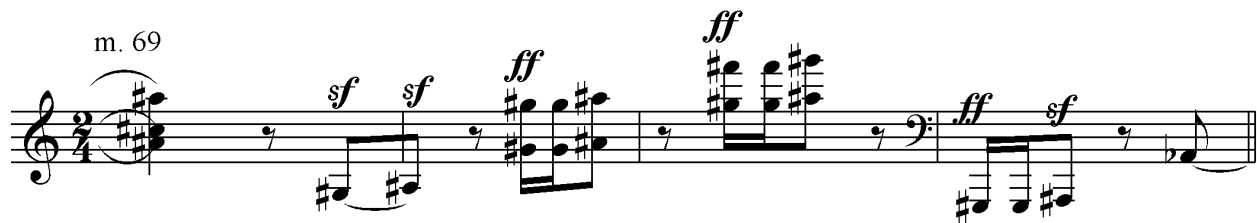
Somfai also attributes the function of motivic elaboration to the second of his archetype motives, but since this motive itself is an audible elaboration of the original motive, it is contentious to assert that certain manifestations of this motive relate more to the second archetype motive than to the first. This confusion is demonstrated when Wilson writes, "The themes (...) have an evolutionary quality, so fluidly does each seem to grow from its precursor."⁷ Somfai's identification of two archetype motives with independent functions implies the

⁵ Somfai 1984, 43.

⁶ A similar structure in a larger context will be discussed in my analysis of the first movement of Bartók's Sonata for Two Pianos and Percussion in chapter four.

⁷ Wilson 1992, 55

existence of a definable motivic lineage amongst Bartók's motives. Wilson echoes this concept as he writes that the interrelatedness between motives "leads to strong family resemblances of contour and character within and between themes."⁸ Although it is quite fascinating to trace the interrelationships of motives in Bartók, any sufficiently detailed motivic genealogy would be difficult if not entirely impossible to untangle and present clearly. How can we assert that the motives depicted in Example 3.2 relate to one of the archetype motives more than the other? Somfai believes these motives are direct references to motive α despite the lack of dotted rhythm and minor third and that rhythmically this motive is related more to his second archetype motive (labeled α' in Example 3.1b). Whether or not such a clear determination is possible, as Bartók develops fragments of individual motives and combines them with others, problems inevitably abound.



Example 3.2: Motivic fragmentation, Piano Sonata first movement, mm. 69-72

I believe the entire movement is tied to one over-arching motivic idea, α , whose first utterance occurs in the opening measure, and from which all subsequent motives can be traced. Form, and formal differentiation, arises from where and how Bartók utilizes this material. Given Bartók's predilection for continuous development, it is difficult if not impossible to label specific functions within the numerous manifestations of this single motivic idea. For this reason the

⁸ Wilson 1992, 57.

following analysis will track individual manifestations of α for the purpose of illustrating how certain iterations are associated with specific zones and the formal ramifications of these relationships on formal structure. Because it occupies half of the entire movement's run time and introduces all subsequently developed motivic, thematic, and formal strategies, the analysis will focus on the first rotation.

Rotation One

	Rotation 1									
Background:	A		B	C		D			E	
Foreground:	a1	a2	a1	B	C	(a)	D	d/a	D	E
Measure:	1	13	38	44	57	69	76	93	97	116

Example 3.3: Multilevel rotational analysis of Bartók's Piano Sonata first movement, rotation 1

Zone 1A (mm. 1-43)

As seen in Example 3.3, zone 1A can be divided into three major sections, a1 (mm. 1-13) a2 (mm. 13-37), and a1' (mm. 38-43) which are defined respectively through the introduction (and development of) α (as shown in Example 3.1a), a movement away from (and subsequent development) of a varied form of α (Example 3.1b), and return to (the development of) α . Example 3.4 is a melodic reduction of the opening twenty measures of zone 1A. We can understand the opening section (mm. 1-13) as two unfoldings of the α motive in the right hand. The first unfolds the minor third G \sharp -B and the second C \sharp -E. The left hand in these measures, not depicted in the example, strikes an E-major root position block chord on every measure

downbeat throughout this span. In addition, the persistent eighth note repetition of the pitch-class B, the dominant pitch of E, as well as the repetition of E⁵ throughout mm. 7-13 create salient arguments for hearing these measures in terms of a governing E major tonality.

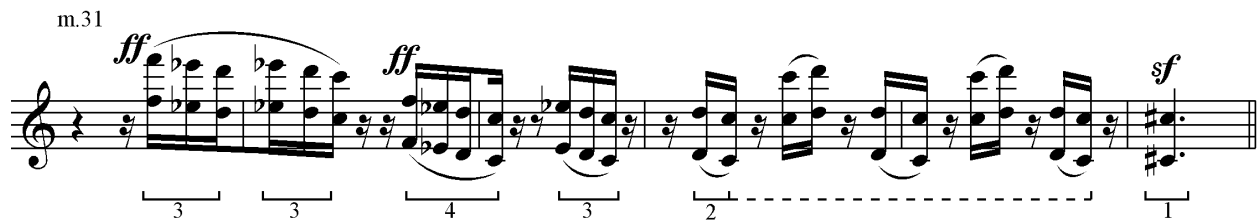
In m. 14 the variant of α identified by Somfai is introduced. While this motive is a rhythmic compression of the original (see Example 3.1) with a contrasting metric position, its unfolding of the ascending minor third E-G reinforces its relation to α . Though G^b is introduced here, shading the E-centricity towards the minor mode, the E-major root position block chords and B pedal tone are still present in mm. 19-20. The introduction of this G^b coinciding with the introduction of a new motive indicates, however, a new goal tone. Notice also in mm. 17-18 how the right-hand movement of a descending perfect fourth from A⁴-E⁴ is unfolded through a series of minor thirds. Perfect fourths will soon become a prominent interval in the movement.



Example 3.4: Melodic reduction of occurrences of motive α in Bartók's Piano Sonata first movement, mm. 1-20

At m. 20, the variant of α is repeated in a manner that parallels the repetition of α in mm. 1 and 7. The repetition is never able to descend back to the expected E⁴, however, and temporarily gets stuck on F^{#4} in mm. 22-25. A feeling of incompleteness is emphasized further through a truncation of motive α down to two sixteenth notes. In mm. 26-35 the two-note rhythmic gesture is combined with several other rhythmic variants emphasizing C^b in the right

hand. Somfai writes, “Naturally Bartók was familiar with 19th century techniques of combining the structure of a sonata form with thematic contrasts and that of a variation form – e.g. in Liszt’s B minor Sonata. (...) Nevertheless, the procedure he applied here – the way in which organically, step by step, motives of 2-3-4 notes are modified – is entirely Bartók’s own invention, based on his study of variant forms and melody types in folk music.”⁹ The progressive fragmentation of the motive into four, three, two, and eventually one note is illustrated below in Example 3.5.



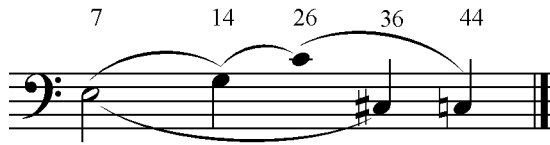
Example 3.5: Fragmentation of α , mm. 31-36

The right-hand arrival of C \sharp in mm. 36-37 is jarring against the previous emphasis on C \flat and coincides with the first break in the opening’s motoric, uninterrupted eighth notes. While these measures sound as though they signal the introduction of something new, they instead lead us to a return of the original α motive, continuing an emphasis on C \sharp through to the close of this zone in m. 43. This return to the beginning imparts the impression of a rounded binary form to the zone. Example 3.6 summarizes Wilson’s analysis of this zone.¹⁰ Through the use of prominent initiating and goal tones outlined above it highlights the areas of pitch centrality. Despite an initial unfolding of an E major triad throughout the first thirteen measures, the example depicts this zone as an E-centric major/minor thirds chain. These unfoldings of thirds at a background

⁹ Somfai 1984, 43.

¹⁰ Wilson 1992, 60.

level demonstrate a remarkable cohesion with the foreground level unfolding minor thirds of motive α outlined above.



Example 3.6: Summary of Wilson’s prominent goal and initiating tones

Zone 1B (mm. 44-56)

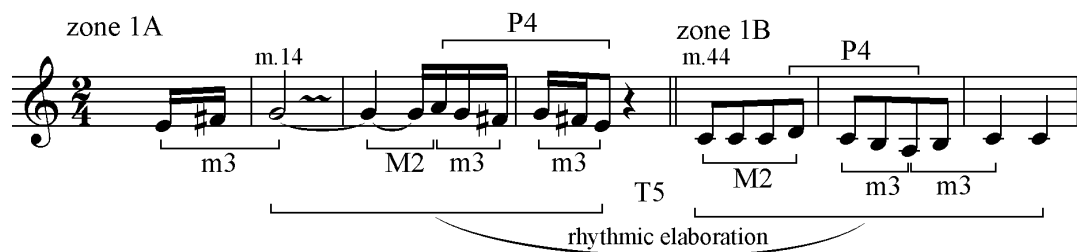
The beginning of zone 1B (mm. 44-46) is illustrated in Example 3.7a. These three measures are representative of the entirety of zone 1B. A new texture featuring parallel motion between the chords of the left hand and a single line in the right as well as continuously interrupted blocks of eighth notes provide a significant enough contrast to launch Zone 1B in m. 44. Despite its contrasts with the previous passage, this zone grows logically from zone 1A. Perhaps the most noticeable motivic relationship shared between the two is the continuation of the motoric eighth notes. Although the eighth notes are interrupted periodically throughout this zone (see Example 3.7a), they are still a particularly salient link between the first two zones (and much of the movement). Somfai also provides us with yet another link between the two zones when he refers to the “perfect, organic train of thought”¹¹ that exists between the oscillation of pitch-classes C and D in the sixteenth-note motive of mm. 34-35 (see Example 3.5) and the prevalence of C and D at the opening of zone 1B in m. 44. Example 3.7b illustrates how the melody of zone 1B can be derived from zone 1A through some minor rhythmic elaboration and a

¹¹ Somfai 1984, 45.

T₅ transformation. This transposition mirrors the unfolding of the perfect fourth (F[#] down to C[#]) in the motive at the end of Example 3.7a.



Example 3.7a: Onset of zone 1B, mm. 44-46



Example 3.7b: Derivation of zone 1B from zone 1A

As indicated in Example 3.6, zone 1A moves through a chain of E-centric thirds that ended on a C^b in m. 44 that is the initiating tone of the zone B theme. Although the melody significantly emphasizes C^b, the entire zone is punctuated by the continuation of C[#] from the previous section. C^{#4} is sustained through the return of α material in mm. 38-43, and its pitch class receives emphasis throughout the entirety of this zone first as C^{#4} in mm.44-48, then as C^{#5} in mm.49-54, and eventually as C^{#6} in mm. 55-56.

The quarter-note gestures of mm. 46-49 also suggest an augmentation of the original two sixteenth-note motives of mm. 24-28 and 34-35 (refer to example 3.5). Similarly, the descending

F \sharp -C \sharp sixteenth-note motive heard throughout zone 1B is rhythmically linked to this previous material, while the perfect fourth that it outlines can be traced back to the F \flat -C \flat that unfolds in mm. 31-33. The T₁ transposition correlates with the movement from C \flat to C \sharp that occurs between zone 1A and 1B.

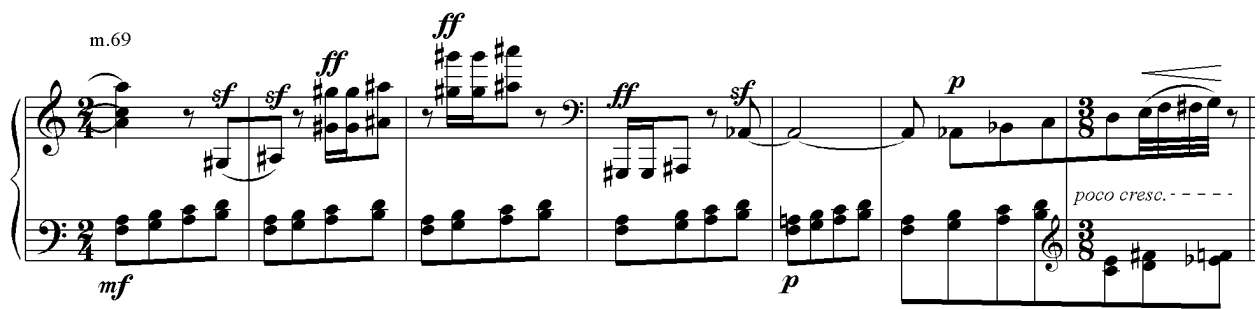
Zone 1C (mm. 57-75)

As depicted below in Example 3.8, the parallel motion that characterized zone 1B is replaced by contrary motion. Though this change creates contrast to the previous zone, the emphasis on a chordal texture through a steady eighth note rhythm continues. Also, though there are obvious similarities between these two zones with respect to their melodic contour (compare Examples 3.7a and 3.8), the motion from C \flat -D \flat in the previous two zones is replaced with the motion C \sharp -D \sharp in zone 1C. While Straus and Wilson hear zone 1C as a continuation of 1B, Somfai and I agree that the overall change in texture and character are heard strongly enough to perceive this section as an independent zone. Still, the continuities and similarities between zones 1B and C will have consequences in the subsequent rotations.

m.57

Example 3.8: Onset of zone 1C, mm. 57-61

Wilson and Somfai believe that the return of α material in mm. 69-75 shown in Example 3.9 functions as a transition into and an articulatory signal heralding the onset of zone 1D. Thinking rotationally, I believe this return of α material recalls the rounded binary effect of the similar passage at mm. 38-43. That is, this event is structurally significant on its own, functioning not as a transition or a signal of something to come, but rather as a repetition emphasizing motivic material that will have later structural ramifications.



Example 3.9: Bartók Piano Sonata mvt.1, mm. 69-75.

Though the motives above in the right hand reflect the two- and three-note motives we have come to associate in particular with zone 1A, the intervals covered by the three-note gestures are now major seconds instead of the original minor thirds, and hence are more reflective of zones 1B and C. This demonstrates Bartók's ability to create salient references to previously heard material despite his reluctance to repeat anything literally.

The final measure of this section (m. 75) introduces a motive, herein referred to as β , that will become an important structural element of the second rotation and of the movement's large-scale rotational structure in general. This motive is another transformation of α (m. 1) and its subsequent reinterpretation (m. 13). As shown in Example 3.10, β , like α , has four notes, and articulates the same ascending minor third (the initial D is not part of the motive but belongs to

the gesture that precedes it). While β is initially introduced here, it is only prominently developed in the second rotation.



Example 3.10. Motivic development in Bartók's Piano Sonata mvt. 1, mm 1, 13, and 75

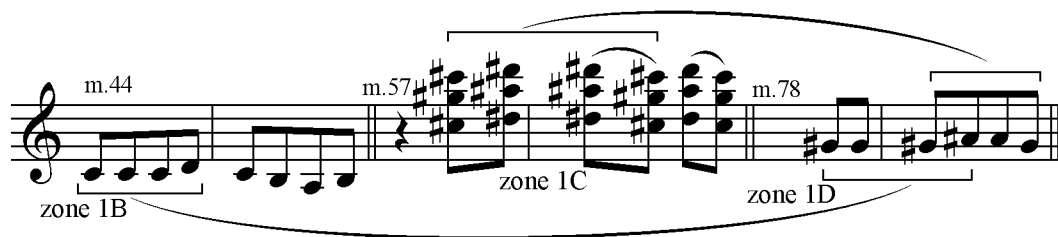
Zone 1D (mm. 76-115)

Zone D is the focal point of the first rotation. This effect is produced in part by its relative length (forty measures) and also because it is the only truly developed melody in the movement.

The first part of this zone (mm. 76-88) is reproduced below in Example 3.11.



Example 3.11a: Bartók Piano Sonata Mvt. 1, mm. 76-88



Example 3.11b: Derivation of zone 1D melody from zones 1B and C

While its longer duration (by comparison to previous melodic utterances in the movement) helps it to stand out, there are, as expected, several elements that link this zone to the previous ones. Example 3.11b shows how the general shape and contour of the zone 1D melody was generated from the previous zones 1B and C. The example illustrates that the initial gesture of zone 1D was originally heard at the onset of zone 1B while another segment is taken from an inner voice heard in zone 1C.

Returning to Example 3.11a, the G^\sharp -B minor third outlined in m. 81 can be understood as a reference to the initial statement of α in m. 1. The descending and ascending fourths encountered in mm. 82-83 recall the various leaps by fourth heard in zone 1B (for example, mm. 49, 51, 53). Also, the two quarter note rhythm of mm. 82 and 84 appeared most prominently in zone 1B (see for example, mm. 46 and 49).

The zone is divided into two sections, the second an elaborated repeat of the first at T_7 . The prominent D^\sharp of the first half, reinterpreted as E^\flat starting in m. 93, becomes the focus of the second half. The two divisions are separated in mm. 87-88 by a conspicuous five-note elaboration of α articulating the familiar minor third. This same motive appears in mm. 110-11.

Zone 1E (mm. 116-134)

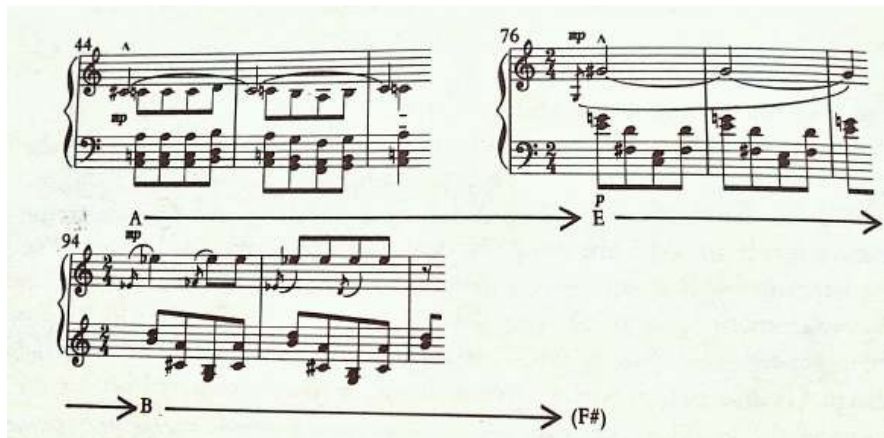
Example 3.12 reproduces the opening measures of zone 1E. While zone 1D contained enough contrast from the preceding zone to facilitate its perception as an individual zone, it simultaneously represented a conglomeration of motivic materials from all previous zones. In many ways, this accumulation of materials would have been a perfect place for Bartók to end the first rotation; he instead contradicts this sense of climax by taking a step backward from the lyrical melody encountered in zone D by returning to the chord texture that was developed in zones 1B and C. This zone serves more as continuation of zones B and C (for example, the contrary motion present in zone C returns and so does the chordal texture associated with both zones B and C) than of zone D.



Example 3.12: Onset of zone 1E, mm. 116-118

Straus and Wilson both agree that the first rotation consists of only two themes, the second of which extends from mm. 44-134. They also agree that this span of music is governed by a composing out of a succession of T_7 transformations. Interestingly, they are at odds where and how this succession begins and ends. Straus' example is reproduced in Example 3.13a. Here Straus uses the initiating tones found in the bass to trace the overarching T_7 succession. This

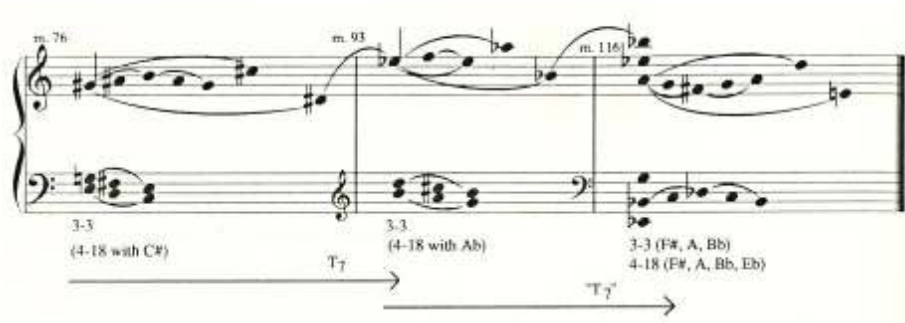
reading focuses on the A in m. 44, the E in m. 76, and the B in m. 93.¹² The next note in his series would be an F \sharp but the actual bass note in m. 116 is an E \flat , thus ending the series a tritone away from where it started. Wilson's example is reproduced in my Example 3.13b. His reading takes the prominent tones of initiation found in the highest voice. It is unclear why he leaves out of his example the obvious C \sharp s of m. 44 or m. 57. He instead begins the series on the G \sharp at the onset of zone 1D in m. 76 moving to the E \flat in m. 93, which in turn moves to the B \flat of m. 116 at the onset of zone 1E. While both interpretations ultimately reveal the same relationship I feel that Bartók seems to be leading us more with the higher register of the right hand than with the supporting bass notes of the left. Regardless, the successive T₇ transformations are cut short and their return in the third rotation will be of significance.



Example 3.13a: T₇ transformations, reproduced from Straus 1990¹³

¹² Note: Straus' m. 94 is a misprint and should read m. 93

¹³ Straus 1990, 110



Example 3.13b: T_7 transformations, reproduced from Wilson 1992¹⁴

Wilson's example also illuminates several unfoldings of fourths throughout the passage. This can be seen in the first part of the example where G^\sharp (m. 76) moves up by fourth to C^\sharp (m. 83) and then down to D^\sharp (m. 87) which is then reinterpreted as E_b (m. 93) before the series starts again transposed. These larger scale unfoldings of perfect fourths recall the prominent $F^\sharp-C^\sharp$ fourths heard throughout zone 1B on the foreground level.

Rotation Two

Of this second rotation Somfai writes, "It is machine-like yet not totally mechanical, for it does not run steadily. The reappearance of some familiar motives, for instance those of the head-motive of the first theme (α), cause surprise and articulate the movement."¹⁵ This rotation is broken into three distinct blocks recalling zone A (mm. 135-154), zone B (mm. 155-175) and a return to zone A (mm. 176-190). While there are other motivic references to the material of other zones, they are mostly fleeting with exception of β , the chromatic flourish that ends zone 1C (m. 75). This motive takes on special significance in this rotation. While β (as has been shown) is related to α , in the second rotation β functions like a counter-motive that opposes α . The manner

¹⁴ Wilson 1992, 62

¹⁵ Somfai 1984, 48.

in which this motive seeps into zones it was not previously associated with is highly reminiscent of the second rotation of the first movement of Bartók's fourth quartet.

Rotation 2

A B A'
A/β B/β α1

135 155 176

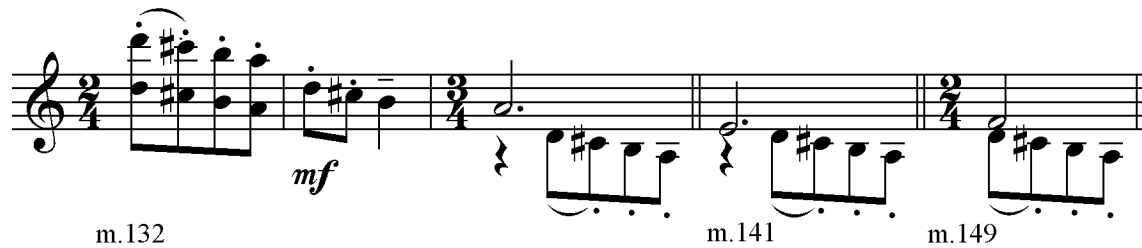
Example 3.14: Background analysis of Bartók's Piano Sonata, Rotation two

Zone 2A (mm. 135-154)

Though its proportions (4 + (3+4) + (4+5)), are somewhat skewed, this zone produces an effect that recalls a traditional musical sentence. The statement (mm. 135-138), depicted below in Example 3.15, develops a three-note gesture that spreads the descending major second (B \flat -A \flat) over the span of four octaves. Overall, this section recalls zone 1A although a similar section can be found at the end of zone 1C in mm. 70-75 (refer to Example 3.9). The module is punctuated at its end by a statement of α in the left hand followed by the β motive in the right.

Example 3.15: Onset of zone 2A, mm. 135-138

The answer (139-146) starts similarly with a continuation of the three-note rhythmic motive, again on B \flat -A \flat . It is almost immediately interrupted in m. 141 by a passing quote from the end of zone 1E, mm. 132-134 (Example 3.16). As will be discussed shortly, this same gesture is also used to articulate the break in the third module at m. 149.



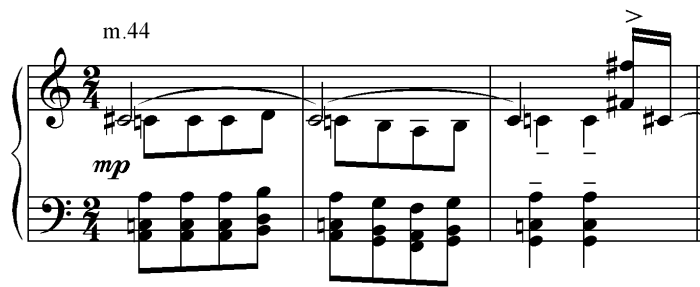
Example 3.16: Motivic recurrences in Bartók's Piano Sonata Mvt. 1

After this interruption the answer resumes as it the first began, articulating descending major seconds; now, however, Bartók also includes a gesture articulating E \flat -D \flat in addition to B \flat -A \flat thus creating a link with the previous T₇ transpositions. This section also ends similarly, with a statement of α in the left hand preceding another instance of the β motive.

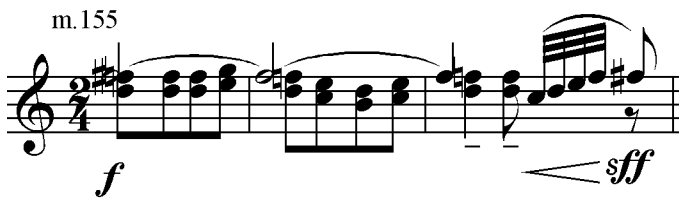
Mm. 147-154 functions as a continuation and begins similarly to the previous two. After two utterances of the descending second motive highlighting B \flat -A \flat and E \flat -D \flat , it is interrupted by an extended scale passage lasting two measures. In the second part of this module, the major second gesture that previously unfolded over the span of three sixteenth notes is shortened to a series of alternating descending and ascending seconds over the span of two eighth-notes. This type of oscillation recalls mm. 34-35 (refer to Example 3.5). Once again this section is punctuated with a statement of the α motive in the left hand followed by β in the right.

Zone 2B (mm. 155-176)

This zone is a mostly straightforward development of zone 1B. Comparison of mm. 44-48 with mm. 155-159 (see Example 3.17a and b) shows that aside from pitch content, the main difference is the addition of the β motive that unifies this rotation. Throughout this zone this motive occurs progressively more frequently; first every three measures (mm. 155-160), then every two (mm. 161-168), then every measure (mm. 169-171).



Example 3.17a: mm. 44-48



Example 3.17b: mm. 155-157, showing insertion of β .

Notice that the material originally presented in m. 44 is transposed by T_5 . This movement from C# in m. 44 to F# in m. 155 mirrors the foreground motive F#-C# found throughout zone 1B. The repeating β motives that occur throughout zone 2A and zone 2B emphasize either F# or C# (with exception of m. 138) creating a salient link with this material until zone A material

returns emphasizing C \sharp . All utterances of this prominent motive between mm. 145-171 terminate on F \sharp with exception of mm. 160, 170, and 171, which terminate on C \sharp , creating another long-range association with the F \sharp -C \sharp fourth.

Zone 2A' (mm. 176-186)

The final block of this rotation clearly recalls the opening of zone A by returning to the development of α in conjunction with a stream of eighth notes on a single pitch (C \sharp). By returning to the opening measures of the movement Bartók creates some ambiguity with respect to where the second rotation ends and the third begins. Though α and the repeated eighth notes of the opening measures do return here they do so in a manner more suggestive of development than of return. For this reason I agree with Somfai and Wilson, that the third rotation (which they call the recapitulation) begins in m. 187. The ambiguity created between rotations two and three will have important significance for our reception of the rotational structure as a whole and will be discussed in greater detail later. For now it is sufficient to state that this material was given its clearest statement in zone 1A and was gradually broken down over the course of the first rotation. In the second rotation it was entirely dissected until this final section, where α begins to reemerge asserting itself across the boundary between rotations two and three.

Rotation Three

There is a sense of continuity between the end of rotation two, which develops the α material presented in mm. 1-13 at mm. 176-186, and the onset of rotation three, which begins with the development of the elaboration of α heard in mm. 14-35. This continuity, however, is overshadowed by the return of the material of mm. 14-35 at its original pitch level supporting E

as a pitch center in near-literal repetition. In this way Bartók creates a sense of contrast strong enough to signal the beginning of a new rotation while simultaneously creating a sense of seamless continuity.

Rotation 3

A	D	E	A
a2	$\frac{D}{A}$	a	E/A
187	211	222	236
			247

Example 3.18: Rotational analysis of Bartók's Piano Sonata first movement, Rotation 3

Zone 3A (mm. 187-210)

Zone 3A recapitulates zone 1A as literally as Bartók allows, prompting Straus to refer to it as “uneventful”.¹⁶ Many of the alterations are in the form of rhythmic nuance and subtle motivic elaboration. Bartók creates the effect of a traditional sonata recapitulation at the onset of the third rotation, but this sense of rhetorical expectation is soon overturned by the unexpected arrival of zone D materials.

Zone 3D (mm. 211-235)

The return of zone D following zone A in m. 211, where we might expect the return of zone B, is striking from an analytical perspective. Perhaps Bartók returns to zone D in an attempt to balance out the absence of this prominent zone in the second rotation. Straus and Wilson both downplay this replacement of zone B with zone D by simply referring to it as the return of the second theme in their two-theme sonata schemes. This judgment seems to be entirely based on

¹⁶ Straus 1990, 110

hearing the movement in terms of sonata, but the placement of zone D materials here should represent a major deformation. To complicate Strauss' sonata reading further, the recapitulation of this second theme does not support the pitch center of the first theme. To the contrary, it begins in m. 211 with an $F^{\sharp 4}$ in the bass voice, thus continuing the T_7 series that was cut short in the first rotation (refer back to Example 3.13a).

As illustrated in Example 3.19, the prominence of zone 3D is quickly compromised by the interpolative return of α in mm. 217-218 (shown in brackets). While D materials attempt to assert themselves again after this intrusion in mm. 219-222, they are once more violently subdued, this time for good, by several appearances in succession of α in mm. 222-224 (also bracketed in the example) followed by the repeated eighth notes of zone A emphasizing the pitch E^{\flat} and recalling the opening tonal center in mm. 223-235). This is only characterized as a foreground-level return of A, still within zone 3D, because of the previous interruption and return in mm. 217-219. In mm. 225-232 we expect the return of D material, and it arrives at mm. 233-234.

Zone 3E (mm. 236-250)

The material of this zone is taken from the end of zone 1E in mm. 126-134 (refer to Example 3.16 for a partial view of these measures) for the right hand while the left hand recalls the materials from the beginning of zone 1A. In the previous zone, the repeating eighth notes on E recalled zone A, creating a juxtaposition of materials in zone 3D. Example 3.20 illustrates how in this section zone A material now occurs in synthesis with zone E material. With a faster tempo indication Bartók clearly signals that he is leading us to a major event.

211

mp

p

mp

sf

mf

p

mp

mp

Example 3.19: Interpolations of motive α (bracketed) in zone 3D, mm. 209-225

piu mosso, $\text{♩} = 144$

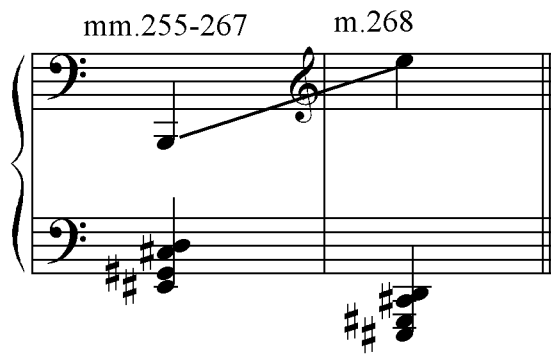
236

f

sf

Example 3.20: Synthesis between zone E (right hand) and zone A (left hand), Rotation 3, mm. 236-240

The driving eighth notes of zone A return to complete the movement at m. 255. This material is not associated with a1 or a2, but with the rhythmic character of zone A in general. A reduction of these measures can be found below in Example 3.21.



Example 3.21: Reduction of zone 3A' (mm. 255-268)

Synthesis

Three analyses – those of Somfai, Wilson, and Straus – engage issues related to large scale form in this movement. While each perspective illuminates several fascinating elements thus increasing our understanding of the work, none of these scholars seems particularly satisfied or convinced with the terminology of sonata form that they have affixed to the movement. Straus sums up this frustration when he writes,

Although the sonata form emerges intact, it does so only after a disruptive struggle, one with effects that linger until the end of the work and beyond. The musical forces that Bartók has set in motion can scarcely be contained by the sonata form. The first theme does eke out a victory, but one that feels strangely incomplete. The recapitulation itself does not resolve the underlying polarity, as would be the case in the traditional sonata. Rather, any sense of resolution is

deferred until the last possible moment, in the coda. Even there, the T_7 scheme of the second theme is not so much reconciled to the demands of the first theme as simply cut off midstream. The scheme implies a continuation that extends beyond the boundaries of the work. This sonata form emerges from musical forces so strong they threaten to shatter the vessel that contains them.¹⁷

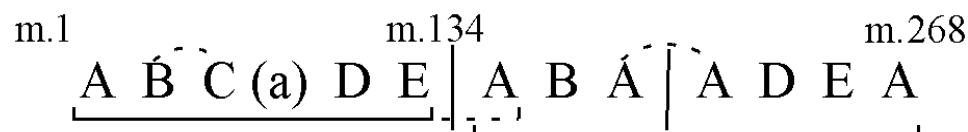
While Bartók was undeniably influenced by some of the practices and procedures of the traditional sonata, as evinced by the description above, to label this movement as such simply causes more confusion than it resolves. As mentioned previously, my goal is not to suggest whether this movement is, is not, or could be a sonata, but rather to show what we can garner from a perspective divorced from sonata rhetoric. None of the analytical insight offered above by Straus, Wilson, or Somfai need be ignored when focusing on rotational form. In fact, as the T_7 scheme discussed above unfolds throughout the movement, it implies a continuously unfolding process that, while in conflict with common sonata practice, serves to reinforce Hepokoski's conception of rotational form as a cyclical, helix-like spiral that successively unfolds throughout the movement.

Example 3.17a illustrates the zones of all three rotations as they unfold throughout the movement on two levels. Example 3.17b is a simplification of the same structure that shows that while three aurally distinct rotations are present (the divisions of these rotations are represented by the vertical lines), on a higher level the movement comprises of two large hyper-rotations.

¹⁷ Straus 1990, 112-3

	Rotation 1										Rotation 2			Rotation 3				
Background:	A	B	C		D		E				A	B	A'	A	D	E	A	
Foreground:	a1	a2	a1	B	C	(a)	D	d/a	D	E	A/β	B/β	a1	a2	$\frac{D}{A}$	a	E/A	A
Measure:	1	13	38	44	57	69	76	93	97	116	135	155	176	187	211	222	236	247

Example 3.17a: Bartók Piano Sonata mvt. 1, rotations 1-3



Example 3.17b: Bartók Piano Sonata mvt. 1, hyper-rotational structure

The first hyper-rotation extends from the opening measure to the end of the first rotation in m. 134, while the second extends from mm. 134 to the movement's conclusion in m. 268. A literal repetition of the modules from the first hyper-rotation can be found in the second if one extends the first to include zone 2A (shown with dashed brackets), but this interpretation is substantially less aurally convincing as a means of illustrating these two large rotations. To achieve this effect Bartók takes advantage of some of the ambiguity he created throughout the movement. First, while zones 1B and C sound distinct enough to function as independent zones, zone 1C simultaneously sounds like a continuation of 1B. With the lack of C material in the second rotation, zone 2B thus functions as a compression of these two zones. The passing reference to zone A that ends zone C (mm. 69-75 – refer to Example 3.6) creates a return to this material. In the first rotation this return occurs at the foreground level within zone 1C, but is reinterpreted in the second rotation as unfolding at the background. At the rotational level, the double return of zone A material and of E \sharp as an initiating tone at m. 187 clearly signal the beginning of the third rotation. However, the end of rotation two develops a1 material while the

beginning of rotation three develops a2 material, recalling the same progression that occurred at the foreground level in zone 1A. To create a hyper-rotation Bartók draws upon the ambiguity he creates here to produce the effect of zone A continuing across the dividing point of rotations two and three in m. 187.

Perhaps the most fascinating aspect of this division of the movement into two hyper-rotations is the uncannily literal division of the movement into two 134-measure halves that occurs between the first hyper-rotation at m. 134 and the end of the movement at m. 268. Somfai has written, “The exact halving has no structural significance. The three manuscript forms show numerous insertions and corrections. Each of these corrections of length has emerged from the context of their direct environment and not by some kind of overall plan using calculated proportions.”¹⁸ Despite Somfai’s well-researched opinion, it seems highly unlikely that this proportion would have escaped Bartók’s attention. As research of several well known scholars including Ernő Lendvai,¹⁹ Roy Howat,²⁰ and Jonathan Kramer²¹ has shown, Bartók was well aware of the architectural proportions of his music. Even if the measures did not literally divide the movement, the relative proportions would still reinforce this division into two hyper-rotations.

¹⁸ Somfai 1984, 41

¹⁹ Lendvai, Ernő. *The Workshop of Bartók and Kodály*. Budapest: Editio Musica, 1983

²⁰ Howat, Roy. “Review-Article: Bartók, Lendvai and the Principles of Proportional Analysis.” *Music Analysis* 2/1 (March 1983). 69-95

²¹ Kramer, Jonathan D. “The Fibonacci Series in Twentieth-Century Music.” *Journal of Music Theory* 17/1 (Spring 1973). 110-148.

Chapter 4: Continuous Process in the Sonata for Two Pianos and Percussion, First Movement

Introduction

The premiere of Béla Bartók's Sonata for Two Pianos and Percussion occurred in Basel on January 16, 1938. As part of the program notes for this performance, Bartók wrote the following regarding the first movement.

The first movement begins with a slow introduction in which a motive of the Allegro movement is foreshadowed. The Allegro movement itself is in *C* and is in sonata form. In the exposition the main theme group is announced, consisting of two themes (of which the second has already been alluded to in the introduction), after which follows the secondary (contrasting) theme. Out of this a codetta develops on rather broad lines, at the end of which a brief reference to the contrasting theme occurs by way of conclusion. The development, after a short transition of superimposed layers of fourths, consists essentially of three parts. The first one, in *E*, employs the second theme of the main theme group as an *ostinato* motive, over which the first theme of the main theme group proceeds in the form of imitatively treated interpolations. The second part is in the nature of a short interlude, after which the first part – with the *ostinato* in *G#* and inverted – is repeated in a much altered form. In the recapitulation there is no proper closing section; it is replaced by a rather extensive coda (with a *fugato* beginning) built on the closing theme.¹

¹ Suchoff 1993, 417

For convenience, Example 4.1 is provided as a diagrammatic realization of Bartók's description with measure numbers. Although this framework provides the skeletal structure of the analysis that follows, some areas will contrast with Bartók's description while others will be greatly elaborated upon. The reason for some of the contrasting analytical perspectives resides in the other analyses provided to us by Bartók through his timings of individual sections and frequent tempo changes that help to delineate the form.

Intro.	Exposition					Development				Recapitulation		
	a1(C \sharp)	a2	b	codetta	b	trans.	a2(E \flat)		(G \sharp)	a1(C \flat)	b	fugato
1-31	32-40	41-83	84-104	105-160	161-174	175-194	195-216	217-231	232-273	274-291	292-331	332-443

Example 4.1: Diagrammatic realization of Bartók's description of his Sonata for Two Pianos and Percussion, first movement

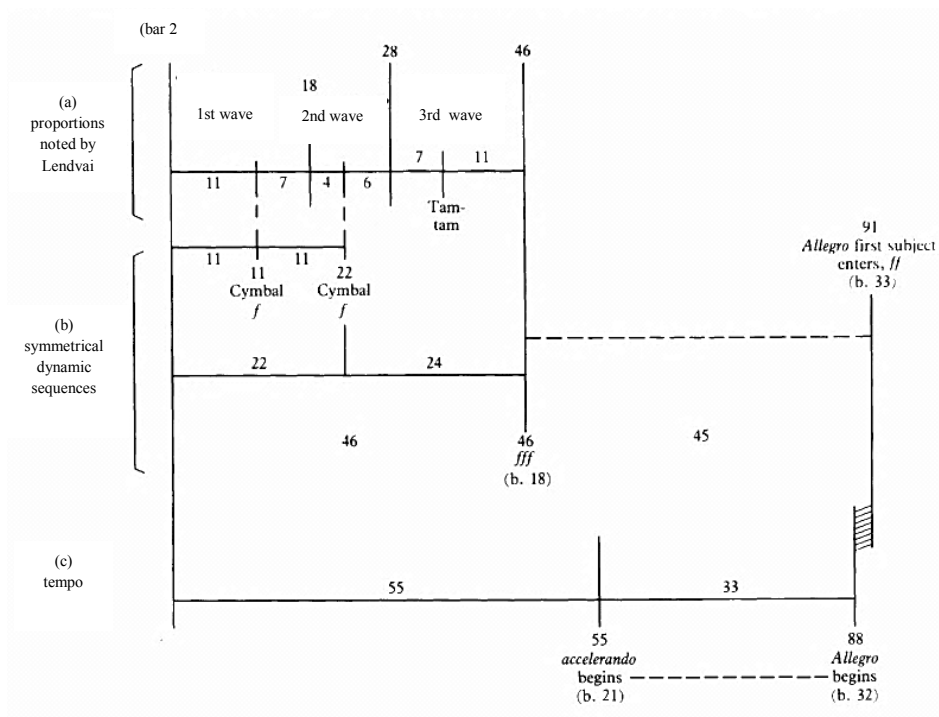
As is typical of Bartók's own accounts of his works, the superficial quality of the information provided in his description regarding the tonal and formal structure, however accurate and useful, ultimately forces us to ask more questions than Bartók chooses to answer. In his analysis Wilson essentially asks three such pointed questions. How are we to understand Bartók's use of the phrase "in C", "in E", and in "G \sharp ", and what are the implications of these pitch centers throughout the movement? Does the succession of these pitch centers, a series of T₄ transpositions, govern the movement's formal structure from beginning to end, or are there other pitch centers acting on a more local level? Also, while the thematic organization of this movement coincides with that of a typical sonata plan, how does Bartók's conception of these pitch centers and their succession conflict with such a reading?²

In addition to the sonata deformations listed above by Bartók – the contrasting theme returning after the codetta to conclude the exposition and the replacement of the movement's

² Wilson 1992, 141.

closing section with a coda that begins with a fugato – and the tonal issues raised by Wilson, a sonata-form reading presents further difficulties. The development section loses its function as a section reserved specifically for development, since the process of development is heard throughout all three rotations, creating in effect a series of rotational variations. Transitions are not necessarily characterized by energy gain as they are in a sonata but are instead based upon the musical characteristics of the zones that they lead to. In addition, as we will see, Bartók's transitions can occur between any two zones. Finally, the departure/return model for the tonal scheme of the traditional sonata is contradicted by a linear progression of major thirds (C E G[#] C) that, while it begins and ends on C, implies a forward movement that begins on one manifestation of C but progresses to a completely different manifestation of C – the sense of return is overshadowed by the linear process.

It is in the thirty-one measure introduction that this sense of linear process is first encountered. While this section serves as a structural upbeat to the movement proper and introduces the ostinato material that will be heard in conjunction with zone A, its main function is to produce a gradual accelerando that starts at $\text{♩} = \text{ca.}70$ and leads to the downbeat of rotation one starting at $\text{♩} = 132$. This sense of continuously driving towards something occurs through the movement's three rotations in that, taken together, they seem to articulate the formal functions of presentation, development, and further development rather than the sonata-normative presentation, development, return trajectory. In the analysis that follows, I will use rotational analysis to produce a more intuitive reading by taking advantage of the cyclical nature of rotation.



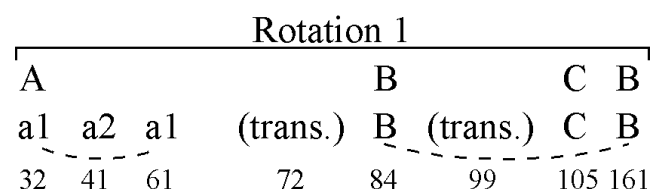
Example 4.2: Proportional relationships in Bartók's Sonata for Two Pianos and Percussion, first movement, mm. 1-33³

Example 4.2 (a reproduction of Howat's figure 1) illustrates some fascinating proportional properties in these opening measures. The example starts with the entrance of the piano in m. 2 and counts beats (dotted quarter notes) rather than measures, although important measure numbers are provided where necessary. Three sequences are presented (a, b, and c). In sequence a, Howat summarizes Lendvai's analysis of this section demonstrating a close approximation of a Lucas series (4,7,11,18,29,47). In sequence b, the cymbal crashes (mm. 6 and 10) are equally spaced. Two similar, near perfect divisions – 22:24 beats leading to the fff dynamics m. 18 and 46:45 beats leading to the structural downbeat of the movement in m. 32 – are also displayed. Sequence c shows that the location of the *accelerando* beginning after 55

³ Howat, Roy. "Masterworks (II): Sonata for Two Pianos and Percussion." In *The Bartók Companion*, 315-330. Edited by Malcolm Gillies. London: Faber and Faber, 1993. 321.

beats, and the location of the piano's entrance in the allegro at m. 33 supply another close approximation, this time of a segment of the Fibonacci series (2,3,5,8,13,21, **34, 55**). Even though some of these proportions are not exact, one can almost subconsciously sense Bartók's internal logic when listening to these measures. Howat writes, "...several of his students have reported that Bartók described the opening of the Sonata to them in terms of creation archetypes, of a cosmos evolving out of formlessness and timelessness."⁴ This process of continuous creation forms a motivic device that unfolds throughout the movement.

Rotation One



Example 4.3: Rotational diagram of Bartók's Sonata for 2 Pianos and Percussion, first movement, rotation 1

After the gradual gain of energy that characterized the introduction, zone 1A begins in m. 32 and serves to sustain this energy. As seen in Example 4.3, zone A comprises three subzones; a1 (mm 32-40), a2 (mm. 41-60), and a return to and subsequent liquidation of a1 (mm. 61-71). Subzone a1, illustrated in Example 4.4, is characterized by a rapid tempo ($\text{♩} = 132$) featuring syncopated percussive attacks of block chords in octaves in both hands of both piano parts. The main component of a1, soon to be varied and integrated with other musical materials, is the distinct rhythmic figure of three quarter notes followed by three eighth-notes (labeled α in the example), offset by an initial eighth note rest and thus syncopated against the movement's 9/8

⁴ Howat, Roy. "Masterworks (II): Sonata for Two Pianos and Percussion." In *The Bartók Companion*, 315-330. Edited by Malcolm Gillies. London: Faber and Faber, 1993.

meter. This subzone also features movement from the pitch center of C, supported in the goal/initiating tones of the pianos in mm. 33-36 and the timpani in mm. 32-39, to G; the latter is introduced at the end of a1 in m. 40 and supported throughout subzone a2 in the timpani to m. 49.

Allegro molto ♩ = 132

Piano I

Piano II

Timpani

Note: Piano II performs identical material to Piano I an octave lower

Example 4.4: Pitch-center of C \sharp supported by timpani and goal/initiating tones of the a1 motive in the piano, Sub-zone a1, mm. 32-34

Subzone a2 begins in m. 41 and can be broken into two phrases, the initial presentation in mm. 41-49 and a varied restatement in mm. 50-60. This subzone, as Bartók implies, consists largely of the ostinato material heard throughout the introduction. Subzone a2 is located within zone 1A rather than creating the onset of zone 1B because a1 lacks a sense of finality. This is due in part to its relative brevity (only nine measures), the continuation in a2 of the timpani's eighth-notes encountered in a1 (as well as in the composite rhythm of the entire section), and the fact that the same sense of energy level pervades the two. Example 4.5a illustrates the melody performed by Piano I that characterizes this subzone. While the ostinato of piano II oscillates between A \flat and F \sharp (the lower and upper leading tones of G) in mm. 41-49, Piano I centers on G's dominant, D. The D/A \flat tritone outlined by the pianos' melodic figure in mm. 45 and 53

recalls the F[#]/C tritone introduced in the timpani in m. 32, creating a further link between subzones a1 and a2.

At m. 50, the piano parts switch roles, as the ostinato material is now performed by Piano I and the folk melody is performed by Piano II. As illustrated in Example 4.5b, this melody is an inversion of the original in mm 43-45, also emphasizing the D/A^b tritone. This second presentation of this melody functions as a varied restatement of the original. As the phrase unfolds across mm. 50-60, an unrelenting ostinato on the pitch C in the timpani signals a return to this former pitch center.



mm. 33-40 41-48 49-56 57-64

(delete head)

transitory passage

61-64 65-68 69-71 72-79

(delete tail)

(rotate)

a. b. c. d.

Example 4.6a illustrates the a1 motive in its original form as presented in mm. 33-40 and its return in mm. 61-64. In mm. 65-68 (Example 4.6b), Bartók shortens the motive by deleting the last quarter note.⁵ In these measures, this motive is stated in every measure by Piano I, as opposed to every other measure in a1. The next manifestation of this motive, shown in example 4.6c and found in mm. 69-71, represents a rhythmic rotation whereby the first note of the original rhythm becomes the last note of the new rhythm.⁶ The rhythm of Example 4.6c also related to that of Example 4.6a through the deletion of the first note.⁷ The rhythm illustrated in Example 4.6d proliferates in both piano parts throughout the transitory passage between zones 1A and 1B (mm. 72-79). It can be interpreted in a number of different ways but I hear it as two

⁷ Leong labels this operation DELHead where a segment of one or more notes is deleted from the beginning of a given motive, see page 80.

iterations of the rhythm in Example 4.6c elided into one another. Regardless of how one understands this family of organic rhythmic relationships, Bartók creates the transitory passage through the manipulation of these rhythmic cells, creating at once a sense of development and unity.

While there are arguments for initiating the transitory passage at m. 65 (example 4.6b) with the first rhythmic manipulation of the a1 motive, I choose to hear this section as a liquidation of zone 1A occurring within the confines of that zone. Measure 72 is the first moment where both pianos begin to move away from zone A material and towards something different. This change is also accompanied by the first break in a steady eighth-note composite rhythm since m. 32.

As seen in Example 4.7, the most striking assertion of D-centricity is the D pedal held across three octaves in Piano II throughout these measures. Also supporting D in this section, the timpani states a glissando three times beginning on G[#] and terminating on D. The appearance of this tritone recalls the F[#]/C tritone of m. 32 and the D/A^b tritone of mm. 45 and 53, creating another backward relating link with zone A. At the same time, the lower succession of pitches in both hands of Piano I unfold the tritone D/G[#] (an enharmonically spelled A^b) emphasizing D as both the initiating and goal tone of mm. 80-83. As the D pedal of these measures continues uninterrupted into and through the entirety of zone 1B, Piano I still recalls zone A through its prominent tritone reference while foreshadowing prominent material of the zone to come. In these ways mm. 72-83 serve as a transitory passage between zones A and B.

80

P.I. *pp* *ped.*

P.II *p*

Perc.I *p* Timp.

Example 4.7: Transitory passage between zones 1B and C, mm. 80-3.

As mentioned previously, a pedal on pitch class D is maintained throughout all of zone 1B (mm. 84-99) before a pedal on G is resumed in the subsequent measures. As compared with the boisterous zone A, this zone has a much more lyrical and flowing character. This is produced as a result of a slower tempo indication ($\text{♩} = 104$ as opposed to 132), a thinner texture, and longer note values. Despite these changes, rhythmically it shares much in common with the variants of a1 encountered in the preceding liquidation and transitory passage.

Bartók uses the half notes of mm. 84-90 as punctuating devices at the beginnings and ends of gestures. If we reinterpret the rhythm of this metrically irregular melody in terms of long and short durations, representing all quarter note values with an eighth note and all durations of three eighth notes or more with quarter notes, as in Example 4.8, we can see the influence of a1 and its variants in these measures.



Example 4.8: Durational reduction showing rhythmic reinterpretation of Piano I, mm. 84-90

While zone 1B seems to be a free development of the preceding materials, with no direct duplication of rhythmic motives between these two sections, we can hear how zone 1A serves as the primary generator for the zone 1B melody. Notice also at the end of Example 4.8 how Bartók achieves the effect of a slowing of perceived musical time between mm. 89-90 by reiterating the same gesture (down a minor third) but with longer rhythmic values on the second hearing. The effect here is the stretching of musical time where dotted quarter notes, originally perceived as a long-note value, become reinterpreted as a short-note value. This slowing of time sets the stage for the measures to come.

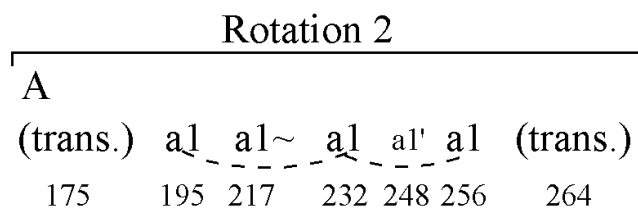
In mm. 91-94 Bartók returns to Tempo I ($\text{♩} = 132$) but as a result of the growing interval between attacks in Piano II, softer dynamics, and the decay of the sustained chord in Piano I, the effect is that of time slowing rather than speeding up. The melody that characterized zone 1B returns for a second statement in mm. 95-99, this time with block chords in Piano II and a new accompaniment in Piano I. Interestingly, the return of this material is accompanied by the slower tempo marking ($\text{♩} = 104$), which sounds faster than the preceding material.

The transitory passage between zones 1B and C begins at m. 99 with the replacement of the timpani's pedal D with a pedal G. At the same time Piano II introduces a first-inversion B major/minor chord (with both D^\sharp and D^\flat present) in mm. 99-100 that is sustained throughout 101-104 before becoming integrated into zone 1C at m. 105. Over this sustained chord in the left

hand, the right hand performs a closing gesture made of the oscillation of pitch class D moving to B. Once again, Bartók returns to the faster tempo I but due to a *rallentando*, softening dynamics, and a gradually decaying chord the faster Tempo I, is once again obscured, sounding as if musical time is slowing.

Measures 99-104 thus serve as a transitory passage in three ways. First, by introducing the first-inversion B major chord that is integral to the opening of zone 1C (see mm. 105-117). Second, by continuing the stretching of musical time, Bartók achieves a smooth transition between two very contrasting zones: zone B, characterized by its flowing and lyrical melody, and zone C, characterized by its rapid folk dance quality. Between mm. 105-115 Bartók raises the tempo from $\text{♩} = 104$ to 176. He is able to achieve this smoothly because of the metric elasticity of the preceding sections. Third, the D-B major sixth introduced as a closing gesture in the transitory passage (mm. 101-104) generates the melodic material of zone 1C.

Rotation Two



Example 4.9: Rotational diagram of Bartók's Sonata for Two Pianos and Percussion, first movement, Rotation 2

As seen in Example 4.9, though the second rotation begins in m. 175 with the return of the a2 ostinato material most typically associated with zone A in Piano I, mm. 175-194 function as a transition creating a structural upbeat leading to the rotation proper which begins in m. 195. This section functions as a transition by building back the momentum that was lost in the

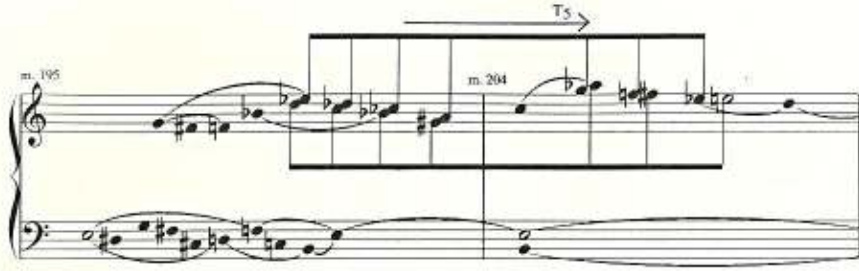
previous section marked *meno mosso*. This sense of transition is achieved through the introduction of zone A material at m. 175 heard in conjunction with the continuation of the trills emphasizing E that ended zone 1B throughout mm. 175-181. The remainder of this section unfolds exactly as Bartók described it earlier – as a succession of superimposed layers of fourths. Example 4.10 illustrates the motion by parallel fourths that characterizes this section.

The musical score for Example 4.10 consists of two systems, P.I. and P.II, each with two staves. The key signature has one sharp (F#) and the time signature is 3/8. The score begins at measure 182. The P.I. part features a complex texture of overlapping parallel fourths, with some notes marked with trills. The P.II part also features parallel fourths, often in a lower register than the P.I. part, creating a dense, layered sound. The notation includes various accidentals (sharps, flats, naturals) and rests, indicating a highly rhythmic and melodic structure.

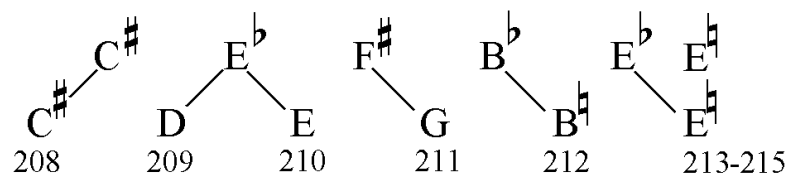
Example 4.10: Layers of superimposed fourths, mm. 182-185

In mm. 195-216, Bartók continues to develop the ostinato material in Piano II while returning to the A1 theme through fragmentation and development in Piano I. E is emphasized as a pitch center in several ways. The downbeat of every measure in Piano II supports E as a pitch center. E is also supported directly by the timpani in mm. 198-203 and through its dominant pitch B in mm. 204-207. An excerpt of Wilson's diagram, reproduced in Example 4.11a, serves to illustrate other linear processes that support and/or drive towards E.⁸

⁸ Wilson 1992, 150.



Example 4.11a: Processes supporting E as a pitch center, mm. 195-216



Example 4.11b: Semitonal partners driving to E, mm. 208-215

Example 4.11a illustrates two linear processes that occur in Piano I (treble staff) with its fragmented development of the a1 motive over the development of a2 material supporting E in Piano II (bass staff). This first process consists of two simultaneous whole-tone descents from Eb/D starting in m. 200 to Eb/Eb in m. 206. This is achieved through a T₅ transposition at m. 205 where the G# of Piano I's left hand becomes reinterpreted as Ab in the right. The T₅ transposition serves as a large scale composing out of the superimposed fourths of the previous section creating a tight link between the two.

As shown in Example 4.11b, a second process projects the movement of paired semitones from mm. 208-216 through the initiating tones of the imitative entries in piano I as it drives towards and eventually attains unison Eb supporting E as a tonal center in all voices. The lower voice projects this collection by starting on C# and progressively increases the distance between successive pitches by one semitone. The upper voice follows suit until the pattern achieves a

unison on E⁴. As shown, the semitone relationship between dyads originally moves from the low to the high voice; this relationship switches in m. 210 where the semitones move from the high voice to the low voice. This switch reflects a similar process that occurred at the T₅ transposition in the previous section.

Bartók described the second of the three sections of rotation two (mm. 217-231) as an “interlude”. Of this section Wilson writes about that it “is in some ways one of the most baffling parts of the piece. (...) It combines a strong homogeneity of rhythm and phrase with an apparently free and unsystematic treatment of pitch material, at least as compared with other sections.”⁹ Bartók may have chosen this unsystematic treatment of pitch to avoid an overemphasis on the pitch E.

These measures are held together through further fragmentation of the a1 theme heard in combination with a2 material. As illustrated in Example 4.12, a1 and a2 are juxtaposed in individual piano parts while they simultaneously occur in synthesis between the two pianos. This dense contrapuntal web is combined with fortissimo dynamic markings to continue the feeling of energy gain that started at the outset of this rotation. At m. 225 some of this energy dissipates as a1 material continues without a2; this sensation of energy dissipation is short lived as a new sub-zone begins in m. 232, reinstating the process of energy gain.

⁹ Ibid., 151.

♩ = 120 217

P.I. *ff* *meno f* *ff*

a1 a2 a1

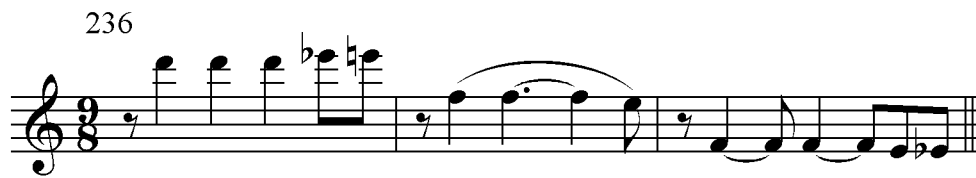
P.II *f* *p cresc.* *ff* *meno f*

a2 a1 a2

Example 4.12: Simultaneous juxtaposition and synthesis of a1 and a2 material, mm. 217-219

The next block of music occurs from mm. 232-263. These measures can be divided into three subsections each comprising two parts. The first subsection (mm. 232-247) starts with a2 ostinato material and is subsequently joined in m. 236 with successive presentations of compressed variants of a1 (see Example 4.13a). This model is continued from mm. 242-247 at which point the second subsection (mm. 248-255) begins. This subsection can be divided into mm. 248-251 and mm. 252-255. The division is apparent through the T_5 transposition of a lyrical melody made from elongated rather than compressed a1 material (see Examples 4.13b and c). In the final subsection (mm. 256-263) there is a return to the compressed a1 material of the first subsection (see Example 4.13d). This return occurs over mm. 256-259 and is followed by the liquidation of this material in mm. 260-263. The overall effect of the passage is that of another rounded binary structure, this one occurring within the sub-zone level and creating a parallel with similar structures we have seen unfolding across significantly larger spans of time.

In his description of the movement Bartók says that this entire section is governed by a pitch center on G \sharp . This center is supported through the presence of G \sharp on the downbeat of every measure in Piano I and/or the timpani throughout mm. 232-259. In mm. 260-263, the pedal on G \sharp /D \flat in the timpani, a reference to the dominant of the home pitch center C \sharp , begins to prepare us for the return of C \sharp and rotation 3.



Example 4.13a: Compressed variants of a1, mm. 236-238



Example 4.13b: Elongated variants of a1, mm. 248-251



Example 4.13c: Elongated variant of a1 transposed at T₅, mm. 252-255



Example 4.13d: Return of compressed variants of a1, mm. 256-258

A brief transition occurs in mm. 264-273. This dissipates the energy built up from the constant developmental processes of the second rotation by a thinning out of texture combined

with a piano dynamic. As material rapidly grows in dynamics and density it begins to reassemble a1 material preparing for its prominent return in m. 274.

Rotation Three

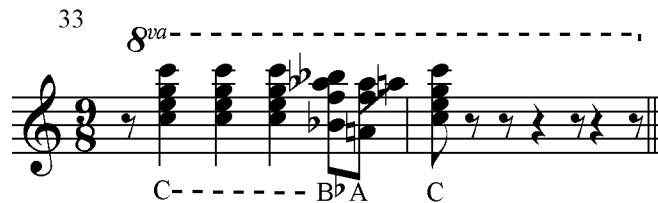
Rotation 3					
A	B		C		A
A	B	(trans.)	C	c/a1	A
274	292	326	332	423	433

Example 4.14: Rotational diagram of Bartók's Sonata for Two Pianos and Percussion, first movement, rotation 3

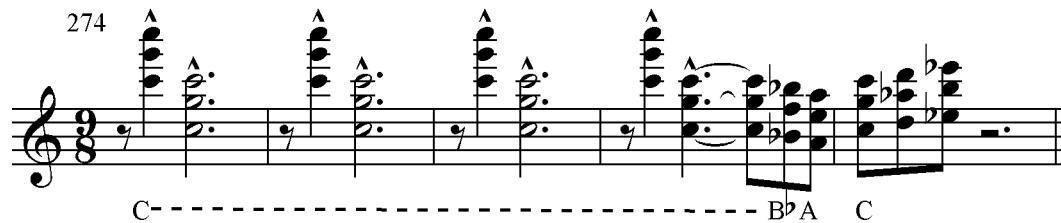
With respect to zone 3A, Wilson writes, "This is a recapitulation the proportions of which are severely altered in comparison with those of the exposition. Having heard so much of the [a1] and [a2] motives in the development, we get hardly anything of them now, even at the outset. The recapitulatory impact of m. 247 depends on tonal center, dynamics, and general texture far more than on thematic return, although vestiges of the first theme's opening are apparent."¹⁰ I disagree with Wilson in that I feel that there are more than just vestiges of the original a1 material at the onset of rotation three in m. 274. Examples 4.15a and b illustrate the openings of the first and third rotations respectively; it is easy to trace the same melodic line, although it is varied in the latter rotation. It is also easy to perceive the melody of mm. 274-277 as a rhythmic variation of mm. 33-34. Bartók's decision to recapitulate these materials at the onset of zone 3A as a varied restatement is not without consequence, however. The effect of return is overshadowed by the sense of further development. This process of continuously

¹⁰ Ibid., 152.

moving forward is reflected in Bartók's key scheme of C E G \sharp C. We hear this movement to C as a continuation of a process rather than as a return to the original starting point.



Example 4.15a: Initial presentation of a1 theme in rotation 1, Piano I, mm. 33-34

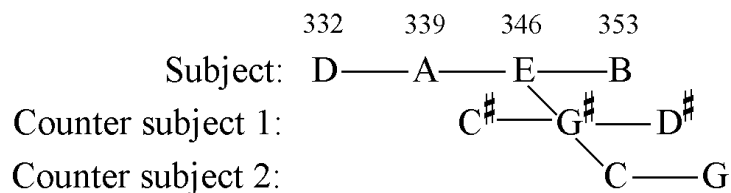


Example 4.15b: Rhythmic variation of a1 theme in rotation 3, Piano I, mm. 274-277

This section can be parsed into three repetitions of the a1 material presented in Example 4.15b sounding in the familiar successive T_5 transpositions in C (mm. 274-277), F (mm. 278-282), and B \flat (mm. 283-285).

Zone 3B (mm. 292-325) is proportionally longer than its rotation one counterparts. Perhaps this decision was made to balance out the two appearances of zone B material in rotation one. Bartók's decision also helps to achieve a sense of compositional balance as zone B's slower, more lyrical character was entirely absent in the second rotation. As such, these measures sound utterly divorced from the zone A material that preceded them. Zone 3B ends with a brief transitory passage (mm. 326-331) that mirrors the one found between zones 1B and C: it serves to thin out zone B material while gradually reintroducing zone C material.

The return of zone C (mm. 332-433) in the third rotation is also proportionately longer and highly varied. These measures take the form of a fugato in which the subject and its two countersubjects, all based on C zone materials, occur in a mechanically worked out succession of T_7 transpositions, as seen in Example 4.16. The first three notes of the second countersubject in m. 346, E G \sharp C, are a reference to the three most prominent pitch centers in the movement. Though the strictly fugal structure breaks down at m. 360, the imitative texture is continued through to m. 377.



Example 4.16: T_7 transformations in zone 3C, mm. 332-360

According to Wilson, main theme (zone A) material returns in m. 383.¹¹ He does not explain this decision and I have trouble hearing this section as anything other than a continuation of zone 3C. Even if there are vestiges of zone A material this early, the eighth-quarter rhythm of zone C is far from played out, especially with all the energy it has built up within the preceding fugato. Zone A material does gradually overtake zone C, as can readily be heard throughout mm. 423-432 (see Example 4.17).

¹¹ Ibid 142.

The image shows a musical score for two pianos, P.I and P.II, in 8/8 time. The score is for measures 425-428. A bracket labeled 'a1' is placed above the P.I staff, and a bracket labeled 'C' is placed below the P.II staff. The music is written in a complex, atonal style with many accidentals and intervals.

Example 4.17: Synthesis between zone C material in Piano II and a1 material in Piano I, mm. 425-428

This synthesis (marked c/a1 in my diagram) leads us to a closing section in m. 433 that finally solidifies zone A material in the initial pitch center of C. Though this closing section is only eleven measures, this theme is so familiar there is no need for it to be repeated any further. Once the eighth-quarter rhythm of zone C is replaced (and zone B does not repeat as it did in the first rotation) there is a sense of finality about the movement.

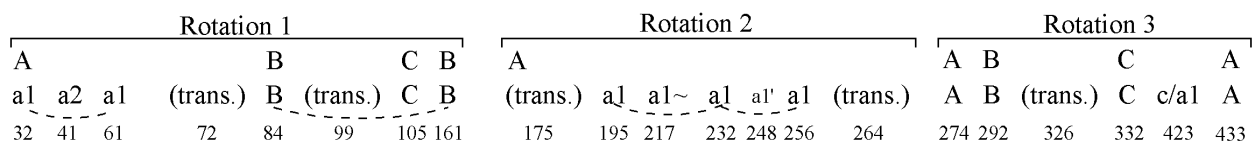
Synthesis

Wilson attempts to make sense of this movement in terms of large-scale harmonic process but cannot seem to convince even himself of any solid process that works across the entire movement. He writes,

Bartók's mention and placement of C, E, and G \sharp as tonal centers, immediately suggests the hypothesis that the events to which he refers are the three structural pillars of the movement, representing a large T₄ privileged pattern connecting an

initial C with goal tone C. Several circumstances militate against such an interpretation. First, it leaves out too much music controlled either by other centers or by different harmonic bases. Second, it leaves out the first appearances of G[#] and E as tonal centers in the exposition, framed as each is by other material before the development. Third, it ignores the change of theme as the music moves from C to the development centers E and G[#]. This change weakens, though it does not render impossible, the connection among the three parts of the proposed structure.¹²

In the absence of a large-scale harmonic process it is clear that Bartók unifies this structure largely through means of thematic ordering. Though there are three distinct rotations in this movement they sound like continuous variations of the same material rather than a sonata-derived presentation (exposition), development, and return (recapitulation). This overall sense of continuous creation was foreshadowed in the gradual *accelerando* of the introduction.



Example 4.18: Rotational diagram of Bartók's Sonata for Two Pianos and Percussion, first movement

As seen in Example 4.18, while Bartók does achieve a sense of return in the third rotation through the return of zone B and C, this sense of return is overshadowed by the continuous

¹² Ibid., 156.

development of zone A material. Bartók also achieves a sense of unity even among highly contrasting zones through the use of transitory passages that gradually usher out the materials of one zone while simultaneously introducing motivic ideas of the zone to come.

Chapter 5: Conclusion

Forcing the sonata model onto movements that do not fully embrace it distracts us from the essential formal processes at work. The following analyses have thus demonstrated how a rotational perspective reveals new analytical interpretations potentially obscured by traditional Formenlehre categories and criteria that accompany the sonata-form readings proposed by Bartók and other scholars. Rotational form allows us to understand compositions in their simplest terms – we are not listening for transitions, medial caesuras, developments, codas, etc – rather we are listening for the introduction and return of prominent motivic ideas that form the basis of the various zones of action. By shifting focus away from the generic/rhetorical expectations of sonata form and towards the rotational presentation of thematic material that lies at the core of this post-tonal repertoire, we can arrive at a more intuitive reading – one that could easily be made, if desired, to enhance or contrast with a sonata reading, or a reading based on post-tonal analytical perspectives such as those of Wilson, Straus, or Antokoletz.

Throughout the analyses presented above certain trends emerge. A common element present throughout all three movements examined in depth is Bartók's compositional practice of continuous variation. This is perhaps the most obvious characteristic shared among all of his mature works; Bartók's habit of never repeating anything literally potentially has the most far-reaching ramifications on local and global formal structure. We have seen this in particular at the foreground level of the Piano Sonata, where the development of a single motive is manipulated to yield five separate but organically derived themes, and at the background level especially in the Sonata for Two Pianos and Percussion, where Bartók creates a sense of continuous variation among the three discrete rotations. In this movement, the variation is the result of a motivic

process rather than a single brief melodic motive. Here, the opening thirty-one measure introduction is characterized by the process of gradual but continuously growing forward motion. This concept of continuous development presented at the outset of the movement is echoed throughout its duration. Though there are clearly three discrete rotations, each rotation sounds more like a variation or a departure than a return. As I have demonstrated, continuous variation creates disagreement among theorists in their readings of both of these movements as sonata forms. Understanding these movements in terms of rotation avoids this confusion by focusing on the introduction and return of prominent motives (fragmented, compressed, elongated, or otherwise developed) rather than on a predetermined scheme it does not fully embrace.

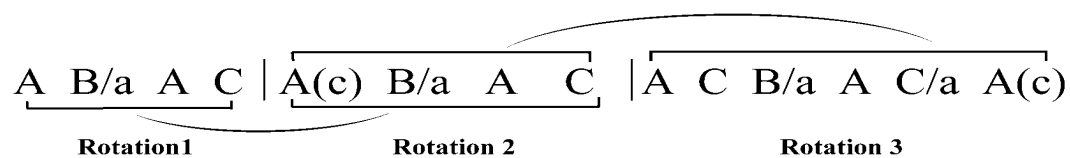
Another strategy used by Bartók to create motion in his rotational forms is the use of transitions to seamlessly connect contrasting materials. This was seen in the analysis of Bartók's Sonata for Two Pianos and Percussion, where transitory passages simultaneously liquidated the prominent motivic materials of the preceding zone and introduced new material to be developed in the following zone. Unlike the transition of the typical sonata, transitional sections in Bartók are characterized by energy-gain or energy-dissipation based solely upon the character of the zone to which it progresses. Similar transitory passages can also be found in Bartók's *Music for Strings, Percussion, and Celesta*, II.

Another rotational strategy used by Bartók is that of teleological genesis. This is a process set in motion at or near the outset of the movement that continues throughout the duration of the movement, either gradually becoming the focal point as demonstrated through the teleological genesis discussed in the Fourth String Quartet. In movements that are teleological, a brief idea is presented early in the movement as a foreshadows the final structural goal, or telos, of the movement. In the case of Bartók's Fourth Quartet, this brief idea (α) is presented first in

the cello of m. 7. Throughout the movement this single idea is interrupted, developed, dissected, and reassembled before the movement ends in almost obsessive iteration of this single idea.

Other works by Bartók exhibit similar processes; two deserve at least brief mention. Teleological genesis in Bartók's repertoire can be found in the fifth movement of his Concerto for Orchestra where a variation of the lone horn call heard in the opening measures of the first rotation returns (mm. 1-4) as a fugal subject in the second rotation (mm. 265-383), and ultimately cast as the movements climax (mm. 556-572) and close (mm. 616-625).

A similar property is illustrated in Bartók's Fifth String Quartet first movement (see Example 5.1). If we directly compare the first rotation with the third rotation in this example, it would seem that the third rotation is almost a random re-ordering of the original material presented in rotation one. However, if we view all three rotations in succession, the organic evolution of one rotation into the next creates a sense of continuous variation of the original. Rotation two is a varied restatement of rotation one that adds a crucial ingredient to our understanding of the rotational structure. The passing reference to zone C material early in rotation two becomes its own zone in rotation three. This passing C material heard in conjunction with zone A is also elaborated on when C and A occur in synthesis at the end of rotation three.



Example 5.1. Organic rotational growth in Bartók's Fifth String Quartet, first movement

Returning to the Sonata for Two Pianos and Percussion, this sense of continuous variation is echoed by a succession of pitch centers that progresses through a chain of major

thirds starting and ending on C (C E G \sharp C). While this scheme begins and ends on C, it implies a forward movement that begins on one manifestation of C but progresses to a completely different manifestation of C – the sense of return is overshadowed by the goal-directed linear process. A similar progression of tonal centers can be found in Bartók's Fifth String Quartet first movement in which the pitch centers of the major sections of the movement unfold a whole tone scale starting and ending on B \flat . Such a progression of tonal centers creates problems for an analyst attempting to interpret the movement as a sonata form, but these continuously unfolding processes mirror and embrace the cyclical nature of rotation. In the Piano Sonata, Bartók creates a similar effect through the presence of a series of T₇ transformations that also cut across the typical sonata divisions. The same linear process that creates analytical problems for Straus in his sonata reading helps to reinforce the helix-like structure of rotational form.

One of the most fascinating rotational strategies discussed above is that of the hyper-rotational structure found in Bartók's Piano Sonata. In this structure, the second and third rotations combine to form an only slightly elaborated version of the first. Taken together, these two hyper-rotations divide the movement precisely into two equal halves. A similar process (illustrated in Example 5.2) occurs in Bartók's Fifth String Quartet, first movement, where two hyper-rotations are presented, misaligned across the three discrete rotations.



Example 5.2. Hyper-rotation in Bartók's Fifth String Quartet, first movement

Several possibilities exist that are worthy of further exploration as they relate to rotational strategy in Bartók's work. In Somfai's reading of Bartók's Piano Sonata he mentions the existence of two archetypal motives. According to Somfai, these motives are related to one another but have independent functions. The implications of such a statement are far reaching. First, the idea that these two motives are related to one another, yet function separately to produce other motives implies the existence of a traceable motivic genealogy. While producing such a taxonomy is far outside the scope of this project, such an undertaking, if applied to all of Bartók's mature work, would no doubt produce meaningful results. Second, the idea that certain formal functions can be associated with individual motives is also a promising outlet for new analytical interpretations. While this study makes use of some such functions, such as synthesis and juxtaposition, a taxonomy of additional functions would undoubtedly increase our understanding of local and global structure.

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