

## *Chapter 6*

### *I. Beethoven, Sonata Form, The Minor Mode, and Chromatic Development at the Beginning of the Nineteenth Century*

With chromatic events already saturating the tonal surface in compositions composed during the last decades of the eighteenth century, especially those of Mozart and Haydn, what more could a composer do to develop chromatic issues before the entire tonal system would collapse? Clarity of thought regarding what constituted a well-defined “tonality” became increasingly blurred as composers sort to expand the tonal spectrum by emphasizing the chromatic over the diatonic in their operas and sonata-form works. Put another way, utilizing the chromatic potential of both the *Primary Chromatic Array* along with structurally significant system shifts, could allow a composer to challenge the hegemony of the tonic itself by heightening localized chromatic events that related more to each other than to supporting the governing tonic key. Large-scale neighboring and third-related progressions, which increasingly articulate each note of the ascending PCA, now vie in importance, not to say motivic interest, with the diatonic harmonic goals they seem to defy. Chromaticism, as a symmetrical force within a hierarchal tonal system in which all musical events support our understanding of the background tonic, now becomes an end in itself and begins to dominate the musical discourse in much the same way it had in mannerist compositions of the sixteenth and early seventeenth centuries (see Chapter 3).

Of all the composers that followed in the footsteps of Mozart and Haydn, it was undoubtedly Beethoven that was most successful in pushing chromaticism to its limits, yet always within the confines of the tonic background. Beethoven found so many innovative ways

of expressing tonic harmony through a greatly extended chromatic surface, that was consistently projected into deeper structural levels, that his compositional methods in this regard became a source of inspiration for most of the composers that followed him over the course of the nineteenth century, consciously and unconsciously.

We have previously discussed, albeit somewhat superficially, Beethoven's compositional methods and their relevance to PCA and system analysis in Chapter 2, using Beethoven's Symphony no. 5 in C minor and his piano sonata in C major, Op. 53 ("Waldstein") as examples. Now that we have had a chance to examine the relevance of this theory in more detail in the works of Haydn and Mozart, a more detailed discussion of Beethoven's approach to chromatic development would seem a logical next step. We have deliberately picked minor mode works as examples of Beethoven's compositional methods, since the minor mode seems to have had a great attraction for this composer and, in addition, we have not as yet given detailed examples of minor mode pieces in relation to the present theory.

Beethoven's piano sonata, Op. 57 ("Appassionata"), in F minor, was composed in 1804-05. The work is notable for its motion into the minor relative of the tonic at the close of the exposition, a harmonic event unprecedented in the literature before this point. In fact, Beethoven had begun to work out the consequences of this gesture as early as 1793 in the first movement of his C minor Piano Trio, Op. 1 no. 3, where the relative minor in the bridge precedes the major relative as the second harmonic area of the exposition. Beethoven next becomes quite a bit more daring in his treatment of the minor relative in the first movement of his piano sonata in C minor, Op. 13 ("Pathétique"), where the second harmonic area itself is in the minor relative before releasing its tension into the major relative at the closing period. Finally, the "Appassionata" is the most extreme in that stage of this evolutionary process since the end of the exposition *is in the minor relative*, an event anticipated in the bridge, and then presented in the closing period *after* the major relative has been achieved as the second harmonic area. The expositions of these three works may be illustrated as follows for the sake of comparison (note that the counterstatement in the early C minor trio *beings on the submediant degree*, a most unusual procedure for its time, not lost on Schumann's Piano Quintet, Op. 44, 1<sup>st</sup> movement – see discussion below):

1). Piano Trio in C minor, Op. 1 no. 3 (1793)

Exposition

1 <sup>st</sup> Harmonic Area	— Counterstatement/Bridge —	2 <sup>nd</sup> Harmonic Area
c minor	A $\beta$ --- e $\beta$ minor	E $\beta$ Major
i	VI    iii	III

2). Sonata “Pathétique”, Op. 13 (1799)

1 <sup>st</sup> Harmonic Area	--- 2 <sup>nd</sup> Harmonic Area —	Closing
c minor	e $\beta$ minor	E $\beta$ Major
i	iii	III

3). Sonata “Appassionata” , Op. 57 (1804-05)

1 <sup>st</sup> Harmonic Area	— CS/Bridge—	2 <sup>nd</sup> Harmonic Area —	Closing
f minor	fm — a $\beta$ m	A $\beta$	a $\beta$ minor
i	I    iii	III	iii

In each case, the turn toward the minor relative causes a shift of the prevailing system into extreme flats. In C minor, the system-shift motivator (that is, a chromatic pitch class that, when introduced, causes a system shift either up or down from the prevailing system, depending on its spelling) would be G $\beta$  shifting the tonic 3 $\beta$  system down to 6 $\beta$ s. In both the early piano trio and the “Pathétique,” the correcting A $\_$  returns the system to 3 $\beta$ s before the structurally significant relative major is reached. In the case of the “Appassionata,” the shift of system into 7 $\beta$ s, first before the second harmonic area (which is corrected by a D $\_$  in m. 32), and then at the closing period in m. 51 (here, the C $\beta$  remains uncontested), is so distant a system shift that Beethoven plunges into the development section without repeating the exposition.

Diagram 6.1 gives an overall background harmonic plan for the first movement, which also indicates the PCA rise. The PCA in minor mode operates somewhat differently from that of major mode since the second harmonic area is usually in the relative major and not in the

dominant. If the relative major is the goal of the second harmonic area, as it is in this case, the PCA ascent within the exposition will terminate at pc 3, the root pitch of the relative major, here, A $\beta$ . In Classical sonata form, there is only one harmonic area other than the tonic in the exposition; consequently, in a minor-mode exposition, the opening statement and bridge will unfold PCA pitches 0, 1 and 2; pc 3, the tonic of the new harmony, will arrive at the opening of second harmonic area. Each additional cadential arrival within the second harmonic area, namely, to the closing period and codetta, will be articulated by a repeat of pcs 0-2, with pc 3 occurring at the formal cadence to these structural events. On the other hand, if VI is the goal of the second harmonic area, as it is in the first movement of Beethoven's Symphony no. 9 in D minor, the PCA rise will terminate at pc 8, replicating the PCA rise of pcs 0 - 8 at the closing period and codetta. Most importantly, it should be emphasized that it is not necessary to replicate *all* the pitches of the PCA within any particular PCA rise; however, a pitch missing from one rise will usually turn up in a subsequent one. How complete the various rises are within any given section of the form (meaning the extent of the chromatic pitch content) will thus inform the compositional, not to say the emotional, intent of the composer

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**EXPOSITION**

1<sup>ST</sup> Harmonic Area                      C.S. + Bridge      2<sup>ND</sup> Harmonic Area                      Transition Closing (2<sup>nd</sup> period)  
 basic rhythm: \_\_\_\_ established                      (1<sup>st</sup> period)

main dyad conflicts (expanded to trichords):

G<sub>-</sub> – Gβ (βII) – F

D<sub>-</sub> – Dβ (VI) – C

Unison theme

	f minor		f minor –	aβ m Aβ		dβ minor	aβ minor (relates to Fβmajor)
i			[harmonized]		III	iv/III	iii
PCA: F		F-	Gβ –	G <sub>-</sub> → Aβ		-----aβ	
0		0	1	2	3		3

**DEVELOPMENT**

Codetta		G <sub>-</sub> ----	G <sub>-</sub> -----	Gβ	┌──────────────────────────┐			Retrns.
aβ minor–B6		E major	e minor	c minor	Aβ7 →	Dβ –	Gβ –	bm –
iii	[V6   I]				VI		G6/5 –	C –
		(E is enharmonic Fβ)					V	dβ dim.7 →
PCA: aβ		A <sub>-</sub>		Bβ		Cβ –	C <sub>-</sub>	Dβ
3		4		5	6	7	8	Dβ
						----- 8 (sustained through the recap.)		

**RECAPITULATION**

1 <sup>st</sup> H.A. [the melody in m. 138 has D <sub>-</sub> ]	C.S. +	Bridge	2 <sup>ND</sup> H.A. (1 <sup>st</sup> period)	Transition
	Gβ		D <sub>-</sub> –	Dβ –
Dβ→C (in the bass)	Dβ	C	F Major	bβ minor
i6/4	βII6/4	V	I	iv
PCA:	D <sub>-</sub>	Eβ	E <sub>-</sub> F	[D – Dβ – C raised again]
	9	10	11	0

**DIAGRAM 6.1: Beethoven, Appassionata Sonata, Op. 57, 1<sup>st</sup> Movement Background Harmonic Plan**

		CODA	
	Closing (2 <sup>nd</sup> period)		
[Dβ] - C	[Gβ/G_ raised again]	Dβ/D_	[2 <sup>nd</sup> H.A. theme]
		Gβ/G_ conflicts raised again & resolved!	[D_/Dβ conflict resolved]
C	f minor	f minor	Dβ - Gβ - C
V	i	i	VI βII V6/4 - 7/5/3
	tonic arrival - answers the reason		
	why aβ minor as the Closing period		
	in the Exposition		

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	Adagio [Dβ finally resolved into f minor]	Più Allegro	
		[Gβ/G_ resolved + ____ rhythmic issue]	
Dβ→	C	f minor	
	V	i	
		(Actual point of resolution)	

Unlike the relatively longer PCA ascents in the expositions of major mode pieces, the PCA rise to III in the expositions of minor mode works is relatively short. The bulk of the PCA ascent (pcs 4 – 11) is thus relegated to the development section leading to the recapitulation at which point the first octave ascent is unfolded and pc 0 is once more regained at the point of recapitulation and the return of tonic harmony. Developments in minor mode tend, for this reason, to be highly chromatic and dramatically intense. In order to balance the emotional content of the development with that of the exposition, in which the stable nature of the relative is the only goal of motion, Classical composers tended to load the second harmonic area with as much passing and structural chromaticism as possible; an excellent example of this is the second harmonic area in the first movement of Mozart's Symphony no. 40 in G minor. One can infer from the above diagram comparing three of Beethoven's minor-mode first movements, that the composer must have been concerned that the arrival in the relative major in a minor-mode sonata-form movement would create an expanse that was — curiously — too stable. In fact, if we read into Beethoven's inclination to work through the same problem over and over again (with a variety of creative resolutions), we suggest that the composer may have been preoccupied with what he perceived as a significant musical problem. The main issue with III as a second harmonic area in minor mode is that the root of the relative major functions as the hexachord system of the key; thus, the unstable first harmonic area seems to resolve at the point where the relative major is reached. This may be the reason why Beethoven was at such pains to destabilize the relative major through juxtaposition with its parallel minor in the examples above.

The destabilizing effect of modal switching, either before or after the arrival of the relative major (or both, as in the case of the *Appassionata*), does not, however, affect the PCA rise itself in the exposition which still terminates at pc 3 in either case. Notwithstanding so short

an initial rise, Beethoven seizes upon the harmonic potential of each pitch class within the PCA to create a tense harmonic atmosphere within an already unstable minor tonic and, subsequently, in the minor relative. Diagram 6.1 charts the course of the PCA up to the recapitulation (see also Example 6.1 which examines the exposition of the first movement through the start of the development section). Notable is the emphasis given to pc 1 ( $G\beta$ ) as the Neapolitan degree within the initial rise. The  $G\beta$ , which first occurs in m. 5 as part of an arpeggiation of  $\beta$ II, itself generates its fifth,  $D\beta$ , the Neapolitan to the dominant.

**EXAMPLE 6.1: Beethoven, Sonata “Appassionata”: Exposition – Development (mm. 1-72)**

1st Harmonic Area  
Allegro assai

The image shows a musical score for the first harmonic area of the development section of Beethoven's Sonata "Appassionata", measures 1 through 72. The score is written for piano and consists of six systems of music. The first system (measures 1-5) is marked *pp* and includes a circled diamond labeled "PC 0" and a circled diamond labeled "PC 1". The second system (measures 6-11) includes a circled diamond labeled "PC 1" and a circled diamond labeled "PC 2". The third system (measures 12-16) includes markings for *pp*, *poco ritardando*, *f*, *f*, *p*, and *pp*. The fourth system (measures 17-21) includes markings for *ff*, *p*, *ff*, and *p*. The fifth system (measures 22-26) includes markings for *ff*, *p*, *ff*, and *fp*, and a circled diamond labeled "C<sub>5</sub> ↓ 7s". The sixth system (measures 27-31) includes markings for *fp* and *dimin.*. The score is in the key of F major (three flats) and 3/4 time. It features complex harmonic structures, including chromaticism and modulation, and is characterized by its dynamic range and rhythmic intensity.

pp (PC 0) (B<sup>b</sup> / A<sup>b</sup>) (PC 1)

6 (PC 1) (PC 2) (B<sup>b</sup> / A<sup>b</sup>)

12 *pp* *poco ritardando* *f* *f* *p* *pp*

17 *ff* *p* *ff* *p* (B<sup>b</sup> / A<sup>b</sup>)

22 *ff* *p* *ff* *fp* C<sub>5</sub> ↓ 7s

27 *fp* *dimin.*

32  $D\sharp \uparrow 4is$  2nd Harmonic Area

*pp* *dolce*

PC 2 PC 3

36

*cresc.*

PC 3

40

*p* *f* *sf* *p*

PC 2

47

*pp* [PCs 1 & 2 inverted] PCs 2 1 PCs 2 1

[PCs 1 & 2 inverted] PCs 2 1 PC 2 1

51 Closing Period

*f* (No PC 0) PC 1

53

55 *f*

57 *ff* *sf*  
(PC 2)

59 *sf* *sf* *ff* *p* *sfp*  
8<sup>va</sup> (D<sub>6</sub>/C<sub>6</sub>) Codetta  
PC 2 PC 3

62 *sfp* *sfp* *diminuendo*

65 *pp*

69 *tr*  
D<sub>6</sub> ↑ 4s / B<sub>6</sub> ↑ 1s / G<sub>6</sub> ↑ 2s / E<sub>6</sub> ↑ 5s  
PC 4

Both G $\beta$  and D $\beta$  as individual pitch classes are worked out over the course of the movement, either as controlling pitch classes that inform harmonic areas, as in the very opening of the movement, or at climactic points within the development section, or they are sustained in vertical sonorities, often within the context of dyad conflicts, that keep them ever present throughout the movement. An example of the former is the motion into D $\beta$  minor as iv/III during the transition between the first and second periods within the second harmonic area in which the D $\beta$  displaces the previous D $_$  that was part of the previous A $\beta$  major harmony. Similarly, the

G $\beta$ /G $_$  dyad conflict becomes a focal point in the unison run which culminates at the end of the transition just before the closing period (mm. 47-50). On a deeper level, the G $\beta$ /G $_$  conflict permeates the development section, often appearing as chord tones within adjacent harmonies; for instance, G $_$  as part of E minor and C minor harmony, followed by G $\beta$  as seventh within the A $\beta$ 7 chord that leads to D $\beta$  within the climax of the development section. Once D $\beta$  is reached as a goal of motion (m. 109), it is sustained through the passing harmonies of B $\beta$  minor and G $\beta$  major (see Diagram 6.1). After resolving to C in m. 122, D $\beta$  is sustained within diminished harmony up to the point of retransition in m. 132 where it temporarily resolves to the dominant seventh. Lastly, both D $\beta$ /D $_$  and G $\beta$ /G $_$  conflicts may be extended into trichords: D $_$  - D $\beta$  - C and G $_$  - G $\beta$  - F, respectively. The last member of each trichord acts as a point of temporary resolution.

We may now postulate that pc 1 of the PCA (G $\beta$ ) becomes a dominating pitch class from the very opening of the movement, and this fact holds true for each subsequent pitch class over the course of the exposition. Continuing with the PCA ascent, the G $\beta$ , as pc 1, now progresses to pc 2, G $_$ , an equally significant pitch since it is associated both with the dominant of the tonic and as the leading tone of the relative major. The G $_$  first appears as a PCA pitch class in m. 9 as part of a localized dominant harmony, and continues this way until into the bridge where the G $_$  transforms its function as leading tone to A $\beta$ , the goal of the bridge. With the arrival of the major relative in m. 35, pc 3 is reached, the terminating pitch class of the exposition's PCA segment.

At this point, the first segment of the PCA repeats now within the area of the relative. Pc 0 (F) appears at the start of the consequent phrase (m. 37) as the first melodic pitch that seems to initiate an arpeggiation of the subdominant triad of the relative (D $\beta$ ) before it suddenly descends

to C as part of an  $A\beta$  6/4 chord in the next measure. The  $D\beta/C$  relationship is extensively worked out over the course of the entire movement, often articulated by the characteristic rhythm: \_\_\_\_.

Pcs 1 and 2 ( $G\beta$  and  $G\_$  respectively) are, as stated previously, introduced within the unison scalar passage (mm. 47-50) that dramatically leads into the closing section in the minor relative. Interestingly, these two pitch classes are introduced, at first, in reverse order; that is,  $G\_ - G\beta$ . Beethoven thus highlights both the fact that these are the next pitches within the PCA, and also that they are a seminal dyad conflict within the sonata. Incidentally, from the beginning of the movement pc 1 has been consistently spelled as a flat and not as a sharp. If pc 1 were spelled as a sharp,  $F\#$ , Beethoven would have been forced to move into a dominant direction, a path he chose to avoid.

The closing section of the exposition now unfolds a final PCA rise, but with one necessary adjustment to the array. Since the harmonic area of the closing period plunges into the minor relative, the previously diatonic  $F\_ (pc 0)$  is now displaced by  $F\beta$  making pc 0 of the PCA quite difficult to present. Therefore, this last PCA rise within the exposition starts with pc 1 ( $G\beta$ ), a pitch which is now diatonic within the area; previously,  $G\beta$  was dissonant and  $G\_$  was consonant. Pc 2 ( $G\_$ ) follows on the downbeat of m. 58, as part of diminished harmony, but becomes activated as a PCA pitch class on the third beat of m. 60, where it is a cadential leading tone within the dominant seventh to the minor relative. Pc 3,  $A\beta$ , is attained on the downbeat of m. 61, at the start of the codetta, leading directly into the development section.

In minor mode, the bulk of the PCA unfolding takes place within the development section, and ends (usually) at the point of recapitulation and the return of pc 0. Since the development in minor mode must unfold many more pitch classes in its move to complete the

tonic chromatic octave than one would find in the major mode, minor mode developments tend to be relatively lengthy as compared with their major mode counterparts. However, both major and minor mode development sections are compositionally geared to create as much harmonic tension as possible, and therefore both modes tend to emphasize diminished harmony and harmonic areas that stress the minor (vi or iii in major are preferred climactic areas).

In order to avoid overburdening the reader with unnecessary detail, the reader is directed to Diagram 6.1 for the placement of the remaining pitch classes of the PCA rise within the development section of the “Appassionata.” However, it is necessary to point out some salient aspects of the development’s PCA unfolding, since this too ties into the developmental process that lies at the heart of the movement. First, and most striking, is the fact that the closing period in A $\beta$  minor relates more to F $\beta$  major than it does to the tonic F minor. Consequently, the F $\beta$  within the closing harmonic period enharmonically switches into E (m. 65), a pitch class that motivates the E major harmonic area that initiates the development section. (As a matter of course, all the previous flats are enharmonically respelled as sharps). The note A $_$ , pc 4 within the continuing PCA ascent, is now easily presented within E major harmony. Note how each of the subsequent pitch classes of the PCA reflect the harmonic area in which they are presented. For example, pc 5, B $\beta$ , arises out of C minor harmony, and, later, pc 8, D $\beta$ , is structurally significant as the harmonic goal of the development (VI).

Beyond this is the way Beethoven intersects the PCA unfolding with the on-going development of one of the seminal trichords of the movement, D $_$  - D $\beta$  - C. This trichord, in retrograde (C - D $\beta$  - D $_$ ), forms the nucleus of the development section, centered as it is around pc 8 (D $\beta$ ). Pc 7 (C $_$ ) is presented as leading tone to D $\beta$  (part of a linearized V6/5/VI) in m. 108 (pc 6 immediately precedes it in the same measure). As Diagram 6.1 shows, the D $\beta$ , once it is

presented as a harmonic area, becomes a controlling pitch; meaning that  $D\beta$  determines the harmonic progression surrounding it to the extent that  $D\beta$  is sustained right through the recapitulation. On a more foreground level, the  $D\beta$  area gives Beethoven a chance to develop the seminal trichord of  $D\beta - D_- - C$  on different structural levels. For instance, there is the large-scale contrapuntal motion between the  $D\beta$  of m. 109 and the  $C$  attained in m. 122. Within this area,  $D_-$ s enter within B minor harmony (mm. 120 ff), functioning as temporary upper neighbors to the sustained  $D\beta$  underneath; this indicates that  $D\beta$  has not yet been displaced by  $D_-$  within the rising PCA.

More locally, the  $d\beta 07$  that pervades the rest of the development section descends to  $C$  in its guise as rhythmic motive in m. 132, the  $C$  now sustained as an eighth-note pedal into the recapitulation. Since the tonic in root position has not yet been reached, the PCA, in this instance, continues past the expected point of recapitulation: pc 9( $D_-$ ) appears in m. 138 over the  $C$  pedal at the end of the melody's first phrase, but  $D\beta$  again returns as the harmony veers towards the Neapolitan, the harmony of the melody's second phrase, this time over a  $D\beta$  pedal. The  $G\beta 6/4$  harmony brings in pc 10 ( $E\beta$ ) in m. 142, which is then displaced by pc 11 ( $E_-$ ) in m. 144, the latter pitch now acting as a leading tone of dominant harmony, and which remains activated as a note of the array until the counterstatement brings the PCA to its conclusion, and does so in the surprising key of F major (m. 151). All during the highly charged passage that began with the recapitulation,  $D\beta$  and  $D_-$  are in continuous conflict over the  $D\beta$  and  $C$  pedals seething underneath. The presence at the opening of the recapitulation of all three trichord pitch classes ( $D_-$ ,  $D\beta$ ,  $C$ ) brings the last member of the trichord,  $D_-$ , into prominence, as pc 9 of the development section's concluding array.

Once the PCA has been completed at the point of recapitulation (or, in this case, at the counterstatement within the recapitulation), the complete PCA is again unfolded over the course of the recapitulation. In this way, major dyad conflicts and other chromatic issues can now be resolved into tonic harmony since the recapitulation remains entirely in the tonic, whether major or minor, or both. Since the tonic is never actually abandoned, the design of the PCA ascent may take several forms depending on compositional choices. One possible choice would be to reiterate the entire chromatic octave on the way to each point of tonic arrival; specifically, from the bridge to the beginning of the second harmonic area (now transposed into the tonic), from the transition up to the closing period, and, finally, from the transition to the codetta up to the arrival of the restated codetta material at the conclusion of the recapitulation. In addition, another iteration of the PCA ascent may also take place in the coda, if this section is sufficiently extensive, as it often is in Beethoven. Another possibility, and the one adopted by Beethoven in his “Appassionata” sonata, is to extend a single PCA unfolding over the course of the entire recapitulation, the chromatic ascent cutting through all the internal divisions of the recapitulation without any repetition. What is interesting in this regard is how the rising PCA actually coincides with, and even conditions, important harmonic events and resolutions.

If we take the recapitulation PCA as starting with pc 0 at the F major counterstatement in m. 152, pc 1, either G $\beta$  or F $\sharp$  would then be the next pitch. Oddly enough, Beethoven elects pc 1 to be F $\sharp$  in m. 170 instead of the expected G $\beta$ , the Neapolitan pitch class that had initiated the PCA rises previously. However, F $\sharp$ , as part of diminished harmony, soon turns into maneuvers enharmonic equivalent, G $\beta$ , in m. 181 where the minor subdominant, B $\beta$  minor, presages the return to the minor tonic in time for the closing period (m. 190). G $\beta$  is sustained until the opening phrase of the closing period where Beethoven moves this pitch up to pc 2, G $\_$ , within

the same measure (m. 192, left hand). The rise to G<sub>2</sub> is repeated in m. 196, and G<sub>2</sub> is displaced by A<sub>2</sub>, pc 3, in m. 199. This A<sub>2</sub> is now sustained until m. 213 when A<sub>1</sub> appears. Typical of PCA segments, the next passage, mm. 213-222, works out the A<sub>2</sub>/A<sub>1</sub> dyad, even to the extent of passing through a prominent G<sub>2</sub> area in m. 218. The A<sub>1</sub> finally resolves to pc 5, B<sub>2</sub> in m. 222, pc 5 remaining active until it becomes structurally significant in m. 227 when the minor subdominant is restated. The next pitch in the sequence, B<sub>1</sub>, pc 6, follows in m. 229 as the root of diminished harmony that also, most interestingly, coincides with the final resolution of the D<sub>2</sub>/D<sub>2</sub> conflict that has been one of the major dyadic concerns of the movement. The B<sub>1</sub> leads to C, pc 7 (m. 231), as part of a larger 6/4 - 5/3 cadential motion that coalesces into the dramatic final resolution of the D<sub>2</sub>/C motive at the *Più Allegro* in m. 238. After having dramatized pc 8, D<sub>2</sub>, and also since the D<sub>2</sub>/D<sub>1</sub> conflict has now been resolved, there is no need for pc 8 to proceed to pc 9, D<sub>1</sub>; instead, pc 8 goes directly to pc 10, E<sub>2</sub>, in m. 243. This latter pitch is sustained until the formal cadence in mm. 248-49 where pcs 11 and 0 complete the octave. Pcs 11 and 0 are restated in more emphatic form as part of the authentic cadence in m. 257, the actual rhythmic downbeat of the entire movement.

Beethoven's strategy of restating both the counterstatement and the second harmonic area material in F major, rather than in the tonic minor, is part of a larger compositional design to delay the tonic minor until the closing period of the recapitulation, thereby balancing, and even justifying, the unusual A<sub>2</sub> minor close of the exposition. As a general procedure, it should be noted that Mozart, Haydn and Beethoven often use the expositions of their sonata-form movements to "ask questions," or to "pose problems," that only the recapitulation can "solve," since the recapitulation provides the traditional locale to resolve these issues within an area of

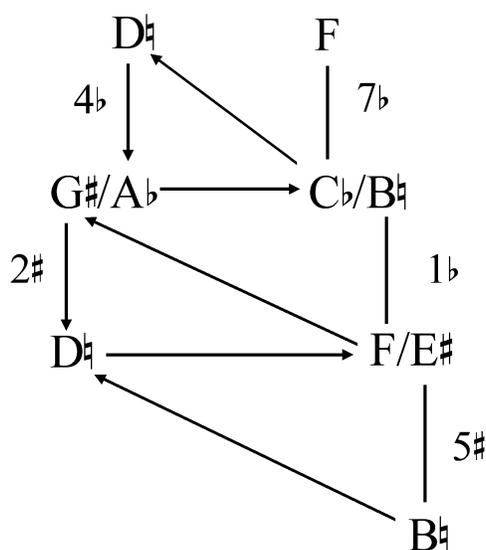
tonic harmony (the coda also has this function, if it is prominent enough). Thus, the two most important dyad conflicts of the movement,  $D\beta/D_-$  and  $G\beta/G_-$ , return in the recapitulation, and are further developed before they finally resolve. Beethoven's motion into the parallel major keeps both  $D_-$  and  $G_-$  "alive," as it were, and the switch back into minor, raising  $D\beta$  and  $G\beta$ , only serves to intensify these conflicts.

After the second harmonic area is recapitulated in the tonic major, the transitional passage that leads back into the original tonic minor becomes a highly dramatized harmonic event (mm. 181-188). In the exposition, this same passage preceded the closing period in the minor relative, with equally dramatic results, but in the recapitulation, the transition now has the added function of leading to the return of the tonic minor!

The coda, beginning in m. 204, restates the rising arpeggios of the opening theme once more before veering off into  $D\beta$  (mm. 210 ff), and then to  $G\beta$  (mm. 218 ff). Within both of these harmonic areas,  $D_-$ s and  $G_-$ s continue to raise the dyad conflicts until in measure 229, a  $d_{07}$  chord, the final expression of  $D_-$ , slowly gives way to the  $D\beta$ -C motive in the bass in m. 235. This motive grinds to a halt on a root position dominant seventh with the dynamic marking of *pp* along with a fermata and the tempo marking of *Adagio* over it, creating one of the most tense moments in all music. With the *Più Allegro* that follows, the tension is disbursed, and it remains only for the  $G\beta/G_-$  conflict to be resolved; this is soon accomplished in mm. 242-43. Finally, Beethoven resolves the rhythmic tension of the  $D\beta$ -C rhythmic motive as the eighths of the motive flatten out first into syncopations, and then into even rhythms. The sixteenth-notes that had created so much of the rhythmic excitement in the movement are dispersed by slowly sinking five octaves down to the original register of the opening, the sixteenths evaporating into a single held tonic chord in the last measure.

At this point it would be well to illustrate the  $4\beta$  system matrix of the “Appassionata,” the diagram of which clearly illustrates the wide-ranging system shifts to extreme flat and sharp systems that govern the course of the first movement (see 6.1).

**FIGURE 6.1: “Appassionata”  $4\beta$  Tonic Matrix System**



How do system shifts inform the progress of this movement? More to the point, how can an understanding of system modulations increase our awareness of the movement’s inner structure. Detailing every system shift in the first movement of the “Appassionata” would be an unnecessary labor, but a look at the most important system modulations can be enlightening in the extreme.

In the minor mode, the missing pitch spelled as an augmented second above the tonic of the relative major, in this case  $B_\flat$ , appears consistently, as a matter of course, since this particular pitch class has an important voice leading function as the leading tone of the dominant: in the “Appassionata’s”  $4\beta$  system,  $B_\flat$ , is the leading tone of  $C$ , the dominant of the tonic,  $F$  minor.

When present, the B<sub>2</sub>, more often than not, is prevented from shifting the prevailing 4 $\beta$  system up to 1 $\beta$ , since A $\beta$ , the missing pitch of the 1 $\beta$  system is ever-present. But what happens when the missing pitch, especially in minor mode compositions, appears as a flat? When presented, this pitch would move the prevailing tonic system down three signatures into a system of extreme flats; and if the tonic is F minor, a 4 $\beta$  system, as it is in the sonata under discussion, the system shift caused by the introduction of C $\beta$ , will thrust the prevailing 4 $\beta$  system down into that of 7 $\beta$ s! The resultant move down into the deeper regions of the subdominant cycle of fifths, challenges the hegemony of the tonic itself, since distant subdominant motions, whichever flat areas they arrive at, form contrapuntal relationships with their surrounding harmonic areas, but have no direct voice-leading function within the key, unlike harmonic progressions centered around the dominant.

At first, Beethoven is careful not to disrupt the tonic surface with too powerful a harmonic digression that might obliterate the important move into the relative major at the start of the second harmonic area in m. 35. Instead, he introduces the first C $\beta$  of the movement as a passing motion within the bridge, almost as a seeming afterthought (see mm. 25-31). The system shift down into 7 $\beta$ s that this move occasions, is supported by the very a $\beta$  harmony that will eventually surface, most dramatically, as the harmonic area of the closing period of the exposition. When Beethoven did this same progression in his earlier piano trio, Op. 1 no. 3 in C minor, first movement, the bridge's E $\beta$  minor prepared not for the closing period of the exposition, but for the more acceptable position as the harmonic area that opens the development section. Here the extreme shift into the minor relative would not disrupt the structural relationship of the tonic to its relative major. After the arrival of the relative major in m. 35, the transition which follows (starting at m. 41), suddenly veers into the minor subdominant of the

relative to prepare for the closing period in A $\beta$  minor. The D $\beta$  harmony moves directly into a cadential 6/4 on A $\beta$  minor the sixth degree of which once more raises C $\beta$ , but now has a far greater significance. The concomitant move into the 7 $\beta$  system occasioned by the C $\beta$ , forces the closing period into the minor relative, the 7 $\beta$  system remaining in effect all the way into the opening period of the development section proper.

The enharmonic switch into E major at the start of the development not only maintains the harmonic tension begun by the unusually dissonant A $\beta$  minor of the closing period, but also compels four system shifts that explode — there is no other term for it — within one measure of music! Each system pitch class is presented simultaneously in m. 71 as part of diminished harmony with each successive missing pitch a minor third away from the previous one; each pitch enharmonically respells part of the *tonic matrix* that governs the entire piece (see Fig. 6.1 above). Specifically, measure 71 first introduces D $_$  which moves the 7 $\beta$  system up to 4 $\beta$ s. Within the same measure, B $_$  now shifts the system up again to 1 $\beta$ . The B $_$  yields to G $\#$ , effecting a 2 $\#$  system; and finally, E $\#$  brings the system in line with the E major harmonic area that initiates the development.

After the 5 $\#$  system has been achieved, Beethoven reverses the process as the harmonic plan of the development moves away from E major toward the next goal, A $\beta$ . As it turns out, the system shifts descend quickly from 2 $\#$ s to 1 $\beta$  in m. 81. At the moment A $\beta$  materializes in m. 87, the A $\beta$  shifts the systems back down to 4 $\beta$ s. As the music descends further into the flat direction, so too do the systems associated with it. Thus, in the measure before the D $\beta$  harmonic area (VI is the next harmonic goal) C $\beta$  once more returns, shifting the system further down into 7 $\beta$ s (m. 108). Extreme flat areas follow: b $\beta$ m and G $\beta$  major in particular, until both D $_$  and B $_$  enter in

m. 120 as the harmony moves into C major. The  $D_{\flat}$  raises the system back to  $4\beta$ s, followed immediately by the  $B_{\flat}$  which raises the system further up to  $1\beta$ . This last system transformation is significant because no  $A\beta$ , the note that is required to reactivate the  $4\beta$  tonic system, follows this shift for the next 15 measures, the harmonic rhythm slowing to a crawl on diminished harmony. Only at the exact point of recapitulation (m. 135), with the return of the arpeggiated opening theme, with its third degree,  $A\beta$ , does the system finally revert to  $4\beta$ s! Thus systems analysis allows us to see exactly how the various system shifts within the development section prepare for, and perhaps even condition, structural goals. The same is true for all sections of the form.

No sooner does the recapitulation revert the system to  $4\beta$ s than  $B_{\flat}$  (the missing pitch (and thus the controlling pitch!) of the  $1\beta$  system) and  $A\beta$  (the controlling pitch of the  $4\beta$  system) collide until  $B_{\flat}$  “wins out” in m. 171 raising the system back up to  $1\beta$ . The newly-regained  $1\beta$  system now prepares for the return of the thematic material of the second harmonic area, now transposed into the tonic major. As the music reverts to the tonic minor,  $A\beta$  now “wins out” over  $B_{\flat}$  (mm. 182-190) in time for the closing period, now transposed into F minor. From here to the end of the movement, the  $4\beta$  system remains in effect, any  $B_{\flat}$ s that remain are quickly offset by the surrounding  $A\beta$ s of the tonic minor.

From this discussion of the “Appassionata” sonata, one could conclude that  $C\beta$ , the missing pitch of the tonic  $4\beta$  system, informs the design of the entire first movement, if not the entire sonata. In countless other pieces Beethoven seems to be fascinated with the compositional problems posed by the working out the minor third degree, in both major and minor modes. For example, the first movement of Beethoven’s piano trio, Op. 70 no. 1 in D (“The Ghost,” 1808), is

a spectacular example of the potential compositional implications of pc 3. The opening theme of this work (see Example 6.2) climaxes on F<sub>2</sub> (the missing pitch of the prevailing 2# system) already by m. 5! The sudden shift into the 1β system is not only shocking, but prolonged: the 1β system remains in effect well into the bridge (mm. 21 ff) despite the attempts of G# to correct the system: the continual presence of F<sub>2</sub> prevents any modulation back to the tonic 2# system. So strong is pc 3 as a governing pitch from the time that it is first introduced, that the bridge itself moves into F major (βIII) as a temporary harmonic area (the entire bridge passage is reproduced in Example 6.3). Only in m. 34, with the introduction of an uncontested G# as lower neighbor to A, does the system finally revert to that of the tonic 2# system in preparation for the arrival of the second harmonic area in the dominant (m. 43). Interestingly, Beethoven avoids treating F<sub>2</sub> as part of an augmented sixth that would fall naturally to the V/V, a gesture often found in Haydn's "Paris Symphonies" of the 1780s. Instead, Beethoven moves the F in the bass up to F# as part of a D# 07 in m. 34, a chord which acts as a leading tone diminished chord to the V/V on the downbeat of m. 35. Beethoven is not just refraining from duplicating a typical Haydnesque progression (see Chapter 5), he is also in the process of working out the seminal F<sub>2</sub>/F# dyad conflict that is the focal point of the opening phrase of the movement.

Upon a more thorough analysis, it becomes apparent that the F<sub>2</sub>/F# dyad conflict, along with its concomitant system shifts, controls most of the movement's harmonic events. For example, the development is governed primarily by flat systems, initiated by a lengthy extension of the minor subdominant, G minor, begun m. 83. As a consequence, F<sub>2</sub>, the pitch that informs the developmental process of the entire movement, is raised in m. 87, causing a major system shift down into 1β. This gesture itself motivates a deeper move into a 4β system when Aβ, the

missing pitch of the 1 $\beta$  system, is introduced m. 94. Thereafter, the development is pulled back and forth between 1 $\beta$  and 2 $\#$  systems until finally G $\#$  in m. 136 confirms the 2 $\#$  system in preparation for the recapitulation in m. 157.

The recapitulation again dramatically raises F $\_$ , this time as part of D minor harmony within the bridge passage that leads to the second harmonic area. Beethoven completely rewrites the bridge so that the opening theme now reappears within D minor harmony (mm. 166 ff). Beethoven's choice of D minor fulfills the modal orientation of the movement's opening phrase where both F $\_$  and B $\beta$  were introduced within the context of D major. The recapitulation bridge subsequently plunges further into B $\beta$ , which balances the F major section of the bridge in the exposition. Significantly, all this harmonic motion is entirely controlled by pc 3!

**EXAMPLE 6.2: Beethoven Op. 70 no. 1, 1<sup>st</sup> Movement Opening Statement (mm. 1-9)**

The image shows a musical score for the opening statement of the first movement of Beethoven's Op. 70 no. 1, measures 1-9. The score is written for Violin, Violoncello, and Pianoforte. The key signature is one sharp (F#) and the time signature is 3/4. The score includes dynamic markings such as *ff* (fortissimo) and *p* (piano), as well as articulation markings like *stacc.* (staccato) and *dolce* (dolce). A specific annotation 'F<sub>3</sub> ↓ 1s - Prolonged (!)' is placed above the violin staff in measure 4, indicating a prolonged F3 note. The score is divided into sections, with the first section labeled '1st Harmonic Area'.

**EXAMPLE 6.3: Beethoven Op. 70 no. 1, 1<sup>st</sup> Movement, Bridge Passage (mm. 21-43)**

The musical score for the bridge passage (mm. 21-43) of Beethoven's Op. 70 no. 1, 1st Movement, is presented in three systems. The first system (mm. 21-26) shows the Violino, Violoncello, and Pianoforte parts. The Violino part has a melodic line with a fermata at measure 21. The Violoncello part has a bass line with a fermata at measure 21. The Pianoforte part has a rhythmic accompaniment. The second system (mm. 27-31) shows the Violino, Violoncello, and Pianoforte parts. The Violino part has a melodic line with a fermata at measure 27. The Violoncello part has a bass line with a fermata at measure 27. The Pianoforte part has a rhythmic accompaniment. The third system (mm. 32-37) shows the Violino, Violoncello, and Pianoforte parts. The Violino part has a melodic line with a fermata at measure 32. The Violoncello part has a bass line with a fermata at measure 32. The Pianoforte part has a rhythmic accompaniment. The score includes dynamic markings such as *f*, *ff*, and *p*. There are also performance instructions like "Bridge" and "2nd Harmonic Area".

Among so many of Beethoven's other chamber-music works that are motivated by the development of their respective system conflicts, is Beethoven's Piano Trio, Op. 97, in B $\beta$  ("The Archduke", 1810-11). This work is as equally impressive as Beethoven's Op. 70 no.1 discussed above in the exploitation of its complementary systems. For instance, the exposition of the first

movement of the “Archduke” plays out the two conflicting systems of 2 $\beta$ s and 1 $\#$  on a fundamental level: the first harmonic area is in B $\beta$  and the second harmonic area is in G major. The relationship between these two pitch classes is melodically prepared within the opening measures of the movement where the top line of the piano part falls from B $\beta$  to an accented downbeat G in mm. 4 and 5.

Notably absent, however, is any play of systems within the entire opening statement (mm. 1-33), there being exactly eleven pitch classes omitting pc 3, C $\#$ /D $\beta$ . Thus Beethoven has carefully saved this pitch for its dramatic entrance as pc 3 of the exposition’s initial PCA ascent, at the start of the bridge passage that leads to the second harmonic area (the bridge begins in m. 33 and lasts until m. 51). At first, C $\#$  is presented as a melodic lower neighbor to D at the outset of the bridge, but is pitted against B $\beta$  tonic harmony negating a system shift. However, in m. 35 a chromatic 5-6 exchange unexpectedly swings the harmony from B $\beta$  to D major in preparation for the arrival of G major as the second harmonic area. With D major harmony now displacing B $\beta$  harmony, the C $\#$  is now able to effect a system shift up to 1 $\#$ , which system remains uncontested until m. 81, well into the closing area. The second harmonic area is so firmly established within the 1 $\#$  system, that Beethoven changes key signature to 1 $\#$ , 8 measures before the arrival of the second harmonic area. Only when the B $\beta$  returns at the end of the exposition, and the system reverts to 2 $\beta$ s, does Beethoven then change the key signature to 2 $\beta$ s as well, in preparation for the repeat of the exposition.

Another important aspect of the “Archduke” trio in terms of the interplay of its systems, is what transpires in the recapitulation. The second harmonic area returns transposed into B $\beta$  major (thus strengthening the connection between G major and B $\beta$  major), but the closing area



Most obvious in the above diagram is Beethoven's preoccupation with the major/minor parallel of the submediant and its concomitant working out of the C#/C<sub>-</sub> dyad conflict that informs most of the movement. The exposition is further distinguished by the fact that its structural harmonic areas revolve completely around the C matrix, shifting between "0" and 3# systems (see Ex. 6.4). Of interest is that within the opening tonic period Beethoven introduces the missing pitch of the "0" system first as E $\beta$  and not D# (not unlike the "Waldstein" sonata composed several years later, and in the same key), the E $\beta$  appearing as a chord tone within an F# 07 (see mm. 7 and 15). Thereafter in the bridge, the missing pitch is spelled consistently as D# as Beethoven moves into A major for his second harmonic area. The preparatory A minor passage within the bridge raises C<sub>-</sub> which conflicts with D#, the one pitch contradicting the other until D# finally wins out on the last eighth-note of m. 39, just in time for the arrival of the second harmonic area in A major. The rest of the exposition vacillates between A major and A minor, the C<sub>-</sub> and D# in constant conflict with each other until C<sub>-</sub> wins out within a minor harmony, the A minor area capped by the codetta at the end of the exposition.

# EXAMPLE 6.4: Beethoven Quintet, Op. 29, 1<sup>st</sup> Movement (mm. 1-41)

1st Harmonic Area (E $\flat$ /F $\sharp$ )

Violino I  
Violino II  
Viola I  
Viola II  
Violoncello

*p* *cresc.* *sf* *cresc.* *sf*  
*p* *cresc.* *sf* *cresc.* *sf*

Bridge (E $\flat$ /F $\sharp$ )

*cresc.* *p* *cresc.* *f* *cresc.* *p*  
*cresc.* *p* *cresc.* *f* *cresc.* *p*

Significantly, C major begins the development section, and is quickly turned into V/IV by m. 103. Beethoven then turns the major subdominant into its own parallel minor, F minor in m. 107, which brings in E $\flat$  and a system shift down to 3 $\beta$ s. F minor becomes the “development key,” its associated harmonic areas throwing the 3 $\beta$  system further down into 6 $\beta$ s as the music moves into D $\beta$  in m. 111. The D $\beta$  area is actually part of a larger progression that gives harmonic support to the basic trichord of the movement: C - C# (here spelled as D $\beta$ )– D $\_$ . In fact, D $\beta$  turns

into C# in m. 117 as part of diminished harmony leading to a G 6/4 with D<sub>2</sub> in the bass (m. 119). Once the G 6/4 is reached, A<sub>2</sub> can now shift the 6 $\beta$  system up to 3 $\beta$ s, an F# in m. 120 further shifting the system back up to "0". From m. 123, right up to the point of recapitulation in m. 179, E $\beta$  and F# conflict continuously, causing any number of harmonic digressions into flat key areas, including a prominent return into the minor subdominant (mm. 151 ff). The emphasis on pc 3 as E $\beta$  over the course of the development balances the exposition's spelling of this pitch as D#, now with the opposite effect of flat-side harmonic motions. What is also interesting is how the system shifts become more and more intense during the retransition (mm. 179 ff), the systems changing back and forth practically ever two measures! Only in m. 167 does the F# finally displace the E $\beta$  altogether, the "0" system remaining in effect in preparation for the recapitulation. Finally, the recapitulation, a virtual summary of the system conflicts of the preceding sections of the movement, now transposes all the areas that were once in the minor submediant within the exposition, into the tonic minor, thus raising E $\beta$ . Similarly, the A major sections of the exposition are now transposed into the tonic major, often necessitating an F# in order to cancel the frequent motions into the 3 $\beta$  system. While D#s also appear, the main focus of the recapitulation is centered around the conflict between 3 $\beta$  and "0" systems, which serve to balance the 3# and "0" systems of the exposition.

The main dyad conflict of the movement, C<sub>2</sub>/C#, often extended to D to form a trichord, now reaches resolution into tonic harmony within the final ascent of the PCA (see Ex. 6.5, mm. 264 ff), all this taking place during the closing period. This last rise of the PCA ascent is complete with all 12 pcs unfolded over the course of 17 measures, from the closing period to the start of the coda. What is of interest is that pc 3 is spelled as D#, finally displacing E $\beta$  altogether

for the rest of the movement. The D# itself finds resolution within the first violin whose part keeps reiterating this pitch class as the PCA unfolds in the cello. The first violin part climbs into the upper octave in m. 276, where, D# is heard for the last time, finally resolves to E. At the same time, pcs 5-9 of the PCA (F<sub>-</sub> – A) are reiterated within the same first violin part (mm. 277-78) in order to highlight the final 3 pitches of the PCA, A# – B – C, at the start of the coda (m. 280). From this point until the end of the movement, the pitch field remains totally diatonic, all the issues having been resolved.

**EXAMPLE 6.5: Beethoven Quintet, Op. 29, Recapitulation mm. 264-280**

[Closing Period]

Violino I

Violino II

Viola I

Viola II

Violoncello

PC 0 PC 1 PC 2

C# / C# is resolved by initiating a complete array

(D# / C#)

PC 3 PC 4

PC 5 PC 6 PC 7 PC 8 PC 9

D# / D# resolved

(PC 5 6 7 8 9)

PC 10 11 0

Beethoven's interest in parallel major/minor harmonic areas could well have come from his admiration of the French "rescue" operas of Luigi Cherubini of the 1790s and 1800s.

Beethoven modeled his own opera *Leonora/Fidelio* (1804-1814), in part, upon Cherubini's *Lodoïska* (1791) and *Les deux journées* (1800). Interestingly, Cherubini's overture to *Lodoïska* has some striking parallels with Beethoven's Op. 29 string quintet. Even though the tonic of

Cherubini's overture is in D major (as opposed to Beethoven's quintet in C), there is a similar working out of the C<sub>2</sub>-C#-D trichord, first heard in the slow introduction to the overture. In addition, Cherubini's second harmonic area in the dominant, juxtaposes A minor in its first period with A major in its counterstatement (Beethoven *preceded* his second harmonic area in A major with a passage in A minor). In Cherubini's overture, this relationship is reversed in the dominant extension that replaces what normally would have been a development section; here, A major succeeds to A minor. In both instances Cherubini works out the C<sub>2</sub>/C# dyad conflict that pervades the overture, similar to Beethoven's quintet. Cherubini also develops the F#/F<sub>2</sub> dyad conflict as well since the tonic major is also juxtaposed with its parallel minor, within the recapitulation: the second harmonic area reappears in the tonic minor, with F<sub>2</sub> also appearing within the context of B $\beta$  harmony. Be that as it may, what is significant is that both pieces develop the inherent properties of their complementary tritone systems on a background level.

Besides an increased interest in chromaticism in general, composers of the nineteenth century seem especially interested in exploiting the harmonic potential of the individual pitch classes of the rising PCA chromatic octave as compositional determinants. That is, each chromatic pitch in turn becomes either the focal point of a harmonic area or is treated as a significant voice-leading pitch, either as a leading tone or as a Neapolitan to a structural harmonic area. We have already seen how Neapolitan relationships, often associated with important system conflicts, govern the opening movement of Beethoven's "Appassionata" sonata discussed above. But Beethoven goes even further than this in his late quartets where there are numerous instances of PCA unfoldings that do not always support a tonic background. Significantly, these PCA unfoldings justify non-tonic expansions of secondary harmonic areas by providing extra weight to PCA notes that, in earlier works of the period, had often been passed through in an almost unceremonious manner. Just as in seventeenth-century modality, where harmonic relationships were often related by fifths on the local level according to the arrangement of their gamut system hexachords, the immediate pitch classes of the PCA in these late works may lead to local harmonic areas that seem deliberately to avoid tonic definition. A particularly good example of this occurs in Beethoven's string quartet in A minor, Op. 132 (1825); the harmonic plan and PCA unfolding of the first movement are given below as Diagram 6.3.

**EXPOSITION**

**1<sup>st</sup> Harmonic Area**

(a) *Assai sostenuto* → (b) *Allegro*

C.S.

+

**Bridge (mm. 30 ff.)**

Signature changes to 1 $\beta$

A minor

→ B $\beta$  – B $\_$  – C – E

a B $\beta$

D minor

i

b07— i6

$\beta$ II

V6/4 – 5/3 → i

$\beta$ II (becomes IV/F)

vi/F

**PCA: A**

0

**B $\beta$**

**B $\_$  C**

-----

**C (m. 39)**

**C# (m. 42)**

**D**

**D#**

0

1

2 3

3

4

5

6

**DEVELOPMENT**

[Bridge]

**2<sup>nd</sup> Harmonic Area (1<sup>st</sup> period) + Closing (2<sup>nd</sup> period)**

C7

F

F

Starts in F

gm -- cm

V7/F

VI

VI

**PCA: E**

7

**F**

8 (pcs 0-8 repeated)

(pcs 0 - 1- 2- 3- 4- 5-[6]-7 repeated→

**F**

**F#**

**G**

**A $\beta$**

8

9

10

11

**[DEVELOPMENT]**

Signature changes back to \_

**1<sup>st</sup> Recapitulation (m. 103): THEMATIC**

**1<sup>st</sup> Harmonic Area** Signature changes to 1# (m. 111)

C major (becomes  $\beta$ VI/e minor) –

B

E minor (relates to F at the start of the Development)

F

V/v

v

$\beta$ II/v (becomes IV/C)

**PCA: [A $\beta$  is sustained until it is enharmonically reinterpreted as G# before the 2<sup>nd</sup> Recap.]**

11

**2<sup>nd</sup> Recapitulation (m. 193):**

**HARMONIC**

1<sup>st</sup> Harmonic Area

Signature changes back to \_ (m. 138)

Bridge (mm. 151 ff.)

2<sup>nd</sup> Harmonic Area (mm. 159 ff.)

E7 → A minor

D minor – A minor (F/E)

C

V7

i

vi/C

VI/ e minor (e doesn't act like a dominant of a minor) –

**PCA:**

**A $\beta$ /G#**

**A**

(pcs 0 -11 repeat)

11

0

[no bridge]

2<sup>nd</sup> Harm. Area (mm. 223 ff.)

A major collapses back into → A minor

E → A Major

E#/

F $\_$  → E resolves (along with all the other important chromatic dyad pairs) ||

I

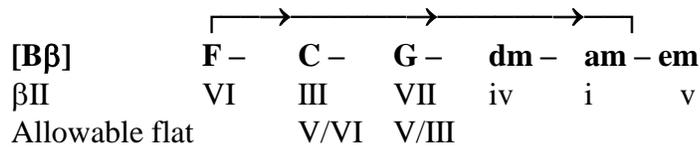
i

**DIAGRAM 6.3: Beethoven, Op. 132 in A Minor, 1<sup>st</sup> Movement**

The diagram above is not meant to explore the richness of detail that exists in practically every measure of the movement. However it does allow us to perceive, at a glance, the most important large-scale harmonic and chromatic relationships that pertain to our discussion. Thus one immediately notices that the second harmonic area is in F, the submediant, and that the exposition closes in that area without any motion to the relative major. In fact, the relative is related more to the submediant as its dominant than to the tonic.

A look at the system hexachord of the quartet allows us to perceive Beethoven's general *raison d'être* for the harmonic scheme that underlies the movement's exposition:

### “0” System Hexachord With A minor as Tonic



Instead of moving three fifths down from the tonic, A minor, to C, the relative, Beethoven moves past C down one more fifth to F. Through this action, Beethoven’s second harmonic area no longer shares the same “key signature” with that of the tonic, as it would have if he had moved to the relative major. In fact, Beethoven supports this contention himself by changing the signature to 1β during the last segment of the bridge. The reader should note that even though the key signature has changed, *the A minor tonic system matrix still applies*; the tonic continues to function on the deepest structural level. As a result, F major, as a harmonic area, does not displace A minor as a new tonic but remains on a lower structural level; that is, F still functions as VI within the key, no matter how long it is prolonged.

Another consequence of establishing VI as a harmonic area is that the submediant cannot fulfill the function of stability within the key. Remember, the more traditional motion to the relative rotates the scale of the tonic minor so that it now starts on the root of its system, here C. In addition, the harmonic motion to III would have been part of a larger arpeggiation of the tonic triad, *adding to the stability of the tonic*. However, when Beethoven moves to VI, a whole new set of conditions applies: besides the fact that the key signature is now one flat, the F itself, as a hexachordal root, is positioned at the very end of the system, and if this pitch class becomes a prolonged harmonic center, a significant system shift out of the “0” system is virtually a foregone conclusion (see the discussion below). In addition, the submediant cannot take part in the larger

unfolding of the tonic triad, further divorcing this area from the support of the tonic background. The move to F, in fact, implies an arpeggiation of the subdominant triad rather than that of the tonic. The above diagram also shows that Beethoven's approach to F follows the harmonic plan of the hexachord, moving down in fifths within a logical sequence: the first move away is towards D minor, then G, as an applied dominant chord to C, followed by the C itself as V/VI, and then finally to F. A moment in B $\beta$  is also included along the way, but is treated as a passing harmony.

The obvious model for a second key in VI within a minor-mode sonata movement is opening movement of Beethoven's own Symphony no. 9 which premiered the year before the Op. 132 quartet. Similar too, is how the relative major is avoided as a harmonic area in favor of its function as V/VI. However, unlike the Ninth Symphony, in which the submediant area is eventually defined as VI of the tonic key – that is, when B $\beta$  unexpectedly drops to A, the dominant, right before the development section – , the quartet avoids this functional relationship by moving directly into the development while still in the subdominant area. So while the contrapuntal relationship of the submediant of the dominant as an adjacent harmonic function is clearly kept separate, Beethoven instead prefers to develop the F/E relationship thematically, as *melodic* pitch classes that operate on a lesser structural level.

Beethoven's preoccupation with dissociating harmonic functions from their traditional relationships, in this case avoiding both C major as relative and the submediant and dominant as neighboring harmonies or harmonic areas, evidences Beethoven's interest in separating thematic from harmonic events. For example, one notices from the diagram of the first movement (Diagram 6.3), that both the initial statement of the Allegro "b" motive and its counterstatement do not begin on the tonic, the first with diminished harmony and the second on the dominant

triad as part of a  $6/4 - 5/3$  cadential progression. Starting the counterstatement on V instead of on I negates its traditional function as initiating the formal bridge period on tonic harmony.

Schumann, as we will discover, used this idea in the first movement of his piano quintet in E $\beta$ , Op. 44, where the counterstatement similarly begins on the dominant. However, Beethoven's placement of the recapitulation, or rather, recapitulations, is startling since there seems to be two of them.<sup>1</sup> The first is purely melodic, and like the second, follows the same theme rotation as the exposition, however with the opening statement returning within the minor dominant (m. 103). Within this first recapitulation, the second harmonic area returns in C major as VI/v, maintaining the same relation of i to VI that characterized the exposition. A second recapitulation follows this one (m. 193), this time the minor tonic returns and the second harmonic area is transposed into the major tonic, balancing the major submediant of the exposition. Thus the return of thematic events, while in the same order, is not always tied to their original harmonic associations.

Returning to the exposition of the quartet, of major interest to our discussion is that Beethoven's harmonic path to the submediant not only follows the ordering of hexachordal roots, but articulates every ascending chromatic pitch class of the PCA leading up to F major as pc 8 (see Ex. 6.6). Pc 0, A, is first heard in the cello on the second beat of the opening measure. The placement of pc 1, B $\beta$  is most startling since this pitch forms the root of its own harmony,

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<sup>1</sup>The unusual phenomenon of a double recapitulation, each within a different key, in the first movement of the Op. 132 Quartet has been noted in the literature: Basil Lam, *Beethoven String Quartets 2* (Seattle: University of Washington Press, 1975): 23-24; Harold Truscott, *Beethoven's Late String Quartets* (London: Dobson Books Ltd., 1968): 73-74; Joseph Kerman, *The Beethoven Quartets* (London: Oxford University Press, 1967): 247.

arpeggiated in unison by all the instruments, with a dotted rhythmic motive (mm. 18-19). Unlike the earlier “Appassionata” piano sonata, where  $\beta$ II was clearly associated with tonic harmony at the very start of the movement, the  $B\beta$  harmony in Op. 132 is unprepared and apparently divorced from tonic harmony; instead, the  $B\beta$  arises out of a 5-6 exchange with the preceding D minor triad which occurs on the downbeat of m. 18. The D minor triad here prepares for its fuller realization during the bridge (mm. 39 ff). After pc 1 has been presented, the  $B\beta$  moves up to  $B_$ , pc 2, in the first violin on the last beat of m. 20 in preparation for pc 3,  $C_$ , which arrives at the Adagio on the downbeat of m. 21 as part of a cadential 6/4. Thus,  $C_$  is absorbed within tonic harmony just at the point the counterstatement is reached.

# EXAMPLE 6.6: Beethoven, Op. 132 in A minor, 1<sup>st</sup> Movement

## (Exposition mm.1 – 48)

Violino I  
Violino II  
Viola  
Violoncello

Assai sostenuto (D# / C) (D# / C)

Allegro f dim. p

Adagio Allegro cresc. (PC 1) f PC 2 PC 3 is sustained fp p

23 p cresc. f

The image displays a musical score for three systems, likely from a piano or chamber music work. Each system consists of three staves: piano (top), violin (middle), and cello/bass (bottom). The score is annotated with various musical notations and performance instructions:

- System 1:** Features dynamic markings of *f* (forte) and *p* (piano). A circled '3' is present in the bass staff, with a 'V7/F' chord symbol below it. The key signature changes to D minor (one flat).
- System 2:** Includes 'cresc.' (crescendo) markings and 'PC 4' annotations. A circled '4' is in the bass staff. A '2nd Harmonic Area' is indicated in the violin staff.
- System 3:** Continues with 'cresc.' markings and 'PC 6', 'PC 7', and 'PC 8' annotations. A circled '6' is in the violin staff, and a circled '8' is in the bass staff. A '3rd' marking is also visible in the bass staff.

The return to tonic harmony now sets the stage for the next significant harmonic motion, the move into D minor, which takes place in the latter part of the bridge. The bridge itself (the entire period covers mm. 30-48) begins in B $\beta$  with a restatement of the dotted rhythm motive that had previously preceded the counterstatement at the end of the opening period. Here, however, the B $\beta$  acts as IV within a much larger submediant harmonic progression that moves into C7 as V7/vi (m. 33), and that ultimately reaches D minor, now interpreted as vi of the submediant. Pc 3, C $_$ , has thus been an active pitch of the array since the Adagio in m. 21 (associated there with A minor), and is now reinterpreted as the root of a dominant seventh applied to F major (see the unfolding PCA in Ex. 6.6). In order to prepare for the short D minor area that follows, the C $_$  becomes displaced by pc 4, C#, first as a melodic passing or

embellishing tone in mm. 37-38, and then, more structurally, as a leading tone in m. 40. Naturally enough, pc 4 now passes to pc 5, D, as we enter into D minor harmony, supported, significantly, by a change to  $1\beta$  in the signature. Pc 5 is in turn displaced by pc 6, D#, in the first violin (m. 44). What makes pc 6 particularly noticeable is its sharp dissonance within the preparatory C dominant seventh chord, the D# acting as a local half-step lower neighbor to E<sub>-</sub>, pc 7. In addition, the D# also attempts to prompt a system change to  $3\#s$ , but is kept in check by the persistent C<sub>-s</sub> in both the second violin and cello parts. The E<sub>-</sub> now takes on the function of a leading tone to the submediant (pc 8) at the start of the second harmonic area; the dominant preparation formally concludes at the authentic cadence to vi on the last beat of m. 47 (see Ex. 6.6). Two other 0-8 PCA rises occur within the second harmonic area of the exposition, one from the opening of the second harmonic period to the closing in m. 57, and another from the closing period to the start of the development (see Diagram 6.2).

There are other important observations to be made about the conclusion of the bridge passage that extends from m. 44 to the end of m. 47. To begin, the first violin part during these measures ascends an almost full chromatic octave from  $f^1$  (m. 44, beat 3) to  $f^2$  (m. 47, beat 3) the only chromatic pitch class absent being D#, pc 6, the missing pitch! Beethoven is careful not to include D# within this SCA (Secondary Chromatic Array) since he has already respelled the PCA pitch D# in m. 44 as E $\beta$  in the cello part at the end of m. 45. This time, the missing pitch spelled as E $\beta$  causes a major system shift into  $3\beta s$  that is sustained right through most of the development section! The motion to the  $3\beta$  system at the close of the bridge also prepares for F, a “flat-key” or subdominant area within the overall tonic hexachord of the “0” system. With the switch to the  $3\beta$  system, F major now comes under the control of the complementary E $\beta$ -A<sub>-</sub> tritone system from which it, as well as all other subdominant-related harmonic areas within the

movement, is ultimately derived.

Understanding the nature of system shifts also allows us to see why Beethoven would want to maintain pc 8 (F) as a *terminus* that is sustained for so long a period before moving on to the next pitch class in the series: the missing pitch of a  $3\beta$  system is F# (pc 9), the next pitch class to be introduced within the ascending PCA. Since Beethoven wishes to prolong submediant harmony until the development section, he is careful not to introduce this pitch at any time within the second harmonic area, since by so doing, he would effect a modulation back to the tonic system of the movement, and, consequently, would have to move harmonically out of submediant harmony. Of course, F# could have been introduced during the exposition if it had been contested by E $\beta$ , preventing a system shift, but then Beethoven would have introduced pc 9 “before its time,” as it were, since this F# as pc 9 would necessitate a harmonic motion best left to the development section. Referring to Diagram 6.2, we notice that the development starts in F major (in m. 73), the harmonic area that had ended the exposition.

The next goal of motion is G minor, which occurs soon after (m. 78 ff), over a dominant pedal. As a leading tone, F#, pc 9, moves directly to G, pc 10, within G minor harmony. However, the persistent E $\beta$ s that surround F# prevent the latter from modulating the system up to “0”, at least for the present (note that the key signature is still  $1\beta$  and that the  $3\beta$  system still prevails). C minor follows as the next harmonic goal, allowing the next PCA pitch, pc 11, A $\beta$ , to be raised. Interestingly, Beethoven spells pc 11 *not* as a leading tone, but as the *root* of an augmented sixth chord within C minor. Not surprisingly, pc 11 is sustained for an incredibly long period since it does not enharmonically alter its function to a leading tone (G#) until the structural dominant is reached on the last beat of m. 192, just before the second recapitulation! Thus the first complete rise of the PCA is sustained right through the first thematic recapitulation

and does not reach completion with pcs 11 and 0 until the downbeat of the harmonic second recapitulation. While it would be inappropriate to argue the point here, based on the previous PCA analyses, one could make the case that the first thematic recapitulation occupies a “lower structural level” than the second, and could well be considered as part of a much larger development section which has inserted material (in particular, the same thematic ordering as that of the exposition) between the end of the retransition and the start of the second recapitulation, rather similar, in fact, to that of the earlier “Appassionata” sonata.

But what of pc 9, F#, and its effect on the system shifts within the development proper? We had seen that F# when it was presented as pc 9 at the start of the development, could not effect a system change owing to the Eβs surrounding it. However, at the end of the C minor passage, which had introduced Aβ as pc 11, F# returns, now as a system-shift motivator (m. 91) as the leading tone to G as V/c. Here the F# is left uncontested and is allowed to shift the previous 3β system up to “0”, implying a change in mode as well. This last operation is accomplished in the next measure, supported by a change of key signature back to A minor. C major now displaces C minor in preparation for the move into E minor, the harmonic area that begins the thematic first recapitulation in m. 103. Beethoven now balances the lengthy 3β system with a move in the opposite direction, to that of 3#s, brought about by an enharmonic switch of the missing pitch from Eβ to D#, the latter pitch presented as the leading tone of the dominant minor on the third beat of m. 102.

As the second recapitulation unfolds, Beethoven once again changes key signature, now to 1#, in the same manner he had previously when he moved into F major within the exposition. Again, the reader should note that the change of signature reflects a move to into the dominant side of the key, just as the previous change to 1β reflected motion toward the subdominant side.

However, the matrix still pertains to the tonic matrix system only: in this case, D# has moved the system up to that of 3#s, the change of signature operating within this background system. The 3# system prevails right into the bridge period that leads to C major as the second harmonic area within the thematic first recapitulation. Consequently, the key signature changes back to A minor immediately before m. 138, where the harmony moves into D minor and then into C minor for a short period; note the return of Eβ and the 3β system, if only fleetingly. In turn, C major is first anticipated as a passing harmony mm. 146 – 148, and it is here that the system finally moves back up to “0”: the C\_ dispels the 3# system in m. 142, and within the same measure, Eβ brings the system down to 3βs only to be dispelled in turn by F# in m. 145 and the return of the “0” system.

Because of space considerations it is not possible to give a detailed analysis of the rest of the first movement of the Op. 132 quartet – for instance, the second harmonic recapitulation has its own complete PCA rise. It is important to note, however, that the entire second recapitulation is governed exclusively by the sharp side of the matrix; that is, either C\_<sub>-</sub>F# or A–D#, with the two system-shift motivators, D# and C\_, continually in conflict with each other in practically every measure. Consequently, there are only minute passages that are entirely in one complementary system or another, the other times the two system-shift motivators operate within very short distances of each other, effectively negating their respective attempts at prolonged system shifts. The conflict continues to the very end of the movement: the D# in m. 254 raises the system up to 3#s for a relatively extended period of four measures before C\_, in m. 258, finally reverts the system to “0” for the last time, seven measures before the end of the movement!

Beethoven’s legacy was of crucial importance to the evolution of compositional thinking

over the course of the entire nineteenth century, especially to composers working in German-speaking territories. We now turn our attention to several prominent German and Austrian composers who were particularly interested in expanding the forms and harmonic language of the Viennese classicists in new and novel directions. Pertinent to our discussion is how system and PCA analysis can aid our understanding of the compositional process in the work of these composers.