

CHAPTER 7

*Eleven Pitch-Class Systems in the Music of Middle to Late Nineteenth-Century Romantic Composers**I. Felix Mendelssohn: Piano Trio in D minor, Op. 49, 1st Movement*

As we have seen in previous chapters, the tendency on the part of composers to equate complementary systems, in particular that of the tonic with its parallel minor, can be said always to have existed, at least since the seventeenth century. Throughout the eighteenth century, with the advent of common practice tonality, the juxtaposition of parallel major and minor becomes even more striking, especially in operatic overtures (we may also add numerous arias and vocal ensembles as well), where the emotional intensity of such parallels in the overture acts as a purely sonic preparation for the vocal drama to follow. Mozart, Gluck, Cherubini are just a few of the most prominent composers to use this device. But it is not until the nineteenth century, especially in the works of Beethoven and Schubert, that composers actually “threaten” the hegemony of the tonic through constant iterations of the parallel mode and, therefore, the complementary system that it engenders.

Nineteenth-century Romantic composers seemed to have had a special

affinity for the minor mode, not only because it suited their emotional character, whether elegiac or demonic, but also because of the compositional problems inherent in the instability of the mode itself. Reviewing our discussion of this topic from the previous chapter, what underlies the instability is that the missing pitch of the minor mode is the leading tone of the dominant. Therefore, minor-mode compositions easily fluctuate between tonic minor and parallel major systems, creating unsettled 11 pitch-class tonal fields. For example, in the second movement of Beethoven's sonata, Op. 10 no. 3 in D major, the second movement in D minor constantly shifts between its 1β tonic system to the $2\#$ system of the parallel major each time a $G\#$ appears. This brings Beethoven's primary chromatic issue in that sonata — the conflict between $F_$ (within the 1β system) and $F\#$ (within the $2\#$ system) — to the forefront, the use of one or the other pitch class consistently playing the system-consonant tritone ($F - B_$) off its dissonant complement ($D - G\#$). In the minor mode, therefore, raising the parallel major through the use of scale degree #4 must constantly be deflected by minor tonic harmony. As a result, the conditions that govern minor-mode compositions are inherently more problematic and more difficult to rationalize than those in the major mode: a minor-mode tonic is considerably less stable than its major-mode counterpart. We therefore believe that systems analysis can best explain the reasons for

the inherent instability of the minor-mode, aside from its physical absence from the overtone series.

Of those Romantic composers who succeeded Schubert, Felix Mendelssohn (1809-1847) was extraordinarily inventive in finding new and creative solutions to the problems posed by the minor mode. Mendelssohn's Piano Trio no. 1 in D minor, Op. 49, first movement, is a particularly interesting example for our discussion considering how closely united is the formal structure of the movement with its system modulations. After a lengthy first harmonic area, one would expect the bridge leading to the formal second harmonic area to raise the dominant of the relative major, F. Instead, Mendelssohn opts for a different harmonic direction, moving towards what seems to be A minor, the minor dominant (see Ex. 7.1a, mm. 91-122). In fact, the relative major plays no part in the structural harmonic unfolding of the movement, a compositional choice no doubt influenced by the first movement exposition of Beethoven's Ninth Symphony, also in D minor.

EXAMPLE 7.1a: Mendelssohn, Piano Trio in D minor, Op. 49, 1st Movement,
 Bridge into 2nd Harmonic Area (mm. 91-122)

The musical score is presented in four systems. The first system (mm. 91-98) shows the Violino part starting with a forte (*f*) dynamic and an *espressivo* marking. The Violoncello and Pianoforte parts provide harmonic support. The second system (mm. 98-106) continues the bridge section, with dynamics ranging from *f* to *pp*. The third system (mm. 106-116) shows the transition to the 2nd Harmonic Area. The fourth system (mm. 116-122) is the 2nd Harmonic Area, marked *espressivo*. Chordal annotations include F3/G4, G4/2Bs, and F3/G4. Dynamics range from *sf* to *pp*.

In the exposition of the trio, the motion into A minor is confirmed by a harmonic progression in which an F augmented sixth chord resolves to V/V in

mm. 98-99, after which the dominant chord (E major) moves into A minor harmony in the next measure. The progression is repeated twice in mm. 106-111, the ever-present C_s maintaining minor dominant harmony. Throughout this passage, G#, the leading tone to the dominant, and the missing pitch of the prevailing tonic 1β system, is in constant conflict with F₋, its complementary system-shift motivator. As a result, the continued presence of these two pitch classes prevent any long-range system shift away from 1β to that of 2#s; the overriding tonic 1β system actually supports the motion into the minor, instead of the major, dominant.

Besides the fact that Mendelssohn has chosen to articulate “the wrong dominant,” one wonders about the nature of the German augmented sixth chord on F that keeps cropping up within the minor dominant progression leading to the second harmonic area. Unlike its use in major, where the chord is virtually obtrusive, the augmented sixth makes little if any noticeable effect as a chord supporting the progression into the *minor dominant*, since its root is a diatonic pitch class within the key. As we have seen in previous examples, the augmented sixth in the major mode, formed on the minor third degree of the tonic, also creates a contrapuntal relationship to the opening tonic chord itself (often through a long-range chromatic voice exchange), subsuming all the material from the opening of the movement to the point of the augmented

sixth within tonic harmony! However, such a large-scale relationship to the tonic is altogether mitigated if the tonic is minor since the root of the chord within the minor mode is diatonic, and therefore cannot form a chromatic exchange with the tonic. But Mendelssohn has something else in mind, and this chord will loom large later in the composition.

For the moment, events begin to take a different turn as we get closer to the second harmonic area. From mm. 111 on, the focus shifts to the V/V alone, since no dominant chord follows. In fact, the musical texture seems to vaporize in m. 115-116, where only the piano is left with an isolated E major triad on the first beat of the measure, followed by a simple undulation between E and F₋ in the left-hand of the piano part of the next two measures (taken over from the previous cello figure). Up to this point, the presence of F₋ has effectively prevented any G#s in the area from modulating systems. In m. 117 the bass of the piano moves down to a held dotted half-note D, while the oscillating neighbor-note bass continues in the right-hand, but now with F# displacing the previous F₋. This will now allow the next G# to activate a system shift up to 2#s. The resultant V 6/4/2 chord acts as a dominant preparation, but the listener still does not know the quality of the dominant that ensues. What makes the shift to F# most intriguing is its accentuation; that is, the lower pitch, E, now seems to emphasize the upper neighbor, F#,

with D supporting it. So Mendelssohn has very quietly, and most effectively, projected not just an inverted dominant seventh chord, but also the sound of the major tonic, D major, as preparation for the major dominant as the second harmonic area, beginning with the upbeat to m. 119, along with a concomitant system shift to 2#s. Perhaps Mendelssohn heard A major as a condition of the tonic 2# system by actually preceding the second harmonic area by an implied D major sonority in the piano, thus relating the following A major area to the tonic major and not to the tonic minor.

Polarizing the major dominant against a minor tonic is a most unusual harmonic relationship in a sonata-form exposition since the major dominant as a harmonic area is related to the tonic major, not to the tonic minor, and since the minor mode does not support a major dominant as there is no natural raised fourth degree in minor. Indeed, a large-scale move into the major dominant may well endanger the integrity of the minor mode as a background tonic. This may be the reason why Beethoven avoids minor tonic/major dominant large-scale harmonic relationships in his minor mode pieces, preferring, instead, third-degree relations (relative or submediant) with the minor tonic. But Mendelssohn, again, has his eyes set on further developments that will justify all his harmonic motions, if not at present, at least through hindsight. One must always keep in mind Mendelssohn's extensive classical

training, and his sensitivity to classical balance and proportion, especially in his chamber music. An essential component of classical sonata-form procedure is the relationship between the exposition, which often raises musical ambiguities, and the recapitulation, where these same ambiguities are dealt with and resolved into tonic harmony. In this sense, Mendelssohn is very much a classical composer.

As soon as the A major second harmonic area begins (C# has now displaced C₋), G# returns within V/V harmony (m. 123, see Ex. 7.1) without any conflicting F_s to prevent a system move up to 2#s. The 2# system remains in effect throughout the A major area until m. 164 where F₋, as part of D minor harmony (iv/V), within the lengthy two-part transition to the closing area, reverts the system to 1β. D minor, along with its system shift, now prepares for the A major dominant to collapse into its own parallel minor for the closing area — where the opening theme of the movement is repeated — and codetta. Regaining the minor dominant, after it had been displaced by the major dominant at the end of the bridge, is a necessary harmonic gesture at this stage within the exposition, if the underlying tonic minor is to retain its hegemony. Beethoven's "Appassionata" piano sonata is quite different at this point since Beethoven completely abandons any large-scale reference to the F minor tonic at the end of the exposition (see Chapter 6). Interestingly,

both Mendelssohn and Beethoven do not repeat their expositions, but each has a different reason for not doing so. Beethoven's closing is so harmonically intense, and the music has traveled so far away into A β minor, that the end of the exposition has no harmonic relationship to its beginning; meaning, there is no dominant function to motivate a return to tonic harmony. Beethoven's intent here is to thrust the exposition into the development: one dissonant harmonic area following another without the momentary release of a tonic return. Without a first ending acting as a transition, raising the dominant as a voice-leading chord, a repeat of the exposition would be futile and unconvincing. On the other hand, Mendelssohn's switch to A major at the start of the second key is a powerful gesture that, if left unchecked, would seriously undermine one's understanding of the tonic mode as minor. Once Mendelssohn reverts to the minor dominant, it would be pointless to restate the whole process over again.

Concurrent with the dramatic play of major/minor ambiguity within the second harmonic area, is also the dramatic confrontation of complementary systems. Sometimes these system shifts take unexpected turns that only add to the modal uncertainties swirling around them. For instance, one would expect that when D minor reenters the picture, in the transition to the closing area, the system would not only revert to l β , but that the tonic system would remain

in effect throughout the minor dominant area. Initially, this is exactly what happens (m. 164), but G#, as leading tone to the dominant, soon returns to challenge the 1β system. However, the omnipresent F_s prevent any modulation out of the 1β system. By m. 172, G# gains a bit more control, the 2# system lasting three measures, before F_ transforms the system back to 1β. Measures 183-186 are particularly intense, G#s and F_s follow each other relentlessly until F_ finally remains uncontested right before the closing area begins! Within the closing area itself, G# gains greater ground, the 2# and 1β systems alternating practically every two measures. Again the process accelerates as the music approaches the codetta, but this time it is G# that “wins” the conflict, and the codetta, in A minor, actually begins in a 2# system. If we draw the 3-hexachord system for both 1β and 2#s, we notice that A is a root pitch in both systems – as the dominant minor in D minor and as the dominant major in D major:

1β 3-Hexachord System (D minor)

Quality of 3 rd :	D	A	E_/Eβ	B_/Bβ	F_/F#	C_/C#
Hexachord root:	Bβ	– F	– C	– g	– d	– a
Harmonic function:	VI	III	VII	iv	i	v

G#/Aβ is the missing pitch of the system

2# 3-Hexachord System (D major)

Quality of 3 rd :	Bβ/B_	F#	C#/C_	G_/G#	D_/D#	A_/A#
Hexachord root:	G -	D -	A -	e -	b -	f#
Harmonic function:	IV	I	V	ii	vi	iii

F_/E# is the missing pitch of the system

Likewise, in both systems, the A can support either a major or a minor third, a condition that extends into harmonic areas as well. The possibility of interpreting a harmonic area within two opposing systems is rather similar to compositions in which a particular harmonic progression is ambiguous as to what key it actually relates to. For example, in the Schubert String Quintet Op. 163 in C major, discussed in the previous chapter, the Eβ area is ambiguous as to its function: is it a passing harmony to the dominant, an area in its own right, or an extension of tonic harmony? Schubert seems to imply all three. Interestingly, a systems analysis of the first half of the Prelude to Wagner's *Tristan* shows a continual oscillation between an initial "0" system, whose tonic is ambiguous (with no sharps or flats in the signature, A minor, A major and C major could all vie as possible tonics), and that of 3#s, while the second half moves back and forth between a "0" system and that of 3βs. Similarly, Mendelssohn's A major second harmonic area is equally ambiguous as to its background function: is it V of D minor, V of D major, or is it simply a passing motion that happens to occupy a rhythmically strong

position, but one that ultimately leads to a higher structural minor v that ends the exposition? As it happens, the codetta's 2#s system does revert to 1β in m. 217, at least temporarily. The G# returns, along with the 2# system, a few measures later (m. 221), one beat before the start of the development.

After examining the system modulations in the exposition, one is struck by the fact that the entire exposition is governed by only two complementary tritone systems: the tonic 1β system of F – B_– which continually conflicts with its 2# tritone complement, D — G#. Oddly enough, there is not a single instance *in the entire exposition* of Aβ as a pitch class, nor as the root of the complementary 4β system of Aβ – D, not even in passing! Rather, Mendelssohn consistently spells pc 6 as G#, most likely because of the harmonic design of the exposition and its emphasis on the major dominant. As a result, there is little room, or need, to enter into flat-side harmonic areas. Mendelssohn reserves the exploration of flat-side harmonic areas for the development section which follows.

Like so many Romantic development sections from Schubert on, Mendelssohn's is leisurely, lengthy, and purely melodic, constructed out of material from the exposition sequentially repeated in different harmonic areas. The development begins by repeating the thematic material of the codetta (actually, the opening theme of the movement), and in the same

harmonic area, the minor dominant. As in the codetta, A minor is heard within a 2# system, but now its function is to initiate an inverted fifths cycle — A minor, D minor, G minor, C minor — where the next fifth after A minor is D minor. Naturally, when the D minor area arrives (m. 230), F₋ returns as well, shifting the system back into 1β. The 1β system is now sustained over the course of the fifths cycle, until m. 250 where Bβ (VI) is reached as the primary harmonic goal of the development. The Bβ area, which restates the second theme, is extended by a counterstatement that turns into a *fugatto*, the end of which initiates another fifths cycle: D minor, G minor, C minor, F minor, Bβ. It is during the C minor area within the cycle that Mendelssohn finally explores the Aβ – D tritone system of 4βs. In mm. 291-315, Aβ is in constant conflict with B₋, the complementary-system pitch-class motivator, the only pitch that can prevent Aβ from sustaining a 4β system. Eventually, in m. 315, B₋ displaces Aβ altogether, and the 1β system is temporarily restored. We say temporarily, because G#, along with the 2# system, returns in m. 325 as the music moves into the dominant for the lengthy retransition that will lead to the recapitulation (mm. 338 ff.) The prolonged dominant of the retransition is heard at relating to tonic harmony primarily because of the Bβ augmented six chord that introduces the A major area (m. 337). This same progression will recur in the recapitulation, as a structurally significant

event (see discussion below). For the rest of the development, the original complementary tritone systems of F - B_♭ and D - G[#] govern the harmonic action with the 1βsystem finally displacing the previous 2#system only in m. 357, ten measures before the recapitulation.

Within the development section, the Bβ area, after being interrupted by the second fifths cycle, returns, now interpreted as a single Bβ augmented sixth (m. 327) chord which then drops to the dominant in the next measure, for the start of the retransition. The entire development can thus be reduced to a simple contrapuntal progression: A Minor (v) — Bβ (VI) — Bβ aug. 6 — A (V) — D Minor (i), in which A is continually elaborated by its upper neighbor Bβ throughout.

But our main concern is what happens in the recapitulation which begins on the upbeat to m. 367. Example 7.1b represents the end of the bridge up through the beginning of the transposed second harmonic area. The bridge itself, not unlike classical treatments of recapitulations, is entirely reworked; however certain harmonic details remain as significant events transposed from the exposition. For example, we mentioned the effectiveness, or lack of it, of the F augmented six chord that occurred at the latter part of the exposition bridge, and that served to prolong the minor dominant area before the major dominant second harmonic area. That same augmented sixth now

returns, but this time within the minor tonic, appearing, not three times, as it did in the exposition, but only once (see m. 426 of Ex. 7.1b), and with much greater effect. By transposing the augmented sixth chord a fifth down from F to B β , the chord contains within it the two pitch classes of the primary system conflict of the movement; namely, G \sharp and F $_$, the two system-shift motivators that have been in continual conflict since the development section's retransition. In fact, this same progression, B β augmented sixth to the dominant, was anticipated at the point of retransition (see above), the prolonged dominant supported by a system shift to the 2 \sharp s. However, unlike the retransition passage, the recapitulation's B β augmented sixth chord is momentarily prevented from shifting the system to 2 \sharp s since both G \sharp and F $_$ are contained within the same chord. However, the G \sharp , placed in a prominent register (in the first violin), anticipates the actual system shift that does occur two measures later (m. 428) where an uncontested G \sharp is heard an octave lower in the right hand of the piano part. With the restoration of the 2 \sharp system, we are now prepared for the second harmonic area to return in D major, a transposition down a fifth from the analogous A major area in the exposition. Here the system and the key come together: both are in 2 \sharp s, and, perhaps more importantly, the D major in the recapitulation fulfills the implied relationship of A major to the tonic major that we saw in the

exposition!

EXAMPLE 7.1b: Mendelssohn, Piano Trio in D minor, Op. 49, Recapitulation (mm. 420-438)

The musical score for Mendelssohn's Piano Trio in D minor, Op. 49, Recapitulation (mm. 420-438) is presented in three systems. The first system, labeled '[Bridge]', shows the Violino and Violoncello parts with a *dim.* dynamic, and the Pianoforte part with a *cresc.* dynamic. The second system, labeled '2nd Harmonic Area', features the Violino and Violoncello parts with a *pp* dynamic and the Pianoforte part with a *p* dynamic. The third system continues the piano part with a *p* dynamic, followed by *dim.* and *pp* dynamics. The score includes various musical notations such as slurs, accents, and dynamic markings.

The rest of the recapitulation follows the same harmonic structure, transposed into tonic harmony, and thematic ordering as that of the exposition with the closing area transposed into D minor. As in earlier Classical procedures, the coda summarizes previous events and also resolves system and dyad conflicts, primary issues that are played out over the course of the movement. With regards to system analysis, the coda's plunge into a prolonged 4β system is both fascinating and problematic. In m. 548, an $A\beta$ is introduced as part of a $B\beta$ $6/4/2$ chord that acts as an applied dominant to an area in the

Neapolitan, Eβ, in m. 350. In m. 558, the Neapolitan resolves to D major in 6/4 position, where the theme of the second harmonic area is restated. Thus the final major/minor conflict of the movement is now played out on a grand scale between tonic major and tonic minor. However, the move to D major harmony does not effect a concomitant change in systems since no B_s appear within the passage. Rather, after eight measures of unstable D major harmony, with A in the bass, Bβs enter as part of the minor subdominant, G minor triads sandwiched in between inverted D major triads, here functioning as V/iv (mm. 566-67). The G minor subdominant is now extended into one long pre-cadential harmony, delaying the final resolution to the minor tonic until the authentic cadence in mm. 579-80. The entire passage is subsumed under the prevailing 4β system, no B_s appearing to redress the system. Only after the arrival of D minor occurs, does B_s enter the picture (in m. 583) and finally bringing the system back up to 1β.

With the final resolution of D major to D minor, the primary dyad conflict of the movement, F#/F_s, is resolved as well. Both of these pitch classes interact with the main system conflict of the movement: F#, derived from the D – G# tritone system that supported D major, and F_s, derived from the tonic tritone system of F – B_s, and which supported D minor. The constant battle for superiority between the 1β and 2# systems, with its jostling back

and forth between major and minor, maintained both F# and F₋ as active pitch classes all the way through the movement. Most sophisticated in this regard was the prolongation of the major dominant that was the focal point of the exposition's second harmonic area. As mentioned previously, the deeper meaning of the A major area was that it presumed the tonic major. Its transposition into the tonic major in the recapitulation lent further support to the contention that the ultimate dyad conflict of the movement was indeed F#/F₋.

With the emphatic return of D minor in the coda (m. 580), the rest of the movement is free to resolve the last remaining issue: the conflict of the original system motivators, G#/F₋, each one trying to assert its individual tritone system. The coda, therefore, is quite systemically active throughout its last period, reaching a climax in m. 593, where the tonic matrix G# diminished chord appears, supported by a double *forte* in the piano part and a *sforzando* in the strings. Finally, in m. 600, F₋ preempts G# for the last time, the rest of the movement being totally diatonic, except for C#, the leading tone.

For reasons of space, we cannot go into detail about the PCA unfolding in this work, however this topic will be dealt with more fully in the following discussion of Schumann's Piano Quintet in E β .