

Harmonic Process, Melodic Process, and Interpretive Aspects of Chopin's *Prelude in G Minor*

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In many ways, Chopin's "G Minor Prelude" must be considered a most unstable tonal work. Most obviously, the constant lack of an attack on the first beat in all voices within the texture helps bring about the sense of restlessness. More important, however, the agitato quality stems from the conflicts between its melodic and harmonic processes.

The concept of melodic process is central to a new analytical method, the implication-realization model. This method evaluates relationships both prospectively, according to the implications found in melodic processes, and retrospectively, according to the presence or absence of realizations for those implications.

Eugene Narmour, one of the formulators of the method, has suggested that the theory might be applied to harmony as well as melody, and has indeed provided some instances of multi-parametric analysis.¹ Clearly, harmony can form patterns of implication and realization. The most orthodox harmonic changes consist either of successive consonances or

¹Eugene Narmour, Beyond Schenkerism: The Need for Alternatives in Music Analysis (Chicago: University of Chicago Press, 1977). See especially pp. 144-166 for applications of the implication-realization model to harmony, as well as a method for analyzing rhythm centered around duration.

of dissonances followed by their resolving consonances. Simply put, dissonance implies a realization by its resolution.²

In order to treat the problem of adapting the principles of the melodic theory to the harmonic theory, we must establish what consonance and dissonance are. We shall use figured bass, not only to differentiate between consonance and dissonance, but also to rank intervals within each category. In thoroughbass practice, an unfigured tone indicates $\frac{5}{3}$ above the given pitch in the bass, thereby assigning primacy to the $\frac{5}{3}$. One cannot deny that the $\frac{5}{3}$ is the most closural harmony—aside, of course, from unisons, octaves, or multiple octaves, which are not truly harmonic, since no difference in pitch class occurs. As Example 1A shows, the $\frac{6}{3}$ is slightly less consonant and harmonically less closural than the $\frac{5}{3}$ because one factor of the $\frac{5}{3}$ is displaced. A $\frac{6}{4}$, however, displaces both the 5 and the 3 and creates a dissonance, namely the fourth above the bass. (In this study, the "x" as shown in Example 1A will indicate a dissonance above the bass.) Because the fourth is dissonant only above the bass, it is the weakest dissonance. In summary, all consonant intervals above the bass other than the sixths, which would conflict with the fifth of the $\frac{5}{3}$ norm, are potentially closural—that is, the thirds, the perfect

²Although a dissonance can be likened to a harmonic implication, the fact that a single harmony is in itself relational means that in context, differentiation must be made between the analytical treatment of harmony and that of melody. Briefly, a melodic pitch as an individual phenomenon is neither inherently open nor inherently closed. That is, a single tone cannot imply a continuation with any degree of specificity. Further, a configuration consisting of two melodic tones establishes a beginning and an end, but it does not set up a clearly implicative pattern because no realization can take place until the beginning and middle of a process have been determined. So, in order to emerge as an implicative pattern, a melodic process must contain at least three pitches.

On the other hand, a dissonance in tonal music contains at least one inherently nonclosural relationship within itself, because a dissonant interval implies resolution to a consonant interval, meaning that the horizontal unfolding of two harmonies could result in a harmonic process. For instance, if a work were to begin on a dissonant chord followed by its resolution, its initial harmonic process could consist of only two chords. Nonetheless, because harmonic structures clearly form implications, the methodology of the implication-realization model can be adapted to describe harmonic processes.

Example 1. Consonance and Dissonance.



fifth, the unison, and the octave. All other intervals would be dissonant.

Analysts agree that the consonant intervals can be further classified into perfect and imperfect. We can relate this dichotomy to the concept of ranking according to the degree of closure. The terminology for cadences that distinguishes perfect from imperfect also implies that an octave between the outer voices is more closural than a fifth or a third. Further, in line with the $\frac{5}{3}$ norm suggested by the figured bass system, closure provided by two voices forming a perfect fifth would be stronger than closure resulting from two voices forming a major or minor third. This is because the interpolation of either type of third between the two tones of a perfect fifth will result in a closural consonance. A third, on the other hand, may combine with either a fifth or a sixth above the bass to create a consonance; only one of these, the perfect fifth, produces a closural consonance, the $\frac{5}{3}$ norm. In fact, if we add a minor sixth plus a major third above the bass (as in C-E-A^b in Example 1B) or if we add a major sixth plus a minor third above the bass (as in C-E^b-A in Example 1C), actual dissonance would result between the two upper parts (which will be shown in this study by a squared bracket followed by an "x") despite the fact that no dissonance occurs above the bass. Therefore the third by itself is less ambiguously closed than the fifth and for that reason is inherently less closural.³ Thus, in a context consisting of

³In other words, we can leave aside the ancient mathematical-acoustical basis for the theory of consonance and dissonance as long as we understand that the major and minor triads form the premises for the norm of closural consonance. The mathematical basis for the $\frac{5}{3}$ is another matter, but that theory's problem with justifying the existence of the minor triad is, in effect, circumvented by simply basing the thoroughbass system on the $\frac{5}{3}$ irrespective of whether or not the 3 is major or minor.

consecutive consonances, we can rank the octave ahead of the fifth, and the fifth ahead of the third in degree of closure.

Because thoroughbass measures intervals above the bass, a theory of consonance and dissonance derived from thoroughbass would rank dissonance above the bass as being stronger than dissonance between upper voices. In most contexts, however, the number of dissonant intervals within a chord can determine the relative dissonance of the chord.

Now that the basic concepts of consonance and dissonance have been clarified, let us discuss some of the principles of the melodic theory with an eye toward eventually applying them to the analysis of harmonic process. Melodic structures are either continuous or discontinuous with regard to direction. In Examples 2A and 2B, we see that if

Example 2. Melodic Process.



a melody moves from an initial tone—C in these cases—upward by step as through D to E, or triadically as from C through E^(b) to G, we can say that C-D implies E and that C-E^(b) implies G. C, then, is the initial tone in both examples. Each melodic process proceeds through a medial tone, D and E^(b) respectively. The E in Example 2A and the G in Example 2B are called terminal tones, or realizations. Generally, medial tones are transitional and thus nonclosural—whereas terminal tones are closural.

Also, adjacent intervals within an unidirectional pattern may be combined into one process. In this way, the ascending thirds, C-E^(b) and E^(b)-G in Example 2C can combine with the ascending fourth, G-C, to form a single triadic ascent, C-E^(b)-G. This also means that one could, for instance, mix a rising second with a rising third, as in the C-E^(b)-F ascent in Example 2D, or unidirectional fourths and fifths, as in the C-G-C descent in Example 2E. Continuation patterns, then, take in several intervallic types.

On the other hand, discontinuous melodic processes (Examples 2F and 2G) usually involve a gap ("G" in the examples), which is then filled by a subsequent tone. If the fill lies between the pitch-levels that formed the gap (C-E in Example 2F), then the gap is filled by substitution (D, symbolized by "S"). If the filling process arrives at a return of the

initial tone, then the gap is said to be completely filled—as in Example 2G, where the ascending gap from C to E is followed by a descent through D to C.

With this very general summary of the melodic typology of the implication-realization model in mind, we can consider general and specific aspects of Chopin's prelude and observe the adaptation of the melodic terminology to the analysis of the harmonic process. Recall that the work is propelled by the denial of rhythmic support on the first beat. It is also true that the only $\frac{5}{3}$ on the downbeat (or, for that matter, on any beat) takes place at the very end. In fact, although the work appears to be based on a series of suspensions followed by their resolutions, relatively few consonances appear in the work. Rather, the suspensions tend to move to lesser dissonances, not to consonances that would create actual resolutions. All of these factors contribute to the overall effect of relentless forward momentum.

In addition to the lack of rhythmic support for the $\frac{5}{3}$, the outer-voice melodic processes on the lowest level—that is, the contiguous connections diagrammed in Example 3—show that except at the end, every $\frac{5}{3}$ occurs in the middle of a melodic process. In mm. 5-7 of Example 3, the $\frac{5}{3}$'s appear in the filling process that closes the B^b-G gap from mm. 4-5 of the soprano line. When the fill, D, is reached in m. 9, the harmony is not a $\frac{5}{3}$. In addition to the more slowly moving chromatic descent in mm. 12-15 in the top voice, the overall sequential patterns support $\frac{5}{3}$'s only on medial tones. In mm. 17 and 19, as well as mm. 25 and 27, the sudden octave leaps in the bass form gaps that initiate long fills. Furthermore, the F's above the D^b's in the soprano line (mm. 19 and 25) are clearly nonclosural: medial in m. 19, initial in m. 25. The A^b's that lie below $\frac{5}{3}$'s in mm. 18 and 20, and also in mm. 26 and 28, occur in the middle of the descending fills in the bass. The same can be said for the G's in mm. 22 and 30. In mm. 23, 31, and 33, the soprano line's G's are nonclosural: either the G initiates a gap with C (mm. 23-24 and 31-32) or the G is non-implicative (not shown with arrows affixed to the beams in the analysis of m. 33 because implication is denied, which means that no processive pattern results). Thus, only the final chord is a $\frac{5}{3}$ on melodically closural tones occurring on the downbeat—meaning that only the final chord has melodic closure in conjunction with harmonic closure, and that every internal point of harmonic closure is non-congruent with closure in the melodic processes of the outer voices.

Example 4 describes the symbols to be employed in the analysis of the harmonic processes. In the main the texture consists of four discrete voices, even though in each measure the first note in the highest voice is doubled an octave below and delayed by one eighth note

Example 3. Melodic Process and Harmonic Closure.

1 2 3 4 5 6 7 8 9

10 11 12 13 14 15

16 17 18 19 20 21 22 23 24 25

O.T.

G S

5/3 5/3 5/3

5/3 5/3 5/3

5/3 5/3 5/3 5/3 5/3 5/3

Example 3 continued

Musical score for Example 3 continued, measures 25-41. The score is written for piano (p) and features a treble and bass staff. The key signature is one flat (B-flat). The time signature is 5/3. The score includes various musical notations such as notes, rests, and dynamic markings (p). Measure numbers 25 through 41 are indicated above the staff. The score concludes with a double bar line and a repeat sign.

Measures 25-31: Treble staff shows a sequence of notes with slurs and ties. Bass staff shows a sequence of notes with slurs and ties. Measure 31 ends with a double bar line.

Measures 32-38: Treble staff shows a sequence of notes with slurs and ties. Bass staff shows a sequence of notes with slurs and ties. Measure 38 ends with a double bar line.

Measures 39-41: Treble staff shows a sequence of notes with slurs and ties. Bass staff shows a sequence of notes with slurs and ties. Measure 41 ends with a double bar line.

Example 4. Harmonic Process, mm. 1-4.

The image shows a musical score for the first four measures of Chopin's Prelude in G Minor. The score is written for four staves: Soprano (S), Alto (A), Tenor (T), and Bass (B). The key signature is one flat (F major/D minor). The time signature is 3/4. The analysis includes interval numbers above the upper staves and whole chord symbols below the bass staff.

Measure	Soprano (S)	Alto (A)	Tenor (T)	Bass (B)	Whole Chord Symbol
1	6	4x	2x	G	$\frac{6}{4}$
2	5 x 6 x	4x	2x	G	$\frac{5}{4}$
3	6	5°x	3	G	$\frac{6}{3}$
4	7x 6	4+x	3	G	$\frac{7}{4}$

throughout—serving to intensify the rhythm by providing an attack on the third eighth note of each measure. The numbers below each of the upper staves in the analysis indicate intervals above the bass—similar to thoroughbass practice and to the pedagogy for strict counterpoint. An augmented interval will be identified with a "+" sign, a diminished interval with a "°" symbol. The numbers for the whole chord will be shown below the bass staff—including numbers generally omitted in thoroughbass symbology—and the harmonies graphed according to the methodology of the implication-realization model.

Because each harmony cannot be evaluated without considering the relationships that interact within itself, whereas a single pitch can be measured by itself (as a frequency), melody and harmony must be treated somewhat differently with regard to analytical methodology and symbology.⁵ For instance, the fact that a harmonic process may end on a dissonance necessitates the invention of a symbol to describe such a terminal chord. This differs from the problems of level that arise in connection with melodic closure, where any tone may close a process if certain conditions are met, or where a process may close on a tone that is a realization on one level but may be nonclosural on another. In such cases, we can simply graph both levels. By contrast, it seems contradictory to show a harmonic

⁵As stated in Note 2, a single pitch can be measured by itself; a harmony must be measured in terms of relationships.

process ending on a dissonance, which is essentially open, as being closed on any level. Since dissonance is fundamentally unclosed, but a harmonic process may end on such nonclosure, the sign " $\overset{\cdot}{\rule{0.5em}{0.4pt}}\rightarrow$ " will be used for a dissonance that terminates a harmonic process. The symbol represents the inherent non-congruence that results from the placement of a dissonant harmony in a terminal position.

Example 4 shows that the first measure of the prelude ends in just that way. The harmony consists of $\begin{matrix} 6 & 5 & 6^\circ \\ 4 & 4 & 5^\circ \\ 2 & 2 & 2 \end{matrix}$. It

would seem that the $\begin{matrix} 6 \\ 4 \\ 2 \end{matrix}$ and the $\begin{matrix} 5 \\ 4 \\ 2 \end{matrix}$ would be equally dissonant.

Both contain a total of three dissonances—two dissonances above the bass, $\begin{matrix} 4 \\ 2 \end{matrix}$, plus one dissonance between upper parts. Because the $\begin{matrix} 4 \\ 2 \end{matrix}$ carries through the second chord without resolving, however, the $\begin{matrix} 5 \\ 4 \\ 2 \end{matrix}$ conveys more of a sense of urgency

to resolve than did the initial $\begin{matrix} 6 \\ 4 \\ 2 \end{matrix}$. The final $\begin{matrix} 6^\circ \\ 5^\circ \\ 3 \end{matrix}$ of the

first measure contains only two dissonances, the 5° and the second between 6 and 5 in the upper parts. Moreover, G-F# in the bass resolves one of the preceding dissonances, 2-3 with the A in the tenor line. Thus, the second dissonance is perceived as stronger than the first; the final chord is the least dissonant even though the C in the alto line and the A in the tenor line, which is now consonant, are retained. The principle of retained tones being more dissonant—such as we observed in the $\begin{matrix} 6 & 5 \\ 4 & 4 \\ 2 & 2 \end{matrix}$ motion—then, applies

only when all other harmonic factors are equal, not when verifiable differences can be discerned, as in the $\begin{matrix} 5 & 6 \\ 4 & 5^\circ \\ 2 & 3 \end{matrix}$

progression. The result of all this is a harmonic gap whose fill is the last and least dissonant chord; the harmonic process is highly open at the end.

The harmony in m. 2 contains fewer dissonances. The initial $\begin{matrix} 6 \\ 5^\circ \\ 3 \end{matrix}$ includes three dissonances and forms a gap with the

final $\begin{matrix} 6 \\ 5^\circ \\ 3 \end{matrix}$ of m. 1. The $\begin{matrix} 7 & 6 \\ 5^\circ & 4 \end{matrix}$ motion in m. 2 shows a les-

sening by one dissonance each when the soprano ascends, thereby resolving the F# above the Eb to G above Eb, and when the bass moves from A to Bb, which resolves the seventh

to the sixth in the outer voices. Thus, the final $\frac{6}{4}$ is the weakest dissonance and fills the gap, but is nonetheless harmonically nonclosural. The tenor line in the texture appears to merge with the alto line; because the C in the tenor is consonant with the A in the bass, it is permitted, so to speak, to leap to the E^b. It is difficult to say that the unison between the two inner voices creates an additional fourth above the bass when the lowest voice moves to the B^b. In this context, it seems unlikely that the temporary lack of a separate tenor line increases the degree of dissonance.⁶ Rather, it appears that a $\frac{6}{4}$ is formed above the B^b—resulting in the least mobile harmony in m. 2.

A process moving from the $\frac{6}{4}$ to $\frac{6}{4}$ to 5^+ which shows an

4	4	4
	2	2

increase in degree of dissonance links mm. 2 and 3. On the surface, m. 3 appears to be a transposed repetition of m. 1; it is also analyzed as a harmonic gap structure. Measure 3, however, is more harmonically intense than m. 1, even though its initial $\frac{6}{4}$ contains only two dissonances, as compared to

$\frac{4}{2}$

three for the first chord of the piece. Nevertheless, both the gap-forming harmony and the fill are more unstable than their counterparts in m. 1. The second harmony in m. 3, 5^+ ,

$\frac{4}{2}$

in fact, contains only one consonance: five dissonant intervals arise, and the $\frac{4}{2}$ from the preceding chord remains unresolved. After such a strong dissonance, even a chord like the final $\frac{6}{5^0}$ in m. 3 is a more closural harmony, despite

$\frac{5^0}{3}$

its three dissonant intervals. In sum, m. 3 is far more unstable than m. 1. Furthermore, it is a transposed repetition of the first measure, which also brings about a sense of forward motion.

In the graphs that symbolize  (not ) , it is

not necessary to continue the upper beam's process beyond the terminal (but open) harmony because the symbol for the gap already locates the point of greatest dissonance. In other words, the nonclosure of the harmony has already been symbolized because it has been labeled a gap.

As in m. 2, the harmonic process in m. 4 to some extent relieves the tension as the level of dissonance decreases:

⁶If anything, the degree of dissonance would be decreased by deleting a voice.

from three dissonances in the $\begin{smallmatrix} 6 \\ 4^+ \\ 3 \end{smallmatrix}$ to one in the $\begin{smallmatrix} 7 \\ 5 \\ 3 \end{smallmatrix}$, to the

fourth above the bass in the $\begin{smallmatrix} 6 \\ 4 \\ 3 \end{smallmatrix}$ at the end, which of course leaves the harmony of this measure open. The initial $\begin{smallmatrix} 6 \\ 4^+ \\ 3 \end{smallmatrix}$ of

m. 4 and the final $\begin{smallmatrix} 6 \\ 5^0 \\ 3 \end{smallmatrix}$ from m. 3 are essentially equal in

dissonance, so no arrows are shown between the two chords. In summary, the harmonic process that encompasses mm. 3 and 4 shows a gap between the $\begin{smallmatrix} 6 \\ 4 \\ 2 \end{smallmatrix}$ and $\begin{smallmatrix} 5^+ \\ 4 \\ 2 \end{smallmatrix}$ begins with the $\begin{smallmatrix} 6 \\ 5^0 \\ 3 \end{smallmatrix}$ and in

m. 4 moves through the $\begin{smallmatrix} 7 \\ 5 \\ 3 \end{smallmatrix}$ to the $\begin{smallmatrix} 6 \\ 4 \\ 3 \end{smallmatrix}$.

Example 5. Harmonic Process, mm. 5-9.

In Example 5, the nonclosure of the gap in the soprano line between B^b and G in m. 5 is reinforced by the open-ended harmonic gap from $\begin{smallmatrix} 6 \\ 4 \\ 2 \end{smallmatrix}$ to $\begin{smallmatrix} 7^0 \\ 5^0 \\ 3^0 \end{smallmatrix}$. Harmonically, the gap is

filled through the $\begin{smallmatrix} 6 \\ 4 \\ 2 \end{smallmatrix}$ to the $\begin{smallmatrix} 8 \\ 5 \\ 3 \end{smallmatrix}$ in m. 5. Because of the

transposition of m. 5 in m. 6, however, the soprano line continues downward chromatically (as mentioned before) with the same harmonic process as in m. 5. Measure 7 is identical to m. 6, meaning that the continuation of the

chromatic descent is postponed, and, of course, that the harmonic process is the same for both measures.

After the descending fill of the gap in the soprano line reaches E^b above the 7° in m. 8, the opening four bars are

$\begin{matrix} 5^{\circ} \\ 3 \end{matrix}$

repeated an octave higher in mm. 9-12. However, the E^b in the soprano line takes on a new meaning in m. 9 relative to its function in the first measure. In m. 1, the E^b was the initial tone of the E^b -D neighbor motion—a rather startling non-tonic beginning. In m. 9, by contrast, the E^b -D motion in the soprano line terminates the fill of the B^b -G gap from mm. 4-5. The conflict between the melodic closure in the soprano line on the D with the harmonic gap resulting from the non-resolution of the C and A in the inner voices is particularly intense here. Moreover, the effect of the repetition of the opening, which would indicate at least temporary harmonic stability in most tonal works, in this case redoubles the sense of forward motion because of the lack of stable, consonant harmony. Not even the additional weight of the melodic closure in both outer voices at this point brings about any sense of overall closure. (See Example 3.)

Although it is unnecessary to examine mm. 9-12 (inasmuch as they are, as mentioned, an octave transferral of the first four measures), the differences between the harmonic processes linking mm. 4-5 with those linking mm. 12-13 require comment. In m. 5, the melodic gap in the soprano line acts in conjunction with the harmonic gap from 6 in m. 4 to 7° in

$\begin{matrix} 4 \\ 5^{\circ} \\ 3^{\circ} \end{matrix}$

m. 5. On the other hand, the harmonic process from m. 11 (Example 6) actually reaches a point of closure on the $\begin{matrix} 5 \\ 3 \end{matrix}$ in m. 13, although any sense of overall closure is thwarted by the nonclosure of the B^b -G gap (shown in Example 3) in the bass line between mm. 12 and 13.

Measure 14 is essentially a transposition of m. 13 (Example 7). In both measures, the harmony begins on a $\begin{matrix} 5 \\ 3 \end{matrix}$ chord and moves through a 6 to a gap formed by a 5 that is filled

$\begin{matrix} 4 \\ 4 \\ 2 \end{matrix}$

through a $\begin{matrix} 6 \\ 5^{\circ} \\ 3 \end{matrix}$ to a 5 in m. 14 and an $\begin{matrix} 8 \\ 5 \\ 3 \end{matrix}$ in m. 15. The harmony

in m. 15 proceeds through gradually increasing degrees of dissonance and reaches a 6^+ at the end. Although this chord

$\begin{matrix} 5 \\ 3 \end{matrix}$

is actually spelled as a 7, the fact that the G^b in the

$\begin{matrix} 5 \\ 3 \end{matrix}$

Example 6. Harmonic Process, mm. 11-13.

11 (cf. 3) 12 (cf. 4) 13

6 5+x x 6 x 6 7x 6 5

4x 4x 5⁰x 4+x x 5 4x 3

2x 2x 3 3

6/4 2 5+/4 2 6/5 0 3 6/4+ 3 7/5 6/4 5/3

Example 7. Harmonic Process, mm. 13-17.

13 14 15 16 17

5 6 5 x 6 x 3 4x 3 5 6 6 3

3 4x 4x 5⁰x 8 2x 8 x x 3 x x 4x 4+x 8

2x 3 5 6 4+x 6+x 8 2x 5

5/3 6/4 5/4 2 6/5 0 3 5/3 6/4 5/4 2 3 6/5 0 3 8/5 6/4 8/4 2 3 6+/5 3 8/6 4 6/4 2 8/5

35

64

42

25

52

Example 8. Harmonic Process, mm. 17-20.

17 18 19 20

S
3 4+x 7x 8 7x 8 3 4+x 7x 8 2x 3

A
8 2x 4x 5 5 6 8 2x 4x 5 7x 8

T
5 6 2x 3 3 4x 5 6 2x 3 5 6

B
8 6 7 8 7 8 8 6 7 8 7 8
5 5 4 5 5 3 5 4 5 5 5 6
3 2 2 3 3 4 3 2 3 2 3

G
8 6 7 8 7 8 8 6 7 8 7 8
5 5 4 5 5 3 5 4 5 5 5 6
3 2 2 3 3 4 3 2 3 2 3

⁷The Paderewski edition (Fryderyk Chopin, Complete Works, Vol. 1 (Warsaw: The Fryderyk Chopin Institute, 1949], p. 54) in fact shows an F[#] at this point. We shall also refer to the edition by Thomas Higgins (New York: W. W. Norton, 1973), which contains a reprint of the G. Henle edition (Duisberg and Munich, 1968).

moves through a $\begin{smallmatrix} 6+ \\ 4+ \\ 2 \end{smallmatrix}$. The $\begin{smallmatrix} 6+ \\ 4+ \\ 2 \end{smallmatrix}$ and the following 7 form a gap

that is filled by the 8 in m. 18. The notation in the $\begin{smallmatrix} 5 \\ 3 \end{smallmatrix}$

analysis clearly shows that the 7 above the passing B^b not $\begin{smallmatrix} 4 \\ 2 \end{smallmatrix}$

only functions as the end of a harmonic process moving toward greater dissonance, but also as the gap to be filled by the 8 in m. 18. After the 8, the harmony again forms a $\begin{smallmatrix} 5 \\ 3 \end{smallmatrix}$

gap, created here by the 7 and filled through an 8 to the 8 $\begin{smallmatrix} 5 & 6 & 5 \\ 3 & 4 & 3 \end{smallmatrix}$

in m. 19. Measures 19-20 are the same as mm. 17-18 except that the gap after the 8 in m. 20 is formed by a 7 and $\begin{smallmatrix} 5 \\ 3 & 2 \end{smallmatrix}$

filled by an 8. For the first time, we see a 6 chord, used $\begin{smallmatrix} 6 \\ 3 \end{smallmatrix}$

in this case as a fill. This is the only section where all of the dissonances occur above the bassline, which focuses attention on the tonally remote tones in the bass, D^b and A^b.

Example 9. Harmonic Process, mm. 21-25.

21 22 23 24 25

S 3 3++x x 4+x 7x 8 7x 8 3 3 3 6 x 5 3

A 8 2x x 2x 4x 5 5 x 6 x 8 8 7x 3 7x 8

T 6 5+x 6 2x 3 4x 5 6 5 5^ox 5

B 8 6 3 5+ 3++ 2 6 4+ 2 7 4 2 8 5 3 7 5 4 8 6 5 8 6 3 8 5 3 7 5 3 6 3 7 5 8 5 3

The initial $\frac{6}{3}$ in Example 9 moves through a gap, shown as $\frac{5^+}{3^{++}}$, that is filled very weakly by the $\frac{6}{4^+}$. The $\frac{5^+}{3^{++}}$

designation obviously requires some explanation. In Chopin's spelling the chord would be labeled 6^b and would

contain two dissonances above the bass, 4 and 2, and one dissonance between the alto and tenor lines. It would nonetheless form a gap with the preceeding $\frac{6}{3}$, and the gap would also be tenuously filled by the subsequent $\frac{6}{4}$, which

contains only two dissonances. The written F and A^b, however, ascend chromatically to F[#] in the top voice and A[#] in the tenor line, and therefore actually function as E[#] and G[#] as shown in Example 9. Hence, in this context with E[#] and G[#], the chord would be termed $\frac{5^+}{3^{++}}$, containing five

dissonant intervals.

To continue with the harmonic process in mm. 22-23, a gap is formed between the 8 and the 7. The fill of the gap

unfolds very gradually: through 8, which contains one

dissonance and 8, which includes no dissonances but is less

stable than its successor, the filling 8. In contrast to

its function in m. 20 (see Example 8), the $\frac{6}{3}$ chord in m. 23 acts as an on-going member of the harmonic process. This is important because the $\frac{6}{3}$ chord coincides with melodic closure in the outer voices (see Example 3), but its harmonic non-closure in this context maintains the forward drive. Measures 23-25 are problematical in terms of texture. It is clear that the motion from the 8 to the $\frac{7}{5^0}$ between mm. 23

and 24 creates a gap because the subsequent $\frac{6}{3}$ is less dissonant than the $\frac{7}{5^0}$. The relationship between the 6 and the

7 at the end of m. 24 is less clear because one could suggest that an F[#] would be inferred in the harmony at the end

of the measure. This would have resulted in a $\frac{7}{5}$, which,
 $\frac{5}{3}$

in addition to the seventh above the bass, would have a diminished fifth between the extant C and the supposed F \sharp . Clearly, the $\frac{7}{5}$ would have been more dissonant than the
 $\frac{5}{3}$

preceding $\frac{6}{3}$. The pedal marking, however, clarifies the content of the harmony because only the first two-thirds of the second beat are to be pedaled.⁸ Thus, the F \sharp from the alto does not sustain through the entire second beat; the final harmony in the measure would be $\frac{7}{5}$. But even excluding the F \sharp , the $\frac{7}{5}$ in m. 24 would be more dissonant than the $\frac{6}{3}$ because the 7 of the $\frac{7}{5}$ forms a dissonance above the bass—whereas the $\frac{6}{3}$'s dissonance occurs between upper parts. Thus, a $\frac{6}{3}$ $\frac{7}{5}$ $\frac{8}{5}$ gap process takes place between mm. 24 and 25.
 $\frac{3}{5}$ $\frac{5}{5}$
 $\frac{3}{3}$

As Example 9 shows, the 8 in m. 25 fills the harmonic
 $\frac{5}{3}$

gap. In terms of voiceleading, however, the connection between mm. 24 and 25 is irregular to say the least. We could expect the soprano line to continue the C-B \flat -A descent in m. 24 to G in m. 25; the bass line in mm. 22-24 could also imply continuation to G (see Example 3). Certainly, the F in the soprano is a total surprise; the A-D-D \flat gap process (Example 3) in the bass is also highly unorthodox.

This sudden turn of events ushers in a repetition of the material from mm. 17-23. Such repetition intensifies the forward motion because it suggests that change will follow. The first significant alteration from mm. 17-23 occurs in m. 34 (Example 10), where, in contrast to mm. 24 and 32, C is retained in the soprano line (as in mm. 24 and 32) but the G resolves to F \sharp in the alto and the tenor drops out after the E \flat . (Notice that the C on the third eighth note of the measure is a part of the pattern of delayed doubling of the soprano line and not a part of the tenor line.) The deletion of the E \flat in the tenor in the second harmony of m. 34 means that weak closure takes place on the $\frac{6}{3}$. The subsequent $\frac{7}{5}$ above the A in the bass forms a gap that is
 $\frac{5}{5}$
 $\frac{2}{2}$

somewhat tentatively filled by the 8 at the end of m. 34.
 $\frac{6}{3}$

⁸Pedal markings agree in the Paderewski and Henle-Norton editions.

Example 10. Harmonic Process, mm. 33-34.

(cf. 23) 33 34

Figured bass notation for measures 33 and 34:

Measure 33: 8 5 3, 7 5 3, 6 3, 7 5 2, 8 6 3

Measure 34: 8 5 3, 7 5 3, 6 3, 7 5 2, 8 6 3

Constant denial of resolution characterizes the passage leading to the ending (Example 11). The return of the opening, far from being a major point of harmonic arrival, again recalls how unstable the initial bars were. As in m. 2, a $\frac{6}{4}$ ends mm. 36, 37, and 38. The upward registral shifts build up the sense of frustration caused by these non-resolutions to an almost overwhelming climax on 7° above

5°
 3°

$C^{\#}$ in m. 39. At this point, the bass lies a tritone away from the tonic; every upper voice is dissonant with the $C^{\#}$ despite being consonant with each other. The following 8 is

6
4

certainly less dissonant than the 7° , but it too moves

5°
 3°

through a gap caused by the 8 (note the added voice) on the

7
5
3

way to the final chord, which is—to repeat—the only 8

5
3

that occurs at a point of melodic closure in

Example 11. Harmonic Process, mm. 34-41.

The musical score for Example 11, Harmonic Process, mm. 34-41, is presented for four voices: Soprano (S), Alto (A), Tenor (T), and Bass (B). The score includes measure numbers 34 through 41. Below the staves, there are fingerings and a simplified harmonic diagram.

Fingerings:

- Soprano: 8, 6, 5, 6, 6, 7x, 6, 5^ox, 8, 3, 8
- Alto: 6, 4x, 4x, 5^ox, 5^ox, 5^ox, 4x, 3^ox, 6, 8, x, 5
- Tenor: 3, 2x, 2x, 3, 3, 3, 3, 7^ox, 4x, 7x, 3
- Bass: 3, 2x, 2x, 3, 3, 3, 3, 7^ox, 4x, 7x, 3

Simplified Harmonic Diagram:

- Measure 34: 8/6, 6/4, 5/4, 6/5^o, 6/5^o, 7/5^o, 6/4, 6/5^o, 7/5^o, 6/4, 6/5^o, 7/5^o, 6/4, 7^o/5^o, 8/6, 8/7, 8/5

both outer voices in the entire prelude.

The foregoing discussion can provide some suggestions to the performer of the work. Both the details of the harmonic and melodic processes and the illusory internal articulations they create should be reflected in the interpretation.

With respect to tempo, the *molto agitato* designation seems to be almost an understatement. It would appear that an ideal performance of the prelude would constantly drive forward with relief only in a few places—and, as we have seen, never by the co-operation between closure in the harmonic and melodic processes until the end. The *piu animato* in m. 31 apparently results from the intensity caused by the repetition of the material from mm. 22-23 which is pressing toward change. Other tempo fluctuations (*rubato*) can be suggested by the analysis as well and will be discussed in conjunction with the aspects of thematic structure and dynamics.

We have already observed the most interesting problem posed by the thematic structure, namely the unstable character of the opening material. Both times the initial material recurs (mm. 9 and 35), the use of the sixteenth rest after the A (instead of the dot after the A at the beginning) suggests a delay between the A and G in mm. 8 and

34. The performer should point up the repetition in m. 9 and the return in m. 35 in subtly different ways—probably by slightly lengthening the rest in m. 34 relative to its duration in m. 8. Moreover, care should be taken not to exaggerate this brief pause because a return to instability calls for less emphasis than, say, a well-prepared recapitulation in sonata form.

Few dynamic markings are specified. The diminuendi that occur almost throughout are probably meant to go with the phrasing in the right hand, with the naturally rapid decay of tones on the instrument, and with the decrease in dissonance that generally occurs during the course of each measure. Because the harmony is left unresolved at the end of most measures, however, the pianist should not play inaudibly at the end of each decrescendo; indeed the non-resolutions should emerge clearly so as to maintain the sense of forward motion. The crescendo that begins in m. 9 emphasizes the added momentum stemming from the repetition of the first eight measures in the more intense upper octave placement. The crescendo reaches fortissimo in m. 17, which, as Example 7 shows, is a point of harmonic arrival despite the tonal remoteness of the D^b in the bass. Also important, this articulation is brought to the fore by the sudden focus on the isolated bass line in m. 16. The pianist should mark this moment by observing the added crescendo in m. 16. The illusion of stability promoted by the 8 after the end of the descent in the bass could go with

5

3

a slight delay after the low D^b . Such a pause would not be appropriate for the octave leap in m. 19, however, because the repetition of the material of the previous two measures calls for an on-going approach. The repetition of mm. 17ff in mm. 25ff carries the same fortissimo due to the factor of surprise mentioned earlier, and the same comments for m. 19 apply to the interpretation of m. 27.⁹ Finally, the crescendo to m. 39 (though shown only to m. 38 in the Henle-Norton edition) supports the denial of resolution discussed in connection with the harmony in mm. 36-38 and leads to the 7° on the first beat of m. 39.¹⁰ Thereafter, for the first

5°
3°

time, the melodic and harmonic processes occur on the beat. The final three chords are marked fortissimo, apparently to emphasize their melodic-harmonic resolution.

⁹In fact, an extra fortissimo appears in the Paderewski edition in m. 25.

¹⁰A sforzando in parentheses appears in the Paderewski edition in m. 39.

Although the build-up has been so intense that a long delay after the 7° could be felt unnecessary, the pianist 5°
 3°

could also reinforce the unraveling of the extreme tension that leads from the very beginning to the climax in m. 39 by broadening the tempo at this one moment of resolution. Despite the limited scope of the prelude, the amount of energy generated is, as the analysis shows, quite extraordinary; it does not seem inappropriate to slow down considerably for the last three chords, whose harmonic and melodic processes close together for the first time in the work.

In sum, the non-congruence between the harmonic process and the melodic processes of the outer voices revealed by the implication-realization analysis can be exploited by carefully observing the few indicated dynamics and by adopting some suggestions for rubato. Because it concentrates on process, which is on-going, analysis using the implication-realization model can offer considerable insight into the re-creative problems posed by the prelude and, furthermore, can approach the analysis of a largely unstable tonal work from the standpoint of its essential instability.