

DERIVATIONAL ANALYSIS STEP BY STEP

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During the past century, various theorists—such as Heinrich Schenker, Arnold Schoenberg, Rudolph Réti, and Hans Keller—have expressed the belief that a masterwork represents a series of interrelated pitch-rhythmic events. In the absence of a widely accepted term, I have adopted *derivational analysis* to denote the activity suggested by this belief. And to give my students a methodology for performing derivational analysis, I have formulated the following guidelines.

The basic strategy of derivational analysis involves monitoring initial materials through successive stages of repetition and transformation. First, one identifies an opening gesture as a potential source for subsequent events. Next, one examines Event 2 to see how it may derive from Event 1, proceeding then to Event 3, attempting to determine its relation to Events 1 and 2, taken singly or in combination. As one moves further into the piece, the web of interwoven events becomes ever more intricate. In larger works, connections may be far removed, even bridging the gap between one movement and another. It is important to stress that there are no mechanical rules for devising derivational analyses; we can only rely on our musical intuitions. I shall draw on several well-known tonal works to illustrate derivational analytic technique.

STEP ONE: THE OPENING GESTURE

Some pieces begin with a gesture or motive that is definitely set off from the material that follows. The first movement of Beethoven's Piano Sonata in C Major, Opus 2, No. 3, begins with a clear-cut motive (see Figure 1). Once we hear the rest at the end of measure 2 followed by the repetition in measure 3, we know the first two measures constitute the opening gesture. Many classical works start in this fashion. In rare cases, the articulation of a clear-cut motive may not count as an opening gesture, as in Beethoven's Symphony No. 5 in C Minor, where the initial motive is clear enough, yet is so short that we regard the first few measures merely as introduction to the more substantial gesture beginning after the second fermata.

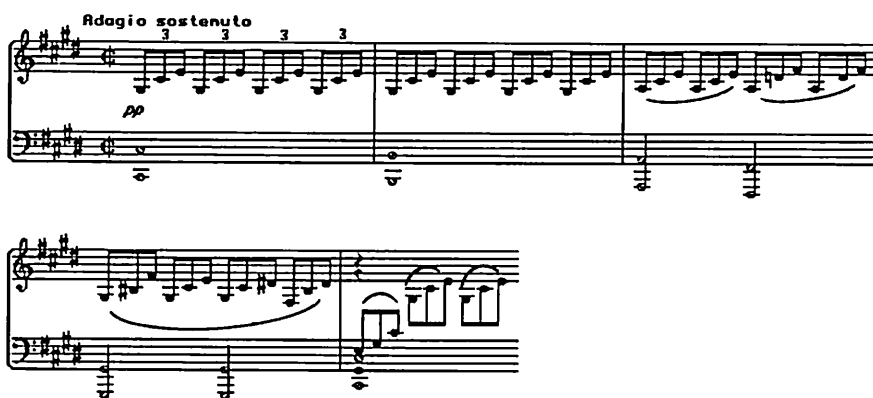
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Figure 1. (mm. 1-8)



By contrast, the opening of Beethoven's "Moonlight" Sonata, Op. 27, No. 2, provides a continuous flow throughout the first five measures (see Figure 2). It seems difficult to break this material down into smaller elements, yet the phrase is so full that we may wish to analyze it as a series of smaller events. For that matter, an opening gesture, even one so clear-cut, is rarely indivisible and can usually be broken down. Thus, Figure 1 exhibits four distinct elements: the opening chord, the neighbors in parallel thirds, the concluding chords, and the final rest.

Figure 2. (mm. 1-5)



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Chopin's Prelude in B Minor (see Figure 3) presents a continuous flow throughout measures 1-4 (like Figure 2), yet clearly articulates an opening gesture in the first two measures (like Figure 1). This shows that while rests are a practical means of setting off an opening gesture, they are by no means required. Figure 4 illustrates a similar passage containing a rest in the vocal line, but with a link in the supporting instrumentation.

Figure 3. (mm. 1-8)

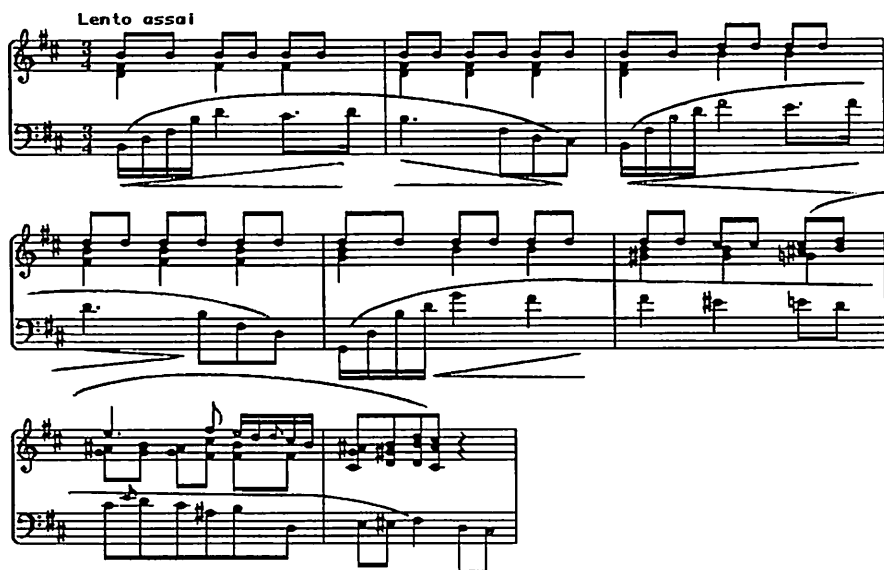


Figure 4. (mm. 1-4)



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Like the "Moonlight" Sonata, Bach's Prelude in C Major, from the first volume of the Well-Tempered Clavier, provides a continuous flow throughout the entire piece (see Figure 5). Nevertheless, we perceive the first four measures as the opening unit, consequent upon the return of the exact pitch content of measure 1 in measure 4. (A similar illustration of tonic enclosure can be found in the opening measures of the slow movement of Beethoven's "Pathétique" Sonata, Opus 13, spanning measure 1 to the downbeat of measure 3.)

Figure 5. (mm. 1-4)



As suggested above, determination of the boundaries of an opening gesture depends on various and diverse criteria; consequently one analyst's notion of an opening event may differ from another's. This should cause no concern, since at worst one version of the first event will be somewhat shorter or longer than another version. The main thing is to show how what ensues is derived from what precedes. To do this, one needs to examine the selected opening gesture in considerable detail, observing all its special, as well as conventional, moves so they can be recognized in whatever form or fashion they later present themselves. In some works, such as fugues, derivation is emphasized intentionally as a continuous feature of the musical surface; but in most pieces, recurrence and transformation of earlier material are concealed—forcing us to dig and delve until we discover any existing derivational continuity.

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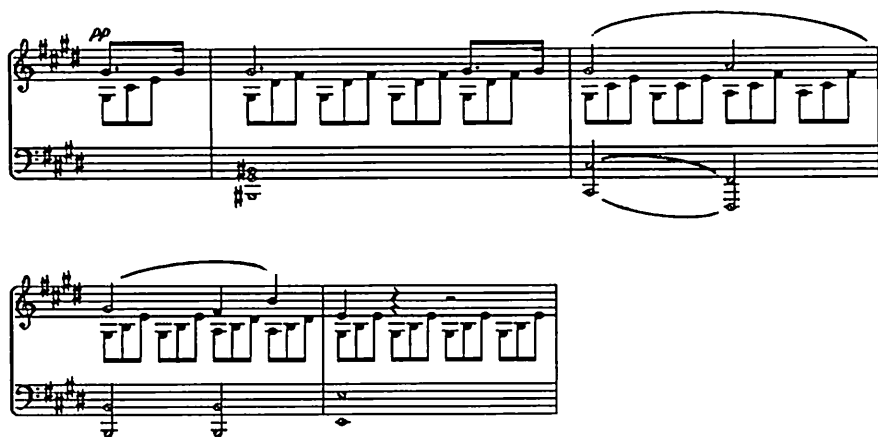
STEP TWO: THE SECOND EVENT

In many pieces, the second event—like the opening gesture—is clearly set off from the preceding and following material, as in measures 3-4 of Figure 1. Here the melodic material starts a step higher than in measure 1 (with F replacing E as first pitch), but the harmony simply reverses the tonic-dominant progression of measures 1-2. In other words, measures 3-4 represent a semi-sequential restatement of measures 1-2 (i.e., sequential melodically but not harmonically). In measure 3 the alto voice mimics the 7-8 relationship of measure 1, as D is ornamented by its leading-tone C-sharp—almost suggesting a melodic, but not harmonic, tonicization of D minor.

In contrast to Figure 1, the second event of the "Moonlight" Sonata might at first appear unrelated to the opening gesture of measures 1-5 (see Figures 2 and 6). However, in following the top line of measures 1-5, we find a linear motion, 3-4-3-2-1, which reappears a third higher in measures 6-9 as 5-6-5-4-3 (with 7 interpolated between 4 and 3). Moreover, in view of the modulation during this phrase, its melodic line is effectively reinterpreted as 3-4-3-2-1 in the secondary key of III. This is a nice illustration of derivation lying just below the actual musical surface.

As in Figure 6, the melodic content of the second event (mm. 3-4) of Chopin's Prelude in B Minor also repeats the first event a third higher (see Figure 3), but in this case with no change in the tonic harmony of the opening gesture.

Figure 6. (mm. 6-9)



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It is by no means always obvious where to locate the second event. In the first prelude of the Well-Tempered Clavier, I regard measures 5-7 (see Figure 7) as the second event, based on the following considerations:

1) The opening unit (Figure 5) consists of five complete neighbor motions, one for each member of the underlying 5-voice texture.

2) Of these five motions, the first one to be completed is 5-6-5, with 6 resolving to 5 exactly at the point where the bass moves from 8 to 7 (m. 3).

3) In measures 5-7 (see Figure 7), the preceding 6-5 line (A-G) is augmented and also emphasized by sounding an octave higher; at the same time, 8 moves once again to 7 in the bass just as 6 (now in the soprano) resolves to 5 (m. 7).

4) Measures 7-11 constitute a complete unit that starts and ends in G Major (V), thereby setting measures 5-7 apart on one end by the tonic prolongation of measures 1-4, and on the other end by the dominant prolongation of measures 7-11. (Observe that a single pitch or chord—in this case the G6 chord of measure 7—may belong to two overlapping events.)

This second unit introduces a new linear element, 6-7-8 of V, as the E of measure 4 splits off into two linear directions, E-F-sharp-G and E-D. This 6-7-8 motion is exploited later in the piece, as we shall see below with regard to measures 11-15.

Figure 7. (mm. 5-7)



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The first two events in Bach's Gavotte from the English Suite in G Minor (Figure 8a) are clearly delineated—each exactly two measures in length—but how is the second event derived from the first? The first thing to notice is the continuing recurrence in the upper part of a 3-note rhythmic figure (quarter-eighth-eighth), but there is more than that. In measures 1-4 the soprano part outlines the following melodic scaffolding: G-B-flat-A-G; E-flat-D-C-B-flat. This half-note series serves as the structural underpinning of the actual surface melody of these four measures. The second part of this scaffolding (6-5-4-3) reverses the left-hand quarter-note line that accompanies the initial soprano motion (1-3-2-1); see Figure 8b. Moreover, in the second unit the left hand parallels the right-hand line in tenths, 4-3-2-1.

Figure 8a. (mm. 1-8)



Figure 8b.



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STEP 3: THE FIRST TWO EVENTS IN COMBINATION

Examine the first two events to determine whether they jointly form a meaningful macro-event. The first two events of Figure 1 combine into a unified whole, insofar as the completion of Event 2 restores the initial pitch content of Event 1. Although the melody consists of an elaborate combination of two passing motions, 3-2-1 and 5-4-3 (see Figure 9), the overall effect—ending up back at the beginning—is like that of a neighbor motion.

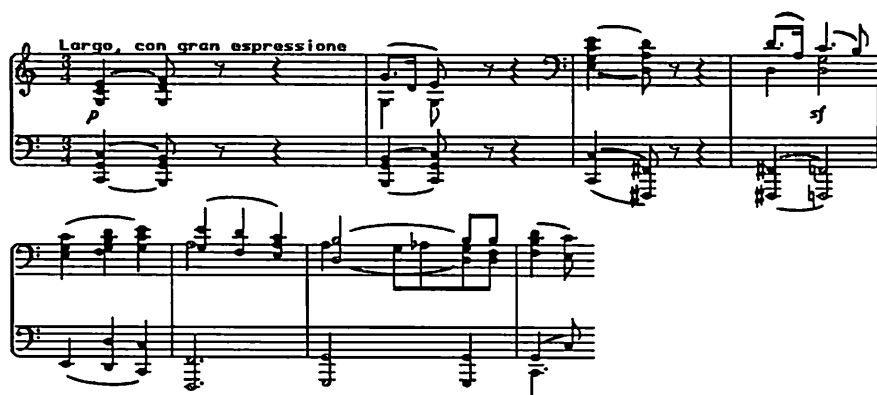
Figure 9.



Another pertinent example is found in the opening measures of the second movement of Beethoven's Piano Sonata in Eb Major, Opus 7 (see Figure 10a). Observe that Unit 2 (mm. 3-4) provides an interesting variation of measures 1-2, in that the G-D-E figure of measure 2 is transposed down a fourth to D-A-B in measure 4, but now expanded to include the accented non-harmonic tone, C. At the same time, we find that both units start with a root-position tonic triad with 3 on top. Viewing Unit 1 as fundamentally a neighbor motion that sustains 3 in the soprano voice (with F essentially resolving back to E rather than passing up to G), we encounter a melodic scaffolding, 3-2-1-7, which embraces all of measures 1-4. This analysis derives from the assumption that in tonal music passing motions carry more structural weight than neighbor motions; therefore, given the choice of locating the inception of the linear descent at the beginning of measure 1 or measure 3, we select measure 1. The goal of this 3-2-1-7 line is the middle C that initiates the third event of the phrase at the downbeat of measure 5. As indicated above, single pitches often serve the double function of starting a new event even while completing a preceding event.

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Figure 10a. (mm. 1-8)



STEP FOUR: THE THIRD EVENT

The third event may follow from preceding material or else represent some new idea. In Figure 10a we find that once the opening linear scaffolding is completed by the soprano C (m. 5), the melody then reascends to 3 only to proceed once again through the entire 3-2-1-7 succession—although with noticeably different harmonic support. This passage shows that consecutive events may occupy different durations; although Events 1 and 2 each lasts two measures, Event 3 (mm. 5-8) is as long as both of them combined.

Figure 10b.



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In contrast to the preceding example (in which the third event is derived from the combined first two events), the third event of Bach's Prelude in C Major (mm. 7-11) primarily resembles the first event, with the second event, measures 5-7, functioning mainly as a link between the two. Figure 11a illustrates Event 3, a dominant prolongation in sharp contrast to the tonic prolongation of Event 1. In Figure 11b we see the previously described combination of five neighbor motions of Event 1 (mm. 1-4). In Figure 11c (mm. 7-11) we find passing motions replacing the outer-voice neighbor motions: i.e., 5-4-3 over 3-2-1 (in the dominant) replaces 3-4-3 over 1-7-1 (in the tonic).

Figure 11a. (mm. 7-11)



Figure 11b. (mm. 1-4)



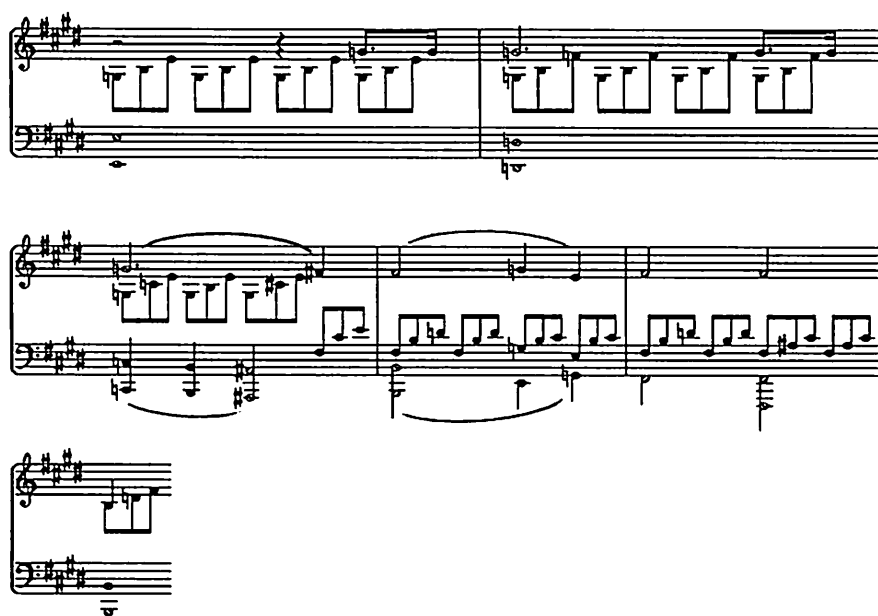
Figure 11c. (mm. 7-11)



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In both passages an inner voice moves 5-6, with 6 resolving back to 5 just as 7 is introduced in another voice. [That is, in Event 1, A resolves to G in the tenor as C moves to B in the bass; in Event 3, E resolves to D in the tenor as G moves to F-sharp in the alto.] Thus, the two passages are interesting both for their similarities and differences. The similarities include the upper voice moving 4-3 in measures 3-4 and 10-11, and the local tonic being treated as a dissonant suspension against 2 in a ii7 chord (mm. 2 and 9). And of course, both units involve the same essential harmonic progression, I - ii7 - V7 - I. The differences involve a) the insertion of the extra dominant-preparation chord, IV4/2, in measure 8 (which is also similar, in that a 4/2 chord again serves as the second chord of the event, as in measure 2); b) the aforementioned descending passing motions in the outer voices; and c) the cadential 5-1 bass motion in measures 10-11. Notice, too, a connection between Events 2 and 3: the outer voices in measures 9-11 (C-B over A-D-G) repeat by inversion the outer voices of measures 5-7 (see Figure 7).

Figure 12.



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The third event of Figure 1 represents a curtailment of the first event, starting on a different scale-degree and lasting just one and a half measures (overlapping into a varied repeat in measure 6). The third event of the "Moonlight" Sonata (see Figure 12) synthesizes elements of the first two events (see Figures 2 and 6): the mode switches back to minor (with E as local tonic), 3 (G-natural) is re-established over a bass motion 8-7-6 (as in mm. 1-3), and yet the rhythmic character of the soprano line is clearly similar to that of measures 5-9. Moreover, Event 3 modulates, like Event 2, whereas Event 1 remains fixed in the tonic; and then, in the newly found secondary key of B minor, the melody sustains 5 (F-sharp, mm. 13-14), similar to the emphasis on 5 (G-sharp) in measures 6-7.

STEP FIVE: THE FIRST THREE EVENTS IN COMBINATION

We now examine the first three events as we earlier did for the first two events. The range of possible interrelationships among three units is considerable. In Bach's Prelude, Events 1 and 3 are substantial while Event 2 is merely a link. In his Gavotte (Figure 8a), Events 1 and 3 are almost identical—with Event 3 representing a new beginning, and arousing our curiosity about Event 4. In Chopin's Prelude in B Minor, the third unit is similar to Events 1 and 2, but is the first to branch out from the tonic triad; in Beethoven's Op. 2, No. 3, the third unit is a harmonic diminution of the first two units. And the third unit of the slow movement of his Op. 7 restates the underlying thematic material of Units 1 and 2 combined (see Figure 10b). We may also discover a larger unit resulting from the conjunction of all three of the initial units. In Bach's Prelude in C Major (Figures 5, 7, 11), an overall unifying effect is achieved throughout Events 1-3 similar to the combined effect of the first two events of Example 10a; each exhibits a descending line, 3-2-1-7, constituting an incomplete larger motion calling for completion in the unit(s) to follow.

STEP 6: THE SMALL VS. THE LARGE

At this stage, the analyst must make a choice: either to continue examining successive local events, or else to step back to get a sense of the structure of the piece (or section thereof, if the piece is a large one) as a whole. In some cases, there is no reason not to proceed immediately to Event 4, as in Bach's Gavotte (see Figure 8a) and Chopin's Prelude in B Minor (Figure 3)—since both passages are about to reach the conclusion of a section. In other cases, where Event 3 itself is the

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conclusion of the opening section or subsection, it is best to step back, rather than push on to Event 4. This is the case in Beethoven's Opus 7, second movement (Figure 10a).

In Bach's Prelude in C major the first three units (mm. 1-11) are part of a larger unit comprising measures 1-19 (see Figure 13). Together, then, there are five individual units here:

- 1) measures 1-4 (opening gesture—tonic)
- 2) measures 5-7 (transition)
- 3) measures 7-11 (middle unit—dominant)
- 4) measures 11-15 (retransition)
- 5) measures 15-19 (closing unit—tonic)

Figure 13. (mm. 11-19)



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As Figure 14 demonstrates, the overall motion is 3-2-1 in the soprano over 1-5-1 in the bass, yet with the soprano voice restoring 3 (an octave lower) at the tonic cadence in measure 19. [This represents an extension of the idea of restoring 3 via the overlapping descending passing motions, 3-2-1 and 5-4-3, as shown in Figure 9.] Measures 12-15 serve the same transitional function as measures 5-7, but in a more complex way. To begin with, Bach replaces the original descent of a perfect fourth (from I down to V) with a perfect fifth (from V down to I); he cannot restate measures 4-7 in measures 11-14 without leading (via an e_6 chord in measure 12) to D major, rather than back to the original C major. Bach achieves this goal by replacing e_6 with d_6 , functioning as ii_6 , thereby heading back to I6 for the onset of the final tonic unit. In measures 11-13 he tonicizes D minor with a melodic 6-7-8 line, derived from the inner voice E-F-sharp-G line of measures 5-7. Having reached the obligatory D6 chord in measure 13, he then models measures 13-19 on measures 5-11, although with one slight change: measure 14 consists of $vii^{04/3}$, rather than $V4/2$, sequentially restating the $vii^{04/3}$ of ii found two measures earlier. The 6-7-8 line now occurs twice: B-C-sharp-D in measures 11-13, and A-B-C in measures 13-15.

The fifth event, measures 15-19, represents an exact transposition of the dominant prolongation of Unit 3 into the tonic harmonic area of Unit 1—thereby producing a synthesis that brings to a conclusion the first large section of the piece, measures 1-19.

Figure 14.



STEP 7: THE NEXT MOVE

By the time one reaches Step 7, various alternatives open up. One may resume examining each local event, or one may once again step back from the music, considering still more or all of the entire work. The choice will depend upon the circumstances of any given piece. And

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there is always the question of how much derivational detail one wants to uncover. One may wish to pursue an entire sonata or symphony in relentless derivational fashion, although perhaps only in special cases, such as when writing a dissertation. Normally, in preparing an analysis suitable in length and scope for a term paper of perhaps 3000 words, it should suffice to select a dozen or so passages that exhibit interesting and meaningful derivations. One should always try to emphasize the passages that seem most absorbing; in this way analysts can best communicate their enthusiasm to the reader.

I shall conclude by presenting some further derivations of special interest drawn from the pieces under discussion.

BACH: PRELUDE IN C MAJOR

After the completion of Unit 5 (see above), the piece once again moves ahead—albeit an octave lower—from the tonic triad in root position with 3 on top. Soon an extended dominant pedal progression is reached, and here we find an interesting derivation from the first part of the prelude. As illustrated in Figures 15b and c, measures 25-27 recall the opening melodic 3-4 counterpointed against 8-7, with 8 once again suspended against 4, while measures 29-32 restate the linear motion 5-4-3, with 8 once again suspended against 4, from measures 7-11 and 15-19. Thus, we find an almost back-to-back conjunction of previously widely separated pitch configurations.

The last four measures of the Prelude (Figure 16) quite obviously derive from measures 1-4. Measure 32 represents the third time that 3/I has appeared at a crucial juncture. The startling alto B-flat of this measure recalls the previous appearance of 3/I (m. 19), with its subsequent conversion into V7/IV in measure 20 (see Figure 15a). In these last measures we hear 3-4-4-3 paired once more against 8-8-7-8 (see mm. 1-4, etc.); acknowledging, however, that this is the concluding phrase of the prelude, Bach exchanges the voices, making the final soprano note 8 instead of 3. [Scale degree 3 is immediately restored in the opening of the fugue that follows. The fugue subject itself is closely modeled after the essential soprano notes of measures 1-7 of the prelude, as shown in Figure 17.]

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Figure 15a. (mm. 20-31)

The musical score for Figure 15a, measures 20-31, is presented in six systems. Each system consists of a grand staff with a treble and bass clef. The music is in 7/8 time, indicated by the '7' over the first staff of each system. The key signature is one flat (B-flat), indicated by a flat symbol on the B line of the bass staff in the first system. The melody in the treble staff is a continuous eighth-note pattern. The bass staff features a simple harmonic accompaniment with quarter notes and half notes, often marked with a '7' above the notehead. The score is divided into two measures per system, with a double bar line separating them. The notation is clear and legible, with standard musical symbols for notes, rests, and clefs.

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Figure 15b.



Figure 15c.



Figure 16. (mm. 32-35)

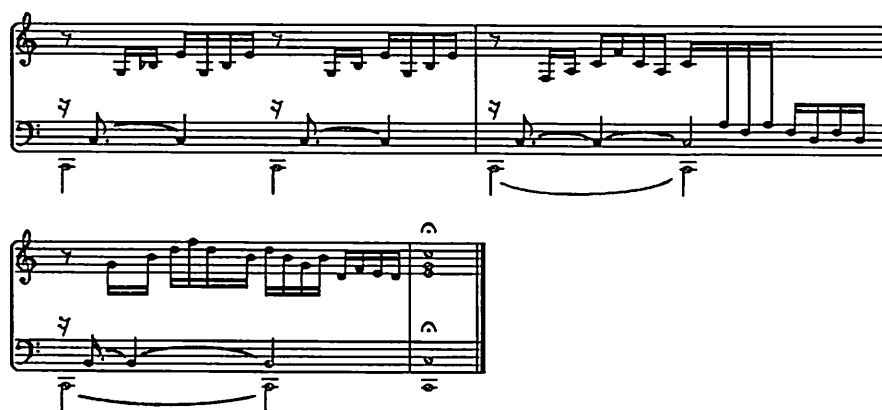


Figure 17.

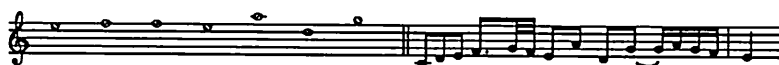


Figure 18.

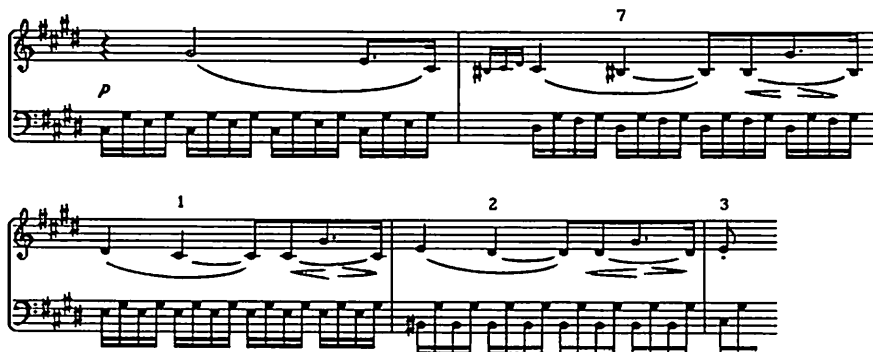


Figure 19.



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BEETHOVEN: MOONLIGHT SONATA

In our earlier discussions we surveyed the first three phrases of this work. After the cadence in B minor (see Figure 12), we hear an arresting phrase featuring a melodic diminished 3rd: B-C-A-sharp-B (mm. 15-19). This phrase returns later in the work, transposed up a step to C-sharp-D-B-sharp-C-sharp (see mm. 51-55). The source of this figure is found in the alto part of measures 1-5 (Figure 2), and the unusual harmonies of measures 16 and 52 originate in the Neapolitan-6th chord found in the second half of measure 3.

The germinal 3-4-3-2-1 line of the first movement reappears also in the finale. The principal theme of the second subject emphasizes an inversion of this source line: 1-7-1-2-3 (see Figure 18). This is followed by a retrograde inversion, 3-2-1-7-1, in the key of the Neapolitan (see Figure 19), again reflecting the seminal importance of the N6 chord in measure 3 of the first movement.

CHOPIN: PRELUDE IN B MINOR

After Chopin repeats the source material of measures 1-2 (see Figure 3), he focuses on the central idea of the first event—the descending passing motion 3-2-1. In measures 5-6, he descends 6-5-#4, extending the motion by means of a suspended 5 (F-sharp) at the downbeat of measure 6. The soprano voice now takes over the melody, presenting a middleground scaffolding offering yet another descending third, 4-3-2 (see Figures 3 and 20). Observe the continued use of suspensions (E and D in mm. 7 and 8, respectively), and the hemiola effect produced by the middleground harmonic rhythm in measures 7-8.

Figure 20.

The figure displays a musical score for Chopin's Prelude in B Minor, measures 1 through 8. The score is written for piano and features a treble and bass clef. The key signature is B minor (two sharps: F# and C#). The tempo/meter is indicated as 'mm. 1-2' above the first measure. The score is divided into four measures, with measure numbers 1-2, 3-4, 5-6, and 7-8 indicated above the staff. The melody is primarily in the soprano voice (treble clef), with the bass line (bass clef) providing harmonic support. The score includes various musical notations such as notes, rests, and accidentals. Above the staff, there are annotations indicating specific melodic lines: '6 — 5 — #4' in measures 5-6 and 'b4 — 3 — 2' in measures 7-8. The notation includes slurs, ties, and accidentals (sharps and naturals) to indicate the specific intervals and chromaticism of the piece.

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BACH: GAVOTTE IN G MINOR

The first section (see Figure 8a) closes with an expanded transposition of the initial melodic scaffolding 1-3-2-1; i.e., G-B-flat-A-G now becomes B-flat-D-C-B-flat (1-3-2-1 in the key of III) with various ornamental insertions (see Figure 21). Also, at the end of Event 3 (mm. 4-6, Figure 8a) notice the diminution of the parallel lines 6-5-4-3 and 4-3-2-1 from Unit 2 (see Figure 8b). Although the surface melodic material of the next section (starting in the middle of measure 8) is closely allied to the 3-note foreground motive of Event 1, it presents an essentially new melodic underpinning, 3-5-6-5 in the key of III (see Figure 22). Then, in the second half of measure 10, the soprano presents continuous 8th-note figurations that outline a 6-5-4-3 scaffolding (as in mm. 2-4) in the upcoming key of D minor (v); see Figure 23. In measures 14-16 the left-hand melody repeats the first part of the opening theme in D minor. Consequently we hear the original middleground motives of Units 1 and 2 (1-3-2-1 and 6-5-4-3) in this secondary key, but in reverse order.

Figure 21.

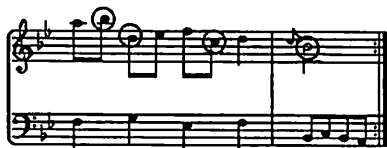
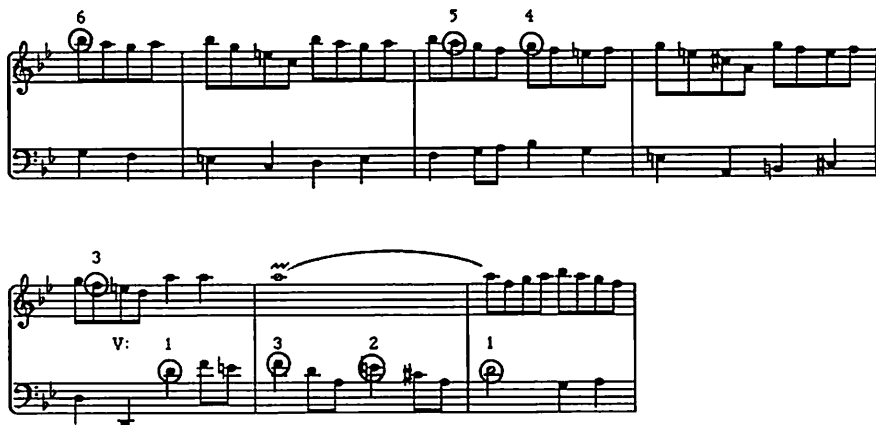


Figure 22.



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Figure 23.



Gavotte II in G Major (Figure 24) functions as a trio to Gavotte I in G Minor. It begins with a melodic line featuring D-E-D-G-B-A-G. This new line combines two basic melodic ideas from Gavotte I: transposition of 5-6-5 from measures 9-10 (see Figure 22), and a modally altered restatement of 1-3-2-1 from measures 1-2.

Figure 24. (mm. 1-4)



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BEETHOVEN: PIANO SONATA, OP. 7, SECOND MOVEMENT

In the first phrase we hear an important 3-note cell, G-D-E (see Figure 10a). A transformation of this cell, G-F-sharp-D, appears in the second phrase (Figure 25; m. 9), recurs frequently in the third phrase (A-E-F, F-B-flat-G, G-C-A, A-D-B; mm. 17-18), and also appears prominently in the contrasting middle section of the movement (E-flat-A-flat-G, D-flat-B-flat-A-flat, C-E-F, etc.; mm. 25 ff.). No wonder that Schoenberg, the master of the 3-note cell—see his Opus 23—regarded Beethoven's derivational technique as a model and inspiration for the Second Viennese School.

Figure 25. (mm. 9-30)

2nd Phrase
fea.

3rd Phrase

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Figure 25. (con't.)

The musical score consists of five systems of piano notation, each with a treble and bass staff. The notation includes various dynamics and articulations:

- System 1:** Features a series of chords in the bass staff, marked with *ff* (fortissimo) and *pp* (pianissimo).
- System 2:** The treble staff has a melodic line with a slur and a fermata, marked *pp*. The bass staff has a continuous eighth-note pattern. The section is labeled *Middle Section* and *sempre staccato*.
- System 3:** The treble staff has a melodic line with a slur and a fermata, marked *sf* (sforzando). The bass staff has a continuous eighth-note pattern.
- System 4:** The treble staff has a melodic line with a slur and a fermata, marked *sf*. The bass staff has a continuous eighth-note pattern.
- System 5:** The treble staff has a melodic line with a slur and a fermata, marked *sf*. The bass staff has a continuous eighth-note pattern.

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As these various illustrations have shown, the inherent possibilities of derivational analysis are unlimited. Of central importance is the imperative to use strong musical instincts as a guide to locating derivations; one must take care to avoid finding derivations where none exist. In other words, one must always strive to keep the ear in control of the eye.