Exploring Tonal Substitutions in Schubert's Late Sonata Forms

By

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Abstract

In his sonata-form movements, Schubert's characteristic remote modulations often received negative reactions from contemporary critics; compared to the Beethovenian standard, Schubert's formal designs seemed inefficient, arbitrary, and meandering. While more recent scholarship has shed the negativity of those early appraisals, there remains at times an outwardly imposed sense of mystery surrounding Schubert's music. Among the scholars whose work has contributed to the undoing of that mystification, Richard Cohn has developed a model for triadic harmony based on parsimonious voice leading that accounts for many aspects of nineteenth-century harmonic practice. Here, focusing specifically on Schubert's late works, I expand some of Cohn's techniques to the level of large-scale form, exposing consistent modulatory strategies in Schubert's execution of sonata form that reveal a specific dialogue between Schubert's sonata practice and earlier approaches.

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Introduction

While Schubert's sonata forms have garnered far less serious study than those of his immediate Classical predecessors – and despite the fact that for many years, most of that limited attention focused on unfavorable comparisons with Beethoven – there has been an increasing effort to rehabilitate these works in formal terms. Schubert's sonata forms are generally understood to be unusual by Classical standards, but by dropping the Beethovenian standard, scholars have begun to see these works both in terms of their dialogue with earlier sonata norms and their own uniquely Schubertian characteristics.

This idea is not necessarily new. Carl Dahlhaus, in his 1978 essay on sonata form in the first movement of the G major String Quartet, D. 887, recognizes that "we should not sacrifice historical fairness to a norm based on aesthetics or on compositional techniques."[1] He suggests that Schubert's sonata movements tend toward an aesthetic of remembrance rather than Beethoven's "goal-consciousness," which in turn relates to the importance of variation processes in Schubert's themes.[2] Regarding Schubert's tonal practice, Dahlhaus focuses on the use of chromatic sequences leading to remote keys, from which the expected keys tend to emerge suddenly. In general, he discusses variation technique and other "thematic processes" involved in the movement's motivic development; the resulting analysis is effective but not without issues. For one, as Suzannah Clark has noted, a focus on motivic construction is probably more appropriate for analyzing Beethoven or Haydn than Schubert, and the ensuing extensive comparison

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[1] Carl Dahlhaus, "Sonata Form in Schubert: The First Movement of the G-Major String Quartet, op. 161 (D.887)," translated by Thilo Reinhard, in *Schubert: Critical and Analytical Studies*, ed. Walter Frisch (Lincoln and London: University of Nebraska Press,
[2] Ibid., 8.

of Schubert's and Beethoven's variation technique is counterproductive when the stated goal is to avoid placing Schubert "in Beethoven's shadow."[3] Second, a reliance on remembrance as an alternative to teleology results in analysis that describes rather than explains the music; to say that a phrase in Schubert recalls a Beethovenian model is not necessarily unhelpful, but it is too easy to stop the analysis at that statement.[4]

Finally, though Dahlhaus explicitly sets out to examine the relationship between Schubert's and Beethoven's sonata forms through "analysis that aspire[s] to the realm of theory," the analysis as it plays out hardly lives up to such aspirations.[5] My own goal is to make a similar but more successful move from analysis to theory: through a generalization of Richard Cohn's analysis of the Sonata in B♭ Major, D. 960, and with reference to other aspects of Cohn's theory of triadic harmony, I will demonstrate some trends in Schubert's treatment of tonality in his late sonata form movements.[6] My references to Cohn's theory will largely be drawn from *Audacious Euphony* (2012), which represents a culmination (to this point) of various strands of voice leading-based transformational theory. The focus on late Schubert works is motivated both by

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[3] Suzannah Clark, *Analyzing Schubert*, (New York: Cambridge University Press, 2011) 164.

[4] Clark, *Analyzing Schubert*, 174. Clark also provides several examples of analyses that invoke memory without falling prey to this particular trap.

[5] Dahlhaus, "Sonata Form in Schubert," 1. "Yet it is difficult to understand the relationship between the theory of sonata form, which was extracted from Beethoven's oeuvre, and analyses of Schubert's work that also aspire to the realm of theory, instead of merely describing the musical surface or relying on a hermeneutic that, by dealing only with the most basic issues, pays the price of remaining hypothetical and metaphorical."

[6] Scott Murphy's "On Metre in the Rondo of Brahms's Op. 25," *Music Analysis* 26, no. 3 (2008), accomplishes a similar feat, applying an analogy comparing harmony and meter from Cohn's "Complex Hemiolas, Ski-Hill Graphs, and Metric Spaces," *Music Analysis* 20, no. 3 (2001), to a Brahms work not discussed in Cohn's article. Murphy also proposes a new pitch-time analogy that is inspired by but not directly related to Cohn's.

continuity and by convenience; as Cohn's largest-scale Schubert analysis in *Audacious Euphony* is of Schubert's final sonata, my initial assumption is that a bridge from analysis to theory will be most likely to arise through consideration of works closest to D. 960 chronologically.[7]

Background – Reception and Theory

Schubert the clairvoyant somnambulist

It would be difficult to discuss any kind of sonata form without invoking one or more of the prevailing theories of Classical form; I look to Hepokoski's and Darcy's *Elements of Sonata Theory* as a representation of the Beethovenian (along with Mozartian and Haydnian) standard.[8] I invoke these terms in order to highlight a central difficulty in this area of scholarship. Comparisons with earlier examples (in this case, sonata forms) are crucial, particularly for such a well-studied and heavily theorized genre, but writers dealing with Schubert's sonatas have a long history of maligning his works in terms of their ability to live up to the very particular Beethovenian ideal. Referring to the G major quartet, Clark notes that a traditional Schenkerian reading of the exposition, for example, would find repetitions of the second theme in alternate keys entirely unnecessary,

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[7] I consider every sonata form movement from D. 703 to D. 960 (barring any mistaken analyses), excluding sonata-rondos but including sonatinas, for reasons to be explained later; Appendix A lists these movements. I would of course be interested to see the results of an extension of this study prior to D. 703, the *Quartettsatz* in C minor, the earliest work considered here.

[8] Hepokoski and Darcy do not confine their theory to these three composers, though Caplin does so in *Classical Form* (Oxford and New York: Oxford University Press, 1998).

arriving as they do after the arrival of $\hat{2}$ in the first iteration.[9] Even in his defense of the repetitions as variations, Dahlhaus stops short of any real explanation for why the variations eventually end, nodding vaguely to the imperatives of sonata form as a kind of imposition on the music.[10] Late nineteenth-century evaluations were often more overtly negative, especially in Britain; given his strong association with song and the lyricism evident in his instrumental works, Schubert struggled to find a place in a Victorian value system that balked at the slightest implication that sentimentality might overcome intellectually rigorous design.[11] These attitudes are also reflected in Tovey's early twentieth-century writings; even while praising Schubert's harmonic plan in the String Quintet, D. 956, he criticizes the formal design:

> This is not to say that the first movement had not its diffuseness and redundancies, like every large instrumental work of Schubert; though the other three movements are accurate to a bar in their timing. But defects may co-exist with qualities; and Schubert's defects are often half-way towards the qualities of new art forms.[12]

Also crucial in the history of Schubert reception is the notion of a sort of "clairvoyant somnambulism" associated with his compositional style, especially as it relates to competing conceptions of the concept of "genius."[13] As Clark notes, "although effortless versus labored – two notions of genius – have long existed side by side, different eras have privileged one over the other." While the view of great composers as

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[9] Clark, *Analyzing Schubert*, 168.
[10] Dahlhaus, "Sonata Form in Schubert," 1.
[11] Clark, *Analyzing Schubert*, 32–39. Clark notes Henry Heathcote Stratham, an amateur musician and critic in late nineteenth-century Britain, as a particularly strong voice against Schubert.
[12] Donald Tovey, "Tonality," *Music & Letters* 9, no. 4 (1928): 355.
[13] Clark, *Analyzing Schubert*, 6.

possessing effortless natural talent prevailed earlier in the century – the phrase "clairvoyant somnambulist" actually comes from Wagner's writings on Beethoven – in later decades there was a shift to the notion of the struggling Romantic artist.[14] Beethoven's reputation made the transition from "natural" to "labored," but Schubert's did not. In fact, the persistence of this view of Schubert as a "clairvoyant" composer has its roots in what were intended as positive characterizations of his work, particularly in the writings of Johan Michael Vogl, a contemporary and major proponent of Schubert's songs.[15] The unfortunate corollary to the notion of Schubert's music as trance-inspired mysticism, endlessly imaginative melody without burdensomely intellectualized form, is the subsequent futility of analysis:

> The products of divine inspiration are to be wondered at, not judged. The logical outcome of this view is that such music is not to be theorized, either – especially if, as in Schubert's case, it is so often deemed imperfect, suggesting an inadequate line to the muses. . . . Moreover, why even begin to expend energy theorizing about the music of a composer who himself expended so little energy writing it?[16]

Such sentiments are not limited to the nineteenth century. Though Clark suggests this ironically, other current scholars seem to accept this premise. Writing about Schubert's music in 2005, Richard Taruskin states: "the logic, while demonstrable, is beside the point. To insist on demonstrating it works against the intended effect."[17] While theoretical work on Schubert's music is not generally considered unnecessary,

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[14] Clark, *Analyzing Schubert*, 9.
[15] Clark, *Analyzing Schubert* provides a full history of Vogl's influence on Schubert reception (pp. 11–23).
[16] Clark, *Analyzing Schubert*, 53.
[17] Richard Taruskin, *The Oxford History of Western Music* vol. 3: *The Nineteenth Century* (New York: University of Oxford Press, 2005), 89.

certain areas have yet to be explored thoroughly, particularly Schubert's use of sonata form.[18]

Schubert versus sonata form

Before introducing Cohn's work and my extension of it, it will be helpful to further explore scholarship on Schubert's use of sonata form. There are many differences between Schubert's sonatas and Beethoven's, and these will figure in my theory in different ways; some will reemerge in a new light and others will be relatively unaffected, but should at least be recognized, so that they can be accounted for in the midst of analyses based on Classical sonata theory.[19] James Webster's "Schubert's Sonata Form and Brahms's First Maturity," published contemporaneously with the Dahlhaus essay cited above, will help outline these differences and also provide an opportunity to present some of the principles of Classical sonata form that will guide my analyses.

Webster suggests that the unusual aspects of Schubert's sonata forms are not necessarily a result of his propensity for lyricism, but rather, stem from certain compositional inhibitions: "against leaving the tonic, against establishing new keys by dominant preparation, at times against the dominant itself, and against placing an entire

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[18] For a more nuanced discussion of the attitude exemplified by these quotes from Tovey and Taruskin (including counterexamples demonstrating good theoretical and musicological discussion of Schubert), see Clark, *Analyzing Schubert*, chapter 3.

[19] For the sake of convenience, and because I am presently only concerned with single movements, I will use the term "sonata" very broadly, referring to any movement in sonata form and not to an entire multi-movement work.

large section in a single key."[20] To examine these "inhibitions" in more detail, I will work through the stations of sonata form in order, presenting the standard Beethovenian preferences followed by Schubert's tendencies (as described by Weber) where they differ.

Barring the presence of a slow introduction – rare in Schubert's late sonatas – a sonata's exposition begins with the primary-theme zone (P), which generally takes the form of one of William Caplin's tight-knit themes: sentence, period, or some hybrid or variation of these.[21] P may be tonally open or closed, but while one of sonata form's inevitabilities is that the initial tonic will be left until the final essential structural closure (ESC) at the end of the recapitulation, "P-themes are rarely if ever tonally ambiguous."[22] Schubert, however, often moves to a more or less distantly related key after the initial thematic statement, followed by a return to the original material in tonic, resulting in an ABA structure. Examples include the late B♭ major and G major Piano Sonatas, D. 960 and 894, respectively.[23]

In Hepokoski's and Darcy's theory (which I will refer to generally as "sonata theory"), after P in tonic, a transitional zone (TR) moves toward the medial caesura (MC), most likely ending on a half cadence (HC) on V (III:HC in a minor mode sonata) to prepare for the secondary-theme zone (S) in the dominant or relative major. The second-level default for the medial caesura (MC) is I:HC (i:HC in minor), while the

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[20] James Webster, "Schubert's Sonata Form and Brahms's First Maturity," *19th-Century Music* 2, no. 1 (1978), 35.
[21] James Hepokoski, and Warren Darcy, *Elements of Sonata Theory: Norms, Types and Deformations in the Late Eighteenth Century Sonata*, (New York and Oxford: Oxford University Press, 2006), 69; Caplin, *Classical Form*, 197.
[22] Hepokoski and Darcy, *Elements of Sonata Theory*, 73.
[23] Webster, "Schubert's Sonata Form," 21–22.

third-level default is generally a perfect authentic cadence (PAC) in V (III:PAC or v:PAC in minor, depending on the secondary key).[24] The medial caesura itself is a "brief, rhetorically reinforced break or gap that serves to divide an exposition into two parts."[25] Schubert often begins S in a remote key, resulting in a similarly remote destination for the MC, and the transition itself often does not move to the key of S clearly, if at all.[26] The most common remote keys are generally on the flat side, including the flat submediant in the B♭ major Sonata, D. 960 and the *Grand Duo*, D. 812, and the flat mediant in the String Quintet, D. 956. In minor mode pieces, the flat submediant sometimes stands in for the relative major, as in the *Quartettsatz*, D. 703.[27] Webster notes that while Beethoven occasionally uses remote keys for S, he generally moves to sharp-side, rather than flat-side, keys.

Unlike his predecessors, who generally achieve modulations through structured cadential motion that introduces the dominant of the new key, Schubert often modulates suddenly, through individual pivot chords or reharmonized common tones. This is the case even in movements with more normative key structures, so it represents a broad compositional preference, rather than a strategy for dealing with remote keys in particular. According to Webster, "Schubert's penchant for juxtaposing keys rather than preparing them, for common-tone modulations between indirectly related keys, and for

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[24] Hepokoski and Darcy, *Elements of Sonata Theory*, 25–26. Hepokoski and Darcy refer to default preferences for the various sections and moments in a sonata form movement in terms of levels: first level is most common, second level is slightly less common, etc. I am mainly concerned with their interpretation of the sonata form's tonal plan, and will use their notation for cadences. For example, I: HC refers to a half cadence in tonic.
[25] Ibid., 24.
[26] Webster, "Schubert's Sonata Form," 22.
[27] Ibid., 22–23.

remote keys on the flat side stems from his unease with the dominant;" he posits that Schubert is uncomfortable using his most lyrical material to transition to the dominant, and thus presents the dominant perfunctorily until the retransition (RT) at the end of the development. However, the dominant does appear universally and prominently at the end of Schubert's expositions, resulting in the "three-key exposition" comprised of P in tonic, S starting in a remote key, and a final S section in the dominant – but often with the tonic, a remote "purple patch," or both, interpolated briefly – closing out the "double second group."[28]

Another consequence of Schubert's tendency to juxtapose distantly related keys is ambiguity in determining when the tonic is actually abandoned. As Webster sees it, following such an abrupt modulation, "the underlying reality – in Schubert's unconscious, one is tempted to add – is that the tonic still holds sway."[29] In other words, unlike the usual careful process of chromatically altering one scale degree in order to tonicize and eventually change to a closely related key, Schubert's large and sudden shifts have the potential to obfuscate the structural processes involved and make it difficult to tell what is happening formally until the more normative key emerges later. I generally find that other factors – namely, the rhetorical weight of the MC in particular – make the formal position clear, but I agree that Schubert often holds onto the tonic longer than traditional sonata theory dictates; the prominence of I:HC and even I:PAC at the MC is evidence of this. Though this is supported by the fact that Schubert's sonata forms

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[28] Webster, "Schubert's Sonata Form," 26. Webster suggests that this technique may have its primary antecedent in Beethoven's *Coriolan* overture, which follows a similar procedure.

[29] Ibid., 30.

tend toward longer-than-normal P and TR groups, Webster notes that it is often the movements with a higher proportion of S material that are prone to criticism for formal bloating and redundancy, particularly through extended modulations and repetitions.[30]

Sometimes, the remote key in S is not confirmed with a cadence, allowing the music to move to the dominant relatively smoothly and leaving the status of the remote key somewhat ambiguous. This is particularly notable in the first movement of the String Quintet in C major, D. 956, in which S begins in E♭ major but moves to G major before the theme ends. Clark describes this section as based "around" G rather than "in" E♭ or G, emphasizing the importance of G in the melody and treating E♭ major as a reharmonization; this is basically compatible with Webster's interpretation, which regards the entire E♭ section as an expanded transition leading to the later G major material.[31] I do not fully agree with Webster here, because in general I am more willing than he is to place the proper start of S at the first appearance of a remote key, but I do agree with his analogous argument concerning the sudden appearance of B minor in the E♭ Piano Trio; I will return to this issue later.

As far as sonata theory is concerned, "S may be articulated in an abundance of differing shapes: period, repeated period, sentence, hybrid phrase, and so on," and it is generally less tightly knit (in Caplin's sense) than P.[32] Tonally, it must move to the dominant in a major mode movement; the relative major is standard in the minor mode, with the minor dominant as a distant second option. Sonata theory does allow for "tonally migratory" S-themes, inspired by the *Coriolan* overture, which follow a i–III–v

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[30] Ibid., 31.
[31] Clark, *Analyzing Schubert*, 185; Webster, "Schubert's Sonata Form," 28.
[32] Hepokoski and Darcy, *Elements of Sonata Theory*, 124; Caplin, *Classical Form*, 97.

tonal scheme, but if Schubert was indeed inspired by *Coriolan* for his own three-key movements, he clearly takes additional liberties with the model.[33] Certainly, sonata theory allows for multiple theme groups in S, an almost ubiquitous feature in Schubert.

A crucial moment late in the exposition is the essential expositional closure (EEC), which ends S and marks the beginning of the closing section (C). This moment is always marked by a PAC in the subordinate key, and it falls at the end of S, but the exact location is subject to some debate. When the S-C group contains multiple themes with their own PACs, Caplin tends to consider S to have stopped when the musical material no longer coheres into fully defined themes and instead takes the form of one or more codettas; in this case, EEC happens at the PAC for the last fully thematic section.[34] Hepokoski and Darcy instead side with William Rothstein's view that the first PAC in the subordinate key closes the exposition proper, and subsequent "S" themes are actually part of C. In short, EEC occurs "on the attainment of the first satisfactory perfect authentic cadence [in S] that proceeds onward to differing material."[35] I prefer the latter definition, though in Schubert the issue arises less frequently due to the smaller proportion of material in his S groups that is actually in the subordinate key.

Due to the modulatory nature of the development section in general, it will be less important than the exposition and recapitulation in my theory, and Webster hardly mentions it. That said, there are norms associated with it, particularly with its beginning and ending, that will be important as points of comparison with Schubert's practice. Though the concept of first-level defaults is less useful in the development, the most

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[33] Webster, "Schubert's Sonata Form," 27.
[34] Caplin, *Classical Form*, 122.
[35] Hepokoski and Darcy, *Elements of Sonata Theory*, 121–122.

common opening key is that of the recently finished C group, usually the dominant or relative major, followed by a progression of descending fifths on the same material. P material is common at this point, but as Hepokoski and Darcy list the episodic opening as the second level default and C material as the third, it is difficult to specify with any certainty what will actually happen at the beginning of the development. It is, however, important to note the possibility of an opening harmony somewhere on the sharp side of the subordinate key, presenting the opportunity to move back to more familiar territory through downward fifth motion.[36]

A normative development typically ends with a retransition (RT) that heavily emphasizes the dominant as chord rather than key, but there is precedent for other endings. The dominant of vi is most common, as Hepokoski and Darcy note that the submediant is often an important key in the development. V/iii is another option, and the authors also mention occasional instances of vi:PAC or iii:PAC immediately followed by the recapitulation.[37] Schubert generally closes the development in the dominant of the key that beings the recapitulation, which is not always tonic. The key of the subdominant is not uncommon (and recognized by Hepokoski and Darcy as an unusual but plausible starting key for the recapitulation), resulting from the literal transposition of P down a fifth, but Schubert moves to far more distant keys at times: the flat submediant in the B♭ Piano Trio, D. 898, and the flat mediant in the finale of the *Grand Duo*, D. 812, among others. As Webster notes, the off-tonic recapitulation is most common in movements with multiple themes in P, or at least multiple iterations of the same theme, and tonic is

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[36] Ibid., 206–212.
[37] Ibid., 199–203.

usually restored relatively quickly in one of these later phrases.[38] A similar phenomenon does appear in Classical sonatas, but it is extremely rare.

In sonata theory, the recapitulation is by default relatively straightforward, presenting all of the material from the exposition in the same order, but with S and C transposed to the tonic. The recapitulatory P and TR zones are the sections most likely to be modified to any significant extent, particularly when the transition originally modulated to the subordinate key; the clear implication is that the TR zone must be changed in order to end on tonic. Some themes or sections may be omitted in the recapitulation only to reappear in the coda. Schubert sometimes avoids any modification by essentially transposing the entire exposition down by fifth, as in the E♭ Piano Trio and the String Quintet (resulting in the IV-opening recapitulation mentioned above), but he more often transposes only the S and C groups, creating a more normative tonal path. This is often accompanied by the transposition of the final P theme into the subdominant, preserving the key relations from that point on, though Webster notes that this subdominant inflection is not unusual in Classical examples. However, Schubert's S groups are often in remote keys, so the subdominant P theme may lead to a mediant-related key rather than back to tonic. When Schubert does open S in a new key, he occasionally recapitulates the entire group in tonic, changing the key relationships throughout the recapitulation. The first movement of the *Grand Duo*, for example, moves from ♭VI to V in S in the exposition, then from i to I in the recapitulation. Yet another option involves recapitulating the material in both possible keys, as in the first

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[38] Webster, "Schubert's Sonata Form," 31–32.

movement of Symphony No. 9, in which S (in E minor, iii, initially) comes back first in i and then immediately again in vi.[39]

It is worth noting that I have avoided the term "deformation," which Hepokoski and Darcy would likely use for the sorts of exceptions Webster notes in Schubert's sonata forms. I am sympathetic to their nuanced use of the term, and I find it justified in general; in short, they "do not use this term in its looser, more colloquial sense, one that can connote a negative assessment of aesthetic defectiveness, imperfection, or ugliness…within [their] system, 'deformation' is a technical term referring to a striking way of stretching or overriding a norm."[40] On the other hand, I agree with Clark that Hepokoski's and Darcy's language comes "perilously close" to that of some of Schubert's detractors in their negative assessments of his music.[41] Thus, in a conscious effort to avoid treading on sensitive territory, I will avoid the term "deformation" (or any term with a negative colloquial meaning) in my analyses.[42] I prefer the less charged concepts of difference and dialogue between Schubert and Classical forms.

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[39] Webster, "Schubert's Sonata Form," 34.
[40] Hepokoski and Darcy, *Elements of Sonata Theory*, 615.
[41] Clark, *Analyzing Schubert*, 205–206. Clark provides more examples of negatively charged language that, on the surface, closely resembles Hepokoski's and Darcy's.
[42] Joseph Straus considers the term from the standpoint of disability studies in "Normalizing the Abnormal: Disability in Music and Music Theory," *Journal of the American Musicological Society* 59, no. 1 (2006), where he suggests that "if musical form can be understood metaphorically as a human body via the image schema of the container, then deformations in musical form may metaphorically suggest deformations in a human body" (129). Importantly, Straus aims not to condemn scholars whose work deals in terms of normality and abnormality, but to recognize the cultural and temporal contingency of such norms. My goal in discussing the concept of "deformation" as it relates to Schubert scholarship is the same.

The triad's double life – Richard Cohn's *Audacious Euphony*

While Webster takes relatively detailed account of some of Schubert's more unusual modulations, he does not attempt to explain why or how Schubert may have chosen these keys. Richard Cohn's theory of pan-triadicism and the corresponding notion of dual syntax in nineteenth-century tonal music, presented in its most recent and complete form in *Audacious Euphony* (2012), will help to make sense of these previously unexplained decisions.[43] Central to Cohn's work is the difficulty caused by the "enharmonic seam," the ambiguity that arises when, in equal-tempered chromatic space, a contradiction arises between perception and notation. To clarify this point, consider the chord progression in Figure 1.[44]

Figure 1. Reduced from the first movement recapitulation of Schubert's Sonata in B♭ major, D. 960. Adapted from Cohn, *Audacious Euphony*, 2, *Figure 1.1*.

The stationary bass voice in mm. 2–3 indicates that F♯ is a notational substitute for G♭, ♭$\hat{6}$ in B♭ major, and the bass motion from F♯ to A unambiguously traverses a minor

[43] Cohn, *Audacious Euphony*. Much of the work presented in *Audacious Euphony* has been developed in previous years under the general banner of "neo-Riemannian theory," a label which Cohn avoids now in order to avoid giving "too much credit to Riemann," and to avoid drawing unwanted comparisons with unrelated work in a field that has "has never been very stable" (xiii). See the book's introduction for a more thorough discussion of terminology.

[44] The discussion of Figure 1 is adapted from Cohn, *Audacious Euphony*, 2–3.

third, resulting in a B♭♭ chord that has simply been respelled as A major (with a cadential 6/4 embellishment and dominant seventh). The voice leading from C♯ to D in the alto (mm. 5-6) thus indicates a respelled move from D♭ to E♭♭, and since that note sounds like the third of a major chord, the root is actually C♭♭, not B♭. However, this abstract notational difference is hardly reflected in the way the passage is perceived, and Cohn's conclusion is that the rules of diatonic harmony are poorly adapted for capturing this kind of musical process. Moving away from a tonal sense of triadic distance, he suggests that voice-leading work, in terms of semitonal displacement under idealized voice leading, is an effective alternative metric (7–8).[45]

Beginning with the smallest possible unit of voice-leading work—a single semitone—any triad can be transformed into two different triads of the opposite mode. For example, C major can be transformed into E minor or C minor by lowering its root or third, respectively, and E minor can be transformed into E major to C major by raising its third or fifth. These reciprocal transformations of major and minor triads form a cycle, as shown in Figure 2.[46] Figure 3 shows a progression through the northern system on a strip of the *Tonnetz*, with perfect fifths running west to east, major thirds running southwest to

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[45] A "tonal sense of triadic distance" essentially refers to a Roman numeral analysis; the progression above, starting in B♭ major, would be I–♭VI–♭vi–♭I–♭♭II. Idealized voice leading refers to the minimal motion between members of sonorities in terms of pitch class rather than pitch in register. As another distance metric, Cohn also discusses but ultimately rejects common tone retention, which is less sensitive than voice-leading distance; for example, a C major triad moving to an A minor triad retains the same number of common tones as C major to C minor, but the voice leading work is different.

[46] This figure is adapted from Richard Cohn, "Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late-Romantic Triadic Progressions," *Music Analysis* 15, no. 1 (1996), though a similar figure is presented in *Audacious Euphony*. Portions of *Audacious Euphony* are based on previously published articles, which I will reference when applicable. The original sources often provide extra mathematical support for relevant concepts and additional analyses.

northeast, and minor thirds running northwest to southeast; cardinal directions in both figures are arbitrary and only referenced for easy orientation.

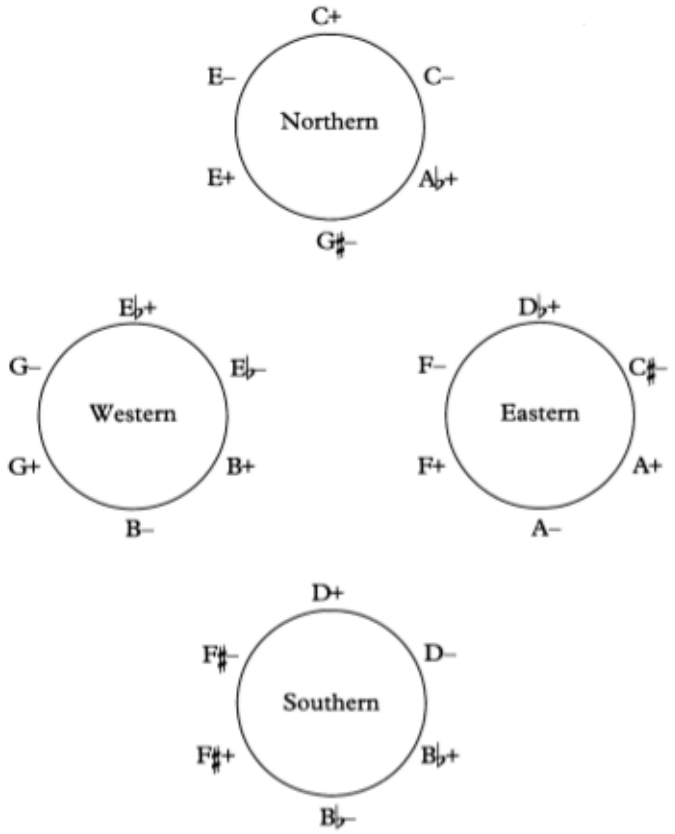

Figure 2. Hexatonic systems. Fig. 1 from Cohn, "Maximally Smooth Cycles," 17.

Since each chain only contains six triads, there are four unique chains, or hexatonic systems, each consisting of six notes forming a hexatonic scale. The voice leading among the triads in a hexatonic cycle is balanced, in the sense that motion through the cycle in either direction consists of alternating upward and downward semitonal motion. This means that transitions between same-mode triads within a hexatonic system involve only contrary motion, and even lengthy progressions through a hexatonic cycle are registrally stable under idealized voice-leading.

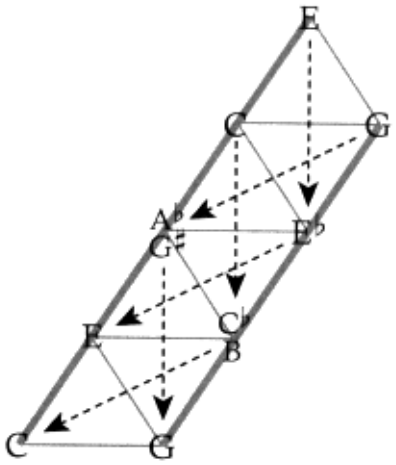

Figure 3. Traversing the northern hexatonic system. Figure 2.10 from Cohn, *Audacious Euphony*, 29.

The particular voice leadings used to navigate the hexatonic cycle are **P**, for the transformation that moves a triad to its parallel major or minor, and **L**, for the transformation that lowers the root of a major triad or raises the fifth of a minor triad (29).[47] Note that these, like all of Cohn's basic transformations, are involutions, which means that any one of them applied twice will return to the original triad. One other transformation, **H**, is not explicitly present in the hexatonic cycle; instead, it moves across the cycle by shifting all three voices. **H** stands for "hexatonic pole," representing the farthest point away from any given triad in the cycle. Importantly, although all three voices move by one semitone, two are in contrary motion, resulting in a total of one unit of voice-leading work and a change of mode (31). For example, C major moves to its

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[47] **L** stands for *Leittonwechsel*, or "leading-tone exchange," a concept that draws on dualist interpretation of inversional equivalence for major and minor triads. Pan-triadic (and all neo-Riemannian) theory has a rather long and complex relationship with the nineteenth-century concept of dualism, which I will not discuss in detail but which Cohn treats extensively; see pp. 37–39. As a rule, I follow Cohn by setting transformations in bold typeface.

hexatonic pole, G♯ minor, by progressing halfway through the hexatonic cycle: C moves down to B (**L**), G moves up to G♯ (**P**), and E moves down to D♯ (**L**).[48]

Central to the hexatonic system and its propensity for smooth voice leading is the augmented triad; note that in Figure 3, the system's darkened boundary lines represent two augmented triads, which together contain all six notes in the system. It is the consonant triad's similarity – but not identity – with the augmented triad that makes possible the kind of smooth voice leading represented by Cohn's transformations. As an example, see Figure 4, which presents an augmented triad on a traditional clock-face diagram, along with the minimal perturbations necessary to reach six different consonant triads. Smooth motion between triads can be represented as inversion around an axis chosen such that two of the triad's tones map onto each other, as in Figure 5, which demonstrates an **L** operation on C major and E minor. "In order to create a small but recognizable displacement of a single voice under inversion, the trichord must be as even as possible, but not perfectly even;" this is visually evident if one imagines that the points of the triangle in Figure 5 were less evenly distributed – the less "equilateral" the triangle, the larger the displacement created by any inversion (35–36).

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[48] Richard Cohn, "Neo-Riemannian operations, parsimonious trichords, and their Tonnetz representations," *Journal of Music Theory* 41, no. 1 (1997), provides in-depth mathematical discussion of the original **PLR** transformations, including an extension to nearly even trichords in chromatic systems with more than twelve notes.

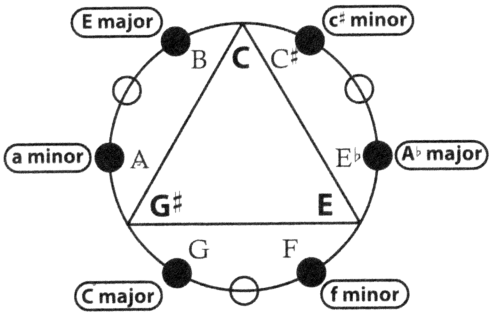

Figure 4. Augmented triad with consonant triads available through minimal perturbation. Figure 2.15a from Cohn, *Audacious Euphony*, 35.

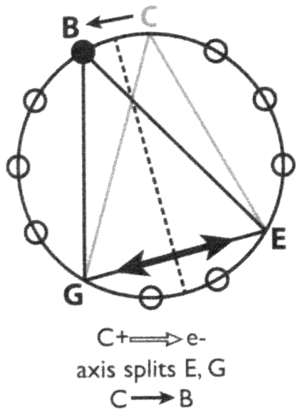

Figure 5. An **L** operation demonstrated through inversion. Figure 2.16a from Cohn, *Audacious Euphony*, 35

Hexatonic systems demonstrate smooth voice leading quite effectively, but each system has been presented as something of an island; there is no systematic way to move among them at this point. The augmented triad provides the stepping stone, as Cohn demonstrates through a discussion of reciprocity. Reciprocity, in musical terms, essentially describes some sort of even exchange between two objects, usually triads. The notion of the *Leittonwechsel*, for example, implies that the relationship between $\hat{5}$ and $\hat{6}$ in a minor key is reciprocal to the relationship between $\hat{1}$ and $\hat{7}$ in a major key (46).

Cohn's discussion, however, shifts from a conception of reciprocity between consonant triads to an exploration of reciprocity between consonant and dissonant objects; namely, the major triad and the augmented triad. A traditional understanding of dissonant harmonies subordinates them to consonant ones; Schenkerian analysis is perhaps the ultimate expression of this norm, interpreting dissonant harmonies as prolongations of surrounding consonances, and even most of those consonances as dissonances against a global tonic. However, reciprocally, dissonant harmonies can direct the operations of consonant ones. A large-scale chromatic sequence that moves by minor thirds could be considered a prolongation of a dissonant diminished seventh chord just as easily as Schenker's sacred triangle represents the prolongation of a single tonic chord. Cohn, drawing on Fétis, describes these dissonance-controlled moments in terms of a shift in preferences, from a diatonic scale-controlled musical background to one under the influence of uniformity and symmetry (47). A similar shift informs Carl Friedrich Weitzmann's 1853 treatise, *The Augmented Triad*, which in turn forms the starting point for the remainder of Cohn's theory.

Instead of defining the augmented triad in terms of (and thus as subordinate to) the consonant triad, Weitzmann essentially generates the twenty-four consonant triads through single-semitone displacement of the four augmented triads. This technique already made an appearance in Figure 4, and is now taken to completion in Table 1.

Table 1. Weitzmann's grouping of the consonant triads as displacements of augmented triads. Table 3.1 from Cohn, *Audacious Euphony*, 57.

I. {C, E, G♯} (and its enharmonic transformations)		
1. C major	2. E major	3. A♭ major
4. a minor	5. c♯ minor	6. f minor
II. {D♭, F, A} (and its enharmonic transformations)		
1. D♭ major	2. F major	3. A major
4. b♭ minor	5. d minor	6. f♯ minor
IV. {D, F♯, A♯} (and its enharmonic transformations)		
1. D major	2. G♭ major	3. B♭ major
4. b minor	5. e♭ minor	6. g minor
III. {E♭, G, B} (and its enharmonic transformations)		
1. E♭ major	2. G major	3. B major
4. c minor	5. e minor	6. g♯ minor

Each augmented triad generates three major and three minor triads, and the roots of each set of modally matched triads are major third transpositions of each other. This description matches that of a hexatonic system, but a Weitzmann region (Cohn's newly minted term for Weitzmann's six-triad groups) contains a set of major and relative minor triads, not the hexatonic system's major and parallel minor (59).[49] Also, unlike their hexatonic counterparts, these triads are not inherently cyclic; Cohn represents them graphically as "waterbugs," in which the feet are consonant triads and the body is the presiding augmented triad, as in Figure 6.

[49] The relative and parallel relationships described here are not the only ways to represent the relationships among triads in the respective systems – one could easily conceive of hexatonic systems as containing three major third-related major triads and their respective **L**-related minor triads, for example. However, the root-stability of the **P** transformation is attractive for purposes of efficient description, as is the relative major/minor distinction in a Weitzmann region.

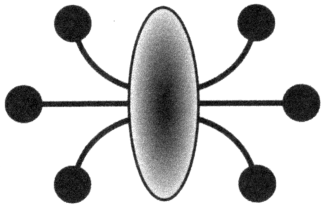

Figure 6. A Weitzmann "waterbug." Figure 4.1a from Cohn, *Audacious Euphony*, 60.

This representation is particularly effective, because it captures the notion that motion from one triad to another requires the voice leading to enter the bug's augmented triad "body" before moving to another triad. This process of "undoing" the original displacement before applying a new one demonstrates another difference from the hexatonic system: Weitzmann transformations inherently involve two semitones of voice leading rather than one. As with the hexatonic system, there are three primary Weitzmann transformations: **R**, moving to the relative major or minor, is most familiar, moving one voice by whole step; **N**, "which Weitzmann describes as inversion about the root of a major triad, or about the fifth of a minor triad," is equivalent to the progression I–iv or i–V, with two voices moving in the same direction by semitone; **S**, the "slide" transformation, takes a major triad to the minor triad a half step higher (preserving the third of the chord but changing its quality), and likewise transforms a minor triad into a major triad a half step lower (61, 64).[50] The triads that cannot be reached by these operations – namely, those that are major third transpositions of the original triad – can be represented with the combinations **PL** and **LP**. While these names imply intermediate

[50] Cohn refers to **H** and **S** as "maverick" transformations due to their lower frequency of occurrence in the repertoire than the others, though they will both appear in the Schubert pieces analyzed below.

motion through a minor rather than augmented triad, they seem to represent the most efficient way to notate these particular transformations (60). Figure 7 demonstrates all of these transformations with the intermediate step included.

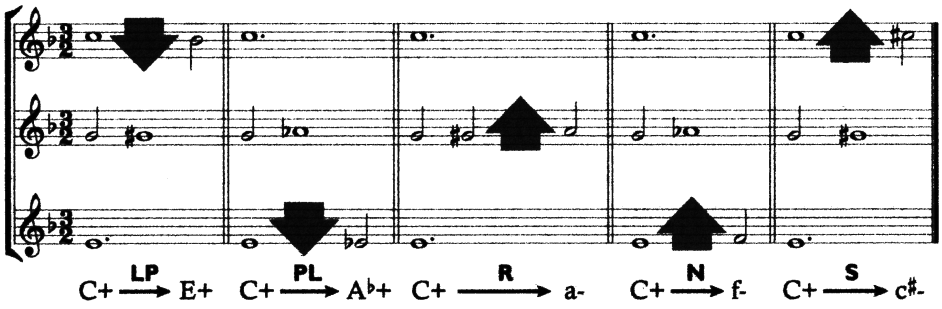

Figure 7. Two-stage Weitzmann voice leadings through an augmented triad. Figure 4.2 from Cohn, *Audacious Euphony*, 61.

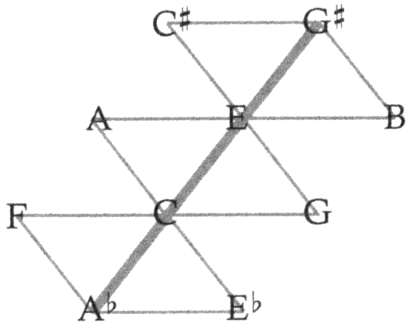

Figure 8. A Weitzmann region on the *Tonnetz*. Figure 4.6a from Cohn, *Audacious Euphony*, 65.

The Weitzmann equivalent of Figure 3 is given in Figure 8 above. The *Tonnetz* representation of a Weitzmann region is slightly problematic because of the augmented triad's voice-leading relevance; for example, an **R** operation on the traditional *Tonnetz* does not capture the fact that two semitones of motion are required, even though it looks

geometrically identical to **L** and **P**. Cohn's solution is to consider the augmented triad axis as an object itself through which voices must move, rather than as a transparent boundary, hence its representation as a darkened line (65–67).[51]

Like hexatonic systems, Weitzmann regions are limited on their own, containing only six out of the twenty-four consonant triads. However, both groups are structured so that they can combine in powerful ways. Figure 9, adapted by Cohn from Weitzmann's treatise, provides a glimpse at the potential connections. Each augmented triad is surrounded by its Weitzmann group; the next, more distant set of triads share the same root as each Weitzmann triad but are in the parallel mode. These combine with the adjacent boundary triads to form a hexatonic system, such that the entire figure consists of consecutive Weitzmann groups and hexatonic systems that overlap at the edges (84).[52]

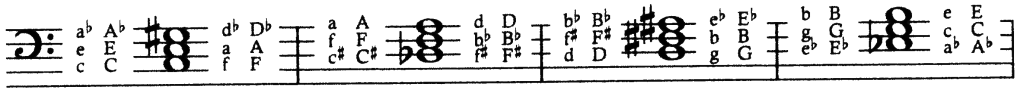

Figure 9. Weitzmann's organization of the consonant triads around the augmented triads. Figure 3.9 from Cohn, *Audacious Euphony*, 58.

[51] This issue reveals an inherent bias in the *Tonnetz* toward a common-tone rather than voice leading-based metric for triadic distance. Cohn is aware of this, and defends the use of the *Tonnetz* as a historically important tool that is more effective at tracking individual pitch classes than "fused-triad" graphs; both visualizations feature prominently in his analyses where applicable.

[52] Cohn also notes that the idealized voice leading between triads consistently "upshifts" from left to right, and thus "downshifts" from right to left.

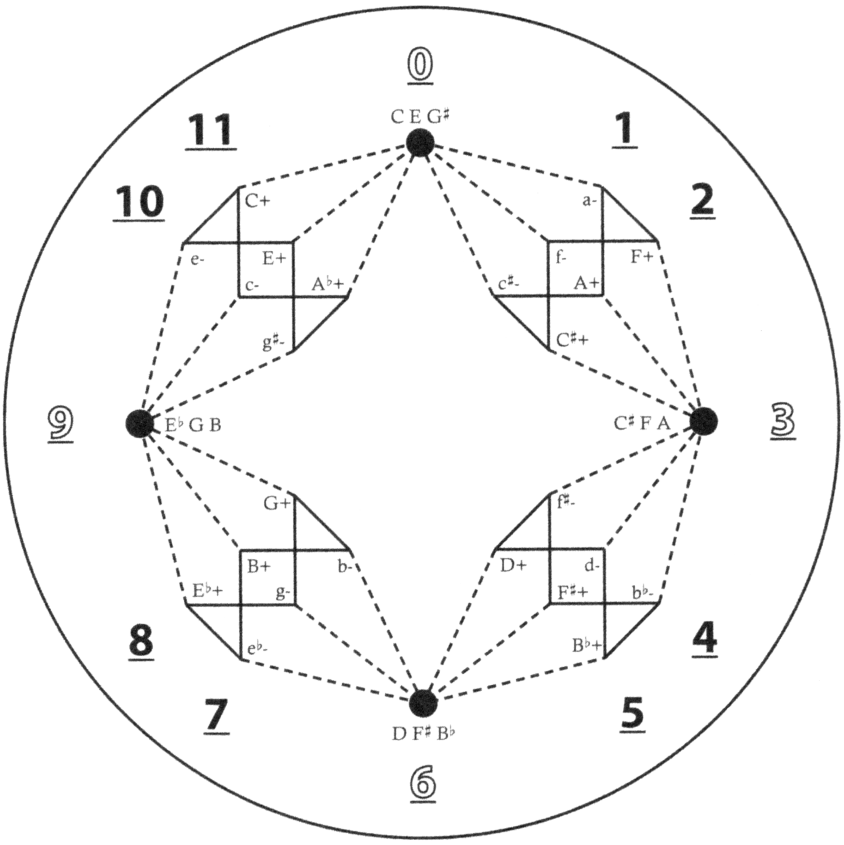

Figure 10. Cube Dance, with voice-leading zones added. Figure 5.24 from Cohn, *Audacious Euphony*, 104.

These relationships are represented visually in Figure 10, Jack Douthett's Cube Dance. The dotted lines connect Weitzmann region triads to their corresponding augmented triad, while the solid lines connect the members of each hexatonic region. Each line segment represents one unit of voice-leading work; this explains the "zigzag" shape of the hexatonic groups, a cosmetic adjustment that aligns modally matched triads while preserving the representation of their voice-leading distance. The Cube Dance maintains the up- and down-shifting consistency in Figure 9, with clockwise motion corresponding to upshifting in pitch class space (84). Now it is possible to visualize paths through triadic space while taking full account of voice-leading distance, as the

augmented triads represent the additional semitone involved in Weitzmann group transformations, whether or not the augmented triad is actually present in the music. Figure 11 provides a brief example drawn from Cohn's analysis of Schubert's overture to *Die Zauberharfe*, presented here to demonstrate the strengths and weaknesses of the Cube Dance and *Tonnetz* representations. The Cube Dance version clearly demonstrates the voice-leading size of each step in the progression, as well as the upshifting trajectory and the near-complete circumnavigation of triadic space that results; it also makes the presence of actual augmented triads very clear. The *Tonnetz* representation, on the other hand, masks the circularity and directional components, but it foregrounds that this is essentially an **R/P** chain, which is not at all clear from a glance at the Cube Dance's jagged path.

The combination of hexatonic and Weitzmann transformations allows for sequences by a variety of intervals not accessible within a single group's transformations. In addition to the minor third transposition resulting from the **R/P** chain in *Die Zauberharfe*, Table 2 demonstrates the various possibilities (90).[53]

[53] Cohn gives examples of the dark and light shaded combinations, though he has not found any examples of the remaining two possibilities, **H/R** and **H/S**. The dark shaded combinations are those that consist of transformations that are possible within common practice syntax, **L**, **P**, **R**, and **N**. Scott Murphy, in his review of *Audacious Euphony, Journal of Music Theory* 58, no. 1 (2014), demonstrates one instances of an **H/R** chain in a piano trio by Joachim Raff, but the final all-maverick chain remains undetected.

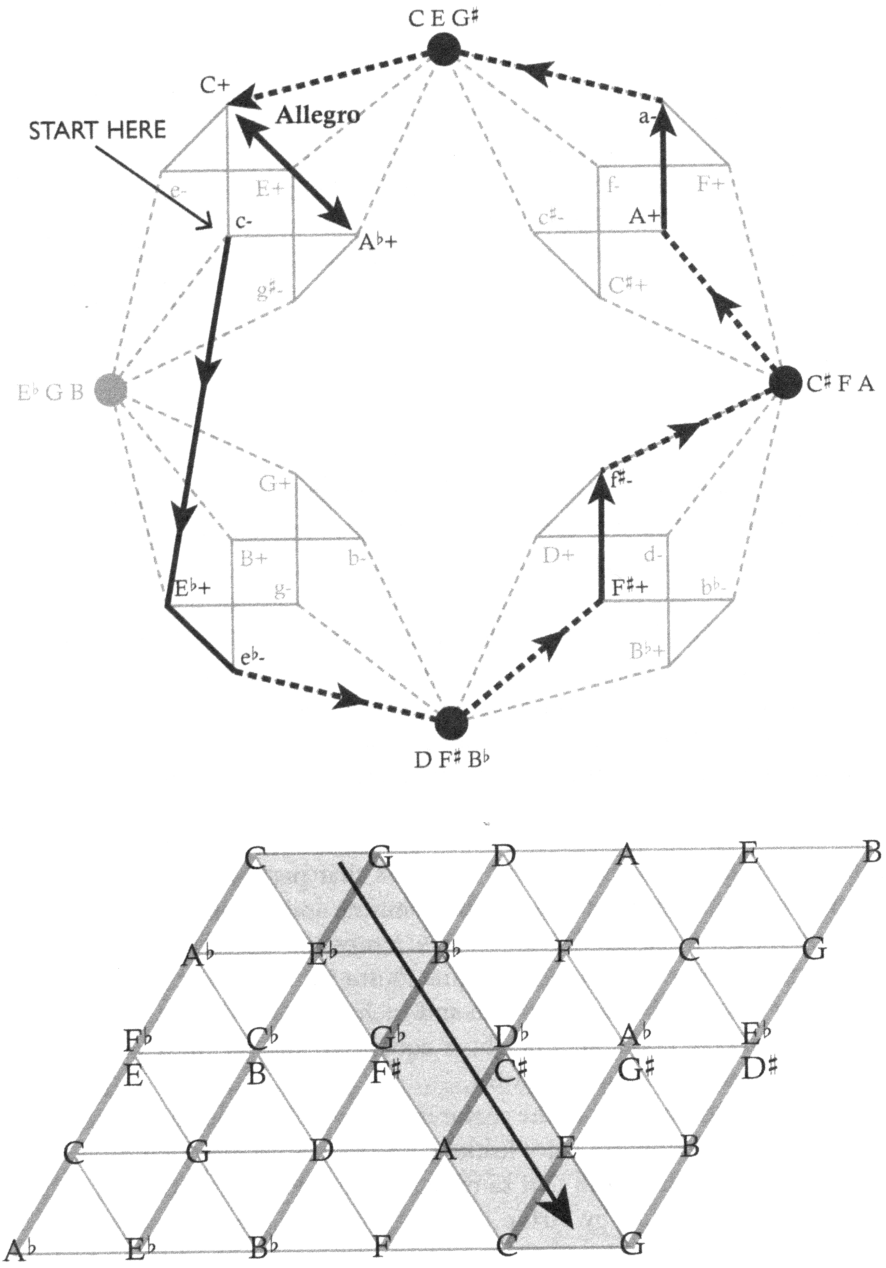

Figure 11. Opening music from Schubert's *Die Zauberharfe* represented on the Cube Dance and the *Tonnetz*. Figures 5.4 and 5.5 from Cohn, *Audacious Euphony*, 87.

Table 2. Combinations of Hexatonic (H) and Weitzmann (W) operations. Table 5.1 from Cohn, *Audacious Euphony*, 90.

	R	**N**	**S**
L	T±5	T±1	T±3
P	T±3	T±5	T±1
H	T±1	T±3	T±5

Figure 11 makes it clear that there are many ways to circumnavigate triadic space; most points on the circumference of the circle correspond to several triads, each a major third apart. This suggests that a composer in the process of writing a sequence might vary which of these triads is chosen without disrupting the overall voice-leading trajectory (95).[54] Such variation is accomplished through the substitution of one same-group transformation for another; "represented on the Cube Dance, the directional trajectory continues but traverses different nodes (96)." Figure 12 shows Cohn's analysis of a passage from Brahms's *Ein Deutsches Requiem*, in which an **L/R** chain is disrupted when **N** substitutes for **R**. The progression is thus **L/R/L/N/L/R/L/R/L**; however, representing hexatonic transformations with H and Weitzmann transformations with W, the passage can be represented as a uniform alternation of H/W/H/W/H/… /etc. with a steady trajectory through voice-leading space, represented here by the uninterrupted motion leftward on the *Tonnetz*. Alternatively, similar substitutions could be used to advance a slow-moving sequence by fifth or semitone so that it can return to the original harmony (or any other harmonic goal) much more quickly (96–97).

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[54] A common word of warning regarding sequences notes that they should not continue for too long or risk sounding trite, and Cohn suggests that the ability to substitute voice leading-equivalent but transpositionally varied triads represents a useful strategy for avoiding this problem in an extended sequential passage.

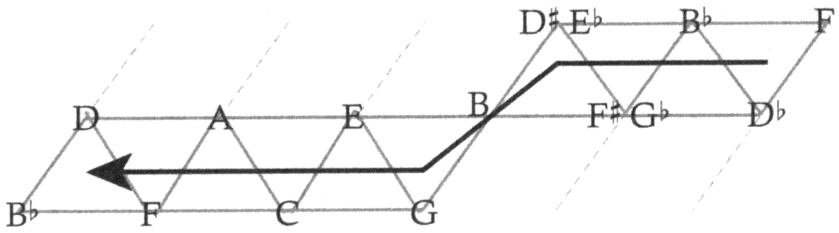

Figure 12. Brahms, *Ein Deutsches Requiem*, 2nd mvt., mm. 266–271, demonstrating a W group substitution on the *Tonnetz*. Figure 5.16 from Cohn, *Audacious Euphony*, 97.

One final addition to Cohn's theoretical edifice involves the previously unmentioned numbers surrounding the Cube Dance in Figure 10. The numbers refer to voice-leading zones corresponding to each station on the perimeter of the Cube Dance, and they serve to generalize the voice-leading equivalence of major-third related triads under this system (102).[55] Just as H and W transformations are grouped into equivalence classes in the previous example, major third-related triads now constitute their own equivalence classes (101–102).[56] The zones have the property that the difference between their numbers is equal to the aggregate up- or down-shifting separating their triads in semitones.[57] For example, D major (zone 5) can move to F major (zone 2)

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[55] With twelve voice-leading zones, it is useful at times to think of the Cube Dance as a clock face, with no particular intent to remove the baggage associated with clock face representations in other areas of music theory.

[56] "When we say that two objects or transformations are equivalent, we are saying that they are so with respect to some well-defined context, not with respect to every conceivable context." As an example, Cohn describes the concept of equivalence as applied to even numbers: four and one hundred are equivalent in their evenness, but not in magnitude.

[57] There is an important distinction here between combined voice-leading work and actual voice-leading motion: consider the **H** operation, which results in one semitone of upshifting or downshifting in voice-leading space, but requires motion in all three triadic voices. For example, to move from E major to C minor on Figure 10, it takes three line segment traversals to make the one-zone downshift.

through 5 - 2 = 3 semitones of voice leading: D moves to C (two semitones) and F♯ moves to F (one semitone). Another rather surprising property is that each zone number equals the sum of its pitch class contents mod twelve (where numbers "wrap around" upon reaching twelve), and thus triads can be located on the Cube Dance and their voice-leading magnitudes determined through simple addition (104).[58] In transformational terms, H-class operations map triads into a zone higher or lower by one, while W-class operations map triads into a zone higher or lower by two. Since every individual transformation changes its operand's mode, W-class operations map major triads up and minor triads down, and vice versa for H-class operations, such that all transformations keep the resulting triad within the same Weitzmann or hexatonic group (105).

It is important to keep in mind that the discussion so far focuses on describing music that privileges smooth voice leading. However, "if nineteenth-century composers accorded privilege to smooth voice leadings, they also accorded privilege to the contravention of privilege," so it is worth considering the ways in which this system allows for disjunction and entropy in addition to parsimony (106). Just as the tritone is the largest possible distance on a pitch-class clock face, a shift by six voice-leading zones

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[58] This consequence seems incredibly counterintuitive, but there is perhaps more sense to it than appears at first glance. We conventionally number the chromatic pitches starting with C = 0, and also place the C augmented triad at the top of the Cube Dance. Since the members of any perfectly even chord will always sum to 0 mod the size of the system, and if we accept that each line in the diagram represents one unit of voice-leading work (and thus, the previously discussed voice-leading properties of the Cube Dance are true), it is trivial to note that upshifting a chord by one semitone increases the sum of its members (and thus its voice-leading zone) by one. Essentially, the only way to avoid this property would be to mirror the entire diagram and number the zones in downshifting rather than upshifting order. This concept is introduced and dealt with more mathematically in Richard Cohn, "Square Dances with Cubes," *Journal of Music Theory* 42, no. 2 (1998).

represents the greatest disjunction on the Cube Dance. The result is that the major second and tritone are the most disjunctive transpositions in terms of voice leading, requiring a minimum of six semitones of motion. Within the confines of a single hexatonic or Weitzmann region, the maverick operations **H** and **S** seem to represent the greatest disjunction, but with caveats; while **H** requires the most voice-leading work and traverses the greatest possible distance in a hexatonic cycle (hence the "pole" designation), the non-cyclic nature of a Weitzmann region means that **S** is only "most disjunctive" by convention, being the least tonally normative of the three W group operations (107). Alternatively, a composer could opt for maximum variety in voice-leading distance among a number of chords. In such a case, traditional atonal theory suggests that one of the all-interval tetrachords [0146] and [0137] would provide such variety, and both prime forms map onto the triadic voice-leading zones—noting that, because some zones are occupied solely by augmented triads, not all pitch class sets will map onto purely triadic subsets of the Cube Dance (108). Cohn provides examples of both all-interval tetrachords as models, drawn from the finale of Beethoven's "Tempest" Sonata, Op. 31, no. 2, and the beginning of Wagner's *Götterdämmerung*, shown here in Figure 13.

Although Cohn's theory to this point has dealt solely with triads, much of it is extensible to common varieties of seventh chord as well, and there are several primary strategies for dealing with dissonances, all of which are also relevant beyond this theory.

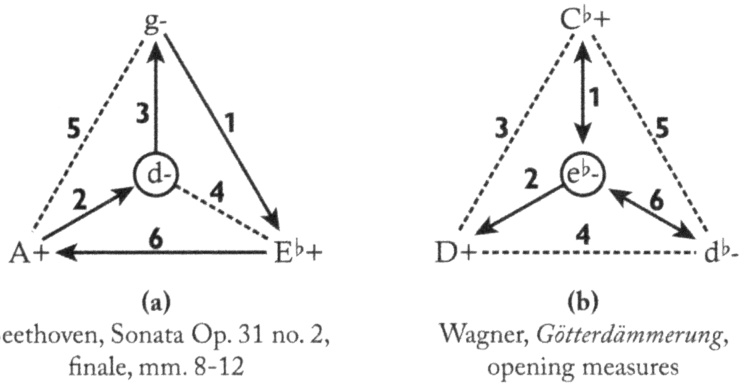

Figure 13. Maximal voice-leading variety in Beethoven and Wagner. Figure 5.26 from Cohn, *Audacious Euphony*, 109.

As mentioned in the discussion of reciprocity, the standard interpretation of dissonant chords is as prolongations of surrounding consonant ones, and this understanding is relevant in any analysis that reduces the musical surface before describing it; for example, any sequence that contains seventh chords (or any other prolongational harmonies) may be reduced (through deletion) to the starting or ending triad of every sequential block in order to foreground the underlying voice leading (140–141). In some cases, a dissonant chord can be incorporated into the analysis through reduction of the chord itself, by removing either a dominant seventh or root (in the case of a half-diminished seventh chord), leaving a simple triad (142–143). Dissonant harmonies may even be dealt with more thoroughly through a revision of the Cube Dance to handle "Tristan-genus" chords, dominant and half-diminished sevenths, so-named because the first five chords of the *Tristan* Prelude explore a "Boretz spider," the seventh chord equivalent of the Weitzmann "waterbug."[59] The resulting diagram, shown in Figure 14

[59] The Boretz spider, analogous to the Weitzmann "waterbug" discussed earlier, acknowledges Benjamin Boretz's analysis of the *Tristan* Prelude from his dissertation

as Douthett's "Four-Cube Trio," functions in much the same way as the Cube Dance, and most concepts from the rest of the discussion still apply. For example, the voice-leading zones still function as indicators of voice-leading distance, but the hexatonic pole is replaced with the octatonic pole.[60] I will generally rely on the deletion and reduction strategies and will not invoke the Four-Cube Trio, but it is worth noting that, perhaps intuitively, Tristan-genus chords group into equivalence classes based on minor rather than major third transposition (159).[61]

Cohn also describes a number of different strategies for navigating the universe of triads and transformational pathways that it represents. My extension of Cohn's theory is largely based on one of these, while the others are more incidental; even so, I will describe them briefly in order to provide a sufficiently broad picture of the possibilities available within this approach. One strategy involves "kaleidoscopic pan-triadic harmonizations of a static pitch," essentially taking advantage of minimal-work voice leading to maintain a single common tone among seemingly unrelated harmonies (113).

(cite), in which he made observations analogous to Weitzmann's, but regarding the fully diminished seventh chord rather than the augmented triad. These chords are the basis for regions with many of the same properties, being the perfectly even chords of four- and three-note cardinality respectively. See Cohn, *Audacious Euphony*, 151–156, for a more in-depth introduction to Boretz regions.

[60] Cohn, *Audacious Euphony*, chapter 7. Note that there is an error in the Four-Cube Trio as it appears therein; some of the connections within the octatonic regions do not accurately represent directed voice-leading distance. The version presented here is from Murphy's review, with corrections.

[61] Cohn also describes the groups of Tristan-genus transformations analogous to H and W; these are rather more complex and harder to distinguish than their triadic counterparts, but certainly useful for music that relies heavily on seventh chords.

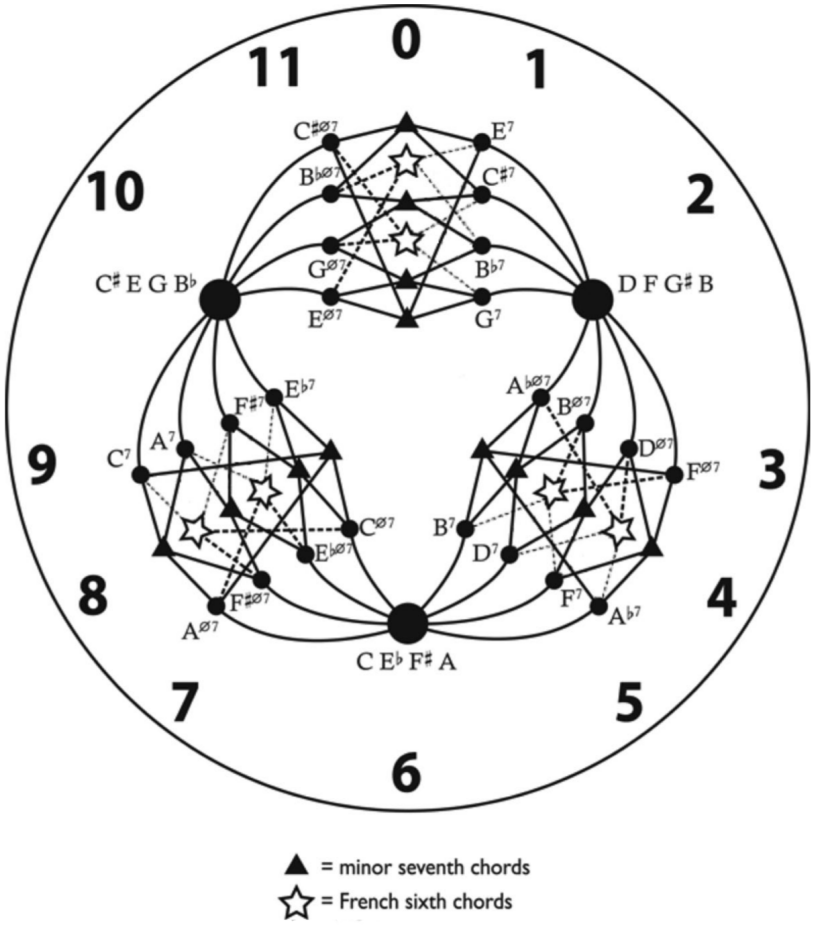

Figure 14. Four-Cube Trio, with correction. Figure 2 from Murphy's review of *Audacious Euphony,* 91.

This strategy, which explores a "neighborhood" around a single pitch, potentially forming a "pitch retention loop," is demonstrated on the *Tonnetz* in Figure 15.[62] Another strategy involves continuous upshifting motion; Cohn notes that each half of Schumann's *Dichterliebe*, each consisting of eight songs, presents a convincingly smooth upshift in terms of each song's beginning and ending triads.

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[62] Recall that the *Tonnetz* is particularly well suited for the representation of common-tone relationships because it avoids fusing pitch classes into triads, unlike the Cube Dance.

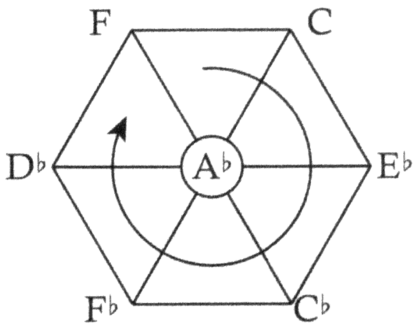

Figure 15. A pitch retention loop around A♭. *Figure 6.3* from Cohn, *Audacious Euphony*, 116.

Rather than continuously upshifting, a piece could instead traverse the Cube Dance in one direction before turning around and returning to the starting point. The concept of "departure/return" is common throughout musical discourse, not least as it relates to sonata form, which will be the focus of my own analyses. There are, however, less traditional ways to leave and return; Figure 16 shows Cohn's analysis of Schubert's "Auf Dem Flusse," in which several stanzas begins and end in the same zone (10), but with varied paths through voice-leading space. Each stanza downshifts and then upshifts through alternating H and W transformations, but the first setting of the final stanza includes a **P**-for-**L** substitution that takes the correct path in terms of zones but must be shifted through a same-zone **PL** transformation in order to regain the original transposition within zone 10.

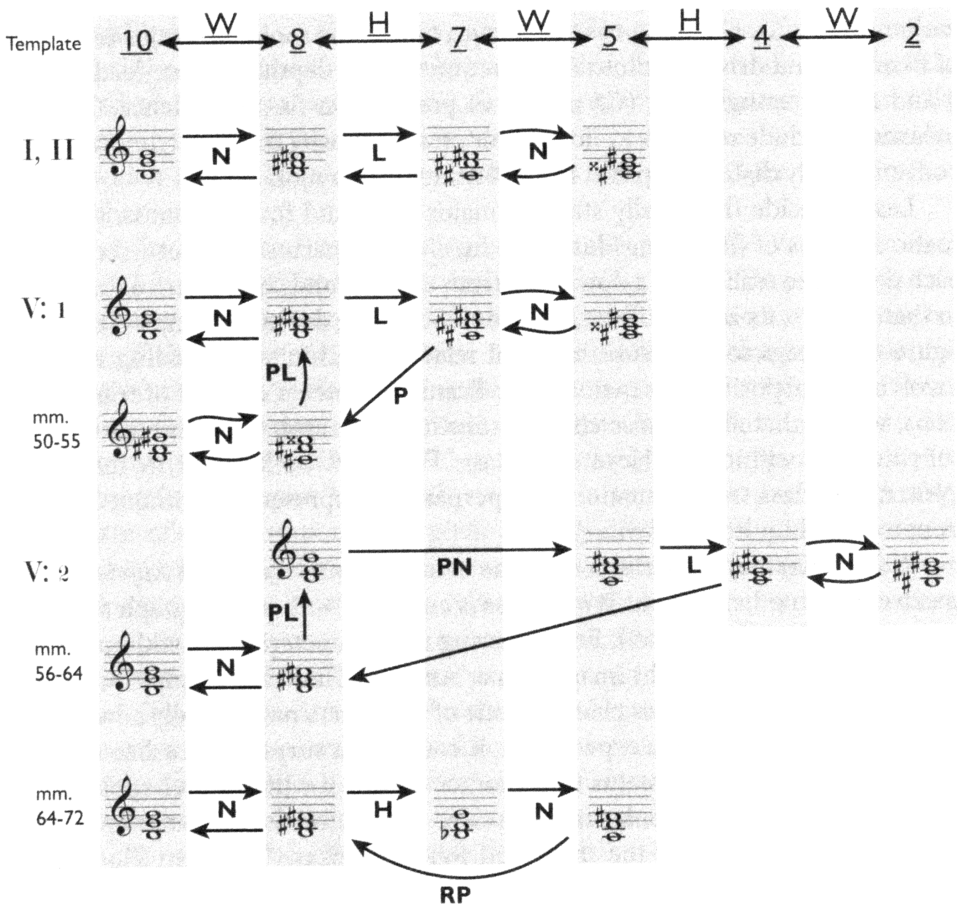

Figure 16. Departure and return in Schubert's "Auf Dem Flusse." Figure 6.8 from Cohn, *Audacious Euphony*, 123.

Returning to sonata form, it is certainly not necessary to invoke transformations or voice-leading zones in order to effect a departure/return narrative; the sonata's tonal plan is already built around such a procedure: namely, the departure from and regaining of tonic, as discussed earlier. However, Cohn's theory allows for some additional analytical finesse, particularly for pieces that modulate to unexpected keys. First, movement from dominant to tonic is one example of upshifting–consider a close-position G major triad moving to C major with idealized voice leading–and thus the normative sonata tonal plan can be understood, more generally, as large-scale downshifting

followed by upshifting. In an early analysis of the first movement of Schubert's Sonata in B♭ Major, D. 960, Cohn relates hexatonic systems to tonal functions,[63] allowing major third transpositions of diatonic harmonies to substitute for them in the course of the movement's tonal plan. Figure 17 maps the movement's first 80 measures in terms of the four hexatonic systems, which have also been assigned functional labels.[64]

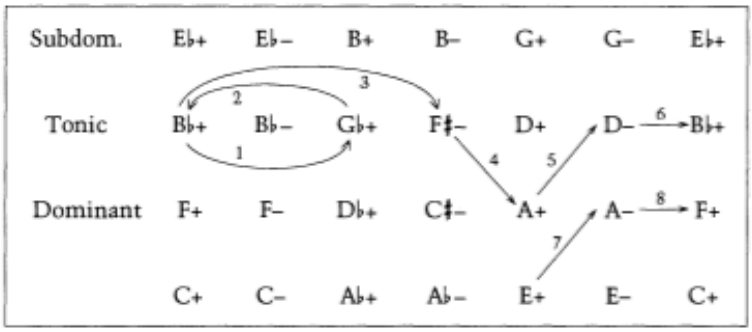

Figure 17. Hexatonic substitution in the B♭ Major Sonata, exposition. Figure 5 from Cohn, "As Wonderful as Star Clusters," 220.

This approach makes sense of moments that are otherwise rather difficult to explain in traditional harmonic terms. For example, the strongly prepared resolution from E major to A minor midway through the exposition (mm. 72–74), while foreign to B♭ major, represents a substitution for a double dominant resolution to dominant in hexatonic terms, and indeed the actual dominant appears soon thereafter. In fact, the overall functional trajectory in Figure 17 is quite normative, though Schubert's

[63] A hexatonic system's balanced voice leading prevents its members from upshifting or downshifting far enough to enact a tonic-dominant transition (which requires at least two semitones of motion in the same direction), allowing for a one-to-one mapping between the four hexatonic systems and four important tonal functions: tonic, subdominant, dominant, and double dominant.

[64] Richard Cohn, "As Wonderful as Star Clusters: Instruments for Gazing at Tonality in Schubert,"*19th-Century Music*, 22, no. 1 (1997): 219.

propensity for holding onto tonic (as noted by Webster) is certainly in evidence. That said, the more mature theory in *Audacious Euphony* allows for other potential interpretations; Figure 18 adds a functional analysis based on Weitzmann (rather than hexatonic) substitutions, along with a more value-neutral reading that interprets harmonies purely in terms of voice-leading zones.

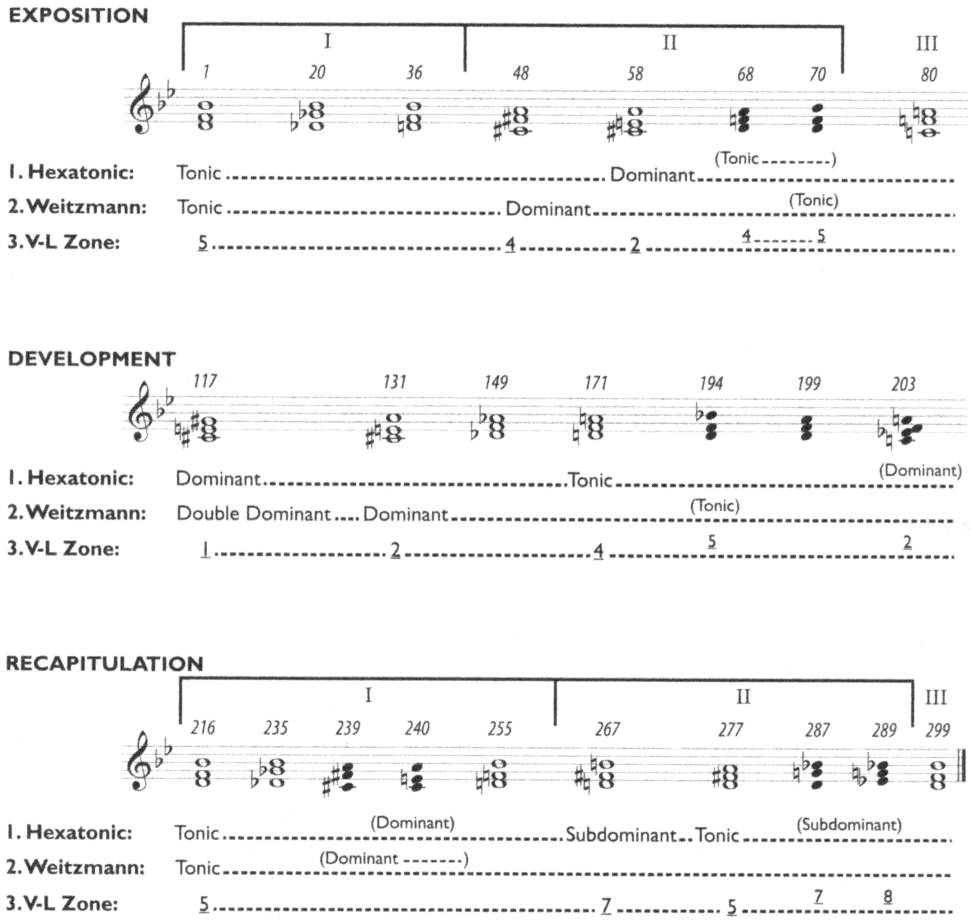

Figure 18. Cohn's analysis of the B♭ Major Sonata. *Figure 6.9* from Cohn, *Audacious Euphony*, 126.

The Weitzmann-based reading actually relieves Schubert of accusations of tonic attachment, as it places the F♯ minor section in the same region as F major, based on the

S relationship between the two rather than the major third root displacement between F♯ and B♭ that is privileged in the hexatonic reading. Now the dominant appears at the start of the S group (being careful not to confuse Hepokoski and Darcy's formal S with Cohn's transformation **S**), and the sonata's tonal plan no longer looks so unusual. The voice-leading zones remove explicit considerations of sonata normativity altogether and instead take a more neutral approach, via the earlier observation that sonata form can be modeled with large-scale downshifting followed by upshifting (with an "overshoot" to subdominant in the recapitulation, as expected). As Cohn observes, there are benefits to each of these approaches; while the functional labels are quite convincing in this case, "we need not make this move if aspects of it make us uncomfortable," and the voice-leading zones provide such an effective model for the "departure-overshoot-return" narrative that a functional interpretation is not necessary unless it provides additional information that might be useful (127). As it is the centerpiece of my own analytical method, Table 3 should clarify the substitutional mechanism; it provides an example of a diatonic key (in this case, C major) with the most significant tonal functions and their substitutions listed together. For example, for a piece in C major, a section in E major might stand in for tonic, perhaps as part of the P group, while a passage in B major might represent the dominant. Note the similarity between the Weitzmann substitutions and Table 1 (see p. 22 above). Of course, some of these harmonies may be better interpreted diatonically; it would probably not make sense to read A minor as representing the subdominant, since it is already closely related to C major as its relative minor. The

substitutions that bear analytical and theoretical fruit are generally those involving keys most remote from the overall tonic.[65]

Table 3. Potential substitutions for important harmonies in C major.

Function		I	IV	V	V/V
Hexatonic substitutes	**major**	C, E, A♭	F, A, C♯	G, B, E♭	D, F♯, B♭
	minor	c, e, a♭	f, a, c♯	g, b, e♭	d, f♯, b♭
Weitzmann substitutes	**major**	C, E, A♭	F, A, C♯	G, B, E♭	D, F♯, B♭
	minor	a, c♯, f	d, f♯, b♭	e, g♯, c	b, e♭, g

In this study, I am interested in those situations where functional interpretations allow for comparisons between Schubert's sonata form practice and more traditional examples. Cohn's incorporation of pan-triadicism into a familiar departure-return narrative is highly effective in the case of the B♭ Major Sonata, and I will demonstrate the extent to which this methodology can be extended to Schubert's other late works. To be sure, not every analysis can be extended into a full-blown theory. Cohn himself has dealt with this issue explicitly in the past; his analysis of Bartók's Sonata for Two Pianos and Percussion incorporates a transformation, Q, that is entirely idiosyncratic to the piece in question and whose "only virtue" is that it produces insight in the context of that analysis.[66] In general, there is no particular reason to assume that a given analysis can be

[65] This discussion addresses these distinctions conceptually, but there seems to be an implicit understanding that a more traditional tonal hearing would take perceptual precedence over a voice leading-based hearing; these kinds of considerations suggest the need for further work on the perceptual aspects of this theory.

[66] Richard Cohn, "Pitch-time Analogies and Transformations in Bartók's Sonata for Two Pianos and Percussion," in *Music Theory and Mathematics: Chords, collections, and*

generalized beyond its original context, but certain consistencies in Schubert's sonata practice suggest that the endeavor will be worthwhile in this case.

One issue inherent in both theory and analysis making use of pan-triadicism is the difficulty of reconciling diatonic and tonal considerations with the transformational syntax presented here. By definition, even the most chromatic late common-practice works incorporate traditional harmonic practices to some extent, and when both syntaxes operate within the same piece, "the challenge is to model their intertwining without collapsing them into each other."[67] Against detractors who suggest that such a double syntax is beyond the bounds of human perception, Cohn proposes a number of justifications. For one, multilingual human beings demonstrate the ability to "code switch" with ease, particularly when switching between languages with "intersecting lexical units;" the consonant triad, with its diatonic basis combined with the potential for smooth voice-leading, thanks to its near-evenness, represents just such a lexical unit (202).[68] Furthermore, such over-determination is often cognitively opaque in everyday life; Cohn points out that clothing can serve many purposes (warmth, protection, social signification and attraction, etc.), but such functions are essentially independent of the actual physical action involved in getting dressed (203). Similarly, one would likely drive a car in exactly the same way whether the intent of the trip was to take the car to the shop or to take the driver to the store, even though the function is reversed between the two cases. This formulation is especially useful, because it can be expressed musically:

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transformations, ed. Jack Douthett et al. (Rochester: University of Rochester Press, 2008).

[67] Cohn, *Audacious Euphony*, 169.

[68] Cohn also discusses the complex issue of comparisons between language and music.

in tonal music, the tonic pitch orients the members of the tonic triad, which orient the members of the diatonic scale, against which non-diatonic chromatic notes can be measured. On the other hand, pan-triadic music is based first on the equal-tempered chromatic scale, which orients the three-note triads (or four-note Tristan-genus chords), which themselves determine their constituent pitches. This causal reversal may seem unintuitive from a musical point of view, but everyday experience suggests that we "cannot dismiss the possibility that switching between musical syntaxes might transpire beneath the horizon of awareness (205)." My own work relies on a conception of dual syntax based not only on rules of local harmonic progression, but also on the large-scale tonal plan of sonata form itself.

Analysis to Theory

Generalizing Cohn's analysis

In attempting to generalize Cohn's analysis of the B♭ Major Sonata, it is important to keep in mind a number of different analytical and theoretical strategies. Cohn's analysis, for example, compares hexatonic- and Weitzmann-based interpretations of the sonata's voice-leading trajectory, and these two interpretations are similar but with some subtle differences in timing. However, this strategy is less than useful for minor-mode movements; in a minor key, the **N**-related tonic and dominant chords are in the same Weitzmann zone, so the resulting functional analysis is incoherently ambiguous. As an example, consider my analysis of the *Quartettsatz* in C minor, D. 703, represented

in Table 4.[69] Note that in this case, the actual harmonies corresponding to each zone have been left out in order to highlight the ambiguity involved.

Table 4. Schubert, String Quartet No. 12 in C minor, *Quartettsatz*, D. 703.

	Exposition						Recapitulation				
	P			S			P				S
Hexatonic	T	T	T	D	T	D	X	D	T	T	T
Weitzmann	?	S	?	?	S	?	X	?	?	S	?
Voice-leading zones	t	e	t	8	e	8	5	8	t	e	t

Although basic knowledge of sonata form allows for a reasonable guess at what functions the harmonies designated by question marks represent, the ambiguity involved is not acceptable for an effective analysis. As a result, the hexatonic interpretation is the only good option for minor-mode movements, short of abandoning the functional analogy altogether (127).[70] This example does help to foreground the difference between the hexatonic and Weitzmann interpretations in general: parallel triads are functionally equivalent in hexatonic systems (so that ♭VI and ♭vi could both stand in for I), whereas relative ones are equivalent in Weitzmann regions (so that III and ♯i could both stand in for I, though also note that the latter triad is the **S** transformation of I). It is also worth noting that this theory does not fully explain the unusually structured *Quartettsatz*, which

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[69] This table reads as a simplified version of Figure 18, where hexatonic, Weitzmann, and voice-leading zone analyses are displayed for comparison. The numbers in the voice-leading row correspond to standard clock face positions from Figure 10 (see p. 26 above), with lower-case letters to avoid confusion between zone labels and tonal functions. The functional labels are as follows: T = Tonic, S = Subdominant, D = Dominant, X = Double Dominant.

[70] Cohn, as discussed earlier, dispenses with the functional analogy when it makes untenable demands on the music or the analyst.

begins its recapitulation on what seems to be the first S theme (though the thematic grouping is also not clear) in the major subtonic; even as a substitute, this harmony represents the double dominant, an unusual choice for the beginning of the recapitulation.[71]

Another aspect of Cohn's analysis that will not generalize throughout Schubert's late sonata-form works is the consistent downshifting and upshifting trajectory that is so striking in the B♭ Major Sonata. For example, in the String Quintet in C Major, D. 956, represented in Table 5, the only section with a multi-stage trajectory is the development, which moves from zone two down to zone eight with a brief overshoot through zone five. The exposition and development consist essentially of alternations between two zones, representing dominant and tonic in the exposition followed by tonic and subdominant in the recapitulation. The lack of voice-leading trajectory, however, does not hinder other aspects of Cohn's analysis; the E♭ major second theme can be explained as a major-third substitute for the dominant, and the same substitution appears in the recapitulation. Thus, this study will for the most part focus on substitutions in general, rather than the up- and downshifting narratives that they sometimes enable.

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[71] Hepokoski and Darcy note that this movement is "most fundamentally in dialogue with the Type 2" sonata form principle, in which the recapitulation begins after P (*Elements of Sonata Theory*, 364). Other common types are the Type 1 sonata, or sonatina, and the Type 3 "textbook" sonata form (344).

Table 5. String Quintet in C Major, D. 956, 1st mvt.

	Exposition						Development						Recapitulation						
	P-TR	S-C											P-TR		S-C				
Key	C	E♭	C	G	B	G	A	D♭	E	B	D	G	C	F	A♭	F	C	E	C
Hexatonic	T	D	T	D	D	D	S	S	T	D	X	D	T	S	T	S	T	T	T
Weitzmann	T	D	T	D	D	D	S	S	T	D	X	D	T	S	T	S	T	T	T
Voice-leading zones	e	8	e	8	8	8	2	2	e	8	5	8	e	2	e	2	e	e	e

At times it can be difficult to distinguish between structural tonal centers and passing local modulations or sequential sections. I have attempted to identify the most strongly established keys, preferably through the presence of a cadence but often through rhetorical assertion.[72] Schubert often passes through keys quickly, so it is often a matter of subjective judgment whether a new key is worth including in an analysis. In any case, my analyses generally use note names to represent keys and not chords, except in the case of the medial caesura and any other "standing on the dominant" situations, which are at times best described as being "on" a harmony rather than "in" a key. [73]

With the assumption that the features observed in Cohn's analysis will be most prevalent in music composed closest chronologically to the B♭ Major Sonata (1828, and

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[72] Daniel Harrison, "Nonconformist Notions of Nineteenth-Century Enharmonicism," *Music Analysis* 21, no. 2 (2002): 115–160, discusses different ways that a key can be established. "Asserted keys and formal keys have a strong establishing rhetoric in common, but formal keys are properly introduced by cadential chord progressions" (144); thus, for example, the E♭ major S opening in the String Quintet would be an asserted key, as it is preceded by a half cadence in C major and never gets an authentic cadence of its own. Due to the rapid nature of many of Schubert's modulations, remote keys are often (but not always) asserted rather than formally confirmed by a cadence. This distinction also gets at the issue that Webster raises concerning the structural value of some remote keys in the S group; he prefers to interpret asserted keys as having a transitional or pivotal function.

[73] Caplin, *Classical Form*, 133.

Schubert's last sonata in any form), the pieces analyzed here are all drawn from Schubert's works composed after 1820, starting with D. 703, the *Quartettsatz*. Aside from that movement and the Symphony in B minor, "Unfinished," D. 759 (1822), the rest of the works have Deutsch numbers above 800 and were composed in 1824 or later. Naturally, the majority of the works considered are first movements. Although most of these include Schubert's characteristic distant modulations, several are almost entirely normative and can thus be explained in Hepokoski's and Darcy's terms without modifications; these include the Arpeggione Sonata, D. 821, the second movement of the Symphony No. 9 in C Major, D. 944, and the first movement of the Piano Sonata in C minor, D. 958. See Appendix A for a list of all works consulted.

Substitutions in the P group

As Webster notes, Schubert's P groups often have an ABA form, in which A is in the tonic while B is in a distantly related key. The B♭ Major Sonata moves from B♭ major to G♭ major and back in its opening group; this major-third modulation remains within the same voice-leading zone and thus prolongs tonic through substitution. Variations on this strategy are quite common, as in the second movement of the "Unfinished" symphony, D. 759, whose P group moves from E major to G major and back. As in the B♭ Major Sonata, the melodic material in the B section is similar but not identical to that of A, but in this case the substitution is different in an important way: G major, ♭III in E major, is a minor third rather than a major third away from the tonic, and,

as in the String Quintet, it substitutes for dominant.[74] Thus, this theme prolongs tonic through what amounts, in voice-leading terms, to a I–V–I progression.

In fact, P groups with an ABA structure invariably prolong either tonic or dominant through substitution by major third. In the Grand Duo (Sonata in C Major for Piano, four hands), D. 812, the B portion of its P theme largely remains in C major, but E major (III), the only nondiatonic chord in the section lasting more than a single beat, appears around its midpoint (m. 15–16). The Piano Sonata in G Major, D. 894, has an ABA P group that also modulates to the mediant, but its clarity and thematic continuity tie it more closely to the B♭ Major Sonata. In this case, P begins with an A section in G major, followed by a B section that moves from B minor to B major. As in D. 960, the B theme begins on the same pitch as the A theme, but the melody is slightly varied, aside from simply applying the new effective key signature. The voice leading in the modulation back to G major is efficient, moving directly from F♯ major to D dominant seventh (mm. 15–16). A similar upper-mediant substitution occurs in the Piano Trio in B♭ Major, D. 898: its P group consists of A in B♭ major (I), B in D major (III, m. 18), and A again in B♭ major (m. 26).

Some examples are slightly less typical but still exhibit the same prolongational substitutions in P. In the unfinished Piano Sonata in C Major, "Reliquie," D. 840, the initial P theme is repeated immediately in A♭ major, ♭VI. Upon its conclusion, the A♭ major chord is treated as an augmented sixth moving back to C major, and then the P

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[74] This example highlights a potential point of confusion, so it is worth reiterating: the harmonies involved, E major and G major, are not a major third away from each other, but are instead a major third away from the harmonies for which they substitute. Thus, ♭III substitutes for dominant, because G is a major third away from B.

theme returns (m. 28), though in this case it is texturally varied and presses on into the TR. In light of its differences from the basic ABA model, and depending on whether thematic repetition or key structure is privileged, this P group could be described as AA'(TR) or ABA', but the significance of the major-third substitution is clear. A similar case occurs in the Piano Sonata in D Major, D. 850, in which the P theme in tonic is followed by a similar theme in F major, ♭III (mm. 8–11). F major moves directly to its downward major-third transposition, C♯ major, which in turn moves immediately to the dominant, A major (m. 14). These steps through the major third cycle in the dominant's hexatonic system are notable because the idealized voice-leading connections between them are immediately visible on the musical surface thanks to the homophonic texture (see Figure 18) and they present all three possible major third transpositions of the dominant.[75] Although m. 16 begins an almost exact repetition of P in tonic, the music is slightly varied thereafter, and thus the P group is thus not strictly ABA; that said, the effect of the modulation and return is essentially the same, as in the "Reliquie" sonata.

[75] As discussed earlier, the seventh in the dominant chord in m. 14 is omitted in the analysis – the "reduction to a subset" strategy for dealing with dissonance – but the voice leading involved is smooth even with the seventh included, as Figure 18 makes clear.

Figure 18. Schubert, Piano Sonata in D Major, D. 850, 1st mvt., mm. 11–14.

Substitutions at the Medial Caesura

Schubert sometimes reaches the MC in a remote key,[76] though even in these cases he may begin S in the dominant. Examples include the G major String Quartet, D. 887, which has its MC on F♯ major, or VII, though this chord is reached through a brief (mm. 54–59) ascending fifths progression from G to F♯ (actually a **P/N** chain: G–Gm–D–Dm–A–Am–E–Em–B–Bm–F♯), which makes it difficult to tell if the music has modulated to a new key or simply stopped on a single chord with enough rhetorical force to make its

[76] As Webster observes, Schubert's sonatas often hold onto tonic longer than usual. This can result in an arrival on tonic harmony for the MC, an extremely rare fourth-level default in sonata theory. However, Hepokoski and Darcy suggest that I:PAC or I:IAC is usually reserved for "light, small-scale works, in some telescoped or abbreviated expositions, and in some slow movements" (*Elements of Sonata Theory*, 29). This holds true for the second movement of Schubert's Symphony No. 9, but it does not apply to that same work's first movement; both reach the MC on I (in m. 83 and m. 130, respectively). Furthermore, neither is presented as a PAC or IAC; both seem to arrive at the MC by assertion. In any case, I will not consider these tonic caesuras further, as they are not "remote" in the sense with which I am concerned.

MC function clear. In any case, VII is in the same voice-leading zone as V, and the S group that follows begins in the dominant. The Piano Trio in B♭ features the same substitution of VII for V at the MC, in this case A major for F major, followed by S in the dominant (mm. 55–59). In fact, the remote key for the MC in the Piano Trio is approached through an ascending fifths sequence fueled by a **P/N** chain as well, though it (F–Fm–C–Cm–G–Gm–D–Dm–A, mm. 41–49) devotes equal time to the minor chords in the sequence, as opposed to the perfunctory, single-eighth-note minor chords in the quartet's sequence.[77]

Other times, the substitutional MC leads to an S group that begins in the same remote key. The first movement of the Grand Duo reaches ♭vi:HC before continuing to S in the key of ♭VI (mm. 46–50).[78] In the sprawling finale of the Piano Sonata in C Minor, D. 958, the MC (and much of the P group) is in the key of the Neapolitan, followed by an S group that begins in the enharmonically re-spelled sharp tonic. While the Grand Duo's flat submediant can stand in for tonic—not a normative choice for S, but somewhat in line with Schubert's tendency to stay on the tonic longer than usual—the C minor sonata's secondary key is difficult to reconcile with normative sonata theory even under substitutional logic.

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[77] The figure in the quartet's pre-MC sequence is motivically significant for its similarity to the movement's opening gesture, in which a major chord is held for two full measures and then changes to its parallel minor on the last eighth note.

[78] The minor mode (♭vi) before the MC is only briefly present as a consequence of the voice leading out of an augmented sixth chord, though the mode does technically change after the MC. In the present context, parallel triads are easily subsumed under a given hexatonic system.

Substitutions in the S and C groups

Whether or not the MC harmony falls within sonata theory's normative defaults, Schubert often begins the S group in a remote key, but he generally chooses ones that can stand in for either tonic or dominant through substitution by major third.[79] Dominant substitutes, being the more normative choice, include the flat mediant (♭III), and the flat tonic or major triad on the leading tone (♭I or VII), for major keys. In minor keys, the substitutes are the same, with the caveat that the more normative S key would be the (flat) mediant.[80] Also potentially interesting is the mode-equivalence inherent to parallel triads in hexatonic systems and the consequences for interpreting minor-mode works that make use of tonal substitutions. That said, barring the previously mentioned exception, only two minor mode movements considered in this study begin S away from ♭III. The first of these, the *Quartettsatz*, opens S in the key of ♭VI, which is not a substitute for either normative key, though it can substitute for tonic. The other example, the Allegro in A minor for piano, four hands (also known as *Lebensstürme*), D. 947, moves from i:HC MC in the tonic A minor to an S group that opens in the lowered major tonic, A♭ major. Interestingly, of the possible choices for S rooted on a member of the zone 0

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[79] The one exception is the second movement of the "Unfinished" symphony, whose S group begins in the submediant. As discussed briefly above, Schubert's propensity for extending the tonic in the exposition makes a tonic substitution to begin S unexpected but not unreasonable under the current theory. I will return to this issue below.

[80] The major third relationship between ♭III and V seems coincidental to other considerations within the tonal system, though the other major "built-in" substitute, the Neapolitan, actually functions in exactly the same way, both functionally and in voice-leading terms, as the substitutions proposed in my analyses. Indeed, it could be said, with tongue sufficiently in cheek, that Cohn's system as interpreted here simply generalizes that most well-worn of major third substitutions, the Neapolitan for the subdominant.

augmented triad (which also includes the flat mediant and dominant),[81] Schubert has chosen the least normative. I will continue the discussion of *Lebensstürme*'s tonal plan in more detail below.

The "Reliquie" sonata provides an excellent example of the difference between hexatonic and Weitzmann interpretations of an S group substitution; S begins in B minor (vii, m. 54), which is a substitute for the dominant through the parallel-mode feature of hexatonic systems. However, in a Weitzmann reading, vii stands in for V/V, recalling that relative major and minor keys are contained within the same Weitzmann region. This seems to complicate the narrative, recalling Webster's assertion that off-tonic S beginnings might function as no more than large-scale pivot chords into the "actual" subordinate key. Perhaps what seems to be the beginning of S is functioning as a substituted double dominant leading to G major, which does indeed appear in time for the cadence at the end of the phrase (mm. 69–71). However, a closer look at the nature of the shift from B minor to G major (shown in Figure 19) reveals that, far from "resolving" from vii (as substitute for V/V) to V, the diminished seventh chord in m. 68 pivots smoothly between the two keys. With the preceding measures largely alternating between V and vii^{o7} in B minor, the melodic descent in m. 68 does not inherently suggest a key change, and could easily be approaching a cadence in B minor; however, the inner voice on G (rather than F♯) in m. 69 transforms B minor into G major. Hearing this arrival on a second inversion G major chord as the beginning of a cadential progression (as in the analogous music in mm. 64–66, in B minor) confirms this analysis: a

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[81] As the primary key for S, the minor dominant is vastly more normative than the major in sonata theory, but there is precedent for it in Schubert in the *Quartettsatz*.

Weitzmann hearing would suggest that B minor and D major are substitutionally equivalent, but in comparing the two melodic descents from the high G (starting in measures 64 and 68 respectively), it is F♯ major and D major – the dominants of B minor and G major – that occupy the same point in the phrase. Thus, the first portion of the S group moves from a substitute for the dominant to the dominant itself, with the mode change allowing the entire large-scale transformation to be represented by the **L** relationship between B minor and G major.

At times, Schubert's tendency to hold onto tonic extends beyond the MC through substitution; the *Quartettsatz*, as discussed above, is a simple example, and the second movement of the Symphony No. 9, a Type 1 sonata, also moves to the flat mediant for S.[82] More intriguingly, the first movement of the Symphony No. 9, whose S group opens in the minor mediant, provides an opportunity for an explicitly transformational reading. Where the **LR** relationship between a major tonic and its dominant is usually implemented through a traditional modulation – introducing the leading tone of the new key before confirming it with a cadence – this movement modulates through a sectional composing out of the voice-leading relationship between the tonic and dominant triads.

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[82] This is perhaps less surprising in a Type 1 sonata due to its generally smaller scale; Hepokoski and Darcy note that I:PAC is a possible fourth-level default for the MC in less formally complex works, including some slow movements. Hepokoski and Darcy, *Elements of Sonata Theory*, 29.

Figure 19. Schubert, Piano Sonata in C Major, D. 840, “Reliquie,” 1st mvt., mm. 54–71.

After the MC (on tonic, C major), the S group opens in E minor (m. 134), a hexatonic substitute for tonic.[83] The actual arrival on G – initially as a dominant seventh chord in m. 156 and as an independent key center around m. 162 – is actually mediated by a short sequence ending on B minor, which leads directly to G in a reversal of the earlier major-to-minor **L** transformation between C major and E minor. This first prominent arrival of G is thus not even locally prepared with any traditional modulatory techniques; the first functional appearance of its dominant is in the extended cadential progression leading to the EEC several measures later (mm. 162–174). The large-scale **R** relationship between E minor and G major is thus difficult to ignore, and the S group as a whole seems to function as a slow progression through the **L** and **R** transformations that connect the movement's tonic and dominant.[84]

Though it has already factored into the discussion a number of times, the critical substitution in the String Quintet is worth mentioning again: the S group begins in the key of the flat mediant, substituting for dominant, which emerges later in the section. An

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[83] The **L** transformation between these two keys (in triad form) is not present in an idealized form on the musical surface, but it is hinted at in the bass and cello parts, whose persistent Cs following the MC give way to B in the final measure before the S group. This particular B represents the dominant of E minor (the other strings fill out a B major triad), but as a transformation between keys rather than literal triads, the significance of C as root moving to B as fifth is exactly the same.

[84] The sense of tonic retention well past the MC is intensified here by the fact that G arrives only as a dominant chord initially, and is only confirmed as the actual subordinate key in the final cadential measures of the S group. The C section following the EEC appears to follow a similar path, but the keys presented there (mm. 174–253) are for the most part substitutes for dominant rather than tonic (E♭ major and B major). The closing section contains every minor substitute for tonic (A♭ minor and E minor) paired with its dominant, with the dominants extended temporally to the extent that they are not simply incidental to their N-related tonics. The result is a section of music drawn entirely from the Weitzmann region containing zones 8 and 10, missing only C minor, the minor tonic.

interesting consequence of that substitution, in combination with the recapitulation's rather uncommonly exact transposition down by fifth, is that the true tonic (C major) only appears in fits and starts within the recapitulation until the final section of the S group leading to the ESC. This is somewhat unusual for a sonata form, and it relies on the ability, made possible by substitutional logic, to be both in the tonic (represented by a substitute, like the flat mediant) and not in the tonic simultaneously. The vocabulary of voice-leading zones captures this phenomenon rather nicely, as the music can be "in the zone" of the tonic without it actually being present. The present study largely deals with the technical implications of this kind of thinking, but there may be historical, philosophical, or other considerations that in future work might provide further insight into issues of music and meaning.[85]

One final common location for substitutions in the exposition is just prior to the final EEC-inducing cadence, at the end of the S group. Perhaps because of its related function as a subset of the German sixth chord, the flat submediant often appears extensively before the EEC, as in the *Rosamunde* String Quartet in A minor, D. 804, which moves to A♭ major, ♭VI in the subordinate key of C major, for a five-measure passage before the cadence in C (mm. 91–95 in A♭, EEC in m. 98). The passage is approached through an evaded cadence in C, so its substitutional function is fairly clear. The other possible substitute for the subordinate key, the major mediant (relative to the key of S – in the original tonic this key would be VII), appears in the first movement of

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[85] This statement is inspired to some extent by extensions Cohn himself has made from musical detail to extramusical meaning, the most concrete of which is the connection between the hexatonic pole and the uncanny (*Audacious Euphony*, 22). Another example is the hermeneutic twist at the end of Cohn's "Complex Hemiolas, Ski-Hill Graphs and Metric Spaces."

the G major String Quartet. In m. 150, F♯ major stands in for D major, taking the place of the first inversion tonic chord in the approaching EEC in D. This particular substitution is brief and thus below the threshold for most of the substitutions discussed in this study, but F♯ has a special significance in the G major quartet; it is the harmony at the MC, and also features heavily throughout S, as B minor is tonicized heavily, so its appearance before the EEC is significant.

The cadential progression prior to the EEC in the Piano Trio in E♭ Major, D. 929, is relatively drawn out: the actual EEC in B♭ (V) occurs at m. 167, and the previous six measures prolong the double dominant, F major (mm. 167–172). Prior to that, B♭ major (mm. 156–160) leads to six measures prolonging A major as dominant of D major (V/III in B♭ major, mm. 161–166). The entire progression (labeled relative to the local tonic, B♭ major), I–VII (as V/III)–V–I, noting the idealized voice leading between the major triad pairs B♭/D and A/F, simplifies in substitutional terms to I–V–I.

The pre-cadential passage in the D major Piano Sonata, D. 850, is particularly varied harmonically; prior to the cadence,[86] the music moves from unambiguous D major through the following progression: D–A–D7–B♭–C7–A♭–B♭7–G♭–A7–F–B♭–A, as shown in Figure 20.

[86] Referring, in this case, to the ESC in the recapitulation for convenience, so that the prevailing tonal center is tonic; the EEC version is identical but transposed up a fifth.

Figure 20. Schubert, Piano Sonata in D Major, D. 850, 1st mvt., mm. 231–240.

In terms of the D major tonal center, this progression amounts to I–V–V7/IV–♭VI–V7/♭III–♭V–V/II–♭IV–V7–♭III–♭VI–V. Such a description is unwieldy both visually and harmonically, as the dominant chords all fail to resolve to their supposed tonics. An examination of the transformations involved helps to clarify things somewhat, but not entirely: each pair of triads related by major third are related by a **PL** operation,

so the passage can be broken down into **PL** "units" separated by various intervals: [D7–B♭], down a whole step to [C7–A♭], down a whole step to [B♭7–G♭], down a half step to [A7–F], from which the latter chord resolves as dominant to B♭ major. This, however, still does not explain the choice of starting or stopping point, or the reason for the irregular sequential intervals in descending semitones, of 2–2–1. Importantly, the [D7–B♭] unit appears several measures earlier (mm. 224–227), preceded and followed by D major material. Thus, the appearance of this unit, essentially prolonging tonic through substitution of ♭VI (with a nod toward the subdominant through the dominant seventh), is unsurprising when it reappears in m. 232 as the starting point of the sequence. The last unit [A7–F], can be explained as a prolongation of dominant, with the resolution to B♭ in m. 238 constituting a simple dominant-tonic move in a substituted key. Indeed, the D major return at m. 240 resumes the dominant-tonic alternation that began prior to the sequence in m. 232.

Applying voice-leading zone numbers to the sequential units reveals the final piece of the puzzle: starting with the [D7–B♭] unit, the zone progression is 5–11–5–3–5. The closing 3–5 represents the dominant-tonic motion just discussed, but the opening 5–11–5 sequence reveals that the first and third units in the sequence both prolong the tonic voice-leading zone, despite the fact that the tonic chord does not appear in the third unit. The [C7–A♭] unit, then, represents a sort of composing out of the space between those two tonic units: the actual root interval of a major third is filled smoothly through descending stepwise motion, D–C–B♭, while the "zone interval," which is actually zero, is "filled" with a maximally disjunctive move to the voice-leading zone six points away on the clock face. In this reading, then, the following sequential interval, down one half

step from [B♭7–G♭] to [A7–F], is actually the first sign of the sequence's end, representing a move from tonic to dominant that will resolve outside the sequential pattern.

Substitutions in the Development and Recapitulation

The inherent unpredictability of what happens in sonata form developments makes it difficult to say much about them under the present theory, but it is possible to make some observations regarding Schubert's habits at the their beginnings. First, not a single sonata form movement, from D. 703 to D. 960 begins its development on the dominant. This is striking, given that the dominant is the most common harmony for the beginning of the development in Hepokoski's and Darcy's theory.[87] The most common choice by far is the flat submediant, which, in the context of this study, suggests a substitution for tonic.[88] While tonic may seem to be a strange way to begin a development, it is worth keeping in mind that another early-development strategy is to present P-based material, or even P itself.[89] The presence of P in a key other than the original tonic suggests a sense of thematic return that is incomplete, of P-but-not-P; the

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[87] Hepokoski and Darcy, *Elements of Sonata Theory*, 207. The authors do not use their usual terminology for levels of defaults when discussing the development. They do suggest that the dominant is a common opening key for the development largely because it is the key that closes the exposition. Schubert's avoidance of the dominant is particularly interesting, then, given that every one of his major-key expositions reaches ESC in the dominant.

[88] In the pieces analyzed here, the flat submediant appears more often in major pieces than in minor ones as the opening key of the development. Furthermore, the diatonic submediant never opens the development in major mode pieces.

[89] Tonic itself may even appear at the beginning of the development, as discussed by Jack Adrian, "The Function of the Apparent Tonic at the Beginning of Developmental Sections," *Intégral* 5, (1991): 1–53.

use of a tonic substitute provides a similar sense, if perhaps more subtle, in terms of harmony, and regardless of whether or not P material is present. This concept is particularly relevant for the development section and its implications of intensification and "leading-through," from the German *Durchführung*.[90] Hepokoski and Darcy generally conceive of the development as rotational, wherein the expositional thematic material is presented with various modifications, and potentially omissions. Schubert's developmental strategies are not often amenable to straightforward rotational readings, but the idea of beginning the development in a place that is tonic-but-not-tonic seems to be a logical combination of standard practice—beginning the development with P in a new key—and Schubert's documented tendency to hold onto tonic longer than usual.

Schubert's propensity for changing keys abruptly between the C group and the development also provides an opportunity to observe the voice-leading properties underlying the substitutions proposed here. For example, in the D Major Sonata, the exposition's closing dominant, A major, leads directly to the development's opening statement of P in B♭ major; compare Figure 21a, which shows the music as printed, with C leading into the development, and Figure 21b, which shows the music as it sounds when the exposition is repeated and the A major chord resolves to the opening D major. The idealized voice leading is clear on the surface in both cases, and the three semitones of upshifting between A major and B♭ major is the same as the distance between A major and D major.[91]

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[90] Hepokoski and Darcy, *Elements of Sonata Theory*, 195.

[91] The seventh in the dominant chord here does complicate matters slightly – the seventh adds one semitone of downshifting in a resolution dominant to tonic, but two semitones

Figure 21. Schubert, Piano Sonata in D Major, D. 850, 1st mvt., mm. 93–95, a) as written, b) taking the repeat in the exposition.

Other times, the approach to the development's opening harmony is less direct, but not necessarily any less reliant on the properties of major third-related triads. In the G major String Quartet, D. 887, the exposition closes in the dominant, but immediately begins a relatively rapid descending-third cycle through B♭ major, F♯ major, and then through D major and B♭ major again (mm. 175–181). This time, however, B♭ acts as the dominant of E♭ major, in which the development's first proper theme (based on P-group material, m. 185) begins. The "overshoot" in this **P/L** cycle might constitute an "inefficiency" for Schubert's early detractors, but in voice-leading terms, the music is actually strikingly efficient; keep in mind that major third-related triads feature balanced voice leading, with one semitone of motion in each direction. The large-scale half-step

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of downshifting in a resolution from dominant to flat submediant. I am relying on Cohn's strategy of reduction to a subset here to skirt the issue.

modulation (D major to E♭ major) with a mediating "overshot" major third-cycle thus never leaves the voice-leadings zones associated with tonic and dominant in the original key of G major. The effect is reminiscent of the aliasing effect that appears when a spinning object is recorded on video, such that any given sequence of frames could constitute either a small rotation (say, 15 degrees) or a full rotation and then some (360 degrees plus 15 degrees) depending on the rate of rotation and the recorded frame rate. Here, a voice-leading zone analysis shows a simple move from zone 5 (D major and its third-cycle companions) to zone 8 (E♭ major), but the listener experiences the entire 480–degree rotation around the southern hexatonic system in Figure 2 (see p. 17 above) prior to the zone change.

Aside from the prevalence of the flat submediant, no other significant patterns emerge from Schubert's choice of starting key for the development, though the flat mediant does appear in several pieces: two in major keys – the finale of the Symphony No. 9 and the first movement of the Piano Sonata in A major, D. 959 – and one in a minor key – the Piano Sonata in A minor, D. 845. All serve to represent the movement's subordinate key; literally in the case of the A minor Sonata (its S key is the normative relative major) and as a substitute for the dominant in the major examples. In the twenty-four movements considered for this study, there are eleven different choices of opening key for the development, and none appear more than twice beyond the flat submediant and flat mediant.

In general, Schubert's recapitulations tend to be fairly normative, which is to say that any substitutions and other adjustments made in the P group are retained, and those in the S and C groups are transposed down by fifth. There are, however, some notable

exceptions. The *Death and the Maiden* String Quartet, D. 810, includes a striking substitution in its recapitulation's S group; where the exposition moves to the major dominant in m. 102 (as part of a three-key exposition following a slightly modified i–III–V–v tonal plan), the development substitutes the flat submediant for the expected tonic starting in m. 260. Thus, what could have perhaps been a i–I–I–i recapitulation, matching modes with the exposition but transposing each section to the tonic key, instead becomes i–I–VI–i.

The Piano Trio in B♭ Major, D. 898, begins its recapitulation in the key of the flat submediant, set up with a very clear transformation in the retransition from the dominant, F major, to the flat mediant, D♭ major. As shown in Figure 22, the shift is accomplished through a combination of two W transformations, **N** and **R**, from F major to B♭ minor to D♭ major; all three of these harmonies are from the dominant Weitzmann zone relative to the tonic, B♭ major. Schubert returns to the actual tonic through an ascending fifth sequence, ♭VI–♭III–♭VII–iv–I, a technique discussed earlier in the context of the MC as a way to navigate in or out of substitutional key areas.

Figure 22. Schubert, Piano Trio in B♭ Major, D. 898, 1st mvt., mm. 185–192

Slides and other large-scale strategies

While the section-by-section approach works well for an overview of common substitutional techniques, several pieces, including a few mentioned above, warrant additional attention for rarer or more idiosyncratic features that are nonetheless relevant under this theory. The first of these features, the rare **S** transformation, appears prominently in two movements, both for piano, four hands: the opening movement of the Grand Duo, and the Allegro in A minor, *Lebensstürme*, D. 947. In the Grand Duo, the slide occurs in m. 34, from C major (with a dominant seventh) to C♯ major, wrenching

the music from the original key signature far to the sharp side. This striking effect is achieved with efficient voice leading, but its force seems to stop the music cold, as the dynamic level drops from fortissimo to pianissimo over the next several measures; notably, this sudden shift to the sharp side of the circle of fifths is what facilitates the ♭vi:HC MC in m. 49, discussed earlier in terms of its continuation into the S group in the key of the (major) flat submediant. The perceived jump from zero sharps to four sharps to four flats is accomplished rapidly through the progression: C major [**S**] – C♯ minor – E dominant seventh [interpreted as a German sixth in A♭ minor] – E♭ dominant seventh.

In an extended reading of *Lebensstürme*, Steven Rings notes that the **LP** and **S** transformations drive some of the most striking tonal moments in the piece. While I have already noted that the keys of P and S are related by **S**, Rings points out the **S** relationship between the dominant E major, which closes the exposition, and F minor, which opens the development. This leads to an interesting reciprocity: at the MC, **S** transforms A minor to A♭ major on a large scale and **LP** transforms E major to A♭ major locally, but at the opening of the development, **LP** transforms the global tonic of A minor to F minor, but **S** transforms the local harmony, E major, to F minor.[92] The **S** relationship between E major and F minor is particularly intriguing in substitutional terms: the music that opens the development is identical to the piece's opening measures, aside from the transposition to F minor, so that when the exposition repeats, the E major chord at its end is followed immediately by A minor. Diatonically, a dominant triad in a minor key relates to its tonic through **N**, but by substituting a different W transformation just at the point when the

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[92] Steven Rings, "Tonality and Transformation," (PhD diss., Yale University, 2006), 202–203.

development begins (and the musical material mimics the exposition), Schubert simultaneously reaches a remote key to begin the development and maintains the efficient voice leading of the tonic-dominant relationship.[93]

There are even larger-scale substitutional relationships at play in *Lebensstürme* when it comes to the piece's recapitulatory scheme. While the choice of key for many of the main sections seems quite odd at first – S in the exposition starts in the key of ♭I, the MC in the recapitulation is both in and on D♭ major, and S in the recapitulation starts in the key of ♭VI – the voice-leading relationships between the respective keys in the exposition and the recapitulation are actually quite normative. The MC features two triads three voice-leading zones apart: E major in the exposition and D♭ major in the recapitulation. This is the same relationship as between E major and A major, which is in zone 2 along with D♭ major. Likewise, the relationship between A♭ major and F major, the initial keys for the S groups in the exposition and recapitulation, respectively, is the same; in fact, these triads are from the same zones, 11 and 2, as the triads from the MC, and in the same order. Finally, C major and A major, the keys that close S and thus the formal rotation in the exposition and recapitulation, respectively, span the same zone interval and complete the exhaustion of zones 11 and 2 in *Lebensstürme*.

In fact, this unusual effect results from a relatively straightforward transposition of the second half of the recapitulation, starting around the MC, down by minor third. Since a minor third is a major third less than a perfect fifth, the substitutional logic

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[93] This is yet another example of the intriguing relationship between tonic and its substitutes under this theory, and the consideration of the repeat signs, inspired by Rings's analysis, perhaps sheds additional light on Schubert's propensity for beginning the development with the flat submediant.

demonstrated throughout this study holds for the entire section and the transposition is substitutionally equivalent to a perfect fifth. The specific transposition here takes advantage of the fact that the relative major is in the same voice-leading zone as the dominant; just as Schubert occasionally transposes the entire recapitulation in a major-mode movement down by perfect fifth, maintaining the internal tonal relationships but perhaps leading to an unusual global key structure,[94] here he has achieved the minor-mode equivalent, which is perhaps shocking with the D♭ major MC, but then steadily following the exposition's tonal path until reaching the major tonic. That said, the major tonic fails to stick, for all the work it took to arrive; the piece returns to A minor after the ESC, restoring P group material that was omitted from the recapitulation proper.

Pushing the limits – problematic examples

There are certainly instances of remote modulations in Schubert that cannot be normalized through major third or transformational equivalence, usually in movements with one-off tonal plans that break with convention in unique and idiosyncratic ways. The two earliest movements considered here fall into this category: the first, the *Quartettsatz*, begins its recapitulation with the S theme in the key of the subtonic (m. 195). The V:HC (on D major) that closes the development perhaps suggests that S in B♭ major represents a substitution for the double dominant, and a second iteration of S follows in E♭ major (m. 207) leading to a half cadence in the major tonic, C major, after which the music remains in either the major or minor tonic. The justification for

[94] The String Quintet, D. 956, does just that; recall the unusual abundance of subdominant material that results in the P and TR groups as a result of an exact downward transposition of tonic material by fifth.

substitutional thinking here is tenuous at best, however, as it is highly non-normative to begin a recapitulation in the dominant or double dominant, except perhaps as a false recapitulation.[95] Even ignoring the highly unusual choice of S for the start of the recapitulation, this entire line of reasoning is somewhat myopic; it is much more likely that Schubert is treating the relative major (E♭ major) as a tonic substitute in a more traditional sense. In this case, the move from D major to B♭ major at the end of the development may indeed be a substitution of sorts, and one could claim that the recapitulation proper begins with the E♭ major material in m. 207, but any sense of a normative sonata form here remains elusive.[96]

In fact, an unusual beginning for the recapitulation is by far the most common confounding factor for this theory among the pieces considered here. The "Reliquie" sonata, for example, begins what seems to be the recapitulation in B major, VII in the overall tonic of C major (m. 152). When the material that follows does not replicate P exactly, it seems reasonable to assume that the recapitulation to this point has been false; eventually, B major as key becomes B7 as chord, which changes suddenly to D7 in m. 160, which is seemingly closer to the global dominant, G major and might lead to a true recapitulation. Instead, D7 resolves to G minor, which leads quickly to F major for

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[95] Hepokoski and Darcy, *Elements of Sonata Theory*, 260–262. Sonata theory does allow for occasional instances where the "true" recapitulation begins off-tonic, but these generally move to a MC in the tonic key, followed by an otherwise normative recapitulation. The fact that the *Quartettsatz* begins its development on S (and the fact that its MC is difficult to locate in any case) makes it difficult to square with sonata theory's definition of false recapitulation.

[96] Webster goes so far as to claim in no uncertain terms that "the movement as a whole is not in sonata form," though he does not explain exactly what disqualifies it, and he draws a number of examples from it in discussing Schubert's use of sonata form. "Schubert's Sonata Form," 26.

another iteration of P in that key (m. 170). Finally, the TR appears with music that is more normatively recapitulatory, and the S group begins in A minor (m. 217); where S in the exposition began in B minor – a hexatonic mode-swapped substitute for the dominant, G major – it is notable that A minor is a Weitzmann region substitute for C major, but it is also not surprising to see the relative minor appear as a tonic substitute in the recapitulation when reprising a minor-key theme. However, the entire recapitulatory P group remains perplexing. Hepokoski and Darcy note that the subdominant is the most common choice for off-tonic recapitulations,[97] and the earlier B major material can be considered a substitute for V as part of a false recapitulation, but the P material starting in the subdominant is very brief; recalling that P in the exposition has an AA'A form (as discussed earlier), it actually appears that the two P-theme appearances here constitute the A sections from that structure, with the modulatory B7-D-Gm in mm. 158–170 constituting a small-scale "writing over" of the A' section.[98] The "false recapitulation" and AA'A interpretations work at cross-purposes here; the effect is a blurring of the formal boundary between development and recapitulation.

Like the "Reliquie" sonata, the finale of the Grand Duo also begins its recapitulation in a key that substitutes for the dominant: through slight of hand involving a P^1 theme which begins in the relative minor (for example, the very beginning of the piece seems to be in A minor before revealing C major as the actual tonic around m. 9), the retransitional dominant, G major, leads to P^1 in C minor (m. 225) before moving to E♭ major, a key that has appeared as a dominant substitute in several other C major

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[97] Hepokoski and Darcy, *Elements of Sonata Theory*, 262.
[98] Ibid., 212–214.

pieces. This recapitulation features a number of false starts separated by fortissimo G octaves, with each iteration of P^1 seeming to begin in C minor before moving to another key. While the first such beginning follows the i–♭III (or vi–I) pattern of the original P^1, the second (m. 236) moves from C minor to B♭ major, and the third (m. 247) is supported in the bass by an A♭, such that both the opening C-minor melodic gesture and the rest of the theme all sound in A♭ major. A transition analogous to mm. 20–44 in the exposition leads to the fanfare-like P^2 theme in the tonic, at which point the movement settles into a more normative recapitulation centered around the tonic and subdominant. The initial P^1 repetitions resist explanation, however; any attempt at applying substitutional logic quickly becomes futile, as this music does not resemble the exposition closely enough to draw parallels between analogous sections. The simplest explanation is that all of the P^1 iterations are false recapitulations; the G octaves that separate them could be reiterations of the retransitional dominant, with the recapitulation proper starting with the TR in m. 261. This solution, however, is unsatisfactory for the same reasons that the *Quartettsatz* and "Reliquie" sonata elude explanation, and substitutional interpretations of the keys in which P^1 appears do little to make sense of a recapitulation that is non-normative in ways beyond tonal structure.

As a final example of a movement that begins its recapitulation off-tonic (and, again, with a dominant substitute), the finale of the Symphony No. 9 features a retransitional dominant, G major, that changes suddenly, with no pivot or other mediating device, to E♭ major in first inversion, which leads to P in that same key six measures later. A modulatory passage touches on the tonic, C major, before moving to the MC on E major, whose substitutional function is clear; where the MC on V moved to S in the

dominant in the exposition, the recapitulation's III:PAC MC moves to S in tonic. What is problematic here is the recapitulation's opening in the key of the flat mediant. Even more so than in the previous examples, there is no way to claim a false recapitulation, though the dominant function of E♭ here is quite clear from the retransitional **LP** transformation and the lack of any dominant-tonic motion out of the retransition.

Of the five off-tonic recapitulatory beginnings encountered in this study (the *Quartettsatz,* the Grand Duo finale, the "Reliquie" sonata, the B♭ Piano Trio, and the Symphony No. 9 finale), two begin on tonic substitutes – the *Quartettsatz* and the Piano Trio – and the other three begin on dominant substitutes. In fact, from the dominant-substitute category, all three movements are in C major, with two using E♭ major and one ("Reliquie") B major. Due to the *Quartettsatz*'s unusual overall form, the B♭ Piano Trio is the only one of the tonic-substitute examples that appears normative after taking the substitution into account, but the dominant-substitute examples are all normative enough in their global forms that their unusual recapitulatory beginnings deserve additional explanation; as it stands this theory seems unable to provide that explanation.

There are two additional movements whose large-scale idiosyncrasies fall outside the bounds of anything covered here so far, and on which I will not comment other than to note their resistance to substitution-based explanation. These are the first movement of the "Unfinished" symphony, whose S group is in the submediant and mediant in the exposition and recapitulation, respectively, and the finale of the Piano Sonata in C minor, D. 958, which features rapid sectional alternation between tonic and flat supertonic throughout the P group. The relationship between the keys of P and S, particularly as it relates to the MC on ♭II, was discussed earlier in local terms, but the very existence of ♭II

as a significant key in the exposition is problematic under sonata theory, even as a potential substitution.

Conclusions

The examples discussed here seem to demonstrate a degree of generalizability when it comes to Cohn's analysis of the B♭ Major Sonata, though there is considerable flexibility in terms of how its individual concepts generalize across Schubert's late sonata forms works. The substitutional model for tonal function successfully describes the vast majority of Schubert's remote modulations within ABA-form P groups, at the MC, at the beginning of the S group, and often prior to the EEC/ESC as well. The voice leading for the major-third transpositions and substitutions involved is perhaps the strongest evidence that this represents a consistent compositional strategy, as the smooth voice leading often appears directly on the musical surface, functioning in the same way that it does in Cohn's many smaller-scale examples throughout *Audacious Euphony*. It would be surprising if every work conformed to these principles, and there are outlying examples on the scale of the full movement, as in the examples discussed at the end of the previous section, and at the level of the individual section.[99] The next step will be to move backwards chronologically to analyze works prior to D. 703 and to see whether the same principles apply with any consistency for Schubert's earlier compositions.

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[99] For example, in the D Major Sonata, D. 850, the S group (which begins in the dominant) includes a seven-measure excursion into the subdominant before returning to the dominant. While not as remote as some of the modulations discussed here, it is certainly unusual from a sonata form standpoint, and is not easily explained even in substitutional terms.

In her discussion of Schubert scholarship and reception history, Clark notes that recent writers have moved beyond the judgmental assessments of the nineteenth-century critics who accused Schubert of "illogical digressions" and inefficiencies, but the language used to describe these works is largely the same: "metaphors of wandering, enigma, mirage, will-o'-the-wisp, and magic" describe the vibrantly imaginative musical effects in Schubert's music.[100] Today's scholars and listeners largely understand that "his music is not *really* aimless or wandering or enigmatic, but is carefully constructed to sound that way."[101] However, as Clark notes, the musicological imagination has proven more successful at depicting these qualities than theory has been at actually explaining them; traditional sonata form and Schenkerian practices are simply not fully equipped to handle Schubert's music. Cohn's theory is a step toward a better understanding of chromatic harmony in the context of more traditional tonal practices, though he is certainly not the only scholar to have done work in this area[102], and my hope is that the present study contributes to the specific application of these ideas to sonata form. Rather than throwing out sonata principles in favor of idiosyncratic wanderings, we can now see that Schubert employs very specific strategies that put his works in the context of sonata-form concepts of tonal and formal function. Schubert is especially susceptible to a sort of sweeping-under-the-rug when it comes to the technical details of his work, but in the end a theory that can specify, and thus appreciate, the contrasting forces at play – namely, the

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[100] Clark, *Analyzing Schubert*, 155.
[101] Ibid.
[102] Clark, in chapters 3 and 4 of *Analyzing Schubert,* lists more than fifteen studies from recent decades dealing with the B♭ Major Sonata alone, along with countless other Schubert analyses.

triad's dual tonal and voice-leading capabilities – will not eliminate our sense of wonder at the music but rather expand it in new and unexpected ways.

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Appendix A: Works Consulted

D.	Name	Movements
703	String Quartet No. 12 in C minor, *Quartettsatz*	n/a
759	Symphony No. 8 in B minor, "Unfinished"	i, ii
804	String Quartet No. 13 in A minor, *Rosamunde*	i
810	String Quartet No. 14 in D minor, *Death and the Maiden*	i
812	Piano Sonata in C major, "Grand Duo"	i, iv
821	Piano Sonata in A minor for Arpeggione and Piano	i
840	Unfinished Sonata in C major, "Reliquie"	i
845	Piano Sonata in A minor	i
850	Piano Sonata in D major	i
887	String Quartet No. 15 in G major	i
894	Piano Sonata in G major	i
898	Piano Trio No. 1 in B♭ major	i
929	Piano Trio No. 2 in E♭ major	i
944	Symphony No. 9, "Great"	i, ii, iv
947	Allegro in A minor, *Lebensstürme*	n/a
956	String Quintet in C major	i
958	Piano Sonata in C minor	i, iv
959	Piano Sonata in A major	i
960	Piano Sonata in B♭ major	i