CHORD-SPECIFIC SCALAR MATERIAL IN CLASSICAL MUSIC:

AN ADAPTATION OF JAZZ CHORD-SCALE THEORY

by

ANDREW JOHN POKORNY

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Student: Andrew John Pokorny

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This dissertation has been accepted and approved in partial fulfillment of the requirements for the Doctor of Philosophy degree in the School of Music and Dance by:

Stephen Rodgers	Chairperson
Jack Boss	Core Member
Lori Kruckenberg	Core Member
George Rowe	Institutional Representative

and

Kimberly Andrews Espy	Vice President for Research and Innovation; Dean of the Graduate School

Original approval signatures are on file with the University of Oregon Graduate School.

Degree awarded June 2014

DISSERTATION ABSTRACT

Andrew John Pokorny

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Jazz chord-scale theory identifies scales that can be used to embellish a particular type of chord. It has fostered the notion that chords can generate their own local scales. This idea as well as many of the scale types that jazz chord-scale theory identifies are essentially foreign to classical music theory, which instead tends to focus on the scales that represent relatively global key areas—that is, the scales that accommodate entire chord successions. Both the jazz and classical perspectives can coexist, and each can inform and supplement the other.

This study explores implications of the jazz chord-scale perspective for classical music and classical music theory. The scalar notes and intervals that embellish a particular chord are referred to as *chord-specific scalar material* (CSSM). Following the suggestion of jazz chord-scale theory and Ramon Satyendra's *chord spaces*, each chordal zone can exhibit its own local tonal hierarchy potentially consisting of a local tonic note (usually a chord root), chordal notes and intervals, scalar notes and intervals, and sub-scalar notes and intervals. Focusing particularly on the scalar level of these chord-specific tonal hierarchies, CSSM is a relatively foreground phenomenon that can be understood against the backdrop of a deeper, uninterrupted scalar space that is associated with the

key of the passage at hand. A chord succession can occupy the deeper scalar space while each chord is embellished with CSSM suggestive of potentially different local scalar spaces.

This study considers examples of CSSM spanning the music of Bach through Fauré, and it proposes a classification of four general types of CSSM found in classical repertoire. Each type suggests a different theoretical derivation for examples of CSSM, and each type has its own implications for tonal function (both locally and globally), coherence, and color. The fourth type apparently did not emerge until the Romantic era.

Special attention is given to CSSM in the music of Gabriel Fauré, who seemingly developed rather innovative CSSM techniques. Practical benefits of this theoretical approach for today's composers, improvisers, and performers are also considered. Various techniques for generating CSSM are offered, and further scalar possibilities are explored.

CURRICULUM VITAE

NAME OF AUTHOR: Andrew John Pokorny

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene, OR
University of Minnesota, Minneapolis, MN
Webster University, St. Louis, MO

DEGREES AWARDED:

Doctor of Philosophy, Music Theory, 2014, University of Oregon
Bachelor of Arts, Music, 2003, University of Minnesota

AREAS OF SPECIAL INTEREST:

Theory and analysis of scales and scalar structures
Theory, analysis, and history of harmonic, scalar, and other tonal "colors"

PROFESSIONAL EXPERIENCE:

Graduate Teaching Fellow, University of Oregon, 2007–2012

Teaching Assistant, University of Minnesota, 2005–2006

AWARDS, AND HONORS:

Doctoral Research Fellowship, University of Oregon, 2013–2014

Graduate Research Award, School of Music and Dance, University of Oregon, 2011

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Dedicated to my parents, Steve and Joyce

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CHAPTER I

INTRODUCTION

1. Jazz Chord-Scale Theory and Its Implications

Since the 1950s, jazz pedagogy has offered the idea of *chord-scale theory* as one possible aid to improvising over pre-determined chord progressions (Russell 1959; Mehegan 1959). Put simply, it prescribes specific scales (in the sense of scalar pc collections) for every chord in a piece of music, which gives jazz improvisers an adequately sized collection of notes to work with at any given moment. Table 1.1 demonstrates how chord-scale theory might prescribe scales for a common jazz chord progression, and it also shows how most versions of chord-scale theory offer multiple scale options for any given chord.

Table 1.1. Scale options for the chord progression C – A7 – Dm7 – G7 – C, as typically offered by jazz chord-scale theory (e.g., Aebersold 2000)

C	A7	Dm7	G7	C
C major C Lydian	D harmonic minor A mixolydian A HW octatonic A diminished whole-tone*	D Dorian (= C major) D melodic minor*	G mixolydian (= C major) C harmonic minor G HW octatonic G diminished whole-tone*	C major C Lydian
* Although the scales marked with an asterisk conflict slightly with their chords, they are still common choices partly because jazz ensembles rarely perform each chord exactly as the chord symbol suggests. For example, A7 might be performed with an F (equivalent to a raised 5^{th} or lowered 13^{th}) instead of an E, thereby accommodating the A diminished whole-tone scale. Even if chord-scale conflicts arise, they are often deemed acceptable if they are brief and if each part follows through with its own purpose.				

Chord-scale theory is used almost exclusively for jazz music and is not widely known in "classical" music theory, yet it has profound implications for classical music and for music theory in general.[1] From a broader theoretical perspective, chord-scale

[1] Throughout this study, "classical" refers to Western tonal "art" music of the so-called common-practice era (roughly Bach through Brahms). I do not intend to advocate such problematic categories, but I focus on this era of music largely because of its conspicuous lack of anything resembling chord-scale theory.

theory is unique for drawing attention to the various types of scalar material that might occur along with individual chords—what I call *chord-specific scalar material* (CSSM). In terms of chord-scale relations, classical theory usually focuses only on how chords function *within deeper-level scales*. For example, conventional "roman-numeral" analysis describes how chords relate to deeper-level scales suggested by traditional key names.[2] Jazz chord-scale theory reverses the priority in a sense, focusing mainly on the scalar materials that function *within chords*. In other words, classical theory tends to see chords as generated from a scale, whereas jazz theory tends to see scales as generated from chords.[3]

2. The Importance of Scalar Material to Tonality

CSSM is defined as *scalar* melodic material that is specific to an individual chord. Melodic material specific to individual chords can also be *arpeggiative* or *sub-scalar*, as shown in Example 1.1, but these other two types of material do not constitute CSSM. Arpeggiative, scalar, and sub-scalar materials respectively correspond to Lerdahl's (2001) "basic-space" tonal-hierarchical levels c, d, and e (Figure 1.1).[4] When considering

Tymoczko (2011) offers compelling arguments to substantially widen the boundaries of the "common-practice era" label—so as to include Renaissance music, impressionism, most jazz, and some other twentieth-century music.

[2] By "deeper-level" scales, I do not mean that scales are events to be found on a deeper event-hierarchical level. Rather, I mean that the events of a deeper level are understood in terms of these abstract scales. Later, I refer to such abstract, underlying scales as "deep scalar spaces" (first defined in Chapter III).

[3] For example, Nettles and Graf (1997, 177) explain in their definition of chord-scale theory that "[s]cales are derived from extended chord structures (13th chords)." However, I later explain in Chapter II how jazz chord-scale theory did not necessarily originate with this idea.

[4] The terms "tonal hierarchy" and "event hierarchy" are used throughout this study. Generally speaking, tonal hierarchies are organizations of pcs that reflect their statuses in a musical excerpt or, if differences of key are collapsed, in multiple pieces or even part of an entire musical style (Bharucha 1984b; Krumhansl 1990). Event hierarchies, in contrast, are organizations of the events (notes and sometimes rhythms) in a particular piece of music such as those produced in Schenkerian analysis. I discuss tonal hierarchies and their relationship to event hierarchies in greater detail in Chapter IV.

individual chord-melody interactions, *scalar* material is more important to tonality than are the other kinds of melody because it is the only one that contributes significant tonal information beyond what the concurrent chord already provides. Arpeggiative material is chordal by definition and thus contributes no additional pcs or pc-intervals beyond those in the chord itself; and sub-scalar material contributes pcs and intervals only in a generic "one-size-fits-all" manner, providing minimal tonal information.[5] Scalar material, on the other hand, has the potential not only to contribute additional pcs, but also to allude to key areas or other meaningful structures, thus affecting the function of the concurrent chord. Therefore, when it contributes additional pcs, these pcs usually create stronger senses of color and meaning than the pcs contributed by sub-scalar material. The scalar material shown in Example 1.1.b could refer to the key of F major, to an altered form of the tonic B-flat major scale, or to a C mixolydian scale; and, regardless, it contains distinct melodic intervals that contribute to a distinct sonority. The example of sub-scalar material in Example 1.1.c, however, functions more like a glissando, referring to no structures or colors besides the fully chromatic scale (which might even be called an atonal structure anyway).

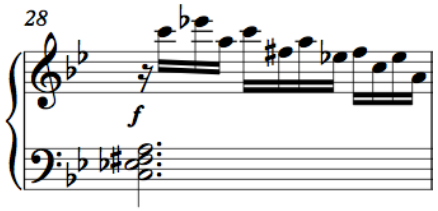
3. Implications and Prompted Questions

If we accept the premise that scalar material is, in fact, more tonally significant than arpeggiative and sub-scalar material when paired with a chord, we will naturally begin to ask questions about it. When scalar material occurs along with various chord-types in classical music, what specific scalar structures are chosen, and what are the implications of those choices? Coming from the perspective of jazz chord-scale theory

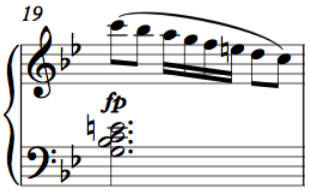
[5] The terms "chord" and "chordal," "scalar," and "sub-scalar" are discussed in detail in Chapter IV.

Example 1.1. Three kinds of melodic material that can be specific to an individual chord: arpeggiative, scalar, and sub-scalar melodic material. All three examples are taken from Mozart, Piano Sonata in F Major, K533/494, movements II and III. The example of scalar melodic material, as it is also specific to a chord, is an example of CSSM.

a. Arpeggiative melodic material



b. Scalar melodic material (= CSSM)



c. Sub-scalar melodic material

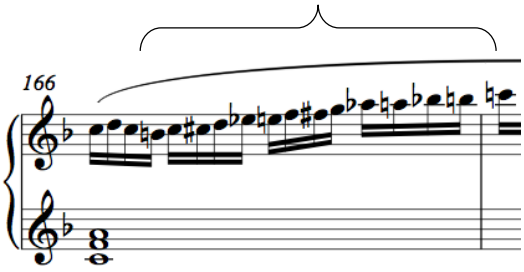


Figure 1.1. Lerdahl's (2001, 47–49) "basic-space" tonal hierarchy, oriented to the key and chord of C major. Levels c, d, and e correspond respectively to arpeggiative, scalar, and sub-scalar melodic material (as shown above in Example 1.1). However, such hierarchies can also apply to longer and deeper spans of music.

Level:													
(a)	C							G					C
(b)	C							G					C
(c)	C				E			G					C
(d)	C		D		E	F		G		A		B	C
(e)	C	C#/Db	D	D#/Eb	E	F	F#/Gb	G	G#/Ab	A	A#/Bb	B	C

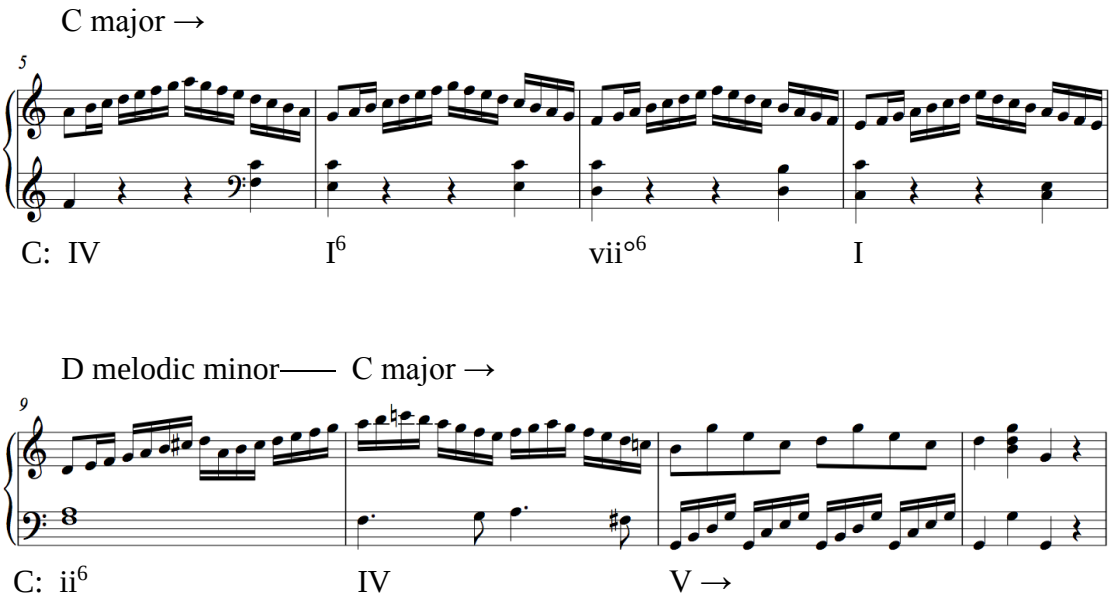
we might ask: What kinds of scales do classical composers use with different kinds of individual chords? How are these various scales derived, and how do they affect the concurrent chord and the rest of the musical passage at hand?

Consider, for example, the scalar runs near the beginning of Mozart's K545 Piano Sonata, shown in Example 1.2. While the chords in mm. 5–8 are each "melodized" through the tonic C major scale, the ii^6 chord of m. 9 is melodized more boldly through a D melodic minor scale.[6] Mozart was not obligated to do this; the ii^6 chord easily could have been melodized with more C-major material, but the D-melodic-minor material appropriately adds a greater sense of tonal weight to this structural pre-dominant chord. How often does Mozart melodize ii^6 chords through their corresponding melodic minor scales rather than simply through the governing tonic scale, and does he ever use other types of CSSM for ii^6 chords (such as harmonic minor, for example)? What factors might influence his decisions? Do other classical composers work similarly with ii^6 chords? What types of CSSM do classical composers use to melodize other chords—including chromatic chords such as Neapolitans, augmented sixths, and common-tone diminished sevenths, none of which suggests an immediately obvious type of CSSM? Can we glean some common principles or techniques from examples in the repertoire? And do these techniques differ across stylistic periods? Surprisingly, classical music theory has only

[6] Throughout this study, "melodic minor" refers only to the so-called ascending form of the scale unless specified otherwise. Regarding my scalar analysis of mm. 9–10, one might ask: Where does the D melodic minor end and where does C major begin? Perhaps we can admit some fuzziness of identification or of segmentation but still maintain that the two identities are present and distinct. In a "real-time" hearing of this passage, even if it is played slowly, most listeners will not immediately identify a new type of scale at the downbeat of m. 10. However, in this study I am primarily concerned with ideal ways of understanding musical structure, and I am only interested in what people tend to hear (an extremely messy topic of study, to be sure) to the extent that it sheds light on ideal ways of understanding musical structure. In the case of the scalar analysis of mm. 9–10 in question here, I find good reasons for understanding a conceptual change of scale-type across the bar line—along with the change of distinct chordal zones (from ii^6 to IV)—and this understanding is still compatible with the fact that the two scales (D melodic minor and C major) share six common pcs, which inevitably (and desirably) obscures the potential boundary in terms of our perception. Conceptual understandings and perceptions can complement each other.

recently begun to investigate these issues with any careful consideration, and many questions remain.[7]

Example 1.2. Mozart, Piano Sonata in C Major, K545, mvt. I, mm. 5–12



4. Contents of This Study and Its Importance

I show in this study that most types of chords—diatonic or chromatic—are subject to different types of CSSM in the classical repertoire. For example, we will later see that J.S. Bach used two different types of scale to melodize minor-key Neapolitan chords in different compositions. Furthermore, I show that these differences have several important implications. As the previous paragraph begins to reveal, a survey of different types of CSSM used throughout the repertoire would significantly contribute to music history and tonal composition pedagogy, and increased recognition of these typically overlooked but meaningful—and often colorful—entities enhances music appreciation. Beyond these

[7] Jazz theory, on the other hand, *has* addressed such issues under different terms—in the form of chord-scale theory; but I later explain why its methodology is not adequate for classical music theory, analysis, or pedagogy (and, furthermore, that it is generally not considered adequate for jazz either).

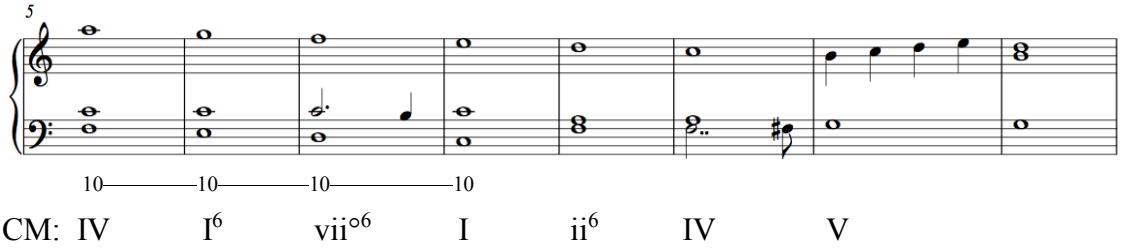
relatively obvious implications, CSSM raises several important theoretical issues that are absent in most other classical-music scale studies because they do not focus on scalar material in terms of specific chords. It adds to the scholarship on chord-scale relations by recognizing varying degrees of chord-scale compatibility (including occasional chord-scale conflicts), and it calls attention to different structural and expressive effects that CSSM can impart onto the concurrent chord. This study shows how CSSM can affect the functional meaning of its chord—through scalar tonicization or other means of "tonal strengthening" (or weakening), or by taking advantage of a chord's *Mehrdeutigkeit* (multiple meanings). Moreover, we will see how CSSM often contributes tonal color to a passage—sometimes by taking advantage of rather obscure chord functions, resulting in some very interesting instances of CSSM.

The chord-specific nature of this study also leads us to recognize that different event-hierarchical levels of music can simultaneously suggest different types of scalar material. Returning to Mozart's K545 (Example 1.2), although we hear m. 9 entirely in terms of D melodic minor at the surface level, we also hear the ii^6 chord itself in terms of a deeper-level that is entirely in C major—hence the label "ii^6" (see Example 1.3).[8] Therefore, the D melodic minor material functions like a colorful appendage (which I call *distinct* scalar material) to the underlying and *uninterrupted* C major material. Although such bi-level scalar relationships have long been acknowledged in Schenkerian analysis in the form of keys, for example, they are usually acknowledged only at deeper levels,

[8] I do not necessarily intend to follow strict Schenkerian methods in such analytical examples. Some analysts will choose to depict the middleground level slightly differently. All that really matters for the present purposes is that we imagine some parts of the music as deeper, as continuing throughout the duration of the temporary foreground-level embellishing scalar material, and as continuously suggesting a deeper-level scalar space that is, at least to some extent, uninterrupted by the surface-level embellishing scalar material.

and many other scalar analyses typically do not get past the mere series of different scalar materials at the musical surface, thereby encouraging (even if unintentionally) a one-dimensional image of scalar structure in classical music. Such an approach would describe the music of Example 1.2 as switching from C major briefly to D melodic minor and then back to C major, but it would fail to explicitly recognize the completely uninterrupted continuation of C major throughout the excerpt at the next deeper level. A more sophisticated approach would recognize (and appreciate) how one continuous stretch of deeper-level scalar material (e.g., C major) can be peppered with several foreground-level articulations of other scalar materials. Such conceptions of scalar structure can also benefit composers, suggesting a logical compositional method for generating new colors without abandoning an underlying tonality.

Example 1.3. Deeper structural level of Mozart, Piano Sonata in C Major, K545, mvt. I, mm. 5–12, heard entirely in C major



Further important implications arise from recognizing the relationship between the two scalar materials in such multi-level situations. Analytical examples in this study demonstrate that when relatively foreground-level scalar material seems to be consistent with concurrent deeper-level scalar material (that is, understood as of the same general "substance"), a greater sense of tonal coherence and continuity results. Conversely, when foreground-level scalar material seems independent of the deeper-level scalar material,

one is more likely to temporarily lose track of the underlying key (or further delay the discernment of a key if one was not already established), which might decrease the sense of tonal coherence and continuity. Exploration of these issues leads to new perspectives on the relationship between keys and scalar materials in classical music. Along these lines, I will also show how CSSM has the potential to either reveal or conceal the deeper function of a potentially ambiguous chord (such as a potentially reinterpreted diminished-seventh or augmented-sixth chord).

In summary, this study has important implications for not only music theory and analysis, but also for music history, musicology, and composition and improvisation:

1. **Analysis and Interpretation:** Different types of CSSM have different effects on the tonal "color" of the concurrent chordal zone and of the passage at hand, the tonal function of the concurrent chord (and thus its meaning), the amount of emphasis on the chord, and the tonal coherence or continuity of the passage.
2. **Music Theory:** This study prompts and facilitates closer examination of music-theoretical concepts such as key, scale, scalar space, scale degree, chord, tonal hierarchy, event hierarchy, and the often-complicated relationships between these concepts. Even the merely preliminary extent of such examination in this study reveals many common oversights and avenues for further study.
3. **Music History and Musicology:** Certain types of CSSM have stronger or weaker associations with different composers, historical/stylistic eras of music, genres, geographic regions, or cultures. The survey also leads one to speculate about the compositional techniques that classical composers might have used to create different

types of CSSM, and this could prompt historical studies that find evidence to support or negate some of these speculations.

4. **Composition and Improvisation:** The CSSM types along with the compositional techniques inferred from the analytical survey could benefit present-day "common-practice-style" (or simply "tonal") composers and improvisers, who have lacked adequate guidelines for creating different types of CSSM in terms of various key-chord scenarios.

The remainder of this chapter discusses the general limitations and assumptions of this study. Chapter II then presents a review of relevant scholarly, pedagogical, and historical literature. The core of this study begins with Chapter III, which introduces a way of understanding examples of classical music CSSM in terms of four types. This chapter also features numerous analytical discussions of examples of CSSM from throughout the classical repertoire. These examples and analyses will presumably raise several more technical questions in readers' minds, and Chapter IV answers these questions with detailed explanation of my analytical methods and terms as well as a fair amount of original theoretical ideas that underlie those methods. Chapter V then puts my approach to CSSM to the test—and also expands on it somewhat—with an analytical case study: a survey of CSSM in the music of Gabriel Fauré. Chapter VI discusses potential practical applications of the study of CSSM—most notably, applications to composition. Finally, Chapter VII summarizes the study and discusses many ideas for further research.

5. Limitations, Assumptions, and Disclaimers

Limitation to Common-Practice-Era ("Classical") Music

All studies must have boundaries. For this study, I decided to limit the applications to "classical" music of the common-practice era (very roughly, Bach through Fauré), which can all be understood through mainstream notions of common-practice-era "tonality." I do not wish to discuss here the pros and cons of acknowledging such artificial boundaries or to dissect the difficult concept of "tonality." The main point here is that my limitation to this scope of music is essentially a way for me to be more than safe in avoiding complications that might arise with other styles.

Perhaps more importantly, I decided on this limitation because existing approaches to CSSM such as chord-scale theory have already been applied to music after the common-practice era—most notably, modern jazz. Such ideas have *not* yet been applied to common-practice-era music in a comprehensive way, and I believe they should be. Many fascinating examples of CSSM can be found in the classical repertoire, but most have sadly gone unnoticed. Furthermore, I have found that classical composers sometimes use CSSM in ways that are virtually unknown in the domains of later impressionism or jazz.

I chose not to consider music before the common-practice era for two reasons. First of all, much of this music is not composed from chord progressions, and is therefore unlikely to contain substantial and clear CSSM. Second, my approach is somewhat dependent on notions of scale, key, harmony, and tonality that become increasingly problematic or controversial as they are applied to earlier music. However, this is not to say that CSSM cannot be found in earlier music.

Tuning and Temperament

Another deliberate limitation of this study is that I do not investigate historical differences in tuning and temperament. Almost all issues are discussed as if twelve-tone equal temperament were assumed. Although this is potentially historically negligent, differences of tuning would probably not change any of the essential results. However, earlier tuning systems could potentially shed light on composers' CSSM decisions. For example, one could imagine a scenario in which an earlier composer favored a particular CSSM type over another because of their respective tunings. For the sake of this study, such considerations are restricted to a very brief discussion in Chapter VII (Conclusions and Ideas for Further Study).

Turning things around, some of my observations regarding CSSM and their classification could potentially influence performers' tunings. For example, a particular instance of scalar material might be tuned differently depending on whether it is heard as derived from the underlying key or representing new, independent scalar material. This is discussed briefly in Chapter VI (Practical Applications).

Scales Are Assumed To Be Significant Entities

Throughout recorded Western music history, scales and similar constructions have been continuously abused. Even well over 2,000 years ago, Aristoxenus complained about the "close-packing" habit of other music theorists (namely, the "harmonicists"), referring to their diagrams that place the notes of different scales into one continuous succession in order of pitch (Mathiesen 2002, 117–119). Such arrangements might serve as complete inventories, which then might illuminate comparisons, but otherwise they are misleading in that they obscure the melodic successions that are actually used in (or

recommended for) musical practice, and they imply successions and intervals that originally had no direct relation to practice.

More well-known is the controversy around the classification of Gregorian chants into the eight church modes. Theorists' struggles with explaining the chant repertoire in terms of the eight modes have been well documented,[9] and some scholars have even suspected that many chants were later altered to fit one of the eight modes.[10]

Today, problems surrounding notions of scales continue. At least in the United States, most music students are still taught that essentially all classical music is based on the major scale or any of the three traditional forms of minor scale: natural, harmonic, and melodic. Theorists have argued for different fundamental forms of minor scale—either Aeolian, Dorian, harmonic minor, or melodic minor—since the development of major-minor thinking in the late seventeenth century.[11] In his *Harmonielehre* ([1906] 1954), Schenker argues for the primacy of Aeolian over the other minor forms, but then he also acknowledges a continuum of potential mixture between the major, Aeolian, and (with some inconsistency) Phrygian modes.[12]

All of this raises questions as to why scales are assumed to underlie music in the first place. Much minor-key music of the common-practice-era, for example, seems to be guided by a set of idiomatic melodic patterns and chord progressions that are not directly derived from any fixed scale. In discussing such issues in a broader sense, William

[9] For example, see Bower 2002, 160.

[10] For example, see Hansen 2006.

[11] This history is discussed in Lester 1989, for example.

[12] For more on Schenker's approach to scales in tonality, see Brown 1986.

Thomson (1999, 74) succinctly remarks, "Scales are abstractions from musical events, not their antecedent sources." Furthermore, Joel Lester (1989) has shown that composers as recent as Beethoven were originally trained in terms of older six-syllable solmization methods, which calls into question whether such composers ascribed the same meanings to scales as are usually ascribed today.

Despite these questions, scalar conceptions of music have dominated Western music theory since as far back as we know it. Jeremy Day-O'Connell even describes scalar thinking as somewhat of a natural human behavior when he says, "Throughout the world musicians routinely, inevitably, eschew the vast continuum of musical pitch in favor of scales—modest collections of discrete, more or less fixed, notes" (2007, 1). In terms of music theory and analysis, the convenience of simplification often wins over the virtue of detailed, complex description. And in terms of musical composition and performance, the convenience of fixed notes and scales wins over the potential virtues of more complex options and methods. Many classical composers *did* consciously work with pre-determined fixed scales at times—largely due to their musical training. And most Western musicians today are trained to hear music in terms of scales. In fact, some musicians involuntarily hear almost any note—even an isolated, non-musical pitch such as the hum of a refrigerator—as some particular scale degree (i.e., in terms of some scalar space). I make these points only to show that the approach I advocate in this study has *some* grounding in widespread musical practice and thinking. In other words, if scalar thinking had always been a mere theoretical abstraction that was never clearly used in practice, I would be more reluctant to develop it further. But scalar thinking clearly

affected the creation of much classical music and clearly affects music and musicians today, so this study is not completely detached from reality.

Theory and Analysis Do Not Always Reflect Composers' Thinking

One of the most obvious dangers of this study is that it might give the impression that classical composers consciously chose to use certain CSSM. However, I do not have adequate evidence to make any claims regarding composers' actual thoughts regarding CSSM. My personal suspicion is currently that many of the composers treated in this study had no reason to think about anything resembling CSSM; some of the CSSM that I observe in their music could easily be by-products of other compositional processes. But in some other cases, I do suspect that the composer was consciously aware of the scalar structure at hand (particularly when one chord's CSSM exhibits a traditionally complete scale and is distinct from the CSSM of the surrounding chords). Regardless, all of these thoughts are beside the main point of this study, which is to present a meaningful, consistent way for *today's* musicians to analyze, interpret, and further appreciate certain aspects of music, or to apply these approaches to new compositions or improvisations.

Scales and Other Music-Theoretical Entities Are Not Objective

I will avoid speaking as if any supposed scalar material is "really" in the music or not. Scalar materials are products of human thinking; they are not objective. Of course, on a deeper philosophical level, one could argue that *all* musical entities are products of our thinking (because if not, they would neither be musical nor entities at all). But on a more practical everyday level, certain musical entities such as sounding notes can be called objective events.

Scalar materials do not even fall into this category, however. At best, they are only events of the mind. Truth value is only applicable to the supposed existence of a scalar material if one discusses what a particular person or population most commonly imagines when engaging[13] with a particular piece of music, or if one wishes to somehow determine what particular imagination (or interpretation) is most rewarding for a person or population with regard to a piece of music (and in this latter case, the supposed existence in question is actually that of the reward—not the imagined scalar material). Although either of these pursuits would be practically impossible to fully prove, my goals in this study are like mild versions of them. The analytical and interpretive choices I make are attempts to figure out what classical musicians tend to imagine and attempts to figure out which imaginations tend to be more rewarding to those musicians.[14]

[13] Note the word "engaging" as opposed to "listening" or "hearing." I do not believe that all the scalar materials and hierarchies that I discuss with regard to musical examples are actually imagined in real time while listening to the music. More likely, these scalar materials and hierarchies can only be fully imagined in the (much longer or slower) time of analytical reflection. I will not attempt to describe the real-time cognition that might occur while listening to music; however, it would be an interesting pursuit for further study, as I mention in Chapter VII.

[14] I mention this particular (and admittedly roughly defined) population so as to make my claims generally safer. If the population were extended to all "Western musicians," for example, the likelihood of counter-examples would greatly increase.

CHAPTER II

OVERVIEW OF RELEVANT LITERATURE

I begin this chapter with a brief overview of jazz chord-scale theory, which provided the initial inspiration for this project. Jazz chord-scale theory is perhaps the only developed (and certainly the most well-known) approach to CSSM that has been applied to Western tonal music. After this overview I address scholarship that somehow relates to CSSM in classical music, and I discuss why CSSM and its implications have been overlooked in classical music theory.

1. Chord-Scale Theory

Joseph Schillinger

Russian music theorist and composition teacher Joseph Schillinger (1895–1943) is possibly the first to mention ideas resembling chord-scale theory, although he is not often recognized for this. His ideas are primarily intended to aid composition (rather than improvisation or analysis) and are not explicitly intended for any particular style of music (such as jazz),[15] but his ideas were disseminated into American popular and jazz domains when he taught several well-known composers in New York City including Eubie Blake, Vernon Duke, George Gershwin, Benny Goodman, John Lewis, Glenn Miller, and Gerry Mulligan.[16] George Russell, who is usually credited as the founder of chord-scale theory (discussed in the following section), was in contact with Schillinger students John Lewis and Gerry Mulligan in the 1940s, and given some striking similarities between Russell's

[15] One of Schillinger's former pupils, Prof. Zvi Keren, explained in an interview that "Schillinger's theories are for all time and for any purpose and for any kind of music" (Keren-Sagee 2010, 22).

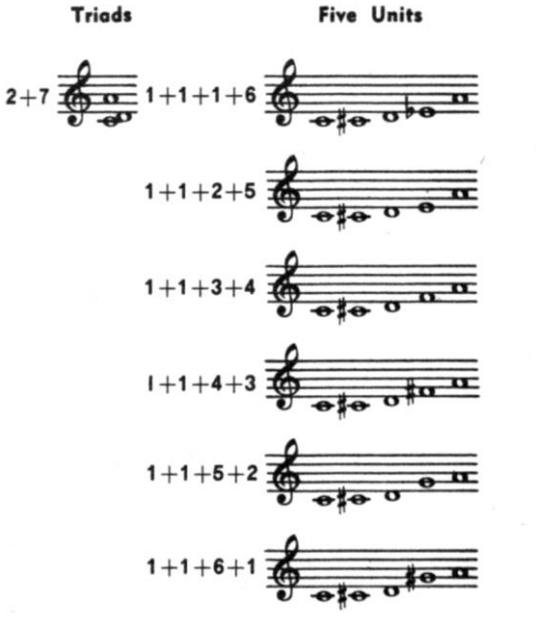
[16] For additional names of Schillinger's students, see Burk and Schneider 2012, Hazell 1995, and Nauert 1994.

and Schillinger's work (to be mentioned throughout this section), we have good reasons to suspect that Russell's jazz chord-scale theory was partly influenced by Schillinger's work. Furthermore, among Schillinger's "12 disciples" (students who were officially authorized to teach the Schillinger System of composition) was Lawrence Berk, who in Boston in 1945 founded the Schillinger House music school, which eventually became the Berklee College of Music. The Schillinger System was a central part of the curriculum at this institution, though Berk said that he "simplified [Schillinger's] theories so the unoriented music student could use them effectively" (Hazell 1995, 12). In recent decades, the Berklee College has been one of the foremost advocates of jazz chord-scale theory, as demonstrated by textbooks based on its teaching methods, *The Chord Scale Theory & Jazz Harmony* (Nettles and Graf 1997) and *The Berklee Book of Jazz Harmony* (Mulholland and Hojnacki 2013), both of which are discussed later in this section.

In *Kaleidophone: Pitch Scales in Relation to Chord Structures* (1940), Schillinger lists all of the possible "scales" that "correspond to any given chord" in twelve-tone equal temperament (12ff). In the context of his chord-scale tables, a chord is any two- to five-note collection that can be reduced to a structure spanning less than one octave and containing no semitones between adjacent notes (but the outer two notes are not considered to be adjacent and therefore can create a major seventh). Following this, a scale is the elaboration of any of these reduced chord structures through the addition of exactly one note (called a "moving tone") in between each adjacent pair of chord tones (called "stationary tones"). Therefore, dyads must correspond to three-note scales (composed of two stationary tones and one moving tone), triads must correspond to five-note scales (three stationary tones and two moving tones), and so forth. Moving tones can

be added anywhere between two surrounding stationary tones, as shown in Example 2.1. Therefore, many individual chords correspond to more than one scale; Schillinger's method results in a total of 137 chords and 1,012 scales (Schillinger 1940, 87). Extensive as this method may be, it precludes chord structures that contain more than one instance of ic1. Moreover, the cardinality restrictions that result from Schillinger's definition of chord-scale correspondence preclude familiar pairings such as the major triad with the seven-note major scale, for example (because, in his method, triads can only correspond to five-note scales). From a broader perspective, Schillinger's method might be criticized for poorly matching our intuitions of what "chord" and "scale" mean. His list includes many chords and scales that many would find bizarre (as shown in Example 2.1), and it also excludes many chord-scale pairings that many would find important (such as the aforementioned pairing of the major triad and major scale).

Example 2.1. One of Schillinger's chords and its corresponding scales (from *Kaleidophone* [1940], p. 25)

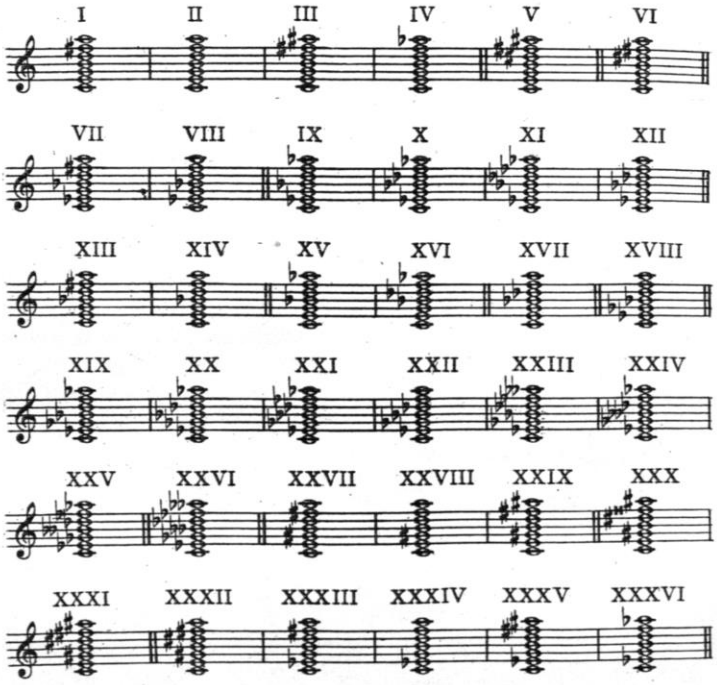


Despite its oddities, *Kaleidophone* is a noteworthy document in the history of chord-scale thinking. Schillinger explicitly discusses the compositional method of developing "melodies from chords, which doesn't conform to the usual conception of having the melody first and the harmonization thereafter" (1940, 17). However, he asserts that "some of the most important composers in the past very often (and some of them always) worked their melodies out from chord progressions," citing Wagner and Franck as "most characteristic" and Beethoven as a less obvious example (17).

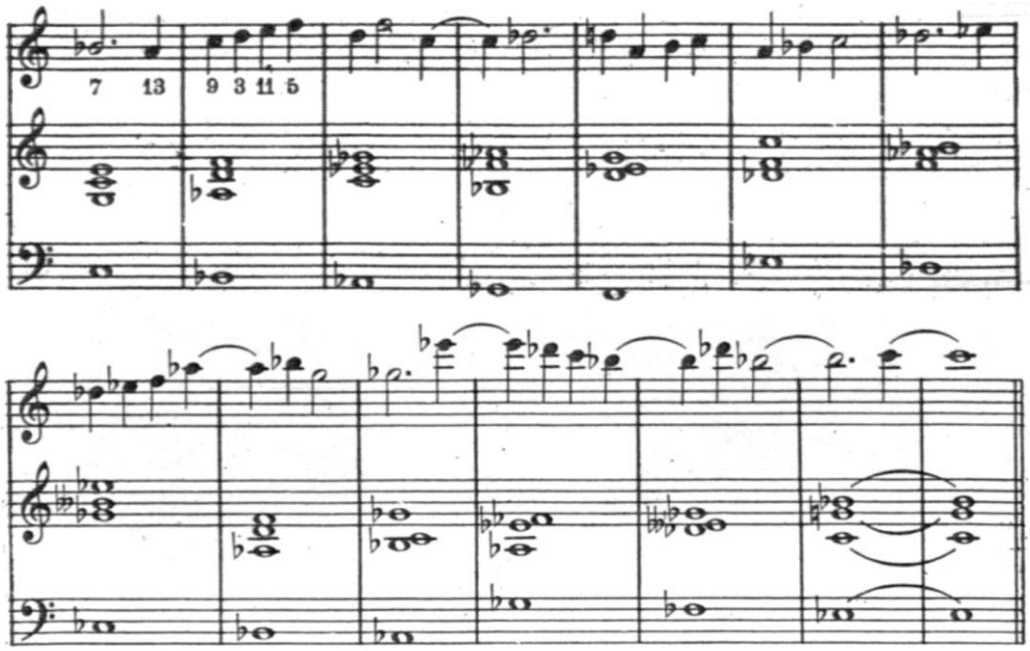
In his posthumously released collection of lesson notes titled *The Schillinger System of Musical Composition* (1946), Schillinger presents various methods for composing melodies over individual chords as well as a chart of the 36 possible tertian thirteenth chords composed only of major and minor thirds (shown in Example 2.2), which suggests not only chordal generation of scales but also the idea of chord-scale equivalence, which later became an important part of jazz chord-scale theory (bearing striking resemblances to aspects of Russell 1959, for example).[17] Example 2.3 reproduces one of Schillinger's demonstrations, in which each measure is derived from a different transposition of his chord number XIII (equivalent to the acoustic scale) in his chart of thirteenth chords.

[17] Schillinger 1946, Book VI, "The Correlation of Harmony and Melody," Chapter 2, Section D, "Symmetric Melodization: The Σ (13) Families," pages 654–661 in particular. Regarding Schillinger's possible influence on Russell, notice both Schillinger's (1946, p. 656) and Russell's (1959, p. 2ff.) use of the term *polymodality*, their excessive uses of jargon, and that Schillinger's chart of thirteenth chords (Example 2.2, shown above) begins with a Lydian thirteenth chord—the chord and scale that Russell bases his theory on (as discussed below).

Example 2.2. Schillinger's "Σ (13) Families" (from *The Schillinger System of Musical Composition* [1946], p. 654, Figure 27: "Complete table of Σ 13")



Example 2.3. One of Schillinger's compositional demonstrations that resemble chord-scale theory (from *The Schillinger System of Musical Composition* [1946], pp. 658–659, Figure 32: "Symmetric melodization")



Ultimately, most of Schillinger's ideas are conceptually problematic or lie outside the boundaries of this study. They were intended primarily as compositional tools rather than for analysis, and for the creation of new music unrestricted by previous conventions. Thus, they bear little connection to traditional tonal music theories and to our intuitions of classical styles. Even if I were undertaking a broader theory of CSSM (applicable to more than just classical music), I find Schillinger's notion of chord-scale correspondence to be far too limiting and simplistic. Claude Palisca said of Schillinger's work that it exhibits a "lack of rigor and misuse of mathematical terminology" (Nauert 1994, 9; originally from "Theory, Theorists" in an unspecified edition of *New Grove Dictionary of Music and Musicians*). Its applicability to music is often obscured by his tedious and jargon-laden style, his obsession with lists and numbers of questionable importance, and a frequent tone of grandiose claims and self-promotion. One reviewer in 1947 described *The Schillinger System of Musical Composition* as "exhaustive and exhausting" and "the most thoroughgoing example of misplaced ingenuity we have ever seen" (Nauert 1994, 11).[18]

George Russell's Lydian Chromatic Concept

Despite Schillinger's contributions, chord-scale theory is most widely said to originate with jazz musician George Russell (1923–2009) as demonstrated in his book, *The Lydian Chromatic Concept of Tonal Organization for Improvisation*, which he began working on in the 1940s and first distributed in 1953.[19] The book has been credited as an

[18] This quote is originally from Geoffrey Sharp, as published in *Music Review* 8 (1947, 311).

[19] Because of the 1953 version's lack of availability, I refer primarily to the 1959 edition of the book. At times, I also refer to the 2001 edition, which contains a significant amount of new material. For historical accounts of the book and Russell's ideas, see Brubeck 2002 (190–194) and Monson 2007 (283–311).

influence on a number of important jazz musicians such as Miles Davis and John Coltrane, and it is also recognized as one of the first significant contributions to Western music theory that is rooted in a non-European musical style (specifically, American jazz).[20] Much like Schillinger's work, *The Lydian Chromatic Concept* has drawn criticism for its abstruse presentation and debatable arguments,[21] but it has also been praised for its fresh perspective on Western tonality.[22] Its central motivating idea is that every chord derives from a "parent" or "principal" scale, which may be realized in a composition or improvisation to fully express the chord. These scales are always in the form of a Lydian scale—which Russell argues to be fundamental—or one of its variants, as shown in Figure 2.1.[23] Russell describes melodic material (whether improvised or composed) as either *vertical* or *horizontal*. Put simply, a vertical approach involves expressing the unique sound of each chord with material derived from their corresponding parent scales—almost as if each chord possessed its own quasi-tonality—whereas a horizontal approach involves the expression of a broader tonic scale, which does not necessarily conform to local chords.[24] I loosely adapt Russell's notions of

[20] See, for example, Boothroyd 2010. For anecdotes about its influence on jazz musicians, see Russell 2001.

[21] See, for example, Brubeck 2002 (191–193), Hendler 1984, and Jeanquartier 1984.

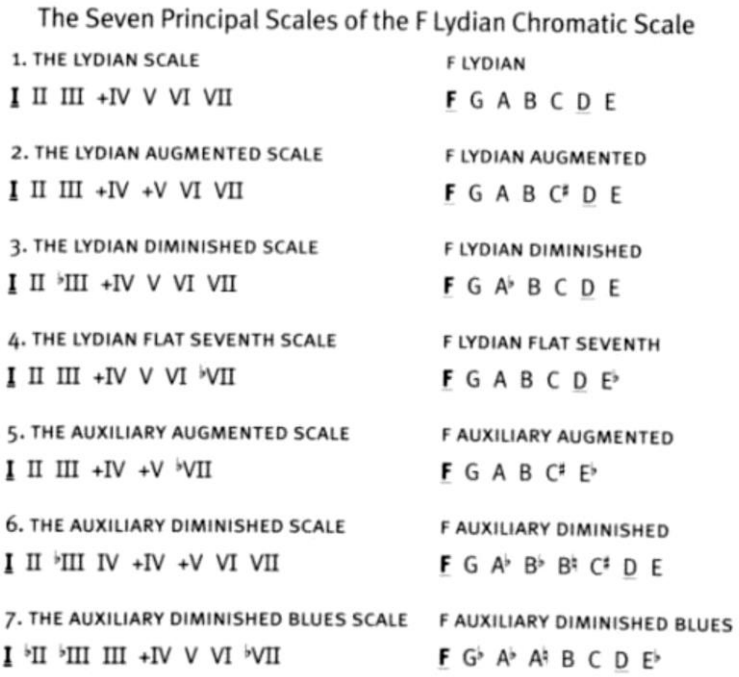
[22] See, for example, Minkenberg 1993. Furthermore, Tōru Takemitsu reportedly lauded Russell's *Lydian Chromatic Concept* as one of the two "finest books dealing with music written [in the twentieth] century," along with Messiaen's *Technique de mon langage musical* (Burt 2002, 73ff.).

[23] Without going into the details of the idea here, one of Russell's most memorable and thought-provoking quotes reads, "The major scale *resolves* to its tonic major chord. The Lydian scale *is* the sound of its tonic major chord." (Russell 1959, iii–iv).

[24] Today, most jazz musicians describe horizontal playing as using one scale (or a similar source of pitch material) over multiple chords, and vertical playing as using a different scale (or melodic pattern, etc.) for each individual chord.

horizontal and vertical melody into my classifications of CSSM types presented in Chapter III.[25]

Figure 2.1. Russell's seven principal scales (from *The Lydian Chromatic Concept*, 4th ed. [2001], p. 13)



Recent Chord-Scale Methods Associated with Berklee College of Music

Two relatively recent jazz pedagogical books that have attempted to explain jazz chord-scale theory in terms that are more compatible with traditional classical theory are *The Chord-Scale Theory & Jazz Harmony* by Barrie Nettles and Richard Graf (1997) and *The Berklee Book of Jazz Harmony* by Joe Mulholland and Tom Hojnacki (2013), both of which are based on methods taught at Berklee College of Music. Of all existing jazz chord-scale literature, these two books are perhaps the most aligned with classical theory.

[25] For a somewhat more detailed but still conveniently brief overview of Russell's *Lydian Chromatic Concept*, see pages 45–50 of Scott Alexander Cook 2012.

Both books attempt to derive numerous types of scales mostly from traditional major/minor sources, much like I do in the present study but unlike much other jazz chord-scale literature. Also unlike popular, simpler forms of chord-scale theory (discussed below), these two books determine scales for chords according to chord function rather than mere chord quality. For example, major–minor-seventh chords are assigned different scales depending on what they tonicize or resolve to within the broader key at hand. Many of their derivations are equivalent or very similar to what I describe in Chapter III as the principles of "Type-1," "Type-2," and "Type-2a" CSSM.

Both books use the term "chord scale" more regularly than most literature that could be described as representing chord-scale theory. They use the term to refer essentially to a scale that is associated with a particular chord, the two of which "do not have independent functions but represent the 'two sides of one coin'" (Nettles and Graf 1997, 10).[26] Their suggested chord-scales (and their derivations) are largely based on theory rather than documented jazz practice; they are essentially theoretical rather than empirical. Some of their chord-scales are problematic. Many involve two versions of a scale degree, sometimes resulting in non-scalar intervals that are presented as if scalar. For example, some of their minor-key chord-scales contain a minor ^7, a leading tone, and a tonic note, all presented in succession. Moreover, some of their scale derivations are not convincingly explained; sometimes certain notes of a scale are included for no apparent reason other than supposed convention.

[26] Nettles and Graf define *chord-scale theory* as "[t]he relationship of scales to certain chords and vice versa" (1997, 177).

Because these two books are written for jazz pedagogical purposes, each refers to only a few small passages of classical music, and their observations of these passages do not amount to very much for the purposes of the present study.

Simplified Forms of Jazz Chord-Scale Theory

Since the emergence of Russell's work, countless pedagogical materials for jazz improvisation have presented simpler, more accessible versions of chord-scale theory. These typically prescribe one or more scale types to each chord type found in jazz and are often presented in the form of a table called a "scale syllabus," an example of which is reproduced in Table 2.1. This popular notion of chord-scale theory is criticized for its lack of attention to harmonic context, which can lead beginning students to treat all chords of the same quality as having the same function,[27] and for its inability to fully explain the pitch content of jazz music.[28] Nevertheless, simplified forms of chord-scale theory remain a staple in jazz education, although jazz educators generally agree that the chord-scale approach must be supplemented with other approaches.

2. Has There Ever Been Anything Like Chord-Scale Theory for Classical Music?

Surprisingly, I have not found anything approaching a general and systematic way to understand individual chord-scale interactions in classical music besides Tymoczko's (2011) brief presentation of what could be called four CSSM compositional techniques,

[27] This is done partly so that improvisers do not always have to think about what key they are in when improvising over chord changes. With the exception of common harmonic formulas such as ii–V–I that clearly suggest a single key, it is much faster to simply think in terms of chord roots and qualities, as keys often change rapidly or are ambiguous (or even absent) in passages of jazz.

[28] For example, see Salley 2007.

Table 2.1. A pedagogical jazz scale syllabus (from Jamey Aebersold [2000], *Jazz Handbook*, p. 14.)

THE SCALE SYLLABUS

LEGEND: H = Half Step, W = Whole Step.; Δ = Major 7th; + or ♯ = raise H; ♭ or - = lower H; Ø = Half-diminished; –3 = 3H (Minor Third)

CHORD/SCALE SYMBOL	SCALE NAME	WHOLE & HALF STEP CONSTRUCTION	SCALE IN KEY OF C	BASIC CHORD IN KEY OF C
C	Major	W W H W W W H	C D E F G A B C	C E G B D
C7 (FIVE BASIC CATEGORIES)	Dominant 7th (Mixolydian)	W W H W W H W	C D E F G A B♭ C	C E G B♭ D
C– (FIVE BASIC CATEGORIES)	Minor (Dorian)	W H W W W H W	C D E♭ F G A B♭ C	C E♭ G B♭ D
CØ (FIVE BASIC CATEGORIES)	Half Diminished (Locrian)	H W W H W W W	C D♭ E♭ F G♭ A♭ B♭ C	C E♭ G♭ B♭
C° (FIVE BASIC CATEGORIES)	Diminished (8 tone scale)	W H W H W H W H	C D E♭ F G♭ A♭ A B C	C E♭ G♭ A (B♭♭)
1. MAJOR SCALE CHOICES	**SCALE NAME**	**W & H CONSTRUCTION**	**SCALE IN KEY OF C**	**BASIC CHORD IN KEY OF C**
CΔ (Can be written C)	Major (don't emphasize the 4th)	W W H W W W H	C D E F G A B C	C E G B D
C	Major Pentatonic	W W –3 W –3	C D E G A C	C E G B
CΔ+4	Lydian (major scale with +4)	W W W H W W H	C D E F♯ G A B C	C E G B D
CΔ	Bebop (Major)	W W H W H H W H	C D E F G G♯ A B C	C E G B D
CΔ♭6	Harmonic Major	W W H W H –3 H	C D E F G A♭ B C	C E G B D
CΔ+5, +4	Lydian Augmented	W W W W H W H	C D E F♯ G♯ A B C	C E G♯ B D
C	Augmented	–3 H –3 H –3 H	C D♯ E G A♭ B C	C E G B D
C	6th Mode of Harmonic Minor	–3 H W H W W H	C D♯ E F♯ G A B C	C E G B D
C	Diminished (begin with H step)	H W H W H W H W	C D♭ D♯ E F♯ G A B♭ C	C E G B D
C	Blues Scale	–3 W H H –3 W	C E♭ F F♯ G B♭ C	C E G B D
2. DOMINANT 7th SCALE CHOICES	**SCALE NAME**	**W & H CONSTRUCTION**	**SCALE IN KEY OF C**	**BASIC CHORD IN KEY OF C**
C7	Dominant 7th	W W H W W H W	C D E F G A B♭ C	C E G B♭ D
C7	Major Pentatonic	W W –3 W –3	C D E G A C	C E G B♭ D
C7	Bebop (Dominant)	W W H W W H H H	C D E F G A B♭ B C	C E G B♭ D
C7♭9	Spanish or Jewish scale	H –3 H W H W W	C D♭ E F G A♭ B♭ C	C E G B♭ (D♭)
C7+4	Lydian Dominant	W W W H W H W	C D E F♯ G A B♭ C	C E G B♭ D
C7♭6	Hindu	W W H W H W W	C D E F G A♭ B♭ C	C E G B♭ D
C7+ (has ♯4 & ♯5)	Whole Tone (6 tone scale)	W W W W W W	C D E F♯ G♯ B♭ C	C E G♯ B♭ D
C7♭9 (also has ♯9 & ♯4)	Diminished (begin with H step)	H W H W H W H W	C D♭ D♯ E F♯ G A B♭ C	C E G B♭ D♭ (D♯)
C7+9 (also has ♭9, ♯4, ♯5)	Diminished Whole Tone	H W H W W W W	C D♭ D♯ E F♯ G♯ B♭ C	C E G♯ B♭ D♯ (D♭)
C7	Blues Scale	–3 W H H –3 W	C E♭ F F♯ G B♭ C	C E G B♭ D (D♯)
DOMINANT 7th SUSPENDED 4th				
C7 sus 4 (MAY BE WRITTEN G–/C)	Dom. 7th scale but don't emphasize the third	W W H W W H W	C D E F G A B♭ C	C F G B♭ D
C7 sus 4 (MAY BE WRITTEN G–/C)	Major Pentatonic built on ♭7	W W –3 W –3	B♭ C D F G B♭	C F G B♭ D
C7 sus 4 (MAY BE WRITTEN G–/C)	Bebop Scale	W W H W W H H H	C D E F G A B♭ B C	C F G B♭ D
3. MINOR SCALE CHOICES*	**SCALE NAME**	**W & H CONSTRUCTION**	**SCALE IN KEY OF C**	**BASIC CHORD IN KEY Of C**
C– or C–7	Minor (Dorian)	W H W W W H W	C D E♭ F G A B♭ C	C E♭ G B♭ D
C– or C–7	Pentatonic (Minor Pentatonic)	–3 W W –3 W	C E♭ F G B♭ C	C E♭ G B♭ D
C– or C–7	Bebop (Minor)	W H H H W W H W	C D E♭ E F G A B♭ C	C E♭ G B♭ D
C–Δ (maj. 7th)	Melodic Minor (ascending)	W H W W W W H	C D E♭ F G A B C	C E♭ G B D
C– or C–6 or C–	Bebop Minor No. 2	W H W W H H W H	C D E♭ F G G♯ A B C	C E♭ G B D
C– or C–7	Blues Scale	–3 W H H –3 W	C E♭ F F♯ G B♭ C	C E♭ G B♭ D
C–Δ (♭6 & maj. 7th)	Harmonic Minor	W H W W H –3 H	C D E♭ F G A♭ B C	C E♭ G B D
C– or C–7	Diminished (begin with W step)	W H W H W H W H	C D E♭ F F♯ G♯ A B C	C E♭ G B D
C– or C–♭9♭6	Phrygian	H W W W H W W	C D♭ E♭ F G A♭ B♭ C	C E♭ G B♭
C– or C–♭6	Pure or Natural Minor, Aeolian	W H W W H W W	C D E♭ F G A♭ B♭ C	C E♭ G B♭ D
4. HALF DIMINISHED SCALE CHOICES	**SCALE NAME**	**W & H CONSTRUCTION**	**SCALE IN KEY OF C**	**BASIC CHORD IN KEY OF C**
CØ	Half Diminished (Locrian)	H W W H W W W	C D♭ E♭ F G♭ A♭ B♭ C	C E♭ G♭ B♭
CØ♯2 (CØ9)	Half Diminished #2 (Locrian #2)	W H W H W W W	C D E♭ F G♭ A♭ B♭ C	C E♭ G♭ B♭ D
CØ (with or without ♯2)	Bebop Scale	H W W H H H W W	C D♭ E♭ F G♭ G A♭ B♭ C	C E♭ G♭ B♭
5. DIMINISHED SCALE CHOICES	**SCALE NAME**	**W & H CONSTRUCTION**	**SCALE IN KEY OF C**	**BASIC CHORD IN KEY OF C**
C°	Diminished (8 tone scale)	W H W H W H W H	C D E♭ F G♭ A♭ A B C	C E♭ G♭ A

NOTES: 1) The above chord symbol guide is my system of notation. I feel it best represents the sounds I hear in jazz. Players should be aware that each chord symbol represents a series of tones called a scale. **2)** Even though a C7+9 would appear to have only a raised 9th, it also has a ♭9, +4 and +5. The entire C7+9 scale looks like: Root, ♭9, +9, 3rd, +4, +5, ♭7 & root (C, D♭, D♯, E, F♯, G♯, B♭, C). My chord symbol C7+9 is therefore an abbreviation, while the complete name of this scale is Diminished Whole Tone (sometimes called Super Locrian or Altered Scale). Similarly, C7♭9 also appears to have only one altered tone (♭9) but it actually has three: ♭9, +9 and +4. The entire scale looks like: Root, ♭9, +9, 3rd, +4, 5th, 6th, ♭7 & root (C, D♭, D♯, E, F♯, G, A, B♭, C). This is called a Diminished scale and my chord symbol abbreviation is C7♭9. **3)** All scales under the Dominant 7th category are scales that embellish the basic Dominant 7th sound. Some scales provide much more tension than the basic dominant 7th sound and require practice and patience to grasp the essence of their meaning. I encourage you to work with ***Volume 3 "The 11-V7-1 Progression"*** since it emphasizes Diminished and Diminished Whole Tone scales and chords. **4)** In category #3, MINOR SCALE CHOICES, the PURE MINOR scale choice is not used very often. I have found the order of preference to be Dorian, Bebop, Melodic, Blues, Pentatonic, and then any of the remaining Minor scale choices.

discussed later in this chapter. Furthermore, I have found hardly any mentioning of any concept resembling CSSM before Schillinger's writings discussed above.

As for primary sources from the common-practice era, one can never be entirely sure that such an idea was never mentioned, but evidence suggests that it was not, or at least that it could not have been widely known. Had it been, one would expect mention of it in a source on performance, ornamentation, or improvisation. I have searched through several treatises and manuals such as those by Christopher Simpson ([1659] 1955), C.P.E. Bach ([1753] 1949), Leopold Mozart ([1756] 1948), Quantz ([1789] 1966), Daniel Gottlob Türk ([1789] 1982), and Czerny ([1829] 1983), and none of these mention anything about how scalar materials might change for certain chords. Basically, they assume a continued major or minor scale (even if not referred to as such) according to the key, and if alterations ever appear along with certain chords in their musical examples, they are not discussed.

Secondary-source studies on classical music have not mentioned such an idea either. Neumann's *Ornamentation and Improvisation in Mozart* (1986) is a particularly opportune context for a consideration of CSSM—especially given Mozart's frequent use of scalar runs over individual chords and his rather bold use of uncommon scalar structures over chromatic chords (as shown later in the present study)—but the book never discusses the nature of the scalar material that occupies individual chords.[29] Similarly, there is no mention of it in articles such as Levin's "Improvising Mozart" (2009) or Moersch's "Keyboard Improvisation in the Baroque Period" (2009), or in

[29] The predecessor to this book, Neumann's *Ornamentation in Baroque and Post-Baroque Music: With Special Emphasis on J.S. Bach* (1978) does not contain anything resembling chord-scale theory either.

articles on the Baroque practice of acciaccaturas (which have the potential to suggest chord-specific scalar pc collections) such as Williams 1968, Goede 2005, and Jackson 2005.

3. Reasons for the Oversight of CSSM and Its Implications

As I have now shown, classical music theory has given very little attention to what I call CSSM and its implications. If it is really as important as I claim, why has it been overlooked or neglected for so long? I suspect a number of reasons. First, most examples of CSSM in classical music are merely "diatonic," using only notes of the tonic major or minor scale (as in mm. 5–8 of Mozart's K545, shown in Example 1.2). However, I later explain why even this simple type of CSSM deserves study; and, regardless, the classical repertoire still contains enough examples of other types of CSSM to justify a survey.

Second, most examples of CSSM in classical music do not constitute a traditionally complete scale.[30] However, I define the CSSM classification schemes in ways that do not require the presentation or inference of complete scales or scalar spaces.

Third, classical music theory scholarship—particularly since the rise of Schenkerian theory—has been more interested in deeper-level, global scalar material than foreground or local scalar material,[31] the latter sometimes being associated with shallow

[30] For the present purposes, a "complete scale" could be defined as a contiguous series of pitch or pc intervals understood as scalar steps that span an octave, creating the sense of a cyclical pc space in which every pc adjacency is understood as a scalar interval. A "traditionally complete scale" is one that includes seven scale degrees, each of which is represented by a different letter name (cf. Hook's [2011] *spelled heptachords*). Beginning in Chapter III, I discuss "variable scalar spaces," which could prompt more complicated definitions of the term "complete scale."

[31] Such sentiments are evident in Taruskin 1985 (95–96, 99) and Riley 2004. Regarding theorists' interest in the implications of scales primarily for deeper levels of structure, also see Forte 1987 (211ff.), Kahan 2009 (4), and Riley 2004 (18–22).

or weak scholarship.[32] The field has an even much longer tradition of assuming that the most important aspects of scales are the chords that they can contain (or "generate"), thus again favoring deeper-level, global scalar material.[33]

Fourth, the differences between different types of CSSM are often subtle and the decisive notes might pass by very quickly in a musical performance. Particularly in such fleeting examples, most listeners will not notice a significant type of CSSM by ear alone. However, like so many other concepts in music theory, aural sensitivity to these subtle features can certainly be acquired, and such sensitivities contribute to a richer musical experience and appreciation.

Fifth, to study classical music with perspectives associated with jazz might seem anachronistic or even culturally inappropriate. Some might argue that a direct focus on CSSM makes sense for jazz, in which chord successions are often 1) delineated clearly and 2) compositionally and conceptually prior to the melodic solos improvised over them, but that the focus is not appropriate for classical music, in which chord successions are not always clearly delineated and are not necessarily prior (compositionally or even conceptually) to concurrent melodic materials. In addition, the jazz framework (at least as understood through popular chord-scale approaches) of a succession of chords each consisting of potentially separate scalar materials (as Table 1.1 suggests) might be seen as

[32] For example, see Forte's (1987, 211) criticisms. Moreover, those scholars who do address local or foreground scalar materials often seem to show signs of (unnecessary) anxiety about it (e.g., Satyendra 1997 and Loya 2011).

[33] For example, consider the long tradition of music theorists that define or justify major and minor scales in terms of their primary triads (tonic, dominant, and subdominant). Also see Riley's (2004) discussion of the nineteenth-century dualists regarding the harmonic major scale and its associated harmonies. Furthermore, consider studies such as Cohn 1996, which investigates the chord-containing properties of hexatonic collections but does not consider the CSSM that might occur within hexatonic chord progressions and does not consider whether hexatonic collections might ever be used as CSSM.

overly compartmentalizing and thus contrary to the classical aesthetic ideals of linearity, counterpoint, and organicism. Although a direct focus on CSSM (or acknowledgment of them as entities at all) might be aesthetically undesirable for certain passages of classical music, for many other passages—particularly those with clearly delineated chordal zones—such a focus is completely natural and might even reflect thoughts of classical composers themselves. Furthermore, I intend my approaches in this study to be compatible with Schenkerian approaches, for example, and thus this study can *enrich* our understanding of organicism in classical music rather than detract from it. For example, I already showed in Examples 1.2 and 1.3 (excerpt of Mozart K545) how different scalar materials can be understood as coexisting on different structural levels, and how every chordal zone provides an opportunity for the generation of new scalar structures that can add tonal variety to a passage without interrupting its deeper scalar fabric.[34]

Sixth, and finally, jazz chord-scale theory is not very well respected (even amongst jazz musicians and educators). As mentioned earlier, Russell's work has been widely criticized, and popular forms of chord-scale theory are commonly criticized for their lack of attention to harmonic context and for their inability to fully explain the pitch content of jazz music.[35] However, such criticisms or shortcomings of jazz chord-scale theory are of little concern to the present study, which is inspired by some of the theory's general ideas but otherwise presents a significantly different approach for different purposes. Moreover, I hope that my work will shed light on jazz chord-scale theory

[34] Such generation of new scalar structures could be understood as a somewhat overlooked aspect of prolongation, despite that scalar structures are generally not regarded as meaningful musical events in the same way that chords, melodies, and lines are.

[35] See, for example, Salley 2007.

(particularly Russell's work), showing that it indeed offers many ideas of value to the theory, analysis, pedagogy, composition, and history of a variety of musical styles.

4. Relevant Scholarship in Classical Music Theory

Despite the oversights discussed above, a few documents *have* at least acknowledged chord-specific scalar material in classical music and some of its theoretical implications. In chronological order, the most notable authors in this regard are John Vincent, George Russell, Ramon Satyendra, and Dmitri Tymoczko.[36]

John Vincent

John Vincent's *The Diatonic Modes in Modern Music* ([1947] 1951), though dealing primarily with scales suggested by chord progressions, contains some occasional observations concerning scales that occur with individual chords. Even the mentions of what I call CSSM, however, are used for the purposes of supporting claims of key. In other words, for Vincent (like many other scholars), complete-scale CSSM is seen as a revealing of an otherwise latent deeper scale associated with the key. His fourth chapter ("Interchangeability of Mode") essentially argues that key can transform freely not only between major and minor, but also into any other of the seven diatonic modes. His discussion of the Neapolitan chord and the Phrygian scale is of particular interest to the present study:

[36] Persichetti (1961) discusses two compositional techniques that involve CSSM. One of these is to embellish chords with scalar material from the major or minor scale built on the chord root, and this falls into the category of my Type-3 CSSM, discussed in Chapter III. As mentioned earlier in this chapter, Nettles and Graf 1997 and Mulholland and Hojnacki 2013 also contain a few applications of chord-scale theory to short examples of classical music, but the results are either insubstantial or problematic.

> Curiously, complete scale passages in conjunction with the N^6 chord are not to be found in the works of the older composers. This is a development which has taken place only within comparatively recent times. Most composers, unable to use the leading tone with the chord because of the resulting augmented second and diminished third, and apparently unwilling to use the subtonic to correct this, since the scale would then become Phrygian (a form incompatible with major-minor habits of thought), solved the problem by avoiding either ascending or descending scale passages at such points. Freed from former hampering viewpoints, contemporary writers unhesitatingly write scales over the N^6 with the result that interchangeability of mode includes the Phrygian. (29)

Vincent then provides two examples, from the music of these "contemporary writers," of complete-scale Phrygian CSSM (Phrygian if starting on the global tonic): Phrygian CSSM embellishing a Neapolitan chord in Sibelius's Violin Concerto, and that embellishing a $bVII^7$ chord in the third movement of Rimsky-Korsakov's *Scheherazade* (29–30).

Vincent goes on to argue analogously for tonic Locrian keys in certain passages of classical music (30–32), but all of his examples of this from the repertoire might be more convincingly understood in terms of the major scale built on the global ^b2 or even as a brief modulation to that key. (These issues are mentioned again in Chapter III of this study in the section on Type-3 CSSM.) Similarly, he shows examples of supposedly mixolydian CSSM so as to support his claim of mixolydian keys, and he notes that "scales employed with a IV of IV or V^7 of IV must be Mixolydian [starting from the global tonic], those above V^7 of V must be Lydian [starting from the global tonic]" (32–34). While Vincent continues to describe scalar materials in terms of the global tonic (implying tonic keys), his study is significant for occasionally isolating the scalar material that is specific to a particular chord (thus recognizing what I call CSSM).

Russell's Analyses of Classical Music

Though earlier editions of Russell's *Lydian Chromatic Concept* do not contain any substantial applications to classical music, the much-expanded fourth edition (2001) does. Its Chapter VII identifies CSSM in a small handful of examples of classical music; but, unfortunately, Russell's theory and analytical methods are so profoundly at odds with traditional classical theory and analysis that his contributions in this regard are mostly unusable for my purposes. From the perspective of today's conventional tonal theory, his identifications of scale-type are problematic in multiple ways. His identifications sometimes depend on notes that are arguably non-scalar (such as sub-scalar lower neighbors). He also groups together notes that conventional theorists would attribute to different underlying scales in succession (as in his Example VII:13 [page 154], of Bach's Fugue in B Minor, which should also be considered in context of the following measure 34 not shown).

Furthermore, some of his Russell's scale attributions are purely theoretical, as in his assignment of scales to the individual chords of Bach's C Major Prelude of *WTC I*, most of which are completely unembellished (his Example VII:16 [pages 168–169]). The theory that underlies his identifications has been criticized for faulty reasoning (as described earlier in this chapter), and his theoretical derivations for scalar material are highly questionable, bearing little connection to classical music theory. Still, all of this is not to say that his book is not valuable in other ways. It certainly is; but his handful of analyses of classical music are unfortunately of little use to the present study.

Satyendra's "Chord Spaces"

Ramon Satyendra's 1997 article "Conceptualising Expressive Chromaticism in Liszt's Music" introduces an original idea that he calls "chord spaces." As Figure 2.2 shows, chord spaces are illustrated as quasi-hierarchical figures, the levels of which respectively identify a root pc, chordal pcs, and scalar pcs of a single chordal zone, much like the tonal-hierarchical figures of Deutsch and Feroe (1981) and Lerdahl (2001; and see Figure 1.1 of this study).[37]

Satyendra is one of only a few scholars to demonstrate how a chordal zone can be understood as articulating its own local tonal hierarchy, which often includes what I call CSSM.[38] However, he applies these tonal hierarchies only to the music of Liszt, and he focuses on basically just one type of scalar derivation, that in which the local scalar fabric of a passage is continuously inflected according to instances of chromaticism in a chord succession. This type of derivation overlaps with my principle of "Type-2" CSSM (discussed in Chapter III and following chapters); but in Satyendra's conception each chord's CSSM is related to that of the preceding and following chords, whereas my Type-2 CSSM is derived from and related to a deeper-level or relatively global reference scale. Along these lines, he does not acknowledge the multi-level scalar layering that I discuss in this study.

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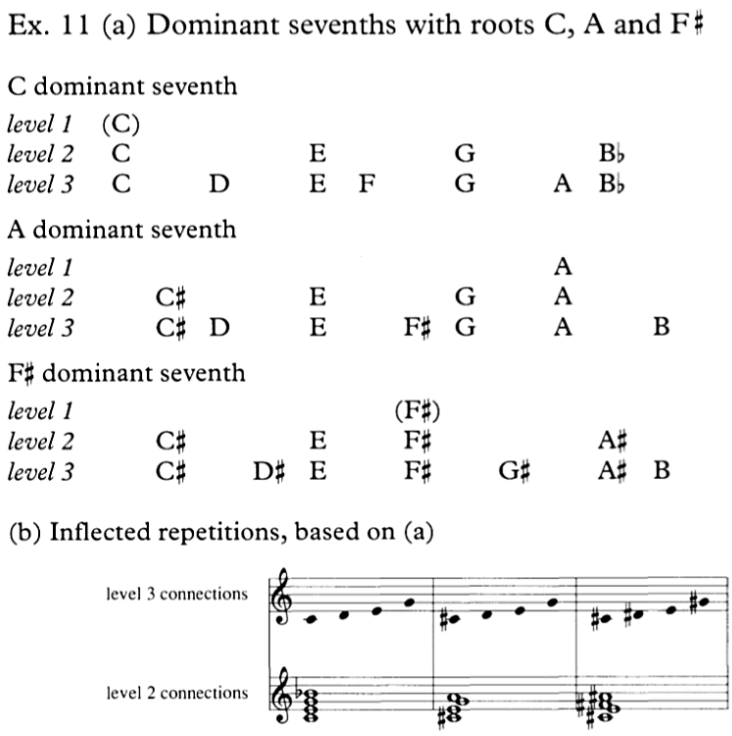
[37] NB: Satyendra's term "chord space" seems to refer to a conceptual pc space, whereas my term "chordal zone" refers to a portion of music. Therefore, his concept of chord space could be understood as the pc tonal-hierarchical aspect of a chordal zone.

[38] Other examples are Järvinen 1995 and Lerdahl 2001; however, Järvinen applies the idea to jazz rather than classical music, and Lerdahl does not apply the idea to single chordal zones in actual repertoire. Larson (2012) refers to jazz chord-scale theory (particularly Russell 1959) as an early suggestion of nested tonal "alphabets" (i.e., tonal hierarchies) within individual chords, and he applies this perspective to an excerpt of a jazz recording by Bill Evans (117–119).

Figure 2.2. An example of Satyendra's chord spaces, demonstrating inflected repetition (from "Conceptualising Expressive Chromaticism in Liszt's Music" [1997], p. 232)



Tymoczko's Work

Dmitri Tymoczko has addressed (what I call) CSSM in classical music more directly and systematically than any other scholar to date. His 1997 article, "The Consecutive-Semitone Constraint on Scalar Structure: A Link between Impressionism and Jazz," paves the way by demonstrating the relevance of jazz chord-scale theory to classical music. Although his primary focus is on structural properties of the scales used (not necessarily for CSSM) throughout an "extended common-practice" era that includes impressionism and jazz, he also identifies several examples of what I call *distinct* CSSM (CSSM that involves pcs or scalar intervals that are distinct from the surrounding chordal

zones) in Ravel's String Quartet (150–152) and "Ondine" (165–172).[39] Furthermore, he briefly acknowledges the interaction of different scales that simultaneously occupy different levels of structure, referring to "a fascinating blend of middleground diatonicism and local chromaticism, a music in which the qualities of 'tension' and 'release' are the products both of shifts between different scalar collections and of background movement among the regions of a single, diatonic scale" (173).

A short section of Tymoczko's *A Geometry of Music* (2011, 220–223) takes chord-specific scalar considerations further by discussing four different general techniques of scalar embellishment of chords that classical composers seem to use. His Figure 6.7.1 illustrates the first three techniques, and his Figure 6.7.3 illustrates the fourth (221–222). All four illustrations are reproduced in my Example 2.4, below, along with their original captions. Tymoczko describes the first three techniques as representing "the main nineteenth-century solutions to the problem of associating chord and scale," and the fourth technique as representing a twentieth-century solution (221). While the first technique sacrifices chord-scale compatibility and the second and third techniques sacrifice well-formed scalar structure (though his second technique is best understood as involving sub-scalar intervals [e.g., G#–G in his Figure 6.7.1(*b*)]), Tymoczko praises the

[39] Tymoczko does not exactly use the term "extended common practice" in his 1997 article, but he frequently uses it in *A Geometry of Music* (2011)—most conspicuously in the book's subtitle—and the idea is still clearly expressed in his 1997 article. Some passages of "Ondine" might lie outside the scope of the present study, which I restrict to unequivocally tonal music in the interest of avoiding additional complications for the time being. (Ravel's String Quartet, on the other hand, is unequivocally tonal in my sense of the word.) Tymoczko's 1997 article also contains an analysis of Debussy's "Des pas sur la niege" including some chord-specific scale identifications (161–164), but this piece is perhaps less clearly tonal yet.

fourth technique for both accommodating a chord's chromaticism and using "collections that possess desirable scalar qualities" (308).[40]

In Chapter III, I propose my own classification of four CSSM types, three of which are essentially equivalent to Tymoczko's techniques, though I arrived at my classification of four types through my own analysis of classical repertoire before the 2011 publication of *A Geometry of Music*, from which I first learned of Tymoczko's four techniques.[41] Despite our very similar classifications, the aims of my study are very different than Tymoczko's, and my study still offers several substantially new contributions to music theory. First of all, CSSM is my primary focus whereas it is somewhat of a peripheral issue in *A Geometry of Music*. Second, I focus on musical examples from throughout the common-practice era—the time period in which scholarship's attention to CSSM is most notably lacking. With regard to CSSM and related issues, Tymoczko primarily focuses on various styles of twentieth-century music. Third, Tymoczko focuses primarily on the implications of only his fourth technique. My study explores the implications of all four of my CSSM types—one of which Tymoczko does not mention, and my types are defined so as to serve analytical purposes better than his techniques. Finally, but perhaps most importantly, my study is unique for its examination of the interplay of scalar spaces on multiple structural levels and for its

[40] One should note, however, that the two supposed acoustic scales in his Figure 6.7.3 could be analyzed as deriving from the traditional keys of A minor and F minor, respectively. Indeed, I would be more inclined to identify such CSSM as "Type 3," a label that is introduced in Chapter III of this study, but that basically means CSSM that derives from a local non-tonic major- or minor-based scale that is "custom fit" to the chord at hand and briefly alludes to a different traditional key.

[41] It is somewhat remarkable that we both independently inferred three of the (essentially) same techniques and both found m. 86 of Mozart's K533/I (shown in Example 3.6 in Chapter III of this study) to be an excellent example of a scalar embellishment of an augmented-sixth chord.

closer theoretical consideration of the nature of chord-specific scalar spaces as components of sustained tonal hierarchies.

Example 2.4. Tymoczko's four chord-specific embellishing techniques (though "(*b*)" is not completely scalar as defined in this study), from pp. 221 and 222 of *A Geometry of Music* (2011)

Figure 6.7.1 Accompanying chromatic chords with scales. In (*a*), the scale does not contain the chromatic chords; in (*b*–*c*) it does. The music in (*b*) augments the diatonic scale with the altered notes, while the music in (*c*) replaces diatonic with altered notes.

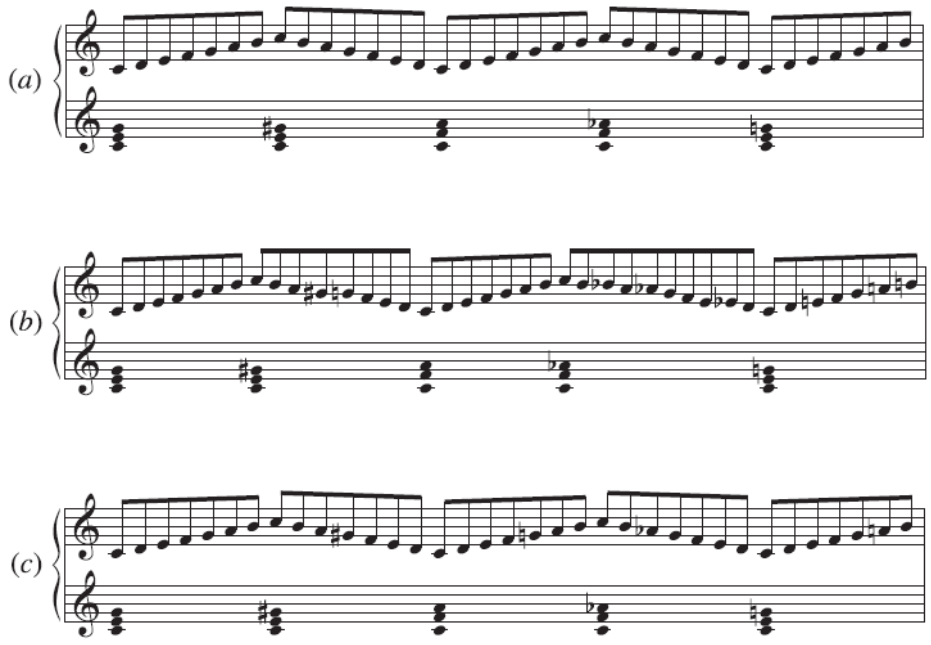
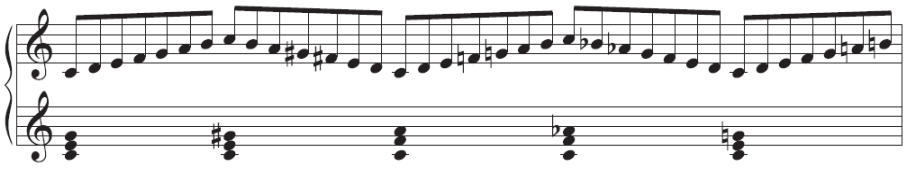


Figure 6.7.3 Twentieth-century scalar composers might use acoustic scales to harmonize altered chords. The result is a melodic texture without augmented seconds or consecutive semitones.



CHAPTER III

FOUR TYPES OF CSSM

In this chapter, I present a way to understand classical-music CSSM in terms of four types. When I first began to examine (what I now call) CSSM in classical music, these four types emerged rather intuitively. Later, I found that Tymoczko (2011, 220–223) arrived at a very similar four-type understanding of CSSM, as explained in Chapter II. That we both arrived at similar types independently of each other might reflect something about their meaningfulness (and possibly a degree of inevitability).

While Tymoczko presents his CSSM types primarily in terms of compositional techniques evident in classical repertoire, one could create different classification schemes, each tailored to different perspectives and purposes. For example, one might study CSSM from a more theoretical or analytical perspective, speculating as to the derivations of different scalar structures suggested by examples of CSSM. Other approaches could focus instead on the way we *hear* various examples of CSSM—perhaps with regard to scale degrees, for example—or on the different tonal functions that examples of CSSM seem to serve within their musical contexts. Rather than choosing just one of these approaches as definitive, the four types I propose here are defined as four general ways of understanding CSSM, each of which can be applied to the various domains mentioned above (compositional technique, theoretical derivation, analysis, scale-degree hearing, and tonal function). In a sense, then, they might be called four "meta-types."

The wide applicability of these types has the benefit of convenience, but it also has the disadvantage of oversimplification. Each domain could certainly receive its own

more detailed and customized classification scheme of possibilities, many of which are not acknowledged by the four types. I discuss some of those other possibilities in later chapters. In particular, in Chapter V, I consider the different ways in which CSSM can generate tonal "color" (specifically in the music of Fauré); and in Chapter VI, I consider more possible compositional techniques for creating CSSM.

I try to avoid overly technical issues in this chapter; its main purpose is to familiarize readers with the four types and their many musical implications—as seen through musical examples from throughout the classical repertoire. My analyses of these examples should provoke many theoretical questions (and even arguments) from thoughtful readers, however, and although I address some of these issues in this chapter, I save much of the theoretical scrutiny for Chapter IV.

1. Defining the Types

Key and Deep Scalar Space (DSS)

The meaning of an example of CSSM depends heavily on its musical context—particularly on the key of the passage. For example, a C major chord embellished with a scalar melody of G–F#–E would be surprising in a passage in the key of C major, but it would not be a surprise at all if it occurred in a key-of-G-major passage. Furthermore, some examples of CSSM in classical music seem to be "in" the concurrent key while others do not, and this points to several important musical differences between CSSM types. In order to recognize these important relationships, I define the four CSSM types partly in terms of how CSSM relates to the key that its concurrent chord is understood to be in. While "key" can mean many different things, the aspect of key of most relevance to CSSM is the scale or scalar space that partly defines the key. For example, "the key of

C major" can refer to certain idiomatic chord progressions, melodic lines, and cadences; but often it also refers to a C major scale—or, more accurately, to a C major *scalar space* that serves as a sort of referential tonal fabric for the relevant passage. I call this a *deep* scalar space (hereafter "DSS") because it applies to relatively deeper levels of music than the levels of the CSSM in question. In short, a DSS can be thought of as the scalar component of a key. The concept of DSS is discussed further in Chapter IV.[42]

The Four Types

Figures 3.1 and 3.2 provide definitions for each of the four types along with generic musical examples to illustrate each idea. The examples are composed so as to encourage each of the four type interpretations, but—as with most acts of identification in music analysis—CSSM type identifications are only interpretations. Strictly speaking, one should not say that any example of CSSM "is" of a certain type because it could also be interpreted as other types. However, in the interest of avoiding cumbersome language, hereafter I often describe examples of CSSM simply as "Type 1" and so forth, rather than as "an example of CSSM that I interpret as Type 1."

The four types are also categorized into two groups: Types 1 and 2 are called "horizontal" while Types 3 and 4 are called "vertical." These terms are borrowed from jazz chord-scale theory, in which they are used with similar implications. Both in this

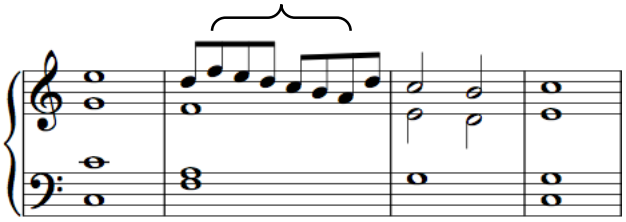
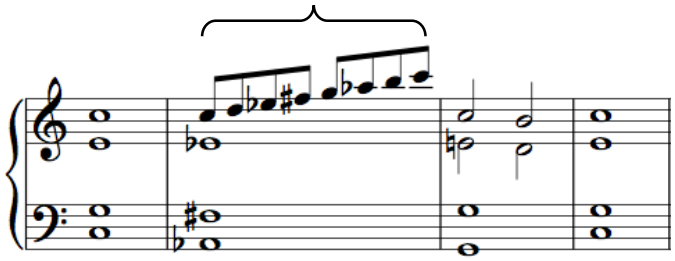
[42] In Chapter VI of this study, in a pedagogical context, I propose the alternative terms "keyscale" and "chordscale." Put simply, a keyscale is a scale that is associated with a particular key and that is understood as source material for the chords of a passage, whereas a chordscale is the scale that is understood to govern the inner tonal space of a particular chord (and that could be understood as theoretical source material for CSSM). The term "chordscale" is already used in jazz chord-scale theory, where it has essentially the same meaning but also refers to an equivalence between a chord and its associated local scale. Besides Chapter VI, this study maintains the term "DSS" instead of "keyscale" because the former emphasizes an applicability to a deeper structural level, and its reference to scalar *space* allows for potentially variable scalar pathways while also conveying the abstract nature of the concept.

study and in jazz theory, horizontal generally refers to melody or a tonal orientation associated with a broader key area, and vertical generally refers to melody or a tonal orientation associated with a single chord.[43] However, my use of the terms here involves meanings that are more specific to the purposes of this study: horizontal refers to CSSM that is understood in terms of the concurrent DSS while vertical refers to CSSM that is understood as independent of the concurrent DSS.

As Figure 3.1 shows, **Type-1** CSSM is understood as a pure manifestation of the concurrent DSS. In the first generic example of Figure 3.1 we understand the CSSM as simply "C major" scalar material, which reflects and completely agrees with the key of the example. **Type-2** CSSM is understood as an altered manifestation of the DSS. The Type-2 CSSM in the corresponding example in Figure 3.1 can be understood as C major scalar material, altered to conform to the chord. In other words, the chromatic (i.e., non-DSS) notes of the chord—Eb, F#, and Ab—simply replace E, F, and A in the C major scale, the rest of which remains unchanged. Though the altered notes are chromatic with regard to the DSS, they are still fully scalar in terms of the local CSSM.

[43] These terms are briefly discussed in Chapter II. The terms "horizontal" and "vertical" are adapted from Russell's *Lydian Chromatic Concept* (1959; 2001) so as to highlight similarities with his concepts of horizontal and vertical melody and "tonal gravity." And, to reiterate from Chapter II, most jazz musicians today describe horizontal playing as using one scale (or a similar source of pitch material) over multiple chords, and vertical playing as using a different scale (or melodic pattern, etc.) for each individual chord.

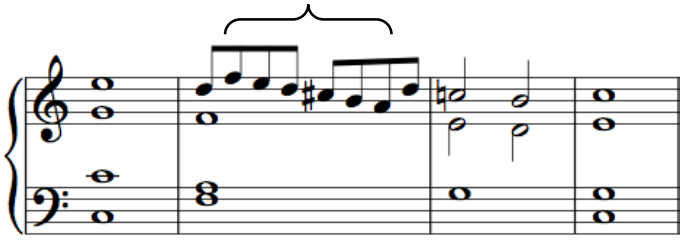
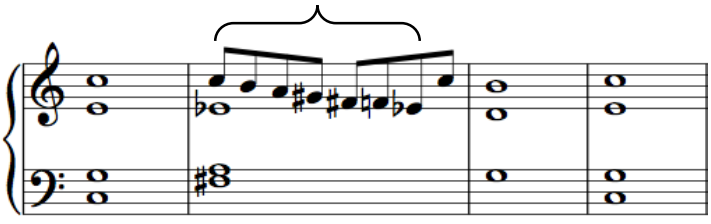
Figure 3.1. Definitions of the "horizontal" types of CSSM, with generic examples

<table>
<tr><th colspan="3">Horizontal CSSM (understood in terms of the concurrent DSS)</th></tr>
<tr><td rowspan="2">Type 1</td><td rowspan="2">Pure
Horizontal</td><td>CSSM that is understood as a relatively foreground manifestation of the DSS</td></tr>
<tr><td>Type-1 CSSM
"C major"
 
CM: I ii^{6} V I</td></tr>
<tr><td rowspan="2">Type 2</td><td rowspan="2">Altered
Horizontal</td><td>CSSM that is understood as a relatively foreground and altered manifestation of the concurrent DSS</td></tr>
<tr><td>Type-2 CSSM
= "C harmonic minor #4"
 
CM: I Ger^{+6} V I</td></tr>
</table>

While Type-1 and Type-2 CSSM is understood in relation to the DSS, Type-3 and Type-4 CSSM is understood on its own terms. As shown in Figure 3.2, **Type-3** CSSM is understood as derived from a major/minor-based scalar space that has no direct relation to the DSS. The CSSM in the Type-3 example of Figure 3.2 can be understood as "D melodic minor" rather than as some form of the C major DSS. The CSSM seems to be custom fit to the D minor chord, in a sense (as opposed to the Type-1 CSSM of the same

kind of D minor chord in the Type-1 example of Figure 3.1). Importantly, Type-3 CSSM does not involve a change of key. If the D minor chord in Figure 3.2 were understood as in a new key of D minor, the D melodic minor CSSM would simply be Type 1.

Figure 3.2. Definitions of the "vertical" types of CSSM, with generic examples

<table>
<tr><th colspan="3">Vertical CSSM (understood as independent of the concurrent DSS)</th></tr>
<tr><td rowspan="2">Type 3</td><td rowspan="2">Traditional Vertical</td><td>CSSM that is understood as a relatively foreground manifestation of a different major or minor key (other than the deeper tonic key)</td></tr>
<tr><td>Type-3 CSSM
"D melodic minor"
 
CM: I ii^{6} V I</td></tr>
<tr><td rowspan="2">Type 4</td><td rowspan="2">Modern Vertical</td><td>CSSM that is understood as non-major/minor-based and not directly related to the DSS</td></tr>
<tr><td>Type-4 CSSM
"Octatonic 2,3"
 
CM: I #iv°^{7} V I</td></tr>
</table>

Finally, **Type-4** CSSM is understood as derived from a non-major/minor-based scalar space that has no direct relation to the DSS. The CSSM in the Type-4 example of

Figure 3.2 is most likely understood as octatonic$_{2,3}$ material with no direct relationship to the C major DSS and no direct basis in the major/minor tradition.

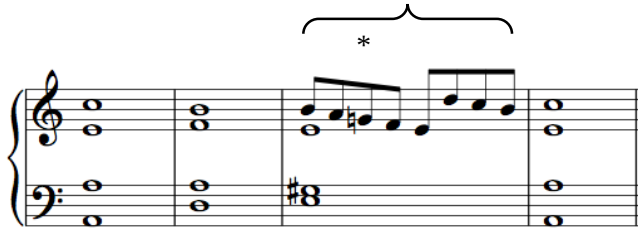
Possible Special Features or Conditions

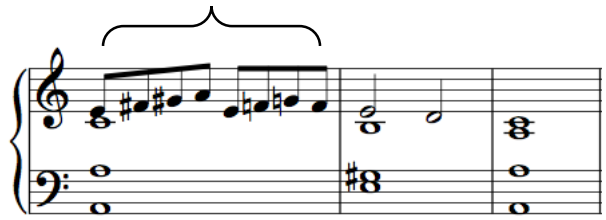
Figure 3.3 defines and illustrates two special features that can apply to CSSM of any type. Two more special features or conditions are presented later in this chapter, and all four are summarized at the end of the chapter. As shown in Figure 3.3, an example of CSSM is identified as "conflicting" when it has a scalar note that conflicts with the concurrent chord, defined here by the occurrence of a non-scalar ic1 interval between a scalar note and a chordal note (with "non-scalar" meaning an interval that does not belong to the DSS, altered DSS, or CSSM). CSSM is identified as "variable" when it exhibits one or more idiomatic scale-degree variations (i.e., different scalar pcs that stand for the same scale degree) that do not signal a new instance of CSSM or a change of CSSM type. The most familiar examples of scalar variability occur with regard to scale degrees 6 and 7 in traditional minor keys. The concept of variability is discussed in more detail in Chapter IV.

Applying the Four Types to Different Aspects of CSSM

Again, the four types are like four general principles that can apply to multiple different aspects of CSSM. Table 3.1 shows what the basic idea of each type implies for the scalar pitch content and scalar interval content of an example of CSSM, the different compositional techniques that might be used to arrive at CSSM, and how we might hear an example of CSSM in terms of a tonic orientation and scale degrees. These particular aspects are chosen because they are more clearly definitive of CSSM type; however, one might also consider other aspects of CSSM not included here. Note that the descriptions

Figure 3.3. Special features that might apply to examples of any of the four CSSM types (NB: Two additional special features or conditions are presented later in this chapter.)

<table>
<tr><td rowspan="2">c</td><td rowspan="2">Conflicting CSSM</td><td>A non-scalar pc interval (an interval that does not belong to the DSS, altered DSS, or CSSM) occurs between a chordal note and an ic1-related scalar note of the CSSM</td></tr>
<tr><td>Type-1c CSSM
 

Am: i iv V i
*Chord-CSSM conflict indicated with asterisk (G–G# is a non-scalar pc interval)</td></tr>
<tr><td rowspan="2">v</td><td rowspan="2">Variable CSSM</td><td>The CSSM exhibits one or more idiomatic scale-degree variations that do not signal a new instance of CSSM or a change of CSSM type</td></tr>
<tr><td>Type-1v CSSM
 
Am: i V i</td></tr>
</table>

given in each cell of Table 3.1 are not necessarily meant to be absolutely definitive, but rather only suggested interpretations. We will see later in this chapter that, occasionally, different aspects of a single example of CSSM might simultaneously suggest different types.

Table 3.1. The general principle of each type applied to four different aspects of CSSM. In some cases, different aspects of a single example of CSSM might simultaneously suggest different types.

	Scalar pitch content	**Scalar interval content**	**Compositional technique**	**Tonic orientation and scale-degree hearing**
Type 1	All scalar pitches belong to the DSS	All scalar intervals belong to the DSS	Use the DSS	Tonic and scale degrees of the DSS
Type 2	All scalar pitches belong to either the DSS or the chord (except in Type 2a, discussed later)	All scalar intervals belong to an altered form of the DSS	Use the DSS, but alter it	Tonic and scale degrees of the DSS (altered notes are heard as altered scale degrees)
Type 3	At least one non-DSS scalar NCT. All scalar pitches belong to either a new major/minor-based scale or the chord.	All scalar intervals belong to a new major/minor-based scale (possibly altered)	Use a new major/minor-based scale	New tonic and new major/minor-based scale degrees
Type 4	At least one non-DSS scalar NCT. All scalar pitches belong to either a new non-major/minor-based scale or the chord.	All scalar intervals belong to a new non-major/minor-based scale (possibly altered)	Use a new non-major/minor-based scale	Either new tonic and non-major/minor-based scale degrees, or the absence of them

Labeling CSSM (Beyond Type Numbers)

One more technical issue should be discussed before proceeding to examples from the repertoire: How should examples of CSSM be labeled beyond their type numbers? Traditional scale labels such as "C major," "C natural minor," and so forth consist of two components: a tonic note and a scale quality. The quality component of such labels depends on every scale degree; therefore, examples of CSSM that do not articulate a "complete" scale (defined here as a set of contiguous scalar intervals that span an octave—also see footnote 30) cannot be identified as truly "being" such a scale. For instance, the generic Type-3 CSSM example in Figure 3.2 is labeled as "D melodic

minor," but not all of the scalar intervals of this scale are present, so in this sense it could just as well be labeled as "D melodic minor #4": in both cases we must assume scalar intervals that are not present. However, we can use such labels to make an interpretive claim about the derivation of an example of CSSM—or at least a meaningful and stylistically consistent way of understanding it (if claims of derivation are deemed too assuming or philosophically problematic)—rather than as literal identifications. In other words, the label of "D melodic minor" in the Type-3 example of Figure 3.2 refers not to the CSSM itself, but rather to its imagined "source scale" or at least to an idealized structure that we want to understand the CSSM in reference to.[44] In conclusion, one should use such labels for CSSM only for the purposes of explicitly making such an interpretive claim, and such claims should be made with care. One should not assume a particular source scale too readily; such assumptions should ideally be supported by convincing music-theoretical justifications as well as historical evidence. In the case of labeling the aforementioned Type-3 CSSM as "D melodic minor," this supposed source scale obviously has very strong associations with the D minor triad, and I have also found multiple examples of ii^6 chords with *complete* melodic minor scales (the tonic of which corresponds to the chord root) in the classical repertoire.

As for the tonic-note component of traditional scale labels, the tonic note of a given example of CSSM is often difficult to determine. We will later see that some

[44] Cf. the term "chordscale" that I mention above in footnote 42 and use later in Chapter VI. Of course, because I composed this example of CSSM, to speak of its source scale is perhaps somewhat silly, but to speak of a referential structure is still applicable. Even in the case of "real" examples of CSSM from the music of revered classical composers, to speak of source scales or derivations is a highly questionable endeavor. However, in a broader sense—beyond the level of individual examples and individual composers—to speculate about such derivations as explaining deeper principles that somehow underlie an entire style of music is arguably a worthy endeavor.

examples of CSSM might be understood as derived from one tonic note but heard in terms of scale degrees oriented to another tonic. Furthermore, not all CSSM is understood in terms of a tonic note. In the generic Type-4 example from Figure 3.2, I see no reason to assume a tonic note for the CSSM (in terms of derivation or hearing), just as I see no reason to assume a meaningful root note for the concurrent diminished-seventh chord (the #iv$^{\circ 7}$ label of which is used only for convenience of quick identification).

With these caveats in mind, I generally label horizontal CSSM (Type 1 or 2) according to the concurrent DSS tonic note so as to emphasize this presumed derivation—even if one might hear the CSSM in terms of a different local tonic. I generally label Type-3 CSSM in terms of the tonic of the understood major or minor source scalar space, which almost always means a tonic pc other than that of the concurrent key. Type-4 CSSM may or may not be understood in terms of a tonic note, depending on the musical details of each example, but I generally avoid identifying any tonic note for understood octatonic or whole-tone CSSM. When one wishes to identify a scale quality but not a tonic, orientation-free quality labels must be used. For example, "major," which by definition depends on a particular tonic orientation, must be replaced with "diatonic."

Of course, one does not have to be limited to traditional scale labels. In fact, valuable specificity can be achieved by simply providing a summary of whatever scalar intervals are present, along with some indication of how those intervals relate to the chordal notes of the example. I use such a method, with and without additional scale names, at times throughout this study (particularly in Chapter V).

2. Analysis of Examples Demonstrating Each CSSM Type

Type 1: Pure Horizontal

In classical music, when chords are embellished with scalar material, the scalar notes are most often just notes that are "in the key."[45] Such CSSM is usually interpreted as Type 1, which is to say that it is understood as a manifestation of the DSS. Thus, most examples of Type-1 CSSM are simply understood as major-scale or minor-scale material and are admittedly not very interesting in terms of pc content or scale quality. However, if studied in greater detail (and perhaps classified in greater detail), one could certainly find subtle beauty in the variety of possible Type-1 scenarios—particularly when considering the many possible subsets of a given DSS. For example, Type-1 CSSM for a IV chord in a C-major key context could involve scalar pc contiguities such as [F–G–A–B–C], [A–B–C–D], [B–C–D–E–F], and so forth, each of which creates a subtly unique color within the IV-chord context. I do not explore these possibilities in the present study, but I offer the idea as a suggested topic for future studies.[46]

Earlier, in Example 1.2 of Chapter I, we saw some Type-1 CSSM in Mozart's K545. Measures 5–8 are shown again here in Example 3.1, which includes CSSM labels for each chord.[47] Admittedly, to label separate CSSM for each chordal zone in such

[45] As a reminder, however, when we casually say "in the key," we could be clearer by saying "in the DSS," which is the specific aspect of key that we are interested in here. Furthermore, as discussed further in Chapter IV, referring to the *scalar intervals* of the DSS is more accurate and precise than referring simply to its notes, pitches, or pcs.

[46] This and other related ideas for further study are discussed in Chapter VII.

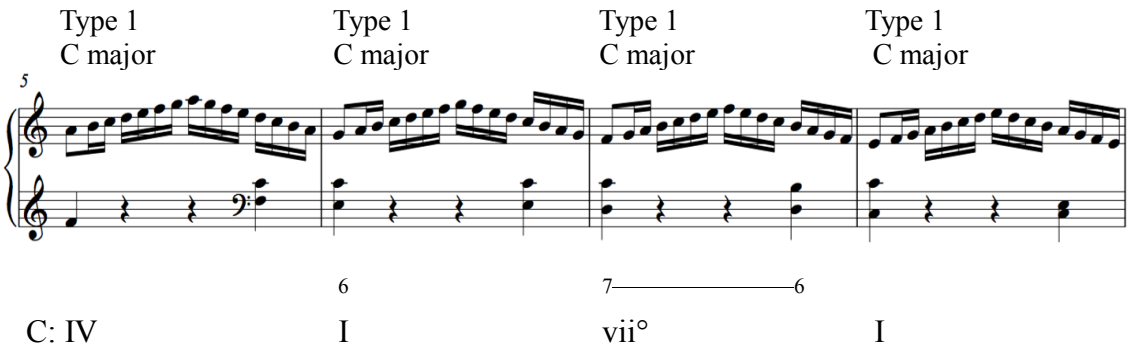
[47] One could also label m. 7 as exhibiting a ii^7 moving to a $vii^{\circ 6}$ on beat 4, but these more localized chordal zones do not line up with the right-hand scalar runs. Everything in mm. 5–8 besides the 7–6 suspension of m. 7 suggests a consistent harmonic rhythm of one chord per measure (at the basic structural level under consideration).

examples is counterintuitive; we would usually say that the entire excerpt involves just *one* type of scalar material: white-key-diatonic (or "C-major," if we also wish to make a claim about theoretical or compositional derivation or about tonic orientation). However, the separate labels serve the chord-specific perspective that is central to this study, as prompted by the broader music-theoretical question, "What are the different types of scalar material that might embellish a single chord?" Thus, I address each chordal zone individually so as to answer this question—even when consecutive chordal zones happen to be embellished with what is probably understood as the same scalar material.

In one sense, Type-1 CSSM is not really "chord-specific" when the same DSS-derived scalar "substance" is understood to apply to multiple chords in a passage. However, "CSSM" is meant only to refer to the collection of scalar material that occurs within the zone of a single chord and that embellishes it. Furthermore, this perspective is actually quite intuitive when we consider how the white-key-diatonic material in Example 3.1 functions somewhat differently in each chordal zone. For example, during the IV chord, A is a locally stable note and G is locally unstable; but during the following I^6 chord, these roles are reversed. In this way, then, the CSSMs of these respective measures are actually different (and could be illustrated as participating in two different local tonal hierarchies—one governed by an F major chord and the other by a C major chord), despite both being understood as derived from the C major DSS. Therefore, in this sense they are rightly called "chord-specific." However, when scalar material that does not seem to acknowledge the local consonance or dissonance it creates with the concurrent chord, or—more to the point—when it does not seem to coalesce with the chord into one local tonal hierarchy, it might not be appropriately understood as chord-

specific (cf. the concept of *melodic-harmonic divorce* [Moore 1995; Temperley 2007; Nobile 2013]). In some of these cases a broader span of scalar material can instead be understood as chord-specific to a deeper and more global chord. I discuss these issues further in Chapter IV.

Example 3.1. Mozart, Piano Sonata in C Major, K545, mvt. I, mm. 5–8



DSS: C major →

As for scale-degree hearing, I suspect that most trained listeners will simply hear all of the right-hand scalar material in Example 3.1 in terms of C-major scale degrees. However, m. 5 also offers the opportunity to hear a local "F Lydian" tonal hierarchy, with F as scale degree 1 and so forth. This would represent a Type-4 scale-degree hearing, but it would probably coexist with a stronger sense of a Type-1 compositional or theoretical derivation. Although some might immediately dismiss the idea of an F Lydian scale-degree hearing as inappropriate or foolish, it is perfectly reasonable as long as it is heard within a relatively deep and global C-major context. Thus, the deeper motion of F3 to E3 from m. 5 to m. 6 should still be heard as C-major scale degrees 4 to 3, but the purely

foreground motion of A4 to B4 that begins m. 5 might be heard as F-Lydian scale degrees 3 to 4.[48]

Example 3.2 demonstrates Type-1 CSSM within a minor-key context. As is typical in minor keys, the CSSM is variable, reflecting the variable nature of the DSS of the minor key.[49] This example also demonstrates chord-scale conflicts, which often occur along with variable CSSM. The variability and the conflicts occur presumably in the interest of avoiding melodic augmented seconds. Beneath D-natural in m. 33 and above C-flat in m. 34, chord-conflicting whole-step neighbor motion is chosen instead of chord-conforming augmented-second neighbor motion.[50]

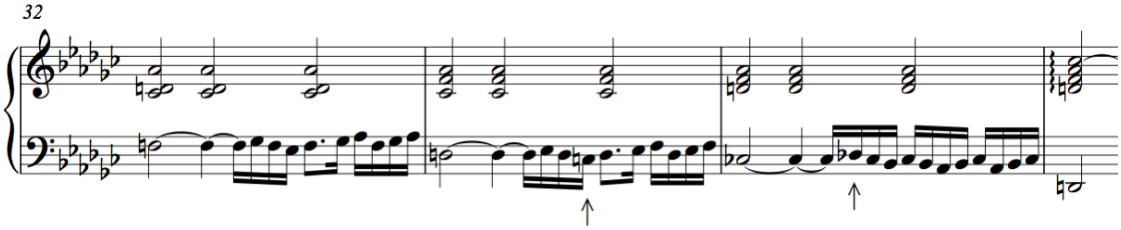
[48] Cf. the discussion of Satyendra's (1997) *chord spaces* in Chapter II of this study, including footnote 38. Some older jazz pedagogical materials prescribe scales according to every chord root—presumably because such scales can be identified faster and because it encourages the improviser to acknowledge local chord tones rather than tonic chord tones. See, for example, Aebersold 1986, which assigns G Phrygian scales to G-minor chords involved in a simple I–ii–iii–ii planing pattern in Eb major at the end of John Coltrane's "Moment's Notice" (16). (This chord-scale prescription was omitted in Aebersold's later editions of the piece.) The prescription of G Phrygian draws the improviser's attention to chord tones of G, B-flat, and D, whereas a prescription of E-flat major might lead less experienced improvisers to treat E-flat as a chord tone instead.

[49] The immediately preceding measures (29–31) temporarily suggest the key of A-flat minor, but the suggestion is weak, and if they are understood in A-flat at all, they are easily reinterpreted in the deeper/global key of E-flat minor once m. 32 arrives.

[50] Note that while I label each measure of Example 3.2 with a separate figured-bass label to show chordal inversions, the entire excerpt can be understood as exhibiting just one chordal zone of vii°^{7}, thereby allowing us to understand just one collection of CSSM in the excerpt. The distinction between CSSM defined in terms of pitch intervals and pc intervals is particularly applicable here. I prefer to understand mm. 32–34 as each articulating a different scalar-*pitch*-interval space (all three of which, incidentally, exhibit a different "Dorian-tetrachord" structure), all of which in turn belong to a more abstract and inclusive scalar-*pc*-interval space of E-flat variable minor, which represents the DSS of the key. In this view, the three scalar-pitch-interval spaces are respectively Types 1, 1c, and 1c, while the scalar-pc-interval space suggested by all three measures is Type 1cv, as explained above.

Example 3.2. J.S. Bach, *The Well-Tempered Clavier, Book I*, Prelude No. 8 in E-flat Minor, BWV 853, mm. 32–35, demonstrating a variable and conflicting CSSM. Chord-scale conflicts are marked by vertical arrows under the staves.

CSSM: Type 1cv* (Eb variable minor) →



Ebm: vii$^{o6/5}$

DSS: Eb variable minor →

*See footnote 50 for a more nuanced interpretation

Some later-nineteenth-century passages establish non-major/minor keys, sometimes resulting in non-major/minor Type-1 CSSM. For example, mm. 42–55 of the second movement of Tchaikovsky's Symphony No. 4 (beginning at rehearsal A) are entirely in the key of A-flat mixolydian (partially shown in Example 3.3), resulting in what could be called non-major/minor-derived CSSM. These CSSM is still defined simply as Type 1, however, because they are all understood as derived purely from the DSS.

Particularly in this example, given the prominence of this thematic melody, to analyze fragments of the melody as supposedly fitting into chordal containers seems admittedly strange. Indeed, in this example, we can more easily imagine that the melody was composed (or conceived of) first, with the chords merely tacked on afterward.[51] Regardless, we still understand the melodic descent from Eb to C in m. 43, the descent

[51] The idea that harmony might sometimes be subordinate to melody is discussed with regard to melodic-harmonic divorce in Temperley 2007 and Nobile 2013. I discuss these issues further in Chapter IV.

from Bb down to Bb in mm. 44–45, and so forth as scalar fillings-in of deeper chordal intervals, and in this sense it is appropriate to speak of separate CSSMs.

Type 2: Altered Horizontal

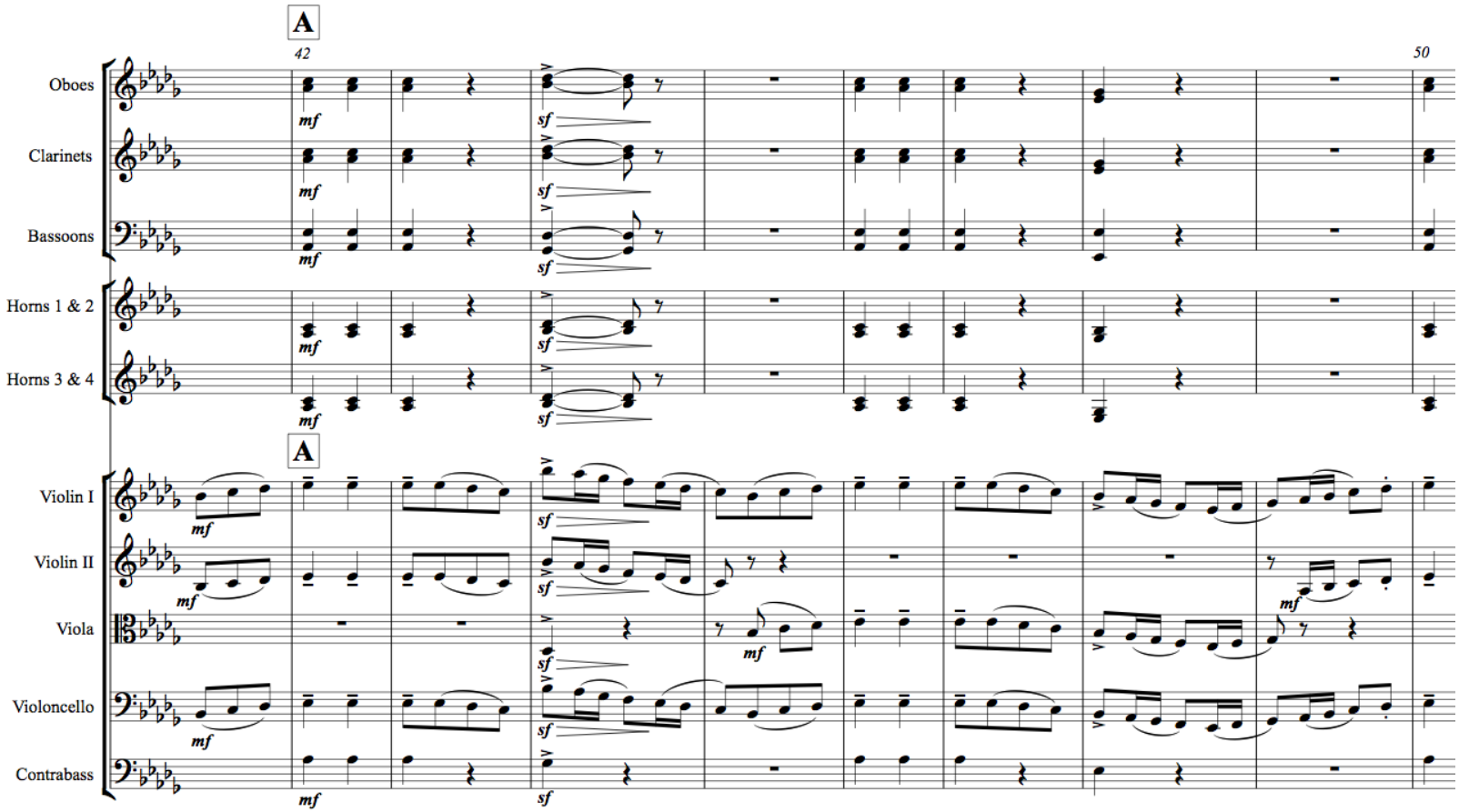
Type-2 CSSM applies only to chromatic chordal zones—that is, chords containing at least one note that does not belong to the concurrent DSS. When CSSM involves one or more chordal-chromatic pcs *in place of* corresponding normative DSS pcs and all other scalar notes in the CSSM belong to the DSS, it is usually understood as Type 2.[52] The general idea of a scale or scalar material that is inflected by a chromatic chord has been mentioned or implied by several authors.[53] For example, Satyendra (1997, 230) describes his similar idea of *inflected repetition* in compositional terms: "When a melody repeats over a change of chord, vary the melody by displacing the note(s) that clash with the new harmony by the smallest possible interval(s) and hold all other notes as common tones."[54]

[52] In the case of chordal-chromatic pcs occurring *in melodic succession with* the corresponding normative-DSS pcs, the resulting intervals will probably be understood as non-scalar or sub-scalar. Tymoczko (2011, 221 and Figure 6.7.1b) provides a generic example of this and refers to the chordal-chromatic pcs in such a melody as "additional chromatic notes" that are inserted, thus similarly implying that those pcs are non-scalar or sub-scalar. In the case of CSSM that contains *separate* scalar instances of one or more chordal-chromatic pcs and the corresponding normative-DSS pc(s), the CSSM will probably be understood as variable, as I later show in Example 3.7. NB: My definition of Type-2 CSSM also allows for the possibility that one or more chordal-chromatic pcs might be "negated" in the CSSM by the scalar use of only the *un*altered normative-DSS version of the pc. If such a scenario were to occur, it would most likely be attributable to a small amount of CSSM and the preference for chord-conflicting whole-step melodic motion over chord-conforming augmented-second melodic motion.

[53] Nettles and Graf (1997), Lerdahl (2001, 62–63), Loya (2011), Tymoczko (2011), and Mulholland and Hojnacki (2013) all acknowledge ideas similar to the Type-2 principle. Hook (2011, 91–94) discusses what is essentially the Type-2 principle in reverse: rather than understanding chromatic chords as inflecting otherwise-diatonic scales, he discusses changes of scale as inflecting otherwise-diatonic chords. Vincent ([1947] 1951) might also imply a perspective similar to Hook's.

[54] As I discuss in Chapter II, the inflections that Satyendra describes are in reference to the preceding CSSM rather than a DSS.

Example 3.3. Tchaikovsky, Symphony No. 4, mvt. II, mm. 42–50

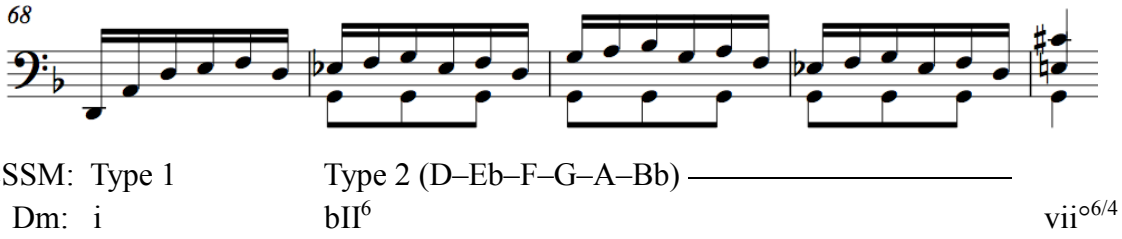


CSSM:	Type 1	Type 1	Type 1	Type 1	
Ab mixolydian:	I	VII	I	v	I

DSS: Ab mixolydian →

Type-2 CSSM is clearly demonstrated in the Neapolitan chordal zone near the end of the Gigue from Bach's Cello Suite in D Minor (Example 3.4). In terms of compositional technique, this CSSM might be the mere by-product of embellishing the Neapolitan chord with diatonic NCTs from the normative DSS of D minor. However, even if it is a mere by-product in terms of compositional process, the resulting CSSM is distinct from the normative DSS. Although E-flat can be understood as an altered scalar note at a deeper level (as b^2), the CSSM introduces a new scalar interval (Eb–F) that does not actually occur at any deeper level.

Example 3.4. Bach, Cello Suite No. 2 in D Minor, BWV 1008, Gigue, mm. 68–72

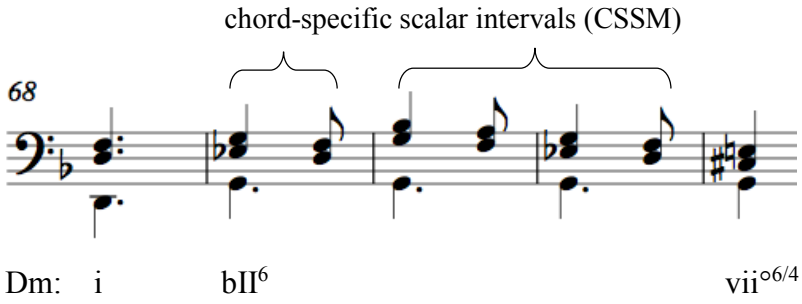


How do we decide whether a chord is chromatic or a reflection of variability in the DSS? Could the DSS of Example 3.4 be considered variable with regard to its second scale degree, the case in which the CSSM of mm. 69–71 would be Type 1v? This alternative interpretation is unlikely and less desirable because of 1) the classical tradition of minor keys, in which the lowered second degree is usually understood as a deviation from the norm; 2) the very small ratio of scalar E-flats to E-naturals in this piece; and 3) the *return* to E-naturals at phrase endings and other deeper events in the music, which signifies it as the normative scale-degree 2. Unless a minor second scale degree (b^2) can be convincingly understood as a normative part of the DSS (at least normative enough to

be a co-representative of a variable second scale degree), I follow the classical tradition of recognizing such notes as temporary, non-normative altered versions of the normative major second scale degree.[55]

Note that this particular example of CSSM contains melodic lines that are deeper than the foreground, as shown in Example 3.5. These melodies do not change the CSSM, however, and they are still subordinate to the Neapolitan chord itself.

Example 3.5. A deeper structural level of Example 3.4, revealing deeper CSSM



As simple as it may seem, the Type-2 principle explains some strikingly interesting scalar structures. Classical composers generally seem to avoid embellishing highly chromatic chords with scalar material (often using arpeggiative material instead), but when they do, they typically use Type-2 CSSM. Mozart's embellishment of the German augmented-sixth chord in m. 86 of Example 3.6 is best understood as derived from the C-major DSS with scale degrees 3, 4, and 6 altered so as to conform to the chromatic notes of the chord. The resulting scale has been called the "Hungarian," "Gypsy," "Gypsy minor," or "Hungarian Gypsy" scale (and is used extensively

[55] Compare to Vincent's ([1947] 1951, 28–32) comments regarding Neapolitan chords, which he generally views as representing Phrygian or Locrian keys (partly quoted in Chapter II of this study).

throughout Liszt's *Hungarian Rhapsodies*, for example), and it contains two augmented seconds and two instances of consecutive semitones. However, I will call it "harmonic minor #4" throughout this study.[56]

Like all Type-2 CSSM, this scale simultaneously expresses both the local dissonant chord *and* the DSS, perhaps representing the chromatic chord's temporary altering effect on the scalar space of the passage. Put another way, this is the key of C major in its "augmented-sixth state." Type-2 CSSM, by situating chromatic chordal notes within a presumably DSS-derived scalar environment, encourages us to hear chromatic chordal notes as altered versions of DSS scale degrees rather than as sub-scalar (merely decorative filler) notes; and the CSSM can actually tell us *which* scale degree we should hear each chromatic note as representing. For example, in m. 86 of Example 3.6 the CSSM suggests that we should hear the E-flats *as ^b3*—despite the voice-leading across mm. 85–87, which to some might suggest a lower neighbor succession of E–*D#*–E (^3–^*#2*–^3).[57] This scalar situating of E-flat also tells us to hear it as an altered-DSS scale degree rather than as a sub-scalar note with no scale-degree affiliation, as I have already explained.[58]

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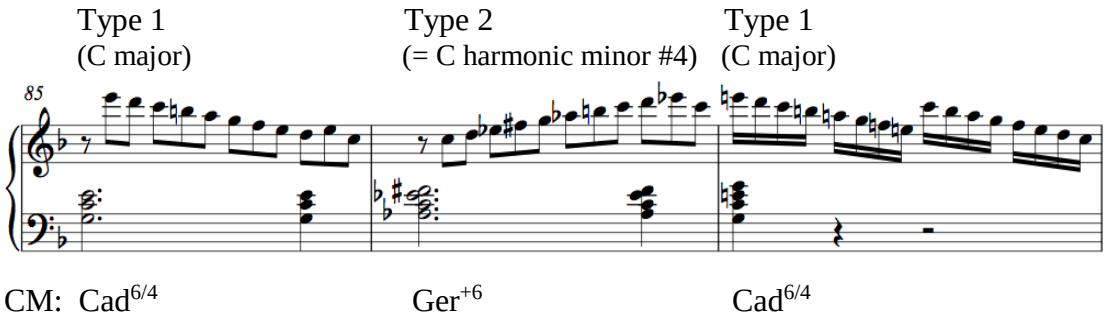
[56] Persichetti (1961) refers to the "double augmented" scale, of which the harmonic minor #4 scale is the fourth mode. Loya (2011) refers to it as the "*verbunkos* minor" scale and offers a deep and careful study of the *verbunkos* idiom as it relates to Liszt.

[57] On the other hand, we might instead choose to acknowledge two different identities of such chords—one identity at the foreground and a different identity at a deeper level. In the case of the Ger^{+6} in Example 3.6, Eb4 might be understood as ^b3 in the local foreground but as ^#2 at a deeper level on which the CSSM is conceptually absent (and thus cannot negate the ^#2 interpretation).

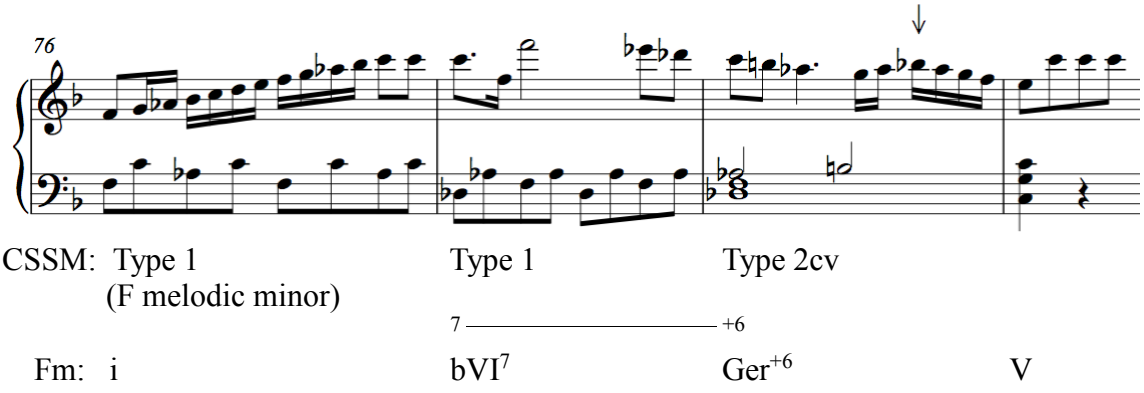
[58] This scalar situating effect of Type-2 CSSM is always possible in major- or minor-key contexts as long as the chromatic chord in question does not contain two differently-spelled instances of the same letter name. However, even chords that do contain two differently-spelled instances of the same letter name can be situated into an altered (and necessarily variable) DSS if the CSSM appropriately exhibits the different spellings (i.e., different versions of the scale degree) in different octaves.

Example 3.6. Mozart, Piano Sonata in F Major, K533/494, mvt. I, mm. 85–87



As with most scalar spaces containing augmented seconds, augmented-sixth-chord CSSM is usually variable, with chord-conflicting whole-step melodic motion often occurring in place of chord-conforming augmented-second melodic motion. An instance of this is shown in m. 78 of Example 3.7, in which Mozart uses a B-flat upper neighbor to A-flat, which creates a smoother melodic line but conflicts with the chordal note of B-natural below. Note also in this example how the efficient half-step transformation of bVI^{7} into Ger^{+6} (involving a 7–6 suspension across mm. 77–78) is emphasized by the biting accented passing tone C6 moving to B5 at the beginning of m. 78.[59]

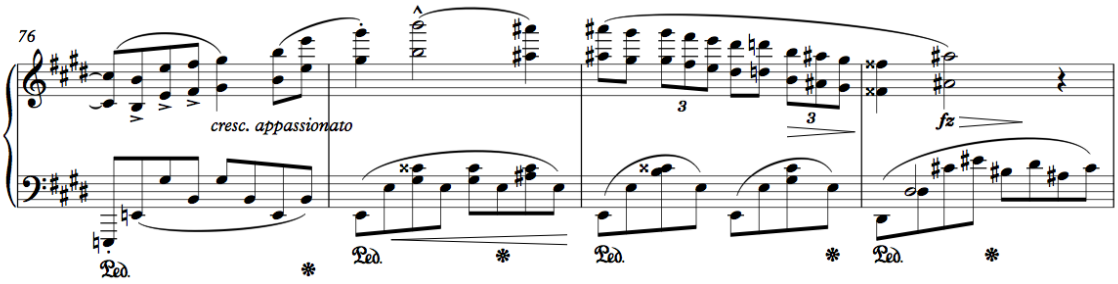
Example 3.7. Mozart, Piano Sonata in F Major, K533/494, mvt. III, mm. 76–79. Chord-scale conflict marked with an arrow above the staff.



[59] From a deeper perspective, mm. 77–78 of Example 3.7 could alternatively be understood as just one Ger^{+6} chordal zone exhibiting a single Type-2cv complete scale of "F natural minor variable 4/#4."

The harmonic minor #4 scale as shown in Example 3.6 is not the only kind of complete scale suggested by augmented-sixth-chord CSSM. Example 3.8, taken from Chopin's Piano Concerto No. 1 in E Minor, features a more-evenly-distributed alternative. The Ger^{+6} of mm. 77–78 is embellished with what I call "natural minor #4" CSSM, which contains only one augmented second (rather than the two augmented seconds in the harmonic minor #4 scale).[60]

Example 3.8. Chopin, Piano Concerto No. 1 in E Minor, Op. 11, mvt. II, mm. 76–79 (piano part only)



CSSM:	Type 1	Type 2 (= G# natural minor #4)	Type 1
G#m:	VI	Ger^{+6}	**G#M:** V^7

In this example, the normative DSS can be reasonably understood either as G-sharp minor switching to G-sharp major in m. 79 or as a variable major/minor DSS throughout. Both of these interpretations account for the definitive minor-seventh scale degree of F-sharp in m. 78. Other examples of minor-seventh scale degrees in Type-2 augmented-sixth-chord CSSM could arise through mere variability (if they occur along with major seventh scale degrees in the same segment of CSSM) or, particularly if in a

[60] The melodic D-natural in m. 78 of Example 3.8 is presumably spelled as such (rather than as C-double-sharp) merely for the reading convenience of the performer, and its function as C-double-sharp is confirmed both by the left-hand chords and the right-hand scale, which already contains a scalar D-sharp, but no other representative of the letter C (i.e., some form of scale degree 4 in the tonic key of G-sharp).

major-key context, through additional alterations to the DSS, including borrowings from a parallel tonic scalar space. The concept of additional alterations is the next topic of discussion, and the final topic within this section on Type-2 CSSM.

Additional Alterations in Type-2 CSSM ("Type 2a")

Type-2 CSSM is defined as that which is understood as reflecting a temporarily altered state of the normative DSS. Usually the DSS is altered only as much as needed to accommodate whatever chromatic pcs occur in the concurrent chord. This means that all of the scalar but non-chordal pcs in Type-2 CSSM usually belong to the normative DSS. Moreover, when CSSM contains scalar but non-chordal pcs that do *not* belong to the normative DSS, the CSSM is usually understood as somehow vertical—as Type 3 or Type 4. However, this is not always the case. In Example 3.9, from Chopin's G Minor Ballade, the CSSM of mm. 164–165 is best understood in terms of the global key of E-flat, but a temporary and local parallel-minor manifestation of the DSS, hence my label of "Eb natural minor" in the example. Neither the G-flats nor the D-flats in this CSSM belong to either the chord or the normative E-flat major DSS, so we must add another possible means of derivation to the definition of Type 2: borrowing from a parallel tonic scale (or scalar space).

Moreover, parallel borrowing might be understood as just one means of deriving "additional" alterations in the scalar structure. As long as the additional alterations are still understood as representing tonic scale degrees, the label of Type 2 is appropriate. Because this stretches the previously established definition of Type 2 somewhat, I add the suffix "a" (to stand for "additional alteration") to the type number when identifying such CSSM. In fact, insofar as this kind of CSSM is understood as a complete replacement of

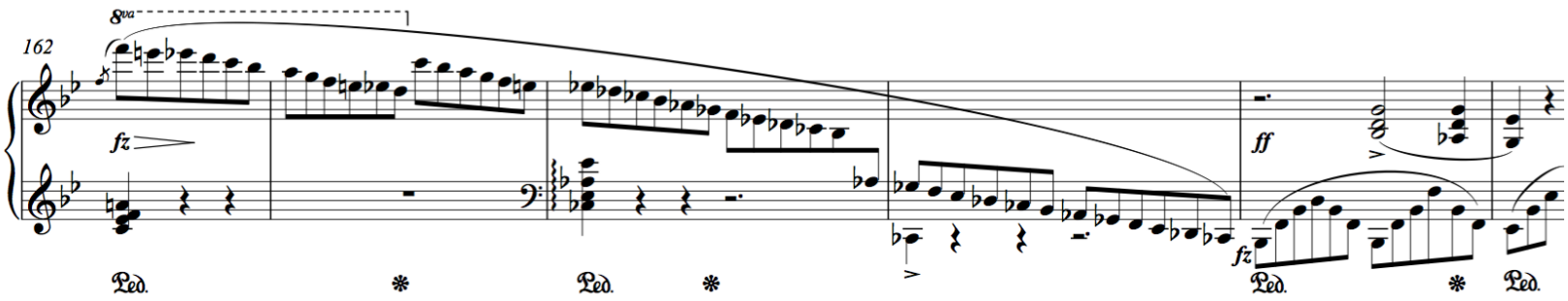
the normative tonic scalar structure, it begins to resemble the spirit of Type 3. This raises difficult questions about how to best categorize our various possible conceptions of CSSM. One could consider adding another CSSM type category, but for the purposes of the present study I find it more desirable to keep the number of types limited and to integrate the possibility of additional alterations into Type 2.

Type 3: Traditional Vertical

I now proceed to discuss the vertical CSSM types, which are not attributable to the DSS but rather seem to be "custom fit" to the chord at hand. Type-3 CSSM is essentially the suggestion of a presumed temporary new major, minor, or major/minor-based scale at only a relatively foreground level, thus mimicking a traditional Type-1 or Type-2 scenario as if in another key. Example 3.10 provides mm. 5–12 of Mozart's K545 once again. In contrast to the Type-1 CSSM of mm. 5–8, the ii^6 chord in m. 9 is embellished with Type 3 so as to articulate a D melodic minor scale. The C-sharp is clearly scalar, yet it is not part of the chord and it is not found at the next deeper level of structure; therefore the CSSM is understood as Type 3. Type-3 CSSM is only *indirectly* related to its concurrent DSS; in Example 3.10, the D minor chord is derived from the C-major DSS, and the D melodic minor scale is, in turn, derived from the D minor chord.

In its entirety, the Type-3 CSSM in m. 9 *tonicizes* the D minor chord much like a traditionally tonicizing progression such as $V^{4/2}/ii$ – ii^6. Though conventional notions of tonicization usually involve two or more chords, Example 3.10 shows that tonicization can also arise from CSSM within just a single chord. However, this ii^6 chord must still be understood as in the key of C major if its CSSM is understood as Type 3. If the chord were understood as "in the key of D minor," its CSSM would be Type-1 instead. This

Example 3.9. Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 162–167



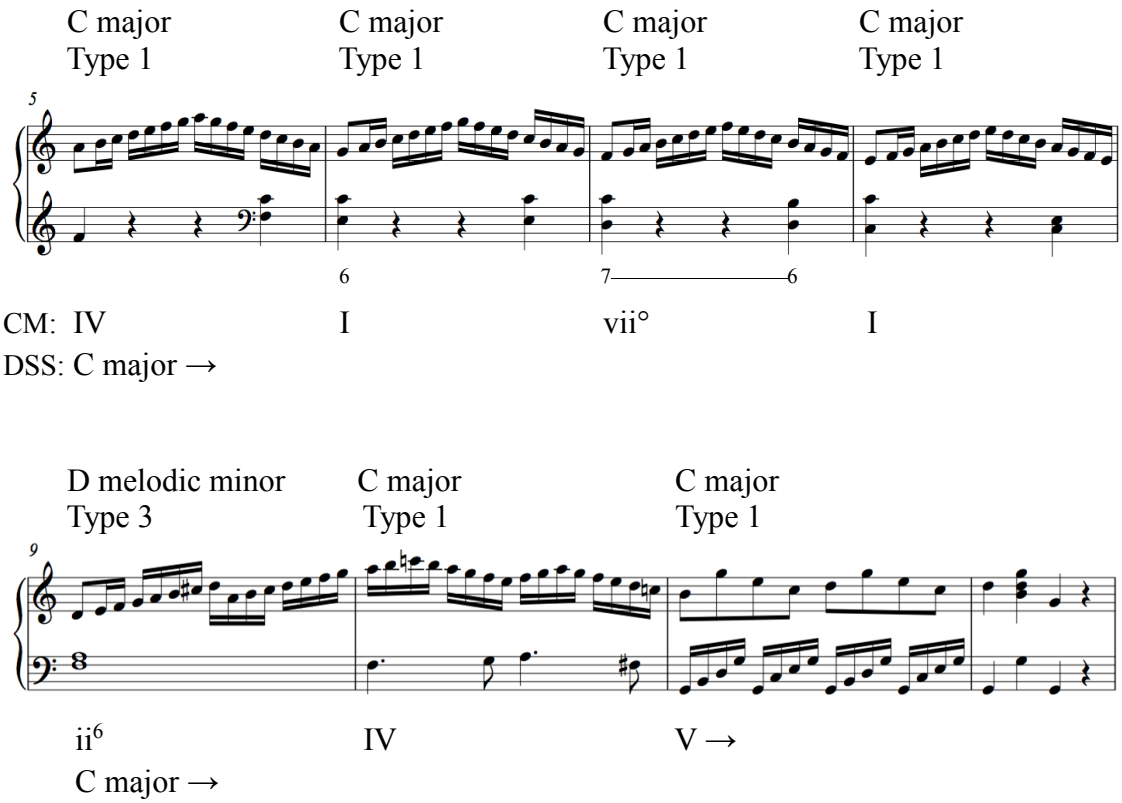
EbM: $II^{4/3}$ (this CSSM is discussed later) — iv^{6} Type-2a CSSM, Eb natural minor — V — 8——b7 — I

prompts a general rule of thumb for properly identifying Type-3 CSSM: since a chord that is embellished with Type-3 CSSM must be understood as in an "underlying" key rather than the "temporary foreground" key that the CSSM alludes to (in other words, since the definition of Type 3 requires that the concurrent DSS and CSSM must contrast), allusions to the "temporary foreground" key should be restricted to the single chordal zone that is said to be embellished with Type-3 CSSM. For example, had Mozart preceded the ii^6 chord in Example 3.10 with a $V^{4/2}$/ii chord, the two chords together would establish a new DSS of D minor (albeit rather locally—but still globally relative to the ii^6 chord itself), and therefore the D melodic minor CSSM of the ii^6 chord would be simply Type 1.

The different CSSM types in Example 3.10 are not used arbitrarily; they actually reflect and support the different functions of their concurrent chords. The use of Type-1 CSSM—which reinforces the concurrent key and minimizes the tonal impact (or independence) of non-tonic chords—appropriately reflects the less structural, sequential nature of the chords in mm. 5–8. In contrast, the ii^6 chord in m. 9 represents the first significant harmonic motion in the entire piece, functioning as the dominant preparation that leads to the medial caesura (on V) of this sonata exposition in m. 12. Therefore, the use of tonicizing Type-3 CSSM is especially appropriate in m. 9 because it gives more tonal weight to this important chord, expressing a more resolute character than would a mere continuation of Type-1 (C-major) CSSM.[61]

[61] Following the relatively structural ii^6 chord, the IV (and #iv°, if acknowledged) chord(s) are merely the result of passing motion at a deeper event-hierarchical level: D5 – C5 – B4 in mm. 9–11, with D5 remaining the structurally most important upper-voice note through m. 12. If one chooses to acknowledge a #iv° chord at the end of m. 10, its CSSM would not demonstrate Type 2 because the F# does not participate in any locally scalar intervals. In other words, the F# would be part of the chord, but not part of the CSSM. The only scalar motions involving the #iv° chord are those into and out of D and C.

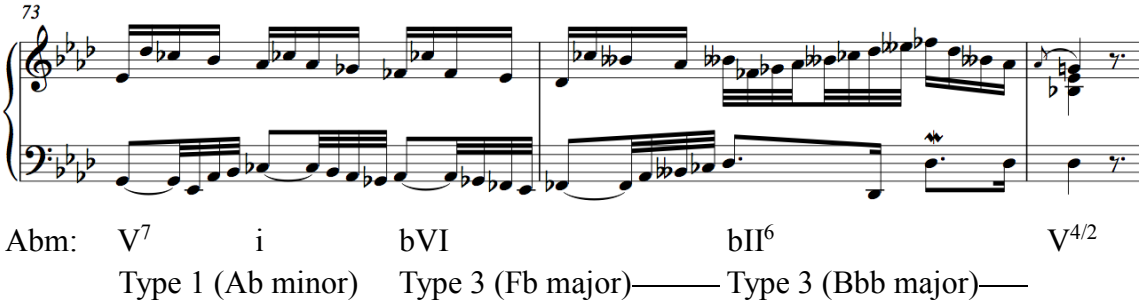
Example 3.10. Mozart, Piano Sonata in C Major, K545, mvt. I, mm. 5–12. CSSM labeled above the staves.



Type 3 is also demonstrated in Example 3.11. In contrast to the Type-2 CSSM that Bach used for the Neapolitan chord in Example 3.4, the Neapolitan CSSM in Example 3.11 suggests a major scale built on the chord root, thereby tonicizing it. I find this interpretation to be more convincing that Vincent's ([1947] 1951, 30–32) interpretation of similar scenarios as representing a Locrian key (thus, he would describe the Neapolitan CSSM in Example 3.11 as A-flat Locrian, which I would classify as a Type-2a interpretation). My reasoning starts with asking why this CSSM employs an E-double-flat rather than simply the E-flat that is already in the key. Bach had to go out of his way to write this E-double-flat. I argue that it serves the purpose of completing the familiar major scale built on the root of the Neapolitan chord; such a purpose would be consistent

with conventional principles of classical major/minor tonality. On the other hand, to say that the E-double-flat serves the purpose of completing a Locrian scale would bear no convincing connection to classical principles. Furthermore, the principle of Type-3 CSSM as representing a major/minor scale that tonicizes its concurrent chord (but without changing the original key of the chord) is exemplified rather frequently throughout the classical repertoire. In addition to Neapolitans (as shown in Example 3.11) and ii^6 chords (as shown in Example 3.10), Type-3 major/minor CSSM can be found to tonicize other major and minor triads such as III, IV, V, bVI, vi, and bvi (again, without changing the key) in the music of Bach, Mozart, Beethoven, Fauré, and others (see examples listed in appendix C).

Example 3.11. J.S. Bach, *The Well-Tempered Clavier, Book II*, Prelude No. 17 in A-flat Major, BWV 886, mm. 73–75



Close CSSM analysis of Example 3.11 also reveals a gradual scalar progression from A-flat minor (represented by the seven-flat diatonic collection occurring after the bass G-natural at the beginning of the excerpt) to F-flat major (eight flats, beginning with the bVI chord) to B-double-flat major (nine flats), proceeding in a hemiolic fashion

typical of Baroque music toward an emphatic rhetorical pause on $V^{4/2}$ at m. 75.[62] Acknowledgment of this scalar hemiola also supports an understanding in which bII does not essentially arrive until beat 2 of m. 74. Aldwell and Schachter (2011, 544–545), for example, mistakenly analyze the entirety of m. 74 as bII, which results in the somewhat puzzling consequence of the chord beginning in 6/4 position.

Returning to the Neapolitan CSSM, why does Bach use different types of CSSM for the Neapolitan chords in Example 3.4 (Type 2) and Example 3.11 (Type 3)? In the case of Example 3.11, I believe the gradual progression from seven- to eight- to nine-flat diatonic scales justifies the Type-3 Neapolitan CSSM. More generally, however, both choices offer pros and cons. Type-2 CSSM maintains a sense of the concurrent global key but potentially sacrifices familiar scalar sonority. Type-3 CSSM, on the other hand, yields more familiar—perhaps even stronger—scalar sonority but abandons the concurrent global key in doing so. One might speculate as to whether the quality of the key (major or minor) makes a difference for Neapolitan CSSM choice. Whereas both Type-2 and Type-3 CSSM work well for minor-key Neapolitan chords, Type 3 allows for significantly smoother scalar structure than Type 2 when used for *major*-key Neapolitans.[63]

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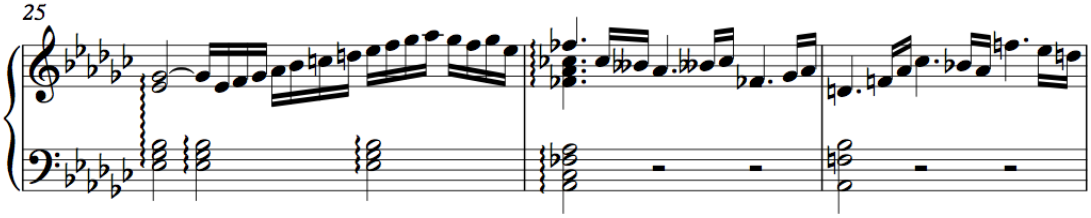
[62] Although the F-flat major scale is not confirmed until the arrival of B-double-flat in m. 74, it is already suggested by the Ab–Gb–Ab motion in the bass that leads into the bVI chord, as such melodic motion is not typical of A-flat minor. Furthermore, it is easy to hear the CSSM at the end of m. 73 as tonicizing the bVI chord despite the local absence of a B-double-flat. One could identify the first quarter note of m. 74 as $iv^{6/5}$, thus possibly suggesting two consecutive chords in an F-flat major DSS (meaning that the CSSM of each of the chords would be simply Type 1); but I find that the somewhat more global perspective of my analysis in Example 3.11 better represents our basic-level hearing of the passage in which the F-flat major material of mm. 73–74 is understood as Type-3 CSSM (within an uninterrupted key of A-flat) rather than a change of key or DSS.

[63] Type-2 CSSM for a major-key Neapolitan creates what Persichetti (1961) and others have called the "double-harmonic" scale (C–Db–E–F–G–Ab–B–C in the key of C), which happens to be the fifth mode of the harmonic minor #4 scale mentioned earlier. A striking example of this scale with a Neapolitan is found in Liszt's Hungarian Rhapsody No. 13 in A Minor, and it is discussed in Loya 2011.

This difference of CSSM type is also a source of inconsistency across various editions of Bach's music. Editor Hans Bischoff notes that the double-flats in m. 74 of Example 3.11 are omitted in some editions, but that this is only due to "a misinterpretation of the old orthography" (Johann Sebastian Bach [1883] 1960, 83n13). Indeed, another example of Bach's use of Type-3 CSSM for a Neapolitan that requires a double-flat is shown in Example 3.12. Further study is needed to determine if Bach generally favored one type of Neapolitan CSSM over the other in certain situations or if he perhaps even changed his habits in this regard over time.

Example 3.12. J.S. Bach, *The Well-Tempered Clavier*, *Book I*, Prelude No. 8 in E-flat Minor, BWV 853, mm. 25–27

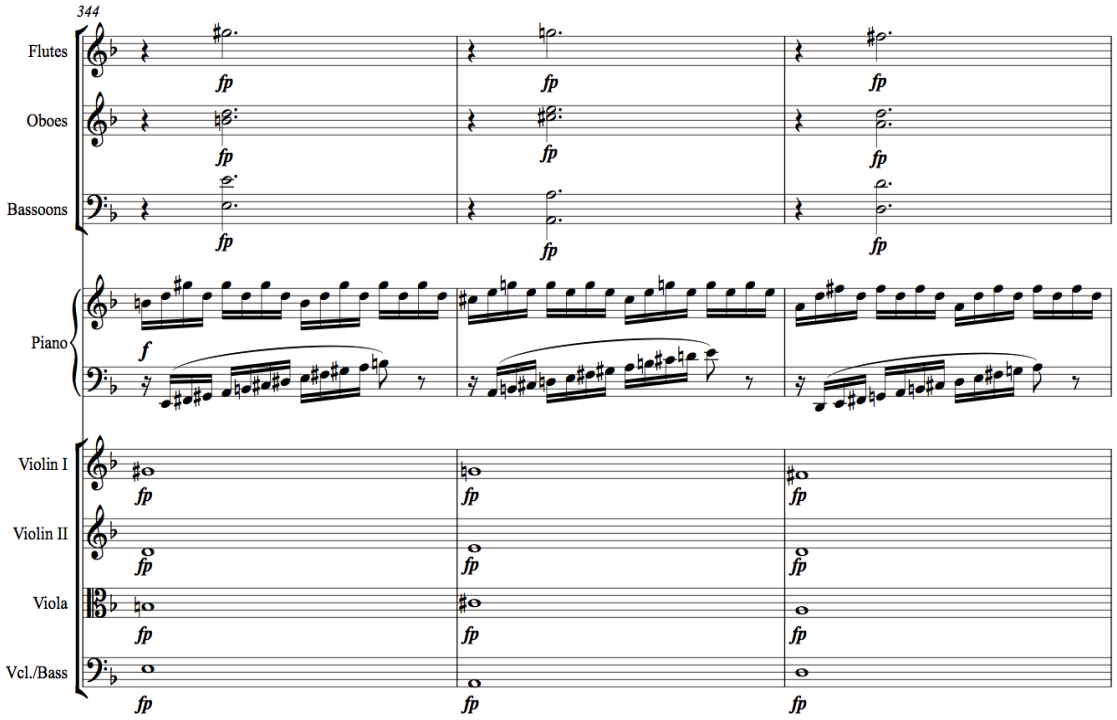


CSSM:	Type 1	Type 3	Type 1
	(Eb melodic minor)	(Fb major)	
Ebm:	i	bII^6	$V^{4/2}$

Type 3 may, in rare cases, create chord-scale conflicts. Mozart appears to have occasionally embellished chords with conflicting major or minor CSSM, two instances of which occur in Example 3.13. Each of the first two measures of the excerpt contains a dominant seventh harmony embellished with a conflicting major scale built on the chord root. Are these conflicts possibly the result of typographical errors or a copyist's misunderstanding? Evidence suggests that they were indeed intended. In Mozart's next piano concerto (No. 21, in C Major, K467), one will similarly find an A7 chord

embellished with an A major scale (mvt. III, m. 147) as well as an Am7 chord embellished with an A melodic minor scale (mvt. III, mm. 141–142). This phenomenon is also found in the music of Beethoven: measure 23 of his Cello Sonata No. 2 in G Minor, Op. 5/2 contains an F7 chord embellished with an F major scale, the E-natural of which requires an accidental (thus suggesting conscious intention).[64]

Example 3.13. Mozart, Piano Concerto No. 20 in D Minor, K466, mvt. I, mm. 344–346



D:	V^7/V	V^7	I
	Type 3c (E major)	Type 3c (A major)	Type 1 (D major)

[64] Just three measures later in this sonata movement (m. 26), Beethoven embellishes an E°7 chord with what can be understood as a Type-1c A-flat major scale, the E-flat of which conflicts with the E-natural in the chord.

Type 4: Modern Vertical

As certain classical composers gradually began to use non-major/minor keys and scales in the nineteenth century—particularly composers associated with Russia and France (as discussed by Tymoczko [2011] and Taruskin [1985], for example)—these new scale types also begin to emerge in vertical CSSM. This is the only CSSM type that must be non-major/minor by definition, but recall that Type-1 and Type-2 CSSM can reflect a non-major/minor DSS (as in Example 3.3, from Tchaikovsky's Symphony No. 4). Type 4 earns its own category because it requires a rather bold step by the composer. The decision to establish a new scalar space with vertical CSSM is one thing, but to do so with scalar material that is not rooted in the major/minor tradition is another. Tymoczko, referring to what is essentially the Type-4 CSSM technique, praises this innovation in nineteenth-century music for its capacity to accommodate chromatic chord tones while also employing "collections that possess desirable scalar qualities" (2011, 308). Because Type-4 CSSM was one means of generating tonal colors that were essentially new in the nineteenth century, it closely relates to the growing nineteenth-century tendency to dwell on individual chords (other than the just the tonic and dominant) for longer periods of time, seemingly in the aesthetic interest of exploring tonal colors for their own sake—an aesthetic that arguably culminated in French impressionism.[65] Related historical issues are discussed with regard to the music of Gabriel Fauré in Chapter V.

Example 3.14 shows one of the earliest unequivocal examples of chord-specific octatonicism, which occurs in the first movement of Chopin's Piano Concerto in F Minor,

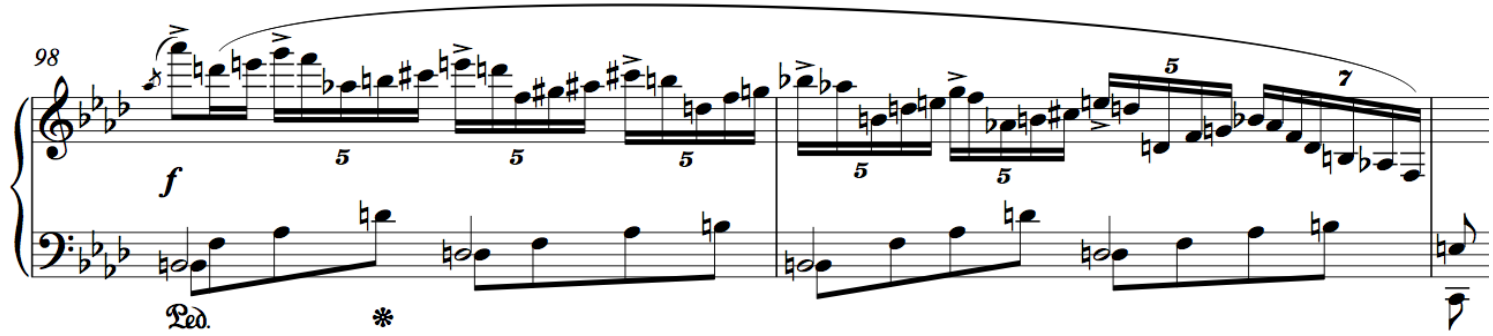
[65] For a historical account of some of these interrelated trends, see Taruskin 2005, Volume 3 "The Nineteenth Century," Chapter 34 "The Music Trance" (61–118).

completed in 1830.[66] The octatonic scale provided composers with a logical alternative to the Type-2 CSSM typically found with vii°^{7}/V chords throughout the classical repertoire (examples of which are discussed later in this chapter). Because of the context of a diminished-seventh chord, which lacks a clear sense of root, and because of the octatonic scale's repeating intervallic structure, the CSSM in Example 3.14 eludes any sense of tonic orientation or direct relation to the underlying key. The result is an oasis of tonal independence and a strange sense of stability within an unstable chord, which encourages more lingering on the chord and emphasizes tonal color more than function.

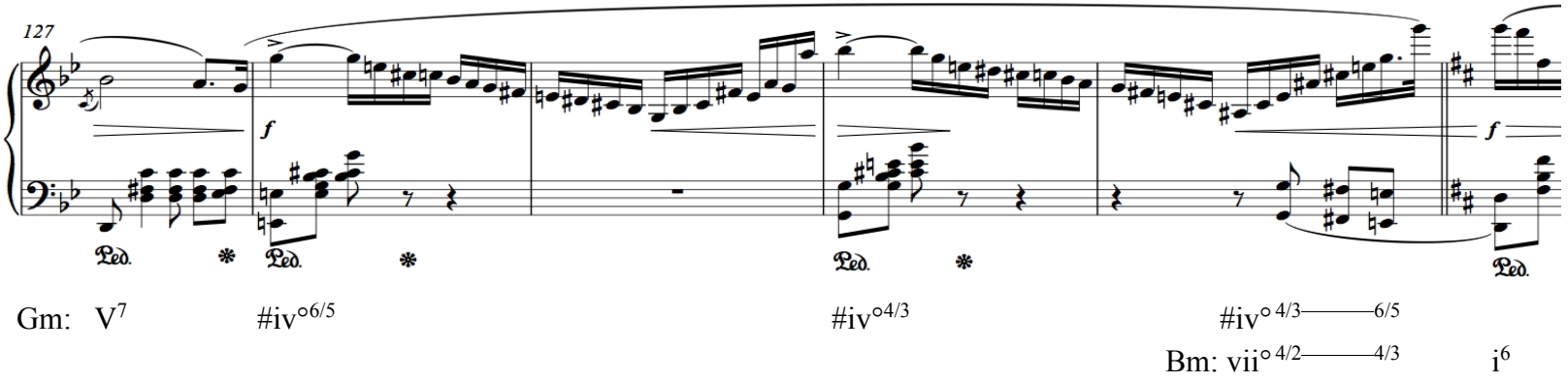
The specific choice of octatonic$_{1,2}$ (as opposed to the other octatonic scale that contains the B°7 chord in Example 3.14—namely octatonic$_{2,3}$) for this passage might have origins in major/minor tonality, however. Some theorists might interpret the B°7 chord of this example as an implied G7^{b9}, which would function as a secondary dominant to the V chord in m. 100, and octatonic$_{1,2}$ is the only octatonic collection that contains both B and G. Interestingly, Chopin's choice of octatonic collection also bears a striking resemblance to the more traditional Type-2 complete scale used to embellish vii°^{7}/V chords in classical music (discussed in the following section, "Type 2/3 Ambiguity"), which in this example would be what I will call "F melodic minor #4." Built on F for the sake of comparison, octatonic$_{1,2}$ comprises [F–G–Ab–Bb–B–C#–D–E–F] while F melodic minor #4 comprises [F–G–Ab–B–C–D–E–F], which would be a proper subset of octatonic$_{1,2}$ if its C were raised to C#. Along these lines, scholars have noted that

[66] Taruskin (1985) provides an excellent historical account of the origins of octatonicism, but he explicitly chooses to focus on octatonicism that spans multiple chords rather than chord-specific octatonicism. Therefore, most of his examples lie outside the scope of this study. Some scholars (e.g., Street [1976] and Taruskin [1985]) have suggested that embellishment of diminished-seventh chords much like the embellishment in Example 3.14 does not constitute true octatonicism, but in Chapter IV, I explain why this CSSM is unmistakably octatonic.

Example 3.14. Chopin, Piano Concerto No. 2 in F Minor, Op. 21, mvt. I, mm. 98–100 (piano part only)



Example 3.15. Chopin, Polonaise-Fantaisie, Op. 61, mm. 127–132



octatonic scales can be obtained by "splitting" the fifth degree of a melodic minor scale into the two pcs that surround it by a half step.[67] For example, if one splits the fifth degree of F melodic minor, C is replaced by B and C#, thus producing octatonic$_{1,2}$.

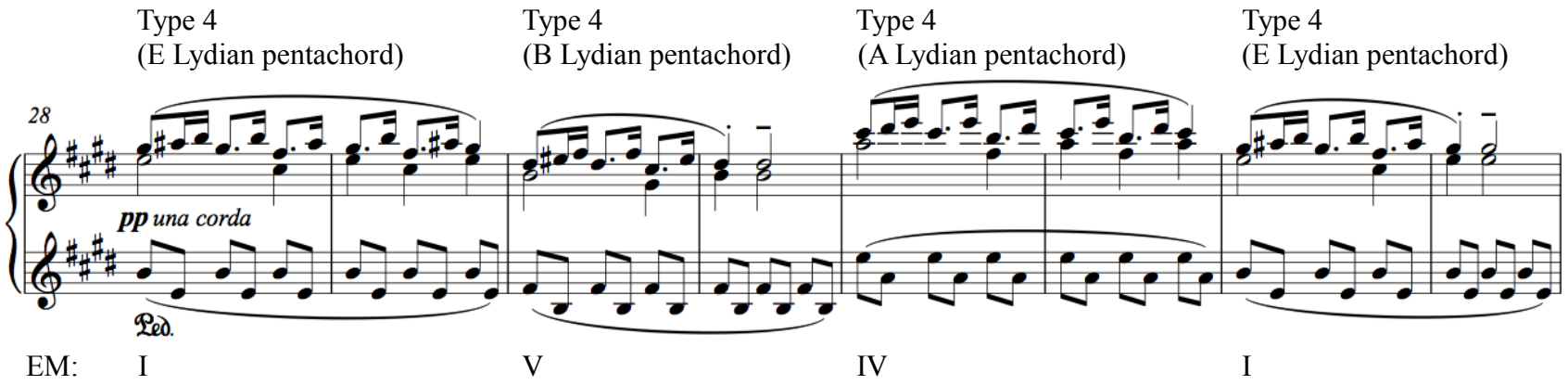
Chopin also uses octatonic Type-4 CSSM in his Polonaise-Fantaisie dating from 1846 (Example 3.15, above). The chord progression of mm. 127–128 is an old form of deceptive resolution (used frequently by Bach, for example) that traditionally prolongs dominant harmony within a minor-key 5–↑6–↑4–5 bass line, but in this example Chopin reinterprets the diminished-seventh chord so as to modulate to the distant key of B minor. Importantly, the ambiguous (with respect to key) structure of the octatonic scale allows it to serve as a *pivot scale* in this example, which allows the concurrent diminished-seventh chord to serve as an enharmonic pivot chord.[68] Type-2 or Type-3 CSSM, on the other hand, would express either the preceding key of G minor (or an altered form of D major) or the following key of B minor, which would spoil the ambiguity of the diminished-seventh harmony and its pivot function.

A different flavor of Type 4 is presented in Example 3.16. This enchanting passage, which suggests a dream of one's distant homeland, given this begins the contrasting middle section of the minor-key piece titled "Hjemve" (often translated as "Homesickness"), is made more dreamlike through the use of Type-4 CSSM—what

[67] Callender (1998) and Tymoczko (2004; 2011) discuss this possible transformation.

[68] Notice, however, that the B-flats begin to be spelled as A-sharps in m. 131. I do not believe this change of spelling has any substantial implications for how the passage should be heard; it only helps the performer prepare for the approaching key of B minor.

Example 3.16. Grieg, *Lyric Pieces, Vol. VI*, Op. 57, No. 6, "Hjemve" ("Homesickness"), mm. 28–35



could be called a Lydian pentachord—for each chord.[69] Though the "A Lydian pentachord" CSSM of the IV chord (mm. 32–33) contains no pcs outside of the DSS of E major, thus potentially suggesting Type 1, this is only happenstance; and it provides an excellent demonstration of why CSSM types cannot be defined simply in terms of pc content. The first two measures are certainly oriented to a tonic of E (coming immediately after a tonic closure on E minor ending the first section of the piece), resulting in a scale-degree hearing consistent with E Lydian (though, strictly speaking, the E Lydian pentachord is the only scalar contiguity confirmed by the music). Therefore, the obvious transpositions of the idea to B and A will likewise be heard as B Lydian and A Lydian. To be sure, the CSSMs in this example cannot be reasonably heard in any other orientations. Attempts to explain it in terms of traditional major or minor scales will not yield any convincing, consistent results. Furthermore, Grieg's transposition of the same Lydian-pentachord idea over three different chords epitomizes the principle of vertical composition.[70]

This concludes the examples of each of the four CSSM types. The remainder of this chapter considers certain challenges in the analysis and identification of CSSM.

3. Type-2/3 Ambiguity

Many interpretive decisions are involved in the analysis of CSSM: one must determine a DSS (which could be variable), a chordal zone, the portions of chordal embellishment that are scalar, and how that scalar material is best understood in relation

[69] The potential Lydian sixth degrees in each chordal zone might be imagined as scalar, the case in which the CSSMs might be named as Lydian hexachords, but the music does not articulate an unequivocally scalar interval on either side of these notes.

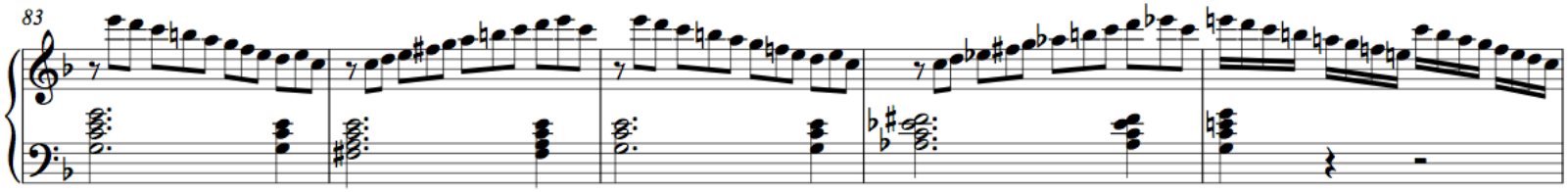
[70] Compare this to Proctor's (1978) *transposition operation*, which for him is an indicator of a "second practice" of harmony that emerged in the nineteenth century.

to the chord and the DSS. Once the first three of these decisions are made, the last one—deciding how to understand the scalar material—is usually rather easy, and the CSSM usually fits one of the four types without much trouble. However, some examples of CSSM are more ambiguous. One particularly common scenario of CSSM ambiguity in classical music is that in which the CSSM occurs with a potential secondary chord (such as a potential V7/V) and can be reasonably interpreted as either Type 2 or Type 3. I call this "Type-2/3 ambiguity." This short section discusses some examples of Type-2/3 ambiguity so as to demonstrate how one might determine either the Type-2 or the Type-3 interpretation to be more appropriate, or how one might accept the ambiguity and acknowledge both possible interpretations.

Type-2/3 ambiguity occurs because of the capacity for many potential secondary chords and their CSSM to be interpreted in multiple ways. Music theorists are familiar with the fact that these chords can be labeled in different ways, each of which suggests a slightly different perspective. For example, in Mozart's K533/I (shown in Example 3.17, which adds to Example 3.6 the two measures that precede it), measure 84 could be labeled as #iv^{ø7}, vii^{ø7}/V, or even as G: vii^{ø7} (as shown in Table 3.2, to be discussed in more detail below). North American music theorists today would probably be divided between preferences for #iv^{ø7} and vii^{ø7}/V.[71] These labels might be taken to imply three different claims about compositional or theoretical derivation or three different claims about the tonic orientation(s) we hear (i.e., scale-degree hearing). Alternatively, one or

[71] Although hardly any theorist today would ever use the label of G: vii^{ø7}, remember that such labels were not uncommon for music theorists of the eighteenth and nineteenth centuries such as Gottfried Weber.

Example 3.17. Mozart, Piano Sonata in F Major, K533/494, mvt. I, mm. 83–87



CM:	$V^{6/4}$	**#iv^{ø7} or vii^{ø7}/V?**	$V^{6/4}$	Ger^{+6}	$V^{6/4}$
CSSM:	Type 1	**Type 2 or 3?**	Type 1	Type 2	Type 1
	C major	**C major #4 (= Lydian) or G major?**	C major	= C harmonic minor #4	C major

Table 3.2. The correspondence of different possible interpretations of m. 84 of Mozart's K533/I

Chord Label:	**CSSM Label:**	**Relative Level and Scope:**	**Tonic Orientation(s) Heard in m. 84:**
C: #iv^{ø7}	CM: Type 2 C major #4 (= Lydian)	Deep and global	C (on all levels)
C: vii^{ø7}/V	CM: Type 3 G Major	Local, but within context	G at the foreground level (the CSSM and the chord); C at a deeper level (only the chordal notes)
G: vii^{ø7}	GM: Type 1 G Major	Local and isolated	G (at every level reached by m. 84 material)

another label might sometimes be chosen based on convenience only. I will discuss only the implied claims about derivation and scale-degree hearing.

Regarding compositional or theoretical derivation, the label of #iv^{ø7} suggests that the chord is derived from the "substance" of the C major DSS. The label of vii^{ø7}/V, on the other hand, suggests a multi-step derivation in which the C major DSS gives rise to its V chord, which in turn gives rise to its own G major scalar space, from which the chord is derived. Thus, the chord is only indirectly related to the C major DSS, but it is still ultimately derived from it. (In fact, this chord label could be written more explicitly as "C: V: vii^{ø7}"). Finally, the label of G: vii^{ø7} also suggests that the chord derives directly from a G major scalar space, but it says nothing about where this G major scalar space may have come from, thus dissatisfying those who seek organic unity in the passage. Because I personally see value in understanding this passage as organically unified (and the passage is very easy to understand in this way), I find that either of the first two chord labels discussed above are appropriate. However, if one also values the principle of Occam's razor, the label of #iv^{ø7} is more desirable because of the much simpler derivation that it implies.[72]

Regarding scale-degree hearing, the label of #iv^{ø7} suggests that C is heard as the active tonic note, the label of vii^{ø7}/V suggests that G is heard as a temporary tonic note within a larger domain of C, and the label of G: vii^{ø7} suggests that G is the only tonic note heard in that measure. Thus, the hearings implied by these labels range from the relatively deep to the contextualized local to the isolated local, respectively. Because

[72] Put very simply, Occam's razor is a general principle of favoring simpler explanations over unnecessarily more complicated ones.

neither a G major triad nor any chord progression characteristic of the key of G major occurs in this passage, I personally am not able to hear the chord in m. 84 in terms of G major scale degrees (not unless I mentally supply an extra G major chord for it to resolve to). The boundary notes of the right-hand scalar runs (C and E) strongly suggest maintained elements of C major, and C4 and C5 are the only two notes emphasized in every measure, making me hear the entire passage in terms of C major scale degrees.[73] Furthermore, this hearing is consistent with what I found to be the most desirable compositional/theoretical derivation, that suggested by the label of #iv^{ø7}. These findings should make music theory teachers seriously question the currently most popular method taught in the United States—the method of labeling such chords as vii^{ø7}/V, primarily because it still involves "diatonic" components (vii^{ø7} and V). Is the value of explaining every chord as fitting exactly into some major or minor scale more important than reflecting a sensible and desirable compositional derivation and scale-degree hearing?[74]

So far, I have primarily discussed the possible interpretations of the *chord* in m. 84. Now I will discuss the CSSM more directly. Table 3.2 shows how the different chord interpretations correspond to different CSSM-type labels and to different perspectives and hearings of the measure. Notice that the three different chord labels correspond to three different CSSM types. One should strive for consistency between chord labels and CSSM labels as much as possible, and one's interpretations of an instance of CSSM and its concurrent chord can inform each other. In the case of this example, my interpretation

[73] To be sure, this emphasis on C, for me, also overrides any potential for F-sharp or A to sound like a local root or tonic; therefore, I cannot hear the CSSM as F-sharp Locrian or as A Dorian.

[74] Put another way, we eventually succumb to chromatic (non-monoscalar) understandings of chords such as augmented-sixths, so why should we be afraid to understand the chord in m. 84 of Example 3.17 as chromatic (as not fitting exactly into its source scale)?

of the CSSM is consistent with my interpretation of the chord; these interpretations are described by the first row in Table 3.2. However, this fortunate consistency of interpretations was made possible by the fortunate consistency of my scale-degree hearing and my understanding of compositional derivation. Such is not always the case: one's understanding of compositional derivation will not always match one's scale-degree hearing, and this does not necessarily reflect a fault or weakness. In fact, the next example I discuss presents a strong possibility for this conflict of interpretations.

Example 3.18, from Chopin's G Minor Ballade, is perhaps more ambiguous and more challenging. The excerpt begins in the midst of a section that is unequivocally in the key of E-flat major. The potential secondary dominant-seventh chord that begins the excerpt (mm. 162–163) could be interpreted as either $II^{4/3}$ or $V^{4/3}/V$. Accordingly, the CSSM of this chord can be reasonably explained as either Type 2 (reflecting an alteration of the E-flat major DSS) or Type 3 (a new source scale of B-flat major).[75] Many musicians trained in classical music theory will see the F7 chord and immediately think of the key of B-flat major. By comparison, this F7 signifies the key of B-flat major more strongly than the $F\#^{Ø7}$ in Example 3.17 signifies the key of G major. Furthermore, whereas the CSSM in Example 3.17 is bounded by notes that consistently encourage a maintained tonic orientation of C (the global tonic of the excerpt), the F7 CSSM in Example 3.18 does not contain any cues that maintain a sense of the global key of E-flat major. Therefore, it is very difficult to *hear* this CSSM as Type 2—that is, as articulating an altered E-flat major scale with E-flat as scale degree 1. We are much more likely to

[75] NB: The E-naturals in this CSSM are clearly understood as sub-scalar notes, which do not factor into CSSM interpretation.

Example 3.18. Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 162–167

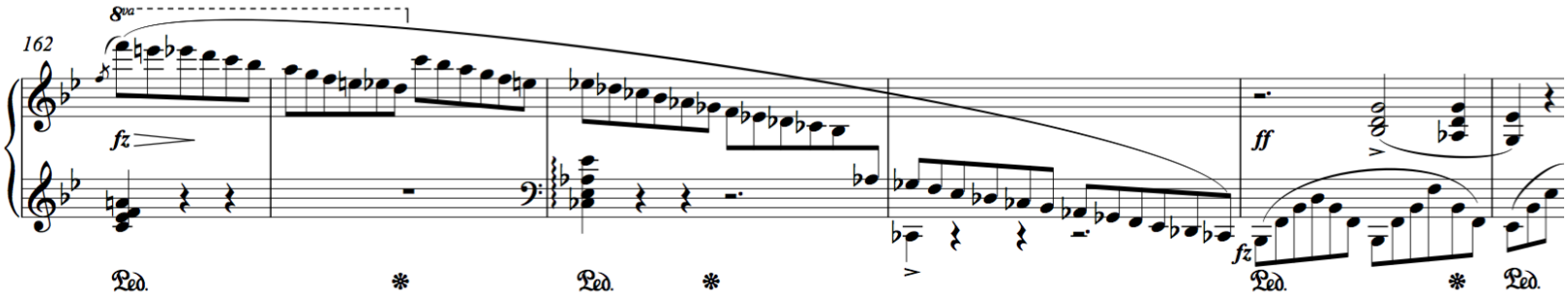


Table 3.3. Conflicting interpretations of mm. 162–163 of Example 3.18

	Compositional/theoretical derivation	**Foreground scale-degree hearing**	**Scale-degree hearing of the next deeper level**
F7 chord	Derived as a chromatic chord in E-flat major (suggests **II$^{4/3}$**)	B-flat major (suggests **V$^{4/3}$/V**)	E-flat major (suggests **II$^{4/3}$**)
CSSM	Either **Type 2** (derived from the alteration of the E-flat major DSS) **or Type 3** (derived from B-flat major)	B-flat major (suggests **Type 3**)	(does not reach the next deeper level)

hear it as B-flat major.[76] Yet, the F7 chord itself seems most appropriately heard in terms of the global tonic key of E-flat major. In fact, F7's function as a chromatic chord in the key of E-flat major is repeatedly hammered into the listener's ear in the phrases that immediately precede this excerpt. Table 3.3 (above) summarizes all of the most reasonable interpretations of the chord and the CSSM. I find that a chord label of $II^{4/3}$ and a somewhat contradictory CSSM interpretation of Type 3 (B-flat major) are the most satisfying options, but in cases that are as tangled as this one, we might instead choose to use multiple labels so as to acknowledge and accept the ambiguity.

One should keep in mind that if potential-secondary-chord CSSM involves a scalar pc that is not in the DSS or the concurrent chord, the CSSM is usually not ambiguous and is more convincingly Type 3. For example, if a B7 chord occurs in the key of C major and is embellished with CSSM potentially belonging to E melodic minor and including a scalar C-sharp, this C-sharp is best explained as Type 3, derived from E melodic minor (rather than as Type 2a, derived from C major).[77]

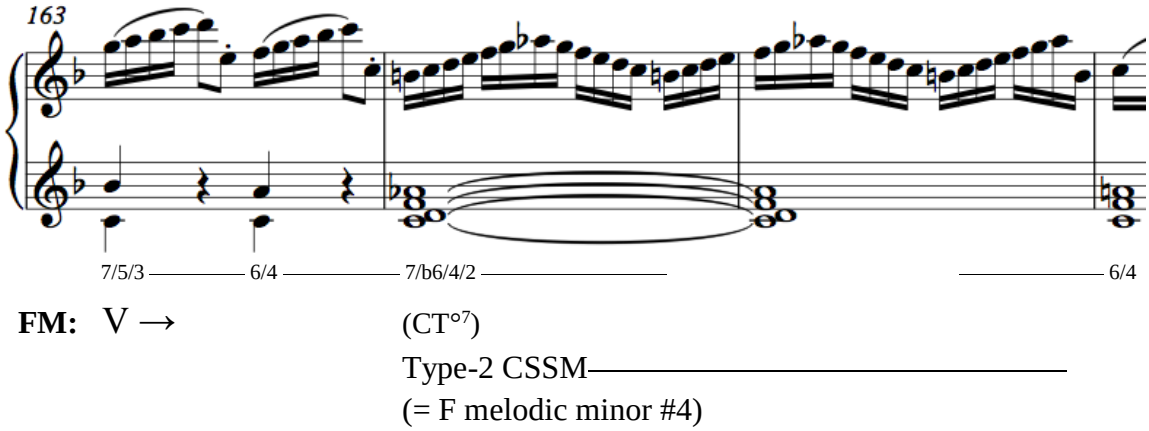
Another potential secondary chord with multiple possible interpretations is the $vii^{\circ 7}/V$ chord, which could also be labeled as $\#iv^{\circ 7}$ or, when resolving to a cadential 6/4 chord, as $CT^{\circ 7}$ ("common-tone diminished-seventh," which does away with the claim of

[76] To modern ears, this CSSM is perhaps most easily heard as F mixolydian. I do not list this as reasonable interpretation, however, because it seems stylistically inappropriate. A much better candidate for such a local mixolydian hearing of CSSM is found with the lengthy Db7 chord in measures 51–58 of Chopin's Nocturne No. 1 in B-flat Minor, Op. 9/1. Most such potential Type-4 hearings of CSSM in classical music are usually understood as compositionally derived from traditional major/minor sources, however (suggesting Type 1, Type 2, or Type 3).

[77] Here, I limit the discussion to the four CSSM types proposed in this chapter rather than considering the multitude of possible compositional techniques that could arrive at such CSSM. One could certainly imagine other explanations for this and other examples of CSSM. For example, in Chapter VI, I suggest a possible compositional technique that I call "distribution adjustment," which involves moving a scale degree by a half step so as to create a more even scalar-pc distribution.

a root note). The type of CSSM conventionally used to melodize this kind of chord in classical repertoire, if amounting to a complete scale, equates to the form of what I call "melodic minor #4."[78] Whether in a major or a minor key, this kind of CSSM could be reasonably interpreted as either Type-2 (the result of the chromatic pcs of the chord replacing corresponding pcs of the DSS), or as Type-3, derived from the major scale built on the dominant, which is altered according to the chord so as to equate to harmonic major built on the dominant. In Example 3.19, the rootless chord label of CT°^{7} is appropriate given that this chord is only one stopping point in the midst of upper-voice planing that clearly anticipates the cadential 6/4 in m. 166, which unequivocally suggests the key of F major. Accordingly, the Type-2 interpretation fits best here, and one would be hard-pressed to support an argument for a Type-3 interpretation in which the CSSM is derived from C major with the sole alteration of A-flat being attributable to the chord.

Example 3.19. Mozart, Piano Sonata in F Major, K533/494, mvt. III, mm. 163–166



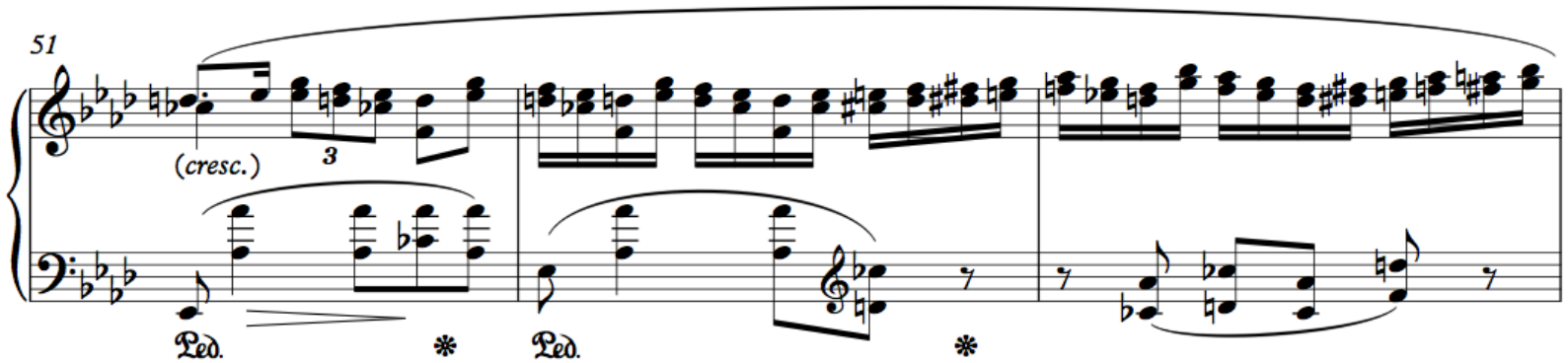
[78] For the sake of consistency, I use this name for all instances of this scalar structure throughout this study, regardless of potentially different derivations for different instances. (For example, the corresponding CSSM in Example 3.19 would more appropriately be named "F major b3 #4.") As will be observed later, this kind of CSSM often also exhibits variability with a perfect fourth degree.

In contrast, mm. 51–55 of Example 3.20 tend to sound like Type-3 E-flat harmonic major due to the lack of A-flat triad material, the initial E-flat pedal, the rather long duration of the chordal zone, and Chopin's dramatic resolution to the pure E-flat major triad at m. 56. Accordingly, I prefer the chord label of vii$^{\circ 7}$/V and a Type-3 understanding of this CSSM, with E-flat harmonic major understood as an altered (and arguably variable, as m. 55 suggests) scale derived from E-flat major, which in turn is derived from the E-flat major triad. However, to label the chord as #iv$^{\circ 7}$ and understand the CSSM as Type-2 "A-flat melodic minor #4" could also be reasonable from a theoretical viewpoint.

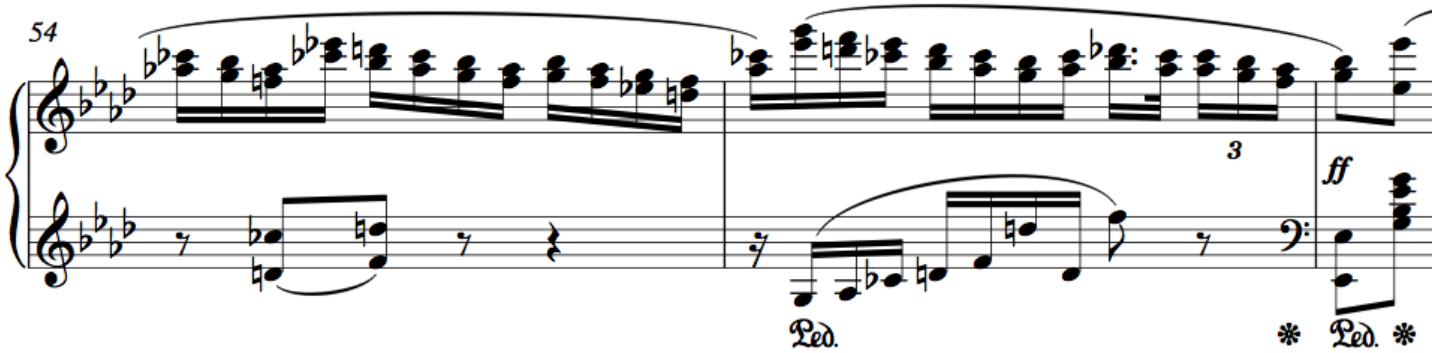
4. Interpreting Subsets or Supersets of More-Familiar Scalar Structures

CSSM that creates a pc subset or superset of a more familiar scalar structure—such as CSSM that creates a pentatonic pc set—can sometimes be interpreted in multiple different ways. However, examples of such ambiguities in classical repertoire are far fewer than examples of Type-2/3 ambiguity. This is because, in classical music, pc subsets or supersets of the more familiar scalar structures are rarely treated in a way that shows all of their intervals to be scalar. For example, the three-semitone intervals in the familiar pentatonic scale are rarely treated as unequivocally scalar intervals in classical music. Rather, these intervals, when articulated melodically, are usually better understood as chordal intervals (though the corresponding chordal structure can be much smaller and much more brief than the chords we usually talk about in music—see Chapter IV) or as non-structural intervals. And in the case of supersets such as a "diatonic+1" pitch set (for example, [C4 D4 E4 F4 G4 A4 Bb4 B4 C5]), one or more half-steps are almost always understood as sub-scalar intervals.

Example 3.20. Chopin, Polonaise-Fantaisie in Ab, Op. 61, mm. 51–56



AbM: vii°^{7}/V (over ^5 pedal) →
Type 3 (= Eb harmonic major) → (sub-scalar—) (sub-scalar—)



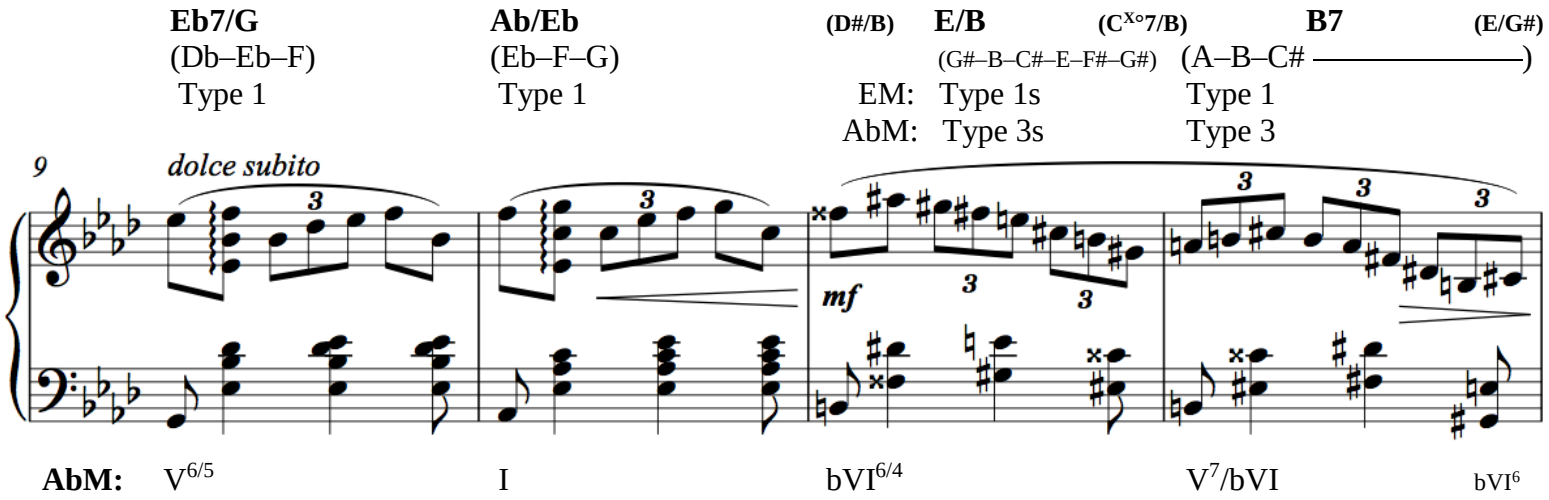
AbM: vii°^{7}/V → V
Type 3 (= Eb harmonic major) →
↑
(variability)

Therefore, if a subset or superset of a more familiar scalar structure is understood as just that and not as a scalar structure in itself, it is not entirely CSSM by definition, so any questions about CSSM interpretation would apply only to the portion of music that is actually defined as CSSM. However, if such a subset or superset *is understood as completely scalar*, then it is entirely CSSM and we can consider how to best understand its derivation or tonal meaning. If the CSSM in question is also understood as belonging to the concurrent DSS—an unlikely scenario in classical music, to be sure—it is simply Type 1. More likely to occur in classical music are situations like that of m. 11 in Example 3.21, below. Here, the E major pentatonic nature of the melody could reasonably be understood as completely scalar. The chords of mm. 11–12 are understood in terms of a somewhat local E major DSS.[79] In the sense of pc collection, the E major pentatonic CSSM seems like merely Type 1, as all of its pcs belong to the DSS. However, if one really understands the intervals of E5–C#5 and B4–G#4 as scalar intervals (and not as skips), these scalar intervals do *not* belong to the DSS. In this case, the CSSM does not comfortably fit any of the four types as they have been defined so far. Therefore, I identify this CSSM as "Type 1s," where the suffix "s" indicates a scalar structure that is a proper *pc* subset or superset of the DSS, but not a proper *scalar-interval* subset.

The suffix "s" can analogously be attached to other CSSM type numbers when applicable. For example, had the E major chord of m. 11 in Example 3.21 functioned only within the global A-flat major DSS, with no signs of an E major DSS, the E major pentatonic CSSM could be identified as Type 3s. This would identify the CSSM as still

[79] However, at the next deeper level, the main structural chords of these measures, EM and B7, are understood in terms of the tonic A-flat major DSS.

Example 3.21. Fauré, Nocturne No. 3 in A-flat Major, Op. 33/3, mm. 9–12



derived from a Type-3 traditional major or minor source scale, but also as articulating one or more different scalar intervals. When considering potentially Type-4s CSSM, one might also consider whether the supposed subset or superset could instead be regarded as the primary structure itself (keeping in mind that the Type-4 category allows for any non-major/minor-derived scalar structures), and thus as simply Type 4. For example, if one encountered CSSM that articulated a seven-pc octatonic subset as completely scalar, one could consider whether it should be understood in terms of the more familiar octatonic scale (and thus identified as Type 4s) or simply on its own terms (and thus identified as Type 4).

To treat such subset or superset materials with this suffix rather than with their own additional type number reflects their slightly less distinct identities, and it also allows for more interpretive flexibility (i.e., the suffix could be attached to any of the four type numbers). Now that four different suffixes have been proposed in different parts of this chapter ("c," "v," "a," and "s"), the chapter summary below provides a concise summary of all of the CSSM types and suffixes (Figure 3.4).

5. Summary of Chapter III

In this chapter, I have proposed a way to interpret and categorize the numerous examples of CSSM one might find in classical music. The four CSSM types, along with four additional acknowledgements of possible special features or conditions, not only provide a quick way to make sense of an example of CSSM, but they also break ground for a broader theoretical consideration of how various examples of CSSM might be derived, and each CSSM type points to different structural and functional meanings, all of which in turn have implications for musical expression.

Because the four types and four special features or conditions were presented in different parts of this chapter, Figure 3.4 below provides a complete and concise summary of all of them.

Figure 3.4. Summary of all of the CSSM types and possible special features or conditions

Horizontal Types:

Type 1: CSSM that is understood as purely representing the concurrent DSS
Type 2: CSSM that is understood as an altered representation of the DSS

Vertical Types:

Type 3: CSSM that is understood in terms of a major/minor-based scale that is not directly related to the DSS
Type 4: CSSM that is understood in terms of a *non*-major/minor-based scale that is not directly related to the DSS

Possible Special Features or Conditions (indicated as suffixes to any type number):

a: Additional alterations to the DSS structure beyond chromatic chordal pcs
c: Conflict between a scalar note and a chordal note (non-scalar ic1 interval)
s: Scalar subset or superset of the scalar structure suggested by the type number
v: Variable scalar space

We have also seen that the four types do not constitute a perfect taxonomy; ambiguity sometimes arises—particularly between Types 2 and 3. Furthermore, the four types proposed here are certainly not the only way to categorize or understand CSSM. I consider other approaches to CSSM in later chapters. The next chapter, however, considers theoretical issues prompted by the analyses in this chapter.

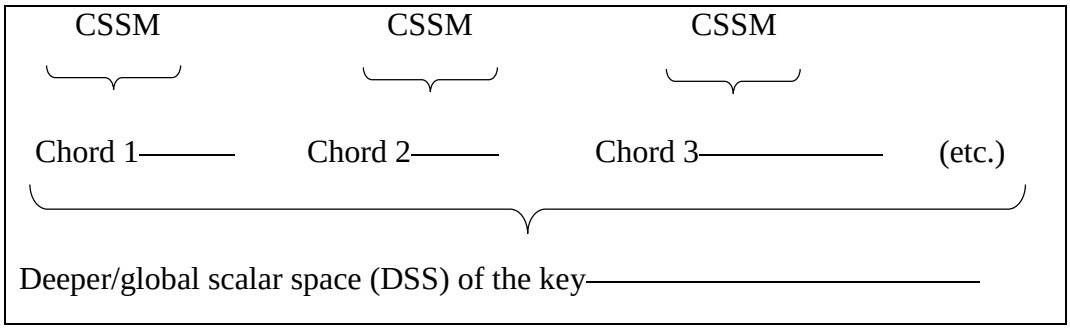
CHAPTER IV

GENERAL METHODOLOGICAL AND THEORETICAL ISSUES

Now that Chapter III has provided several examples and analytical discussions of CSSM, readers should have a better idea of what theoretical and methodological issues are at stake. Many of these issues would risk becoming tedious and too abstract had they been addressed before Chapter III. In this chapter I address some crucial methodological issues that underlie most aspects of this study. In short, those issues concern the definitions and the proper identification of three general kinds of entities: 1) scalar material (as distinguished from chordal and sub-scalar material, and from non-structural intervals)—mostly in terms of CSSM but also in more general terms, 2) chords and chordal zones, and 3) keys and their DSS component.

These three kinds of entities respectively form the three main sections of this chapter. They also constitute what I call the *key-chord-CSSM paradigm*, which applies to a large percentage of classical music, and which describes the ideal scenario for CSSM study. As Figure 4.1 illustrates, a sustained key typically involves some sort of abstract deeper and global scalar space—that is, a DSS. Usually, multiple successive chords are understood as "moving through" the DSS. In turn, each chord might be embellished so as to articulate its own CSSM. This paradigm does not constitute a proper tonal or event hierarchy, but rather a sort of ordering of conceptual priority. Note also that both DSS and CSSM are composed of scalar material whereas chords are of course composed of chordal material. However, DSS is abstract and theoretical, whereas CSSM is "actual" scalar material in the music at hand due. Though both scalar entities, they are addressed mostly in separate sections of this chapter due to their different functions in music.

Figure 4.1. A simple depiction of the *key-chord-CSSM paradigm*, showing abstract relationships between the DSS of a key, chords within it, and CSSM within each chord. (NB: This diagram should not be misunderstood as representing an event hierarchy or tonal hierarchy.)



The following sections can be thought of roughly as addressing the definition and identification of each component of the key-chord-CSSM paradigm, proceeding in what might be thought of as reverse order. Section 1 addresses the definition and identification of scalar material as opposed to sub-scalar and chordal material—issues that primarily pertain to CSSM, but also somewhat to the concepts of chord and DSS. Section 2 then addresses the definition and identification of chords and chordal zones, and Section 3 addresses the definition and identification of key—particularly its DSS component. Musical examples aid the discussions throughout.

1. Defining and Identifying Scalar Material

This section begins by presenting a general classification of tonal materials into four types: chordal, scalar, sub-scalar, and non-structural. This classification underlies most aspects of the present study, and it facilitates careful and meaningful analysis. This is followed by some demonstrations regarding proper identification of these types of tonal materials in classical music, with particular focus on scalar material. Different levels of abstraction are then considered with regard to scalar material. The section ends with some remarks about why all of this matters—why scalarity is musically significant.

Four Types of Tonal Materials

"CSSM" stands for "chord-specific *scalar* material," so the identification of CSSM depends on the proper identification of scalar structure. Recall from Chapter I how scalar material was one of three proposed kinds of *melodic* material specific to individual chords—along with arpeggiative and sub-scalar material (Example 1.1). Broadening the perspective, these three categories were also compared to three levels in Lerdahl's (2001) "basic space" tonal hierarchy (Figure 1.1). In an even broader perspective, I propose here that we can categorize *all* tonal materials on a given structural level as chordal, scalar, sub-scalar, or non-structural.

When compared to Lerdahl's basic space, chordal material corresponds to Lerdahl's levels *a*, *b*, and *c*; scalar material corresponds to level *d*; and sub-scalar material corresponds to level *e* (see Figure 1.1). In this way, these three types of material could be called "tonal-hierarchical level types" (non-structural material, of course, does not correspond to any tonal-hierarchical levels). However, whereas Lerdahl's tonal hierarchies are used as abstract and complete hierarchizations of pitch space, which can then be said to underlie a particular span of music (much like my concept of DSS), I use the four types of tonal material proposed here to directly categorize and hierarchize the materials (which roughly equate to the events) specific to a given structural level in an excerpt of music. In other words, this approach has as much to do with event hierarchy as it does with tonal hierarchy,[80] and it is perhaps closer to the aims of Levy's 1989

[80] Cf. Lerdahl's (2001, 41) distinction between even hierarchies and tonal hierarchies: "An event hierarchy…represents hierarchical relationships inferred from a sequence of events" whereas "a tonal hierarchy, in contrast…embodies the hierarchical relations that accrue to an entire tonal system beyond its instantiation in a particular piece." The relationship between tonal and event hierarchies is complicated and still inadequately understood in scholarship, and part of this is because the term "tonal hierarchy" has been used to mean several different things (compare its uses in Bharucha 1984, Järvinen 1995, Krumhansl 1990,

dissertation than those of Lerdahl. I am not attempting to assemble or even suggest complete tonal hierarchies, but my approach does observe certain tonal-hierarchical principles presented by Levy and Lerdahl.

This classification of tonal materials could be the topic of its own study, but for now I will attempt to keep its presentation as simple as possible. Table 4.1 summarizes how the three structural categories (chordal, scalar, and sub-scalar) are distinguishable in multiple ways—quantitatively and qualitatively. Rather than viewing this as an overly compartmentalizing theory forced upon music, I believe these categories have long been acknowledged (at least latently) by Western musicians and theorists alike, and Table 4.1 shows that they all carry meaningful musical implications.

Clarification of Terminology

The aforementioned categories are described as types of tonal material. "Tonal material" is a general term that could refer to individual notes, pitches, or pcs; intervals between them (specific to a given structural level of the music); or larger structures. Though one could glean the essential points from Table 4.1 above, more precise definitions are given below for the sake of clarification and formality. Readers who are interested only in the broader points of this chapter could skip to the next sub-section: "Demonstrations of the Proper Identification of Scalar Material."

Lerdahl 2001, and Levy 1989, and see Butler's [1989] comments regarding such confusions). This all suggests several directions for potential future study.

Table 4.1. Comparison of chordal, scalar, and sub-scalar materials in classical music

	Chordal Material	**Scalar Material**	**Sub-Scalar Material**
Musical Functions	Provides local points of reference ("anchors") for melody; often participates in deeper-level melodic lines, which can be scalar, etc.	Primary medium of melody; one of the definitive aspects of key	Usually decorative; sometimes imitative of portamento or glissando
Prolongation	Usually prolonged (and sometimes literally sustained) throughout the chordal zone	Prolongs chordal notes/intervals; prolonged by sub-scalar material	Never prolonged; always prolongs scalar or chordal material
Voice-Leading	Usually voice-leads into notes of the next chord	Usually only voice-leads to the immediately next scalar or chordal note*	Voice-leads to the immediately next note
Resolution	Chordal notes require no resolution within the chordal zone	Scalar non-chordal notes require or imply resolution to chordal notes, usually via scale step(s) but sometimes via sub-scalar step(s)	Sub-scalar notes always require or imply resolution to a scalar or chordal note via half-step motion
Prototypical Structures	Intervals larger than whole steps; major and minor triads	Whole-step intervals; diatonic scalar structure and its contiguous subset structures	Half-step intervals; the chromatic scale

* Tymoczko (2011) describes a sort of scale-to-scale voice-leading, showing that successions of scalar structure in classical music tend to follow principles similar to those of chord-to-chord voice-leading. This sort of voice-leading might be understood as more abstract than the traditional sense of the term, which I intend here.

Chordal materials:

- A **chordal note, pitch, or pc** is one that, on a specified structural level of the music at hand, serves as a potential **anchor** (point of departure or resolution[81]) for scalar and sub-scalar materials. Its status as chordal might apply only to this structural level; on deeper levels it might be scalar or sub-scalar. It can participate in chordal, scalar, or sub-scalar intervals. Any note that is involved in any chordal structure is chordal on the level of that chordal structure.
- A **chordal interval** is a harmonic or melodic interval that involves two notes that are chordal in status at the given structural level, and that are understood as conceptually sustained together for some time—however brief, and that serve as potential anchors for scalar and sub-scalar materials.
- A **chordal structure** (or simply a **chord**) is composed of one or more contiguous chordal intervals on a given structural level, provided that it is reasonably understood as one meaningfully unified structure (and not as switching from one to another). Every note, pitch, or pc of a chord is understood as conceptually sustained together for the entire duration of the chordal zone, and each note, pitch, or pc is a potential anchor for scalar and sub-scalar materials.

Scalar materials:

- A **scalar note, pitch, or pc** is defined as one that, on a specified structural level of the music at hand, is understood as departing from or eventually resolving to a chordal anchor note, and it serves as a potential anchor for sub-scalar materials. It also must

[81] This term is used after Bharucha 1984a.

participate in a scalar interval on that structural level. Its status as scalar might apply only to this structural level; it might have different statuses on other structural levels.

- A **scalar interval** is defined here as a melodic (not harmonic) interval that involves two notes, at least one of which must be scalar and the other which can be either scalar or chordal at the given structural level. On any level, this interval must be either scalar or non-structural.
- A **scalar structure** is composed of one or more contiguous scalar intervals on a given structural level, provided that it is reasonably understood as one meaningfully unified structure (and not as switching from one to another). To recognize a scalar structure is to understand a diachronic entity in somewhat of a synchronic sense; therefore, the entire structure must make sense for the entirety of its duration.

Sub-scalar materials:

What I refer to as sub-scalar materials are more commonly referred to as "chromatic." This would be a problematic and misleading use of the term "chromatic," however. In this study, "chromatic" refers to notes, intervals, or chords that lie at least partially outside (or "in the cracks of") the DSS, similar to the traditional term "non-diatonic." However, chromatic notes and intervals can still be scalar—even chordal. Hence the necessity for the term "sub-scalar."[82]

- A **sub-scalar note, pitch, or pc** is defined as one that, on a specified structural level of the music at hand, is understood as departing from or eventually resolving to a scalar or chordal anchor note. It also must participate in a sub-scalar interval on that

[82] Furthermore, not all sub-scalar intervals are chromatic; some are diatonic, as demonstrated in the next footnote with reference to Example 4.1 (below). Tymoczko (2004; 2011) sometimes uses the term "nonscalar" (and usually in reference to notes rather than intervals), but in my terminology this is less specific, potentially referring to chordal or sub-scalar notes or intervals, or to non-structural intervals.

structural level. Its status as sub-scalar might apply only to this structural level; it might have a higher status on a relatively foreground structural level.

- A **sub-scalar interval** is, in classical music, always a melodic half step (semitone) that involves two notes, one or both of which is sub-scalar at the given structural level. On any level, this interval must be either sub-scalar or non-structural.
- A **sub-scalar structure** is composed of one or more contiguous sub-scalar intervals on a given structural level, provided that it is reasonably understood as one meaningfully unified structure (and not as switching from one to another). To recognize a sub-scalar structure is to understand a diachronic entity in a synchronic sense; therefore, the entire structure must make sense for the entirety of its duration.

Non-structural materials:

- A **non-structural note, pitch, or pc** would, on a given structural level of the music at hand, have no tonal relationship with any other notes, pitches, or pcs. Such an event would lie outside the vocabulary of classical music. The note could also be described as purely random, or as contextually atonal.
- **Non-structural intervals**, on the other hand, are abundant in any kind of tonal music. They are simply intervals between any two notes that, on the given structural level, have no direct tonal relationship with each other. Non-structural intervals can be harmonic or melodic, and they can involve adjacent or distantly separate notes—even two successive notes in a principal melody, as we will later see.
- The idea of a **non-structural structure** is self-contradictory, and is therefore not possible for the purposes of this study.

Demonstrations of the Proper Identification of Scalar Material

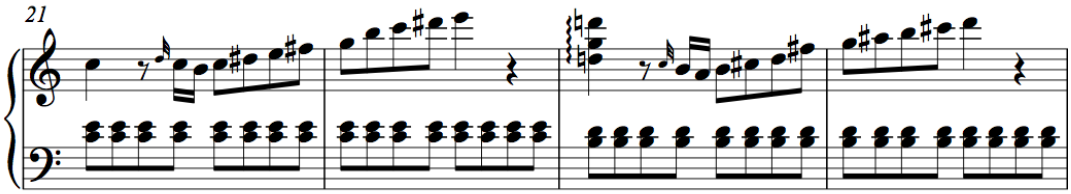
Now that an approach to analysis and its terminology have been presented, I will demonstrate how it can be useful—particularly as it aids the proper identification of scalar material in music. The most common mistakes in the identification of scalar material include 1) mistaking *sub*-scalar notes and intervals for scalar notes and intervals, 2) mistaking non-structural intervals for scalar intervals, and 3) mistaking a group of notes as constituting a scalar structure when it does not exhibit a contiguity of scalar intervals, or mistaking the nature of this contiguity. I now address some of these potential confusions through musical examples.

Scalar versus Sub-Scalar and Non-Structural Intervals

Example 4.1, an excerpt from Mozart's K309, clearly demonstrates how sub-scalar and non-structural intervals might be mistaken for scalar ones. Any scholar of classical music would agree that the D-sharps and F-sharp in mm. 21–22 and the analogous C-sharps and A-sharp in mm. 23–24 should not be considered as scalar notes (at least when considering each chordal zone in its entirety). Rather, they are *sub-scalar* notes because they are clearly derived as half-step neighbor-note decorations to the chordal notes of the C-major and G-major triads, respectively, rather than having any derivation from a scale (besides the chromatic scale, which is not actually a scale as defined in this study). In the melodic line of C–D#–E–F#–G in mm. 21–22, for example, *none* of the four intervals mediating these notes is a scalar interval. The motions of D#–E and F#–G are understood as sub-scalar intervals, while C–D# and E–F# are understood as non-structural intervals—that is, intervals that are merely incidental and are not a part of the tonal structure. Therefore, the only CSSM that occurs in this excerpt is in the

ornamental gestures of D–C–B–C in m. 21 and C–B–A–B in m. 23 (all of which is Type 1).[83]

Example 4.1. Partially sub-scalar embellishment of chords in Mozart, Piano Sonata in C Major, K309, mvt. I, mm. 21–24

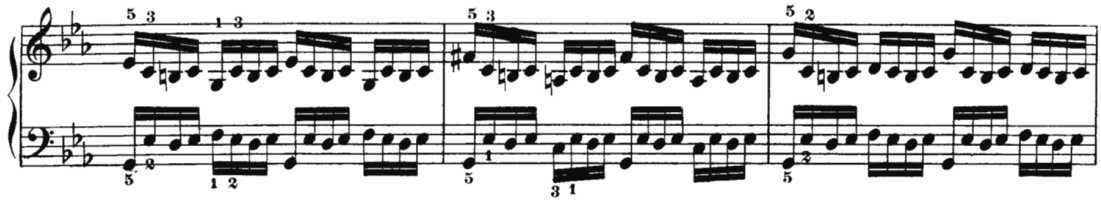


C: I V^6

Any half-step interval is potentially sub-scalar, so the analyst needs to be careful when they are present. Consider Example 4.2, from Bach's C-minor Prelude in *WTC I.* In the $CT°^7$ zone of m. 22 the half-step lower neighbors (B-natural and D) could potentially be merely sub-scalar embellishments, the case in which this measure would not contain any CSSM. However, these notes happen to belong to the C minor DSS, so they are reasonably understood as scalar lower neighbors, and can therefore be defined as CSSM. Importantly, this CSSM is Type 1 rather than Type 2, however. This is because the chromatic chordal F-sharps do not participate in scalar intervals within the chordal zone. The only clearly scalar intervals within the chordal zone are D–Eb and B–C, which are already within the DSS of C minor.

[83] Whether the B–C motion in m. 22 and the F#–G motion across mm. 23–24 should be considered as scalar is open to debate (see the discussion in the following paragraphs), but here I prefer to understand a motivic or compositional-process consistency for all of the half-step approaches in which they are all sub-scalar, despite that some of them incidentally belong to C- and G-major scales.

Example 4.2. J.S. Bach, Prelude in C Minor, from *WTC I*, BWV 847, mm. 21–23



Cm: i CT$^{\circ 7}$ i
(dominant pedal————————————————————————————)

The Burden of Proof for Non-Major/Minor Scalar Structures

In classical music, traditional major and minor scalar structures (including their contiguous subsets) are advantaged—because of cultural traditions rather than because of any supposed "natural laws." Major/minor structures are generally assumed by default when reasonable (as in Example 4.2). Non-major/minor scalar structures, on the other hand, carry a greater "burden of proof." Potential scalar intervals that would lie outside traditional major/minor structure must be shown to be convincingly structural and scalar in their musical treatment. For example, if the decorative ascents in Example 4.1 were subjected to retrograde resulting in melodic *descents* with all of the same notes, this would first of all be highly uncharacteristic of classical music, but it would nevertheless make the D-sharps and F-sharp in mm. 21–22 as well as the C-sharps and A-sharp in mm. 23–24 seem to be scalar because they would proceed to chord tones via whole-step or augmented-second motion rather than merely half-step motion, and because they would be highly uncharacteristic as unresolved sub-scalar suffix embellishments—especially when considering the unidirectional nature of this hypothetical melody.

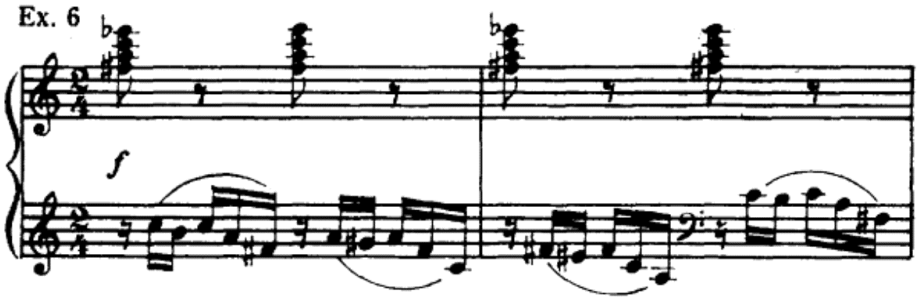
The burden of proof for non-major/minor scalar structures has caused scholars to debate their presence in numerous pieces, and to question when and how the first

legitimate use of octatonic structure (among other non-major/minor scalar structures) occurred in the classical repertoire. Street (1976, 820) correctly points out that instances such as shown here in Example 4.3, which is incidentally also from Mozart's K309, should be considered as merely "inadvertent." The G# in the first measure and the E# in the second measure of the excerpt are best understood as sub-scalar (and the analogous B-natural lower-neighbor embellishments in the surrounding gestures could similarly be understood as sub-scalar). However, I do not completely agree with Street's and other scholars' apparent methods for determining what is incidental and what is truly scalar. Street (particularly in his discussion of his Example 10) apparently treats the unidirectional scalar run as the indicator of true scalarity—even if it still allows an interpretation of merely sub-scalar half-step approaches alternating with non-structural intervals, as I interpret my Example 4.1 to contain. Furthermore, he implies that mere neighbor-note embellishment of a diminished-seventh chord—even if exhibiting whole-step motion—is not sufficient to establish true octatonic scalar structure (820).[84] Whether a number of separate such whole-step intervals should be taken altogether to suggest a particular scalar structure is another issue, which I address later in this section (in "Different Levels of Abstraction in Defining or Identifying Scalar Structure"), but Street's comments could potentially mean that CSSM such as that shown in my Example 3.14 (from Chopin's F-Minor Piano Concerto) is not truly octatonic. In Example 3.14, a clear stepwise-descending line is created on a deeper event-hierarchical level (though still subordinate to the chord) by the accented notes and those that are a step lower: Ab–G–F–

[84] On page 820, Street describes "cases where [the notes of the diminished-seventh-chord] are elaborated by the addition of adjacent *tones* or semitones" as "very much incidental" (italics added here for emphasis).

E–D–C#–B–Bb–Ab–G–F–E–D. This line both satisfies my requirement of resolution of potentially sub-scalar notes via stepwise motion larger than a half-step *and* Street's implied requirement of a unidirectional scalar run (which I do not necessarily require—see "Different Levels of Abstraction in Defining or Identifying Scalar Structure," below).[85]

Example 4.3. Merely illusory octatonicism in Mozart, Piano Sonata in C Major, K309, mvt. III, as shown in Street (1976, 820)



To summarize the foregoing discussions so far, there is unfortunately no simple way to "prove" whether a structure is scalar or sub-scalar, but we can use the following general guidelines to assist careful analysis and interpretation:

1) On a given event-hierarchical level, any half-step interval is potentially sub-scalar.
2) Larger intervals must be scalar, chordal, or non-structural for the event-hierarchical level on which they occur.

[85] As discussed earlier, other scholars such as Taruskin (1985) and Riley (2004) seem to imply that *any* potentially non-major/minor embellishment of a single chord is fortuitous or insignificant, mainly because they are interested in a scale's support of chord progressions. Such an assertion, if actually intended, would certainly be fallacious. That an entity might occur only at a surface event-hierarchical level or for a short span of time should not negate its identity or its musical significance.

3) Half-step intervals that are reasonably interpreted as consistent with the DSS can be understood as scalar.
4) Traditional major and minor scalar structures are privileged in classical music, and such structures are thus privileged in the analysis of CSSM. This means that supposed scalar structures that differ from traditional major or minor structures might require stronger evidence of scalarity.
5) In classical music, prefix embellishments are commonly approached by non-structural intervals, but suffix embellishments are rarely followed by non-structural intervals (with certain instances of the *échappée* potentially being one of the few exceptions). In other words, the analyst should be very suspicious of unresolved suffix embellishments.
6) Therefore, a potentially sub-scalar suffix (i.e., involved in a half-step interval) can be treated as scalar (and thus, possibly interpreted as scalar) if it proceeds by a potentially scalar interval such as a whole step or augmented second.

Scalar versus Chordal and Non-Structural Intervals

Another possible confusion, though less common, concerns potentially scalar intervals that might instead be chordal or non-structural. One source of such confusion is the case of potential pentatonic scalar structures. For example, the major pentatonic scale (such as C–D–E–G–A–C) is a proper pc subset of the diatonic scale, so when confronted with potentially pentatonic minor-third intervals (E–G and A–C in the example given), how do we determine whether they are scalar, chordal, or even non-structural motions? The burden of proof discussed above also applies to pentatonic and other potentially "gapped" scalar structures. As I already suggested at the end of Chapter III, in classical

music, larger melodic intervals such as the pentatonic minor third are usually best understood as either chordal (even if resulting in only a very brief and foreground "chord") or non-structural.

However, some examples might reasonably be interpreted as scalar. In m. 11 of Example 3.21 (excerpt of Fauré's Nocturne No. 3), the melodic interval of B–G# would usually be understood as chordal, given its E major triad context. However, the earlier interval of E–C#, which is not so easily explained as chordal and is unsatisfying if non-structural due to the unidirectional nature of the melody, is perhaps best understood as scalar, which in turn gives reason to interpret the entire descent from G#5 to G#4 as scalar, thus as articulating an E major pentatonic scale.[86]

In conclusion, scalar structure can be distinguished from chordal structure and similarly, from non-structural leaps, with the following general guidelines, reminders, and clarifications:

1) Chordal intervals and structures must, by definition, consist solely of chordal notes, which are notes that are somehow sustained or prolonged throughout the relevant chordal zone, usually so as to voice-lead into notes of the following chord, and that serve as potential anchors for scalar or sub-scalar materials.
2) Scalar structures can include chordal notes, but only chordal notes that are involved in a scalar motion.
3) In classical music, traditional major and minor scalar structures are generally privileged over others.

[86] Cf. Lerdahl's (2001) and Tymoczko's (2011) discussions of the status of pentatonic scales.

4) Therefore, any structure that is a potential subset of a major or minor scale is very difficult to establish as completely scalar (meaning that the diatonic gaps are understood instead as true scalar motions) on its own terms.

Different Levels of Abstraction in Defining or Identifying Scalar Structure

With regard to scalar entities understood on any structural level, we should acknowledge a spectrum of possible levels of abstraction, as briefly summarized in Table 4.2. A very conservative approach might only recognize scalar structures in a passage if they are presented as actual scalar runs—that is, as contiguous in pitch (vertically) and in presentation (horizontally). However, for many purposes we usually allow more abstraction, recognizing a scalar pitch *space* that might be only inferred from separate literal scalar structures, but that applies to an entire chordal zone. Thus, the identification of a scalar pitch space is more abstract and depends on more assumption and imagination, but the abstraction is a form of generalization that can be applied to many more musical examples than could a highly specific entity. More abstract yet, one might infer a scalar *pc* space that could be understood as governing the entire pitch space of a chordal zone (not just the pitches that are actually represented by notes in the music). The abstract idea of a governing scalar pc space is usually implied in our common notions of key, and it makes possible theoretical apparatuses such as tonal hierarchies.

Table 4.2. Aspects of scalar structure and their various levels of abstraction, and implications of understanding scalar structure in terms of note intervals, pitch intervals, and pitch-class intervals

Element Type	**Applicability of the scalar structure**	**Contiguity required**	**Structure Types**	**Vertical Range**	**Extent of Variability**
Note Intervals	Only the actual notes and note-structures themselves are scalar	Notes must be horizontally and vertically contiguous	Linear *note-structure*	Minor second and larger (multi-octave range possible)	None (because a notion of variability would entail a pitch or pc space)
Pitch Intervals	The scalar structure extends horizontally through the chordal zone	Only vertical (pitch) contiguity is needed	Linear vertical *pitch-space*	Minor second and larger (multi-octave range possible)	Unlimited
Pitch-Class Intervals	The scalar structure extends horizontally and vertically	Only pc contiguity is needed	Potentially circular *pc-space*	Limited to one octave	The same variations must apply to all registers

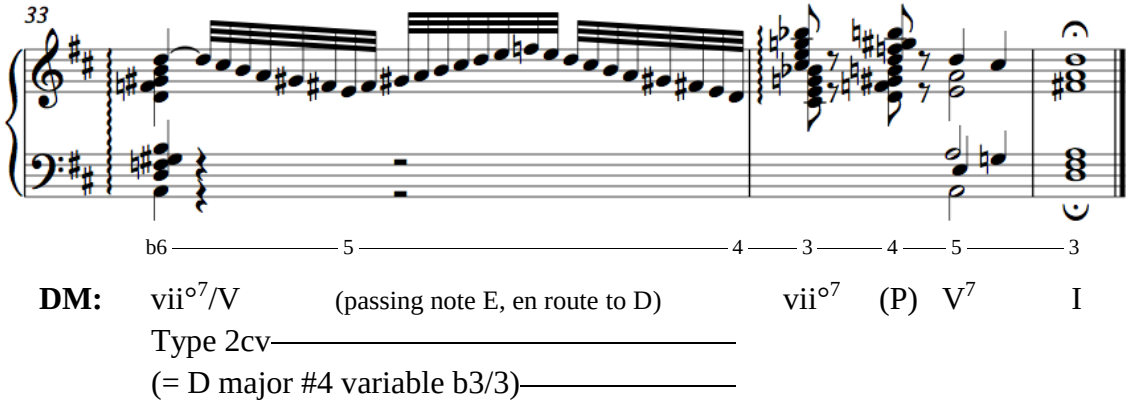
The musical examples presented so far have featured CSSM that is sufficiently contiguous in its pitch structure so as to not leave any doubt of its scalarity. However, particular caution is needed when interpreting CSSM that is not contiguous. When analyzing music for CSSM, simply counting the pcs that occur along with a chord is often not enough. The second measure (m. 22) of Example 4.2 (shown earlier in this chapter) happens to contain all seven pcs of the C melodic minor #4 scale, which would be typical CSSM for $CT^{\circ 7}$ chords in classical repertoire, but this example does not convincingly demonstrate the scale's intervals. Five of the seven pcs here are chordal

(including the G pedal point), and the remaining two pcs (B-natural and D) participate only in half-step lower-neighbor motions. A pitch profile of the measure would reveal only two contiguous potentially scalar structures: C3–D3–Eb3 and A3–B3–C4. Here, we must ask whether the measure exhibits any CSSM at all, despite the tempting presence of the seven pcs of a typical scale. It could arguably be explained as nothing more than a $CT^{\circ 7}$ chord over a dominant pedal and with two neighbor notes, one of which (B-natural) could be merely chromatic. A strict definition of CSSM would require all of its notes to participate in scalar melodic motions, and a strict method of labeling scalar structures (with names such as "C melodic minor #4") would require them to be presented with contiguous pitches. A looser definition might define CSSM only in terms of pcs and might include all chordal or scalar pcs, regardless of the registers of the pitches that represent those pcs. In this way, one might argue that m. 22 of Example 4.2 suggests an abstract scalar pc space that governs the entire pitch space of the $CT^{\circ 7}$ chordal zone (just like we often imagine chords to be abstract chordal pc spaces that govern the entire pitch space of a chordal zone), and that pc space could be called C melodic minor #4. However, previous examples of variable CSSM have shown that different registers of a single chordal zone can involve different scalar pcs for the same scale degree, and previous examples of conflicting CSSM have shown that chordal notes do not always fully coalesce with scalar notes to create scalar structure. For example, in Example 3.13, from Mozart's K466, the seventh degrees of the conflicting major-scale runs do not at all coalesce with the chordal sevenths of their concurrent chords, meaning that the mere inventory of scalar and chordal pcs is misleading. Therefore, the stricter methods and

definitions that take actual pitch and melodic successions into account should always be considered before making a more-abstract pc-related claim.

The Mozart example that was presented in Example 3.19 is also relevant to the issues of scalar contiguity and pc versus pitch, but to a less obvious extent. The supposed F melodic minor #4 scale in mm. 164–165 is mostly convincing, but a direct scalar motion between the pcs A-flat and B-natural is not established. In other words, the looser pc-inventory perspective could mislead one to believe that A-flat to B-natural is a definite scale step that somehow participates in governing the pitch space of this chordal zone. One can choose to imagine the missing scale step, but other examples from the repertoire such as Example 4.4 show that such assumptions can be faulty. In Example 4.4, Bach negates the analogous potential scale step of F-natural to G-sharp by using a conflicting F-sharp in the lower register.

Example 4.4. J.S. Bach, Prelude No. 5, in D Major, from *WTC I* (BWV 850), mm. 33–35

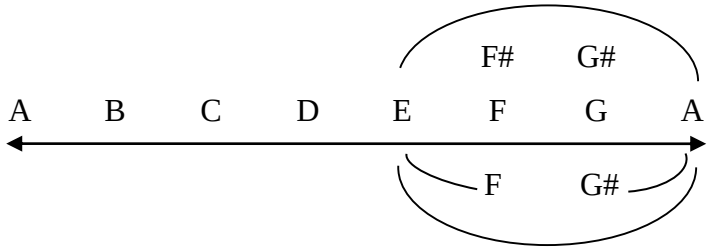


Variable Scalar Structures

A **variable scalar space** involves overlapping scalar pitch or pc intervals. In most cases, the variability can be simply explained in terms of one or more variable scale

degrees, but even in the case of traditional minor scalar space (which I refer to as "variable minor") we must instead refer to a collection of scalar interval *pathways*.[87] Figure 4.2 illustrates a traditional variable minor scalar space as if oriented to a tonic of A. (NB: The tonic-note and tonic-chord orientations are still to be understood as separate from the scalar space itself, even though such traditional variable minor scalar spaces almost always seem to inherently point to these elements as "tonic" elements.)

Figure 4.2. Overlapping scalar intervals (pathways) in a traditional variable minor scalar space, as if oriented to a tonic of A.



The Importance of Scalarity

Why should we spend so much energy determining what supposedly is and is not scalar? This study focuses primarily on scalar structure because it is important in ways that chordal and chromatic structure are not. First of all, scalar structure is, in the Western

[87] In the case of a traditional variable minor scalar space, while the sixth and seventh degrees can each be either minor or major, it does *not* include a scalar pathway between the major-sixth and minor-seventh degrees, as illustrated in Figure 4.2. Loya (2011) recognizes the importance and the cultural significance of what I call variable scalar material in Liszt's music. Schenker ([1906] 1954) and others have proposed the similar idea of mixture between parallel major and natural minor (and sometimes Phrygian) scales, but it has not been explained in terms of scalar pathways. Surprisingly, many scholars have continued to use the inadequate approach of assuming one fundamental minor scale such as natural minor (e.g., Rings [2011] and Lerdahl [2001], though Rings also allows for alternate versions of scale degrees 3, 6, and 7 for certain purposes). London (2002) comments about the problems this causes in Lerdahl's *Tonal Pitch Space* and offers a solution similar to mine. Finally, the idea that minor key involves three different scales (natural, harmonic, and melodic) is cumbersome and is not well reflected in the classical repertoire, in which these three scale types are often mixed in ways that are better explained by variability.

tonal tradition, the primary medium of melody. Lines that move solely through chordal or chromatic spaces, on the other hand, are usually thought of as something other than "true" melody. This is largely attributable to the primarily diatonic tradition that can be traced back through the church modes and to the ancient Greek greater- and lesser-perfect systems. Whole-step motion has long been the prototypical melodic motion in Western music, and this interval is the best representative of the most common scalar structures. Chordal spaces typically lack whole steps, and they typically lack an adequate number of pcs for melodic variety. Chromatic space is a much more recent concept (not popularized until the early eighteenth century), and its intervals are used generally for the function of decoration rather than melody. Along these lines, scales are particularly useful for composers and improvisers because they provide an ideally-divided pitch space within which to create melody.

Scalarity is also important because it is one of the most definitive aspects of key. Traditionally, major and minor keys are often simply described as scales, which are then understood to govern entire passages of music. More specifically, key is often understood in terms of a scalar pc space—a DSS—although it is often variable, and I discuss this further in Section 3 of this chapter.

Scalar structure also tends to be the primary representative of the tonal character or color of a passage. While the total pc content of a passage certainly influences the tonal character of the passage, the tonal-hierarchical structure of these pcs is equally important. For example, C major has a much different character than D Dorian or any of its other modes, despite that they have identical pc content. Similarly, C Lydian with sub-scalar Fs has a much different character than C major with sub-scalar F-sharps. And a

true C major pentatonic with sub-scalar Fs and Bs, if successfully created, would have a different character than C major.

Also with regard to tonal color and character, scalar structure makes possible a multitude of local sonorities that would not be possible with chordal structures alone. In the case of CSSM, for example, compare a piece such as Bach's C Major Prelude from *WTC I*, the chords of which are embellished almost exclusively with arpeggiative (chordal) material until the final measures, with a piece such as Chopin's F Major Etude, Op. 10/8, the chords of which are embellished with CSSM in the form of many interesting melodic shapes (even if mostly Type-1 CSSM). And while sub-scalar structures can add even more pcs to a passage, the limited nature of sub-scalar structures (which consist entirely of half-steps by a strict definition) means that, taken alone, they actually provide fewer possible colors and characters to a passage than scalar structures.

2. Defining and Identifying Chords and Chordal Zones

Basic Definitions

I now turn to the intermediate entity in the key-chord-CSSM paradigm. If CSSM is defined as "chord-specific" we must clearly define what a chord is. A chord (or chordal structure) is any set of notes, pitches, or pcs that are conceptually sustained together (even if only very briefly) at the same time, each member of which is connected to each other member through a chordal interval, and each member of which can potentially serve as a tonal anchor for scalar or sub-scalar intervals.[88]

[88] For the purposes of this study, I do not attempt to explain how one might identify two different chords that occur at the same time, but such an occurrence is highly unlikely in the range of classical music this study is limited to.

A chordal zone, then, can be defined in two different ways. In a careful and strict definition, it is the complex of contiguous intervals of a chord along with all of the scalar and sub-scalar notes and intervals that prolong it. In a more casual definition, it can simply be the horizontal span (i.e., duration) and vertical pitch-space span of music throughout which a particular chord governs. Potential complications are discussed further below.

Different Levels of Abstraction

Just as was discussed in Section 1 of this chapter with regard to scalar structures, we should recognize different levels of abstraction in the identification of chords. In the most concrete sense, a chord is identified only in terms of its "actual" notes and note-intervals, and it governs only the actual notes that prolong it (its chordal zone in the stricter sense described in the previous paragraph). In the most abstract sense, a chord might be identified in terms of pcs and understood as governing an infinite pitch space for a specified duration.

The stricter, more concrete sense of chords is appropriate in situations such as mm. 5–8 of Mozart, K545 (previously shown in Example 3.1). Taking m. 5 as an example, though F, A, and C are the chordal pcs of this chordal zone, some instances of them in the measure are not chordal notes. While all of the left-hand notes are rightly understood as chordal, in the right-hand part, only the boundary notes of A4 and A5 are chordal; the C5s and F5s that occur in the midst of the ascent and descent are only scalar passing notes. To simply identify every F, A, and C in this measure as a chordal note would only perpetuate an all-too-common crude method of analysis.

The stricter, more concrete sense of chords is sometimes crucial for properly understanding extended chords such as ninths, and even sevenths. In some situations, a note that is one octave above a chordal root note might instead be a non-chordal neighbor to the chordal seventh—at the same time as the root note below is chordal.

Another way of explaining such situations is that all of the non-chordal instances of an otherwise-chordal pc are notes that are not as deep as the chordal notes. In fact, a chordal note can also be indirectly prolonged by the same pitch (in the same register), seemingly resulting in a paradox: one instance of the pitch is conceptually sustained while another instance of it is simultaneously understood as non-chordal. The paradox is only resolved when we acknowledge the distinction between notes and pitches. The chordal *note* is prolonged and conceptually sustained, but the pitch serves two different functions at the same time because it is represented by two different notes.

Chords (and CSSM) on Different Structural Levels

The preceding discussion involving structural levels prompts another important point concerning the identification of chords and CSSM. Different chords can occur on different structural levels. At the foreground, one could take the extreme theoretical view of understanding every simultaneity as a chord—just as Schoenberg proposes in his well-known chapter on "'Non-Harmonic' Tones" in his *Harmonielehre* ([1911] 1978). However, this study is concerned primarily with chords that are embellished with at least one scalar interval, and this requires that the chord occurs on some "level" that is deeper than the foreground (because it is prolonged). With this in mind, hardly any of the chords that we typically speak of in music are restricted to only the extreme foreground level;

most of the chords we speak of are still intact at some slightly deeper level (even if we usually do not distinguish between such levels).

The presence of chords on deeper levels means that we can also speak of "deeper" instances of CSSM. Taken to the extreme, if one identifies a 3–2–1 *Ursatz* of an entire piece, the melodic intervals of 3–2 and 2–1 are CSSM relative to the deepest tonic chord.

Does this mean that the DSSs that I speak of in this study are CSSM relative to some deeper tonic chord? Not exactly. DSS is a theoretical abstraction, while CSSM is "actual" musical material. However, most of the DSSs that one will reasonably identify in music will be represented by at least a small amount of deeper CSSM. For example, even if the key and DSS of C major is only suggested by a momentary progression of G7 to C, the DSS is most likely represented by relatively deep scalar intervals in the voice-leading of F–E, and D–C or D–E. Aspects of DSS are discussed further in Section 3 of this chapter.

In some situations, the most immediately recognizable scalar material in a passage seems to embellish a chord that is deeper than the most immediately recognizable chords. I suggested such interpretations for portions of Examples 3.7 and 3.11, for example. In such cases, one should be careful not to confuse structural levels. Usually, all of the scalar material that occurs in these longer chordal zones can be correctly identified as CSSM relative to the chord in question, but one should be mindful of the possibility of relatively foreground scalar material that might apply only to relatively foreground chords *within* the deeper chordal zone. Strictly speaking, such relatively foreground CSSM would be CSSM only relative to the relatively foreground chord that it embellishes, and not CSSM relative to the deeper chord in question.

Embellishment and Priority

This discussion raises the question of whether CSSM must *embellish* its chord or if it can merely accompany its chord. CSSM must, by definition, embellish its chord—at least to some extent. If it does not, it might be better understood as embellishing another chord on a different structural level, as the previous paragraph discusses. And, as I have mentioned earlier in this study, the concept of melodic-harmonic divorce (usually applied to popular music[89]) typically involves melody on the most immediately recognizable level that does not embellish the most immediately recognizable chords, but rather a deeper (sometimes abstract) chord.

To describe CSSM as "embellishing" its chord might seem strange in situations where the scalar melody appears to be compositionally or conceptually prior to the chord. This was mentioned with regard to Examples 3.1 and 3.3 (and perhaps Examples 5.16–5.18 make a stronger case). However, although we usually understand tonal embellishment as entailing that the embellished entity is also conceptually prior to its embellishing entities, this need not always be the case. Using Example 3.3 (from Tchaikovsky's Symphony No. 4) as an example, even if Tchaikovsky conceived of this melodic theme first and attached chords to it only afterwards, the end result is still that the melody contains material that is inevitably understood as embellishing the chords.

3. Defining and Identifying Key and DSS

Some of the thorniest conceptual issues that arise in this study are those concerning key and DSS. In this section, I first discuss definitions for each term along

[89] See Moore 1995 (in which the term originated), Temperley 2007, and Nobile 2013.

with some implications of those definitions, and then I discuss musical examples in which a DSS is difficult to identify.

Definitions of Key

In his recent book *Tonality and Transformation*, Steve Rings (2011) pinpoints a common conception of key through a discussion of how we hear scale degrees:

> To 'hear in a key' is, among other things, to establish a momentarily fixed relationship between scale-degree quale and pitch-class chroma—to invest certain pitch classes with privileged status, as diatonic representatives of certain scale degrees…each scale degree is fused to a particular pitch class as its diatonic representative. (71)

Bringing together the definition of key implied by Rings and those used in research concerning tonal hierarchies (Bharucha 1984b; Krumhansl 1990; Lerdahl 2001), we might define key as an orientation of pcs that is usually hierarchized to some extent and applies to a given passage (typically a relatively global passage) of music. Such orientations can usually be represented by a tonal hierarchy consisting of a tonic pc, a tonic chordal-pc-interval space, a tonic scalar-pc-interval space, and a sub-scalar universe (typically a twelve-tone chromatic scalar space). However, each tonal-hierarchical level listed here successively becomes less important to key; the tonic pc is the most essential level and the sub-scalar universe is the least essential. Keys (orientations) should not be confused with their associated pc sets or interval sets. Therefore, when one says that a passage or a chord is "in the key of A minor," for example, we should take this to mean that it is understood in terms of a particular pc orientation (called "A minor") rather than to mean that it is somehow contained in an A minor scale, for example.

This definition is intended to directly address the most essential aspect of key rather than to get lost in secondary matters such as characteristic chord progressions,

cadence formulas, or specific scale types, all of which are only manifestations of a pc orientation as described above.

Definitions of DSS

A deep scalar space (DSS) is the scalar-level orientation of a key, as described above. I define DSS as an abstract and complete scalar-pc-interval space in terms of which a relatively deep level and relatively global span of music is understood. It provides not the primary orientation of a key (which is that of the tonic pc) but rather a typically weaker, but more specific, orientation of pc space. A DSS can be identified in many ways. The simplest and most traditional method is to automatically assume the DSS to be the traditional major or minor scalar space associated with the conventionally understood key of the passage (which is often determined from characteristic chord progressions or cadential formulas). While this method can be criticized as overly simplistic, overly assuming, and lacking in analytical rigor, it is nevertheless deeply ingrained in the musical thinking of those trained in the Western classical tradition. An alternative, less-assuming method might be to infer a DSS from the scalar melodic intervals that actually occur at deeper levels in the passage at hand. These intervals rarely add up to create a complete scalar space, but the scalar interval positions left open (undetermined) in the hypothetical space are often "filled in" by foreground scalar intervals, which are routinely understood to represent intervals of the DSS. (However, some foreground scalar materials—namely those that I identify as Type-2, Type-3, and Type-4 CSSM—do not represent the DSS.)

The notion of a DSS becomes increasingly abstract and challenging as one deals with increasingly chromatic music. To be sure, chromatic chords are routinely understood

in terms of a DSS even if their notes do not all belong to it. In fact, this is precisely why we call such chords "chromatic." Their identification as chromatic *depends on* a referential DSS. Even when a chord succession seems to be in no particular key, we can always continue to look at a broader context for deeper structures that the chord succession is (directly or indirectly) prolonging.

Highly-chromatic passages with highly obscured DSSs are one issue, but ambiguous DSS is another. Particularly beginning in the late nineteenth century, ambiguity of key and DSS often becomes a point of aesthetic interest, and to try to "solve" it by declaring one or the other key and DSS as the "true" one might be a fruitless endeavor. In such cases, we can feel at ease with two or more possible key and DSS understandings, and these can result in two or more corresponding CSSM understandings.

While this abstract and debatable entity admittedly compounds the interpretive nature of CSSM analysis, I still believe it reflects deeply-ingrained ways of understanding classical music, and it often reveals important musical insights, as we will particularly see in Chapter V.

Questions of DSS in Musical Examples

Though a subjective and abstract entity, a proper identification of DSS is important because it provides the context against which CSSM is heard and understood, and against which CSSM type is defined. For example, although the A-flat mixolydian material of Example 3.3 (Tchaikovsky, Symphony No. 4) is somewhat special in that it is something other than traditional major/minor material, the individual instances of this mixolydian CSSM do not create anything beyond the DSS, and this corresponds to its

identification as merely Type 1. (In other words, the deeper-level chord progression that establishes the mixolydian DSS is what is primarily significant, and the mixolydian CSSM is only a by-product of this.) On the other hand, the Lydian-pentachord CSSM in Example 3.16 (Grieg, Op. 57/6) is more significant from a CSSM perspective because it occurs within an otherwise major key and DSS, and this corresponds to its identification as Type 4. Therefore, our identification of DSS for a passage is crucial to how we hear its CSSM. In some situations, different interpretations of key and DSS are possible, meaning that different CSSM type identifications are possible. Below, I use two examples to demonstrate how the analyst can determine the appropriate key and DSS (and resulting CSSM type) in such situations.

Heard in its broader context, the Chopin Op. 61 excerpt shown in Example 3.20 is clearly in the key of A-flat major. In Chapter III, I argued for interpreting the CSSM of mm. 51–55 as Type-3 E-flat harmonic major. Given the length of this chordal zone and the following tonicized E-flat major triad in m. 56, might the most immediate key and DSS of this passage be E-flat major or even E-flat harmonic major (instead of A-flat major)? If E-flat major, the CSSM would be Type 2; if E-flat harmonic major, the CSSM is only Type 1. Recalling the "burden of proof" on non-major/minor scalar structures discussed in Section 1 of this chapter, because of the stylistic norms of classical music we assume traditional major and minor keys and DSSs by default. A convincing establishment of other types of key and DSS (such as harmonic major) require stronger evidence—evidence that negates the competing interpretation of a major or minor key and DSS. (Recall Schenker's [(1906) 1954, 59–76] dismissals of supposed non-traditional

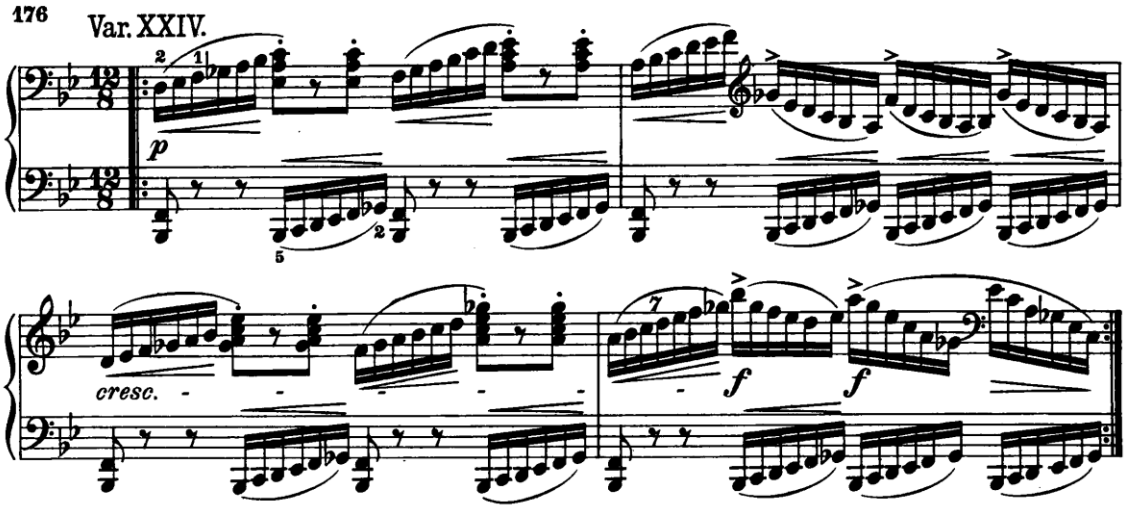
keys such as Lydian and Dorian in his *Harmonielehre*.[90]) I suggest that the notes whose DSS-membership is questionable must be shown to be scalar at either a deeper event-hierarchical level (usually that of the chord-to-chord voice-leading) or in the CSSM of a chord that does not require the use of the note in question. In Example 3.20, C-flat is the note in question. If it is shown to be scalar at the level of chord-to-chord voice-leading or in the CSSM of a chord that does not already contain it (such as the V triad at the end of the excerpt), the excerpt might appropriately be identified as in the key and DSS of E-flat harmonic major. However, the vii$^{\circ 7}$ is the only chord at the deeper level to use the C-flat, and C-flats occur as scalar only within the CSSM of the vii$^{\circ 7}$ chord. Therefore, this excerpt is better understood as in the key and DSS of E-flat major with a chromatic vii$^{\circ 7}$ chord and Type-2 CSSM, or as just in the broader key and DSS of A-flat major, the case in which the CSSM is Type 3.

Example 4.5, on the other hand, *does* establish a DSS of harmonic major. Brahms establishes a key and DSS of B-flat harmonic major not with deeper chord-to-chord voice-leading (in which the questionable pcs of G-flat and A-natural are not clearly shown to be scalar rather than merely sub-scalar neighbors), but with the CSSM of the tonic B-flat chords, which do not already contain G-flat or A-natural (and, therefore, which could have been embellished with G-naturals instead, for example, which would suggest a key and DSS of B-flat major instead). The often-avoided melodic augmented second between scale degrees 6 and 7 is convincingly traversed as a purely scalar motion in the opening right-hand runs of mm. 1 and 3, so one cannot argue that G-flat is only a sub-scalar neighbor, for example. This entire excerpt is therefore best understood as in a

[90] Also see Loya's (2011, 157–160) discussion and critique of this well-known passage by Schenker.

B-flat harmonic major DSS, with all of its CSSM defined as Type 1 (B-flat harmonic-major).[91]

Example 4.5. Brahms, Variations and Fugue on a Theme by Handel, Op. 24, Var. XXIV, mm. 1–4



In summary, the analyst needs to be careful when considering the underlying DSS of a passage because it provides the context against which CSSM is understood, and partly determines the identification of CSSM type. In light of Examples 3.20 and 4.5 as demonstrations, I present the following conclusions regarding questionable underlying DSS:

1) Because of stylistic norms, traditional major and minor DSSs are assumed by default in classical music.
2) In order for a DSS other than traditional major or minor to be established, the pc intervals of the supposed DSS that differ from competing major or minor

[91] I learned of this excerpt from Tymoczko 1997. Riley (2004) offers an entire article about the harmonic major scale, but, disappointingly, it contains very few strong examples of harmonic major keys or what I call harmonic major CSSM. According to my analytical methods, some of his examples are not correctly identified and are better explained as the result of other phenomena.

interpretations must be shown to be scalar (rather than sub-scalar or non-structural) either at the deeper level of chord-to-chord voice-leading or in the CSSM of chords that do not already contain the relevant pc(s).

3) If pc intervals of the supposed non-traditional DSS *and* those of a competing major or minor DSS are both shown to be scalar as described above, the DSS might be variable.

4. Summary of Chapter IV

In this chapter, I have presented detailed definitions of several terms and concepts that this study relies on, and I have suggested methods for properly identifying all three of the kinds of entities that constitute the key-chord-CSSM paradigm. These definitions and methods are presented in terms of three topics that roughly correspond to the components of the key-chord-CSSM paradigm in reverse order: scalar materials, chordal materials, and key—particularly its DSS component. Along the way, I propose that we can understand all intervals in tonal music as chordal, scalar, sub-scalar, or non-structural. Recurring themes throughout this chapter include an emphasis on the *intervals* of scalar structures over their notes, pitches, or pcs; the need for special care when identifying structures in terms of abstract pcs or pc-intervals rather than concrete notes and note-intervals; and the burden of proof on the identification of non-major/minor scalar structures.

Now that this chapter has clarified some important theoretical and methodological issues, the following chapter returns to an emphasis on analysis of repertoire by focusing on several particularly interesting examples of CSSM in the music of Fauré.

CHAPTER V

A COMPOSER CASE STUDY: CSSM IN THE MUSIC OF FAURÉ

Fauré's music is often described as colorful, and this color is often attributed to his choice of scalar materials. For example, several studies have discussed elements of modality in his music and the interactions of so-called modal and tonal elements (e.g., Gervais 1971; Kidd 1973; Orledge 1983; Greer 1991; Gut 1996; Sobaskie 1999). Others have pointed to suggestions of non-diatonic scales in his music (Orledge 1983; Greer 1986), and the "minute chromatic details" of his melodic lines (Sobaskie 1999, 164). However, all of these studies deal primarily with scalar material that occurs over several chords, and none has directly considered CSSM. As I have explained in previous chapters, CSSM is often clearer and more unified (by one harmony—or chordal tonal-hierarchical level) than scalar material that occurs over multiple chords, and the different possible types of CSSM have several important implications. In this chapter, I suggest that CSSM is of particular importance in Fauré's music, showing how it seems to be a means of generating additional tonal color and functional meaning. He routinely takes advantage of the colorful possibilities afforded by various chromatic chords by enriching them with CSSM and by creating striking scalar shifts across successive chords. His CSSM often takes advantage of *Mehrdeutigkeit* by obscuring the chord's deeper function and alluding to a different one, while other instances of CSSM enrich and instead *reveal* more obscure chord-functions. Furthermore, I suggest that his CSSM reflects a broader trend toward the increased use of non-major/minor scalar materials (Tymoczko's [2011] "scalar tradition")—though still within an unequivocally tonal framework—as well as a trend toward relatively euphonious scalar materials.

Section 1 of this chapter explores these themes—the contributions of Fauré's CSSM to tonal color and functional meaning, and Fauré's use of apparently non-major/minor and relatively euphonious CSSM—within the context of three categories: 1) Fauré's special treatments of augmented-sixth-chord CSSM, 2) his frequent allusion to "Lydian" sonorities with CSSM, and 3) other instances of apparently non-major/minor CSSM in his music. After Section 1 discusses many different musical examples that demonstrate these issues, Section 2 of this chapter provides a complete-piece case study: an analysis of Fauré's Nocturne No. 3 in A-flat major, focusing on the various important effects that CSSM contributes to this piece.

1. CSSM's Contributions to Tonal Color and Functional Meaning

Explanation of Terms and Concepts

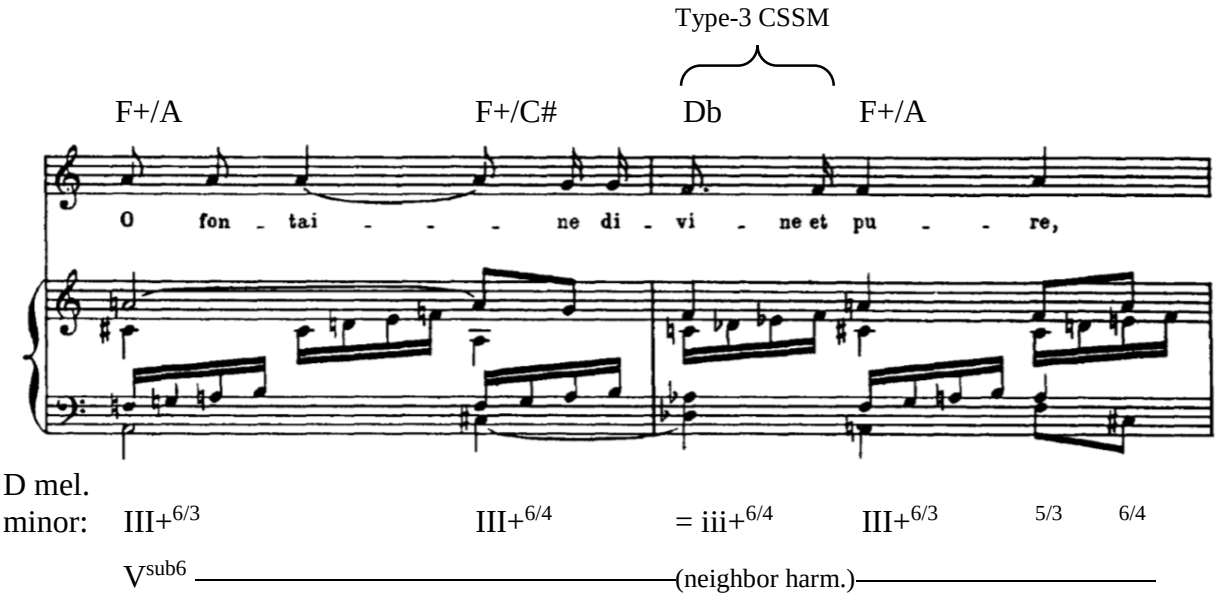
Tonal Color

CSSM can generate tonal color in three ways (all summarized later in Figure 5.1). First, it can introduce new scalar pcs or scalar intervals so as to create a *scalar shift* from the preceding chordal zone.[92] Example 5.1, from "Eau vivante" provides a demonstration. Although the D-flat-major harmony in m. 10 would create interesting chromaticism with or without CSSM, the CSSM introduces new scalar pcs (0 and 3) and scalar intervals (0–1, 1–3, and 3–5), thereby generating additional tonal color and creating a scalar shift from the preceding measure. I show in this chapter that a favorite technique of Fauré's is to alternate repeatedly between two chordal zones that exhibit scalar shift.[93]

[92] This term comes from Temperley 2011, though in the context of analyzing late-twentieth-century popular music. The definition provided here is my own, and might differ slightly from Temperley's.

[93] Fauré very frequently alternates between a pair of chords (it is certainly one of his trademarks), but not all of these contain CSSM, nor are they always chromatically-related chords. In all of these cases, however, these chord alternations seem to serve the aesthetic purpose of basking in an interesting effect of tonal color—whether it be striking and obvious (highly chromatic) or subtle (diatonic, or minimally chromatic).

Example 5.1. Fauré, "Eau vivante" (from *La chanson d'Ève*, Op. 95), mm. 9–10



Second, CSSM can generate a sense of tonal color by encouraging a new scale-degree hearing, with or without a concurrent scalar shift. While scalar shifts created by vertical CSSM (Types 3 and 4) probably account for most new scale-degree hearings (as in the aforementioned Type-3 CSSM of Example 5.1), I explained in Chapter III that even certain instances of Type-1 CSSM are also capable of encouraging a new scale-degree hearing. In short, Type-1 CSSM is more likely to be heard in terms of non-tonic scale degrees if it occurs with a non-tonic chord that 1) is sustained for a longer duration, 2) has a strong root that is somehow emphasized (which usually means that the chord involves a major- or minor-triad structure that points to this root), or 3) is embellished with CSSM in a way that emphasizes the hierarchical priority of its chordal notes. Even if CSSM does not contribute any new scalar pcs or scalar intervals to the passage at hand, a new scale-degree hearing means that "old" scalar pcs and intervals are heard in a new

way. Although this could also be called scalar shift, in a sense, I reserve that term for situations in which the actual scalar pcs or scalar intervals change.

Third, CSSM can generate tonal color by creating a significant sonority. In Fauré's music, such sonorities are deemed "significant" either because of their apparent non-major/minor qualities or for motivic reasons (as repetition draws attention to sonorities that might not otherwise be significant). Significant sonorities created by CSSM can also involve non-scalar chordal notes or sub-scalar notes as long as at least one scalar note or interval is essential to the sonority. They can be identified as pitch or pc collections (with or without hierarchization), scalar-interval collections, as pc set-classes, or as an even broader type of entity. For example, we will later see an example that involves merely Type-1 CSSM that still generates a sense of color because it creates a series of apparent pentatonic sonorities (Example 5.13, in Section 2 of this chapter), with "pentatonic" only broadly defined. And in Example 5.1 above, the Type-3 CSSM in m. 10 creates a Phrygian tetrachord, which is motivically significant in this song.

Functional Meaning

We will also see throughout this chapter how CSSM contributes to functional meanings to a significant extent in Fauré's music. Figure 5.1 lists some of these possible contributions (along with the aforementioned contributions to tonal color). Rather than discuss each of these individually here, I will leave them as self-explanatory for now, and they will be discussed as they apply to later examples.

The following three sub-sections now address Fauré's special treatments of augmented-sixth chords, his apparent Lydian CSSM, and other instances of apparently non-major/minor CSSM. Throughout the examples used to discuss these issues, I will

frequently refer back to the overarching themes of CSSM's contributions to tonal color and functional meaning, and the significance of apparently non-major/minor and relatively euphonious CSSM in Fauré's music.

Figure 5.1. Summary of CSSM's contributions to tonal color and function in the music of Fauré

CSSM can generate tonal color by:

1. introducing new scalar pcs or scalar intervals so as to create a scalar shift from the preceding chordal zone

2. encouraging a new scale-degree hearing, with or without a concurrent scalar shift

3. creating a significant sonority (significant for its apparent non-major/minor qualities or for motivic reasons)

CSSM can contribute to functional meaning by:

1. enriching the chord's function (by adding more "tonal substance" and structural information to it)

2. obscuring the chord's deeper function

    a. usually by alluding to a different function than that which the chord exhibits on a deeper level
    b. usually, tonally distancing it further from the underlying key
    c. sometimes, with apparently non-major/minor CSSM (the functions of which are less defined in classical music)
    d. sometimes, with relatively euphonious CSSM, which tends to give the chordal zone more independence (thus drawing attention away from its deeper function)

3. revealing or contextualizing an otherwise obscure chord-function

4. tonally emphasizing the chord

    a. due to tonicization (e.g., major-scale CSSM for a major triad)
    b. due to scalar shift from the preceding chord

5. tonally de-emphasizing the chord

    a. due to non-tonic CSSM
    b. due to scalar consistency across chords

Fauré's Treatments of Augmented-Sixth Chords

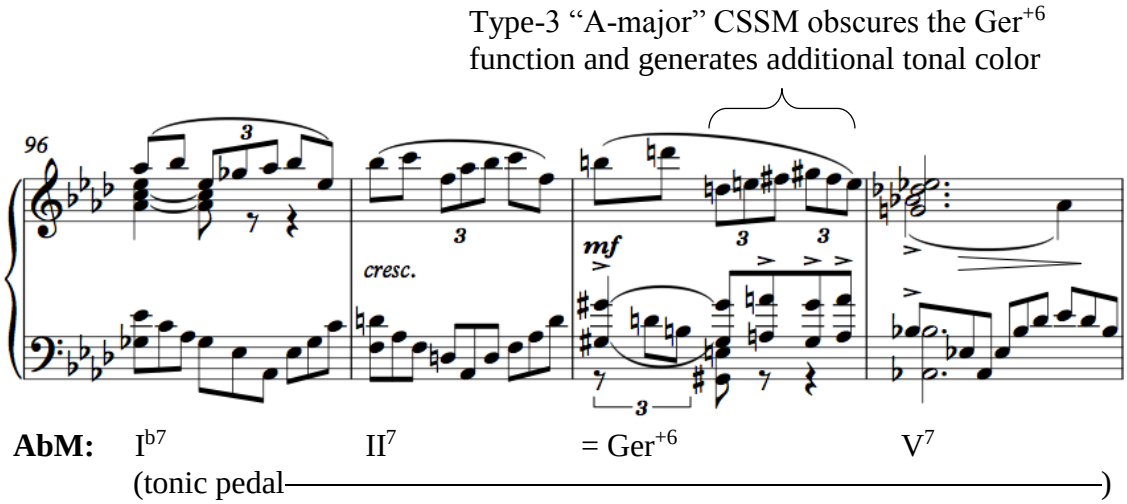
In Chapter III, we saw that the most common scale-types suggested by the CSSM of conventional augmented-sixth chords in the music of classical- and early-romantic-era composers (such as Mozart, Schubert, and Chopin) are what I call harmonic minor #4 and natural minor #4, both built on the global tonic of the passage and typically demonstrating the Type-2 principle. Here, I show that Fauré treated augmented-sixth chords differently, melodizing them with CSSM suggesting scale-types that are more evenly constructed and in this sense more euphonious, thus granting these chords increased independence of the global tonic key and perhaps even subverting their earlier classical meaning. These scale-types are the major scale in which the chord could function as a traditional V7 (corresponding to Type-3 CSSM) and the natural minor b5 built on the global tonic (corresponding to Type-2 CSSM). Though further research is needed, Fauré might have been one of the first composers to use these techniques. Examples below provide demonstration and discussion of each type in turn.

Type-3 Treatments of Augmented-Sixth Chords

Taken alone (without CSSM), the chord progression in Example 5.2 functions entirely in the key of A-flat major, and the chord in m. 98 functions like a conventional German +6 despite its different spelling (a conventional German +6 would be spelled with Fb, Ab, and Cb, along with the D that is written here). "Major–minor-seventh" spellings such as that of this E7 chord seem to be Fauré's preference for chords that function like augmented-sixths, and this says something about their slightly different meaning in his music. It also says something about the different kinds of CSSM he uses for such chords. The chord in m. 98 of Example 5.2 is melodized with Type-3 CSSM

suggestive of A major, which is consistent with the E7 spelling. This takes advantage of the chord's *Mehrdeutigkeit*, alluding to a V7 function in a different key, thus obscuring the deeper traditional Ger^{+6} chord-function.[94]

Example 5.2. Fauré, Nocturne No. 3 in A-flat, Op. 33/3, mm. 96–99



This Type-3 CSSM also generates additional tonal color for the passage. It creates a substantial scalar shift in relation to both surrounding measures, exhibiting unique scalar pc-intervals of 2–4, 4–6, and 8–9, and unique scalar pcs of 4 and 9.[95] To be sure, the earlier conventional augmented-sixth-chord CSSM found in Mozart and others—

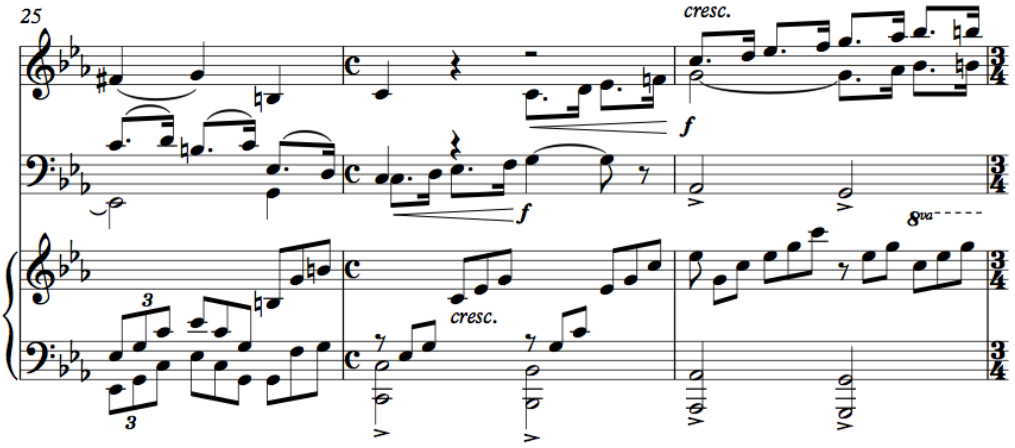
[94] Contextual features such as the tonic pedal point and the melody's descent from G# (^1) to Eb (^5) from m. 98 into m. 99 perhaps encourage a Type-2 scale-degree hearing more than a Type-3 hearing, but the CSSM's scalar interval of D–E (instead of a scalar interval involving D#/Eb) along with the presence of a scalar A-natural (which is not necessitated by the chord and thus not convincingly explained as a Type-2 alteration) nonetheless suggest a Type-3 theoretical or compositional derivation.

[95] In terms of the CSSM in this passage, pitch-class 2 (D-natural) might also be considered a unique scalar pc in m. 98, but it has a very high *potential* for being treated as scalar in the preceding m. 97, and a deeper-level scalar interval of C–D occurs in the voice-leading between mm. 96 and 97. I do not list pitch-class 11 (B-natural) as a unique scalar pc in m. 98 because it is not a part of the CSSM.

usually suggesting a harmonic minor #4 scale—typically also adds tonal color to a passage, but it does so in a way that *reinforces* the chromatic chord's unstable function within the tonic key. In contrast, Fauré's Type-3 CSSM *distances* the E7 chord even further from the tonic key and also creates a relatively euphonious local sonority, thus representing a relatively modern technique of expanding tonal possibilities. The traditional Ger^{+6} function is subverted not only by the allusion to the V7 function, but also—and perhaps more importantly—by the smoother diatonic sonority, which is in some ways antithetical to the highly-dissonant and uneven sonorities created by harmonic minor #4 (or natural minor #4) CSSM.

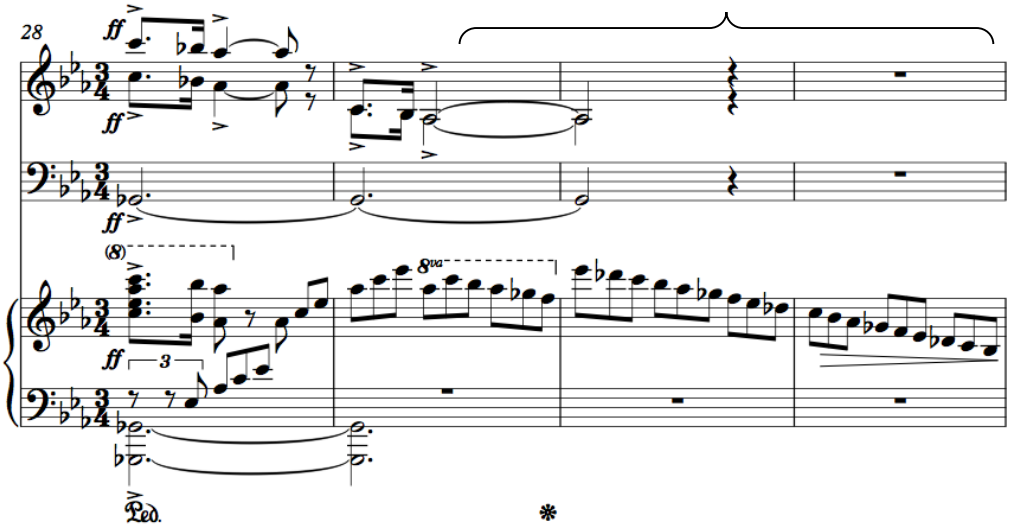
To be sure, the CSSM in m. 98 of Example 5.2 is not unequivocally derived from A major. The A-naturals could be merely sub-scalar notes, and the remaining CSSM can be explained as derived through Type-2 principles of tonic-scale alteration conforming to a chromatic chord (the tonic scale's Db–Eb altered to D–E) and parallel borrowing (E–F# and F#–G# borrowed from the parallel minor). However, Examples 5.3 and 5.4 provide further evidence that Fauré used the Type-3 CSSM technique for augmented-sixth-chords as I suggested above. In Example 5.3, the chord of mm. 28–31, though spelled like an Ab7 chord, sounds like a conventional $Ger^{\circ 3}$ upon its arrival within the unmistakable environment of C minor. It is embellished with Type-3 CSSM: a multi-octave scalar run articulating D-flat major (the D-flat of which is not well accounted for by Type-2 explanations—because it does not belong to the chord or to conventional C minor scales). The only difficulty of Example 5.3, however, is that this potential $Ger^{\circ 3}$ chord does not resolve in the conventional way, but rather proceeds to an F7 chord. Despite this, the key of C minor is reasonably retained and is strongly reaffirmed by m. 38 (shortly after the

Example 5.3. Fauré, Piano Quartet No. 1 in C Minor, Op. 15, mvt. IV, mm. 25–35 (string parts collapsed)

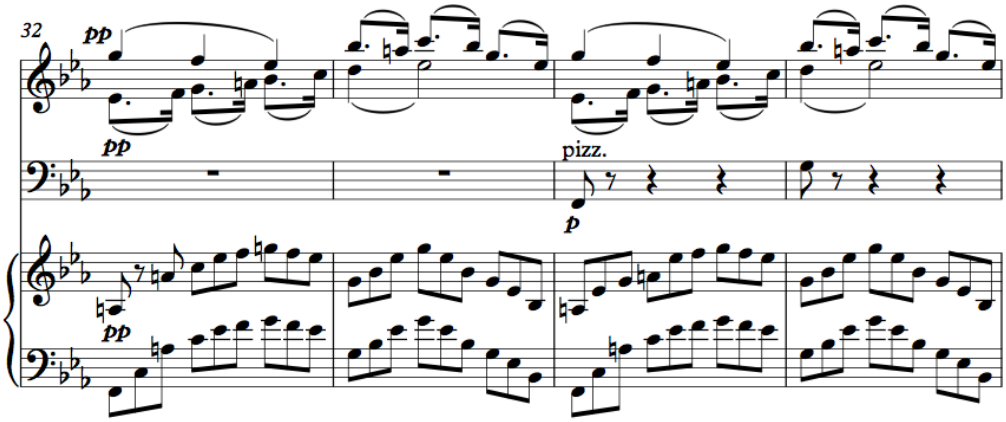


Cm: i^{6} V7 i

Type-3 “D-flat major” CSSM



Cm: = Ger°3 →

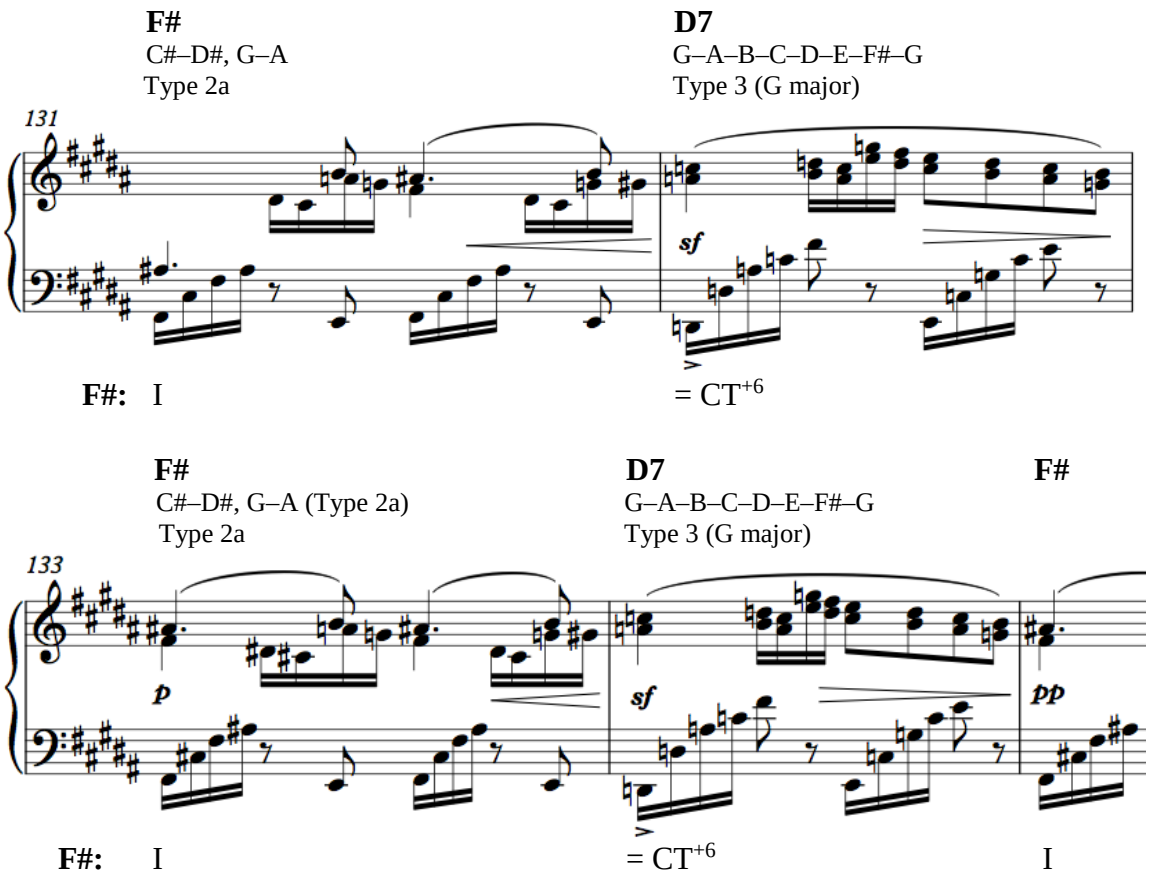


Cm: IV$^{9/7}$ III^{6} IV$^{9/7}$ III^{6}

excerpt provided here), but the potential Ger°^{3} might be understood instead as a genuine Ab7 chord serving an unconventional voice-leading function to connect the surrounding Cm and F7 chords. Nevertheless, until the arrival of the F7 chord in m. 32, the chord looks and sounds like a very typical Ger°^{3}, a potential meaning that cannot be ignored.

Example 5.4, then, provides further support for the claim that Fauré used Type-3 CSSM for chords that could otherwise be understood as traditional augmented-sixths. Here, we have a complete-scale presentation of Type-3 G major CSSM for what can be understood as a conventional CT^{+6} (common-tone augmented-sixth) chord, serving the typical embellishing function between two tonic chords, though less-structural chords intervene and the DSS of the passage is highly variable.

Example 5.4. Fauré, Ballade in F-sharp major, Op. 19, mm. 131–135



Alternative Type-2 Treatments of Augmented-Sixth Chords

Fauré also melodized augmented-sixth chords with Type-2 CSSM—but not that which belongs to the harmonic minor #4 or natural minor #4 scales as found in earlier classical music. Rather, Fauré's preference for spelling augmented-sixth-functioning chords as major–minor-seventh chords often yields Type-2 CSSM suggestive of a natural minor b5 scale (built on the tonic), as we will see. This scale is the third mode of the acoustic scale and the sixth mode of the melodic minor scale, but because of its presumed Type-2 derivation, these associations are only apparent or merely coincidental. In any case, it provides a perhaps more interesting sonority than the diatonic Type-3 augmented-sixth-chord CSSM discussed above, yet it still creates a sense of euphony. In fact, it is arguably more euphonious than the Type-3 diatonic CSSM. Supposing an Ab7 chord in the key of C, the Type-3 diatonic CSSM (Db major in this case) potentially involves a D-flat, which arguably does not blend with the Ab7 chord as well as the D-natural offered by the Type-2 natural minor b5 CSSM. Jazz chord-scale theory would explain this in terms of extended chords: Extending the Ab7 chord through the Db major scale results in a somewhat problematic chordal eleventh (D-flat against the C below) whereas extending the chord through the C natural minor b5 scale allows for euphony through the chordal thirteenth (e.g., Mulholland and Hojnacki 2013, 65).

Example 5.5, from the second movement of Fauré's Piano Quartet in C Minor, contains what clearly functions like a conventional CT^{+6}, though it is spelled as a B7 in the piano part. Its CSSM articulates a scalar span of 9–E–1–3–5–6. This is perhaps best understood as derived through Type-2a principles that could produce an E-flat natural minor b5 scale, as shown in Figure 5.2 (though only six of its seven pcs and only five of

its seven scalar pc-intervals are articulated in this example). Different enharmonic spellings are used in the score for each performer's ease of reading, but the intervallic structure of the CSSM suggests that the chord would most properly be spelled as a C-flat major–minor-seventh, Cb–Eb–Gb–Bbb (relative to the DSS spelling of E-flat major). In other words, DSS scale degrees 3, 5, and 6 are each lowered by a half step to accommodate chromaticism in the chord. However, DSS scale degree 7 is also lowered by a half step (from D to C#/Db). A composer might very well use this scale degree just because it is equidistant from the lowered sixth and tonic degrees (a major seventh degree would yield an augmented second with the lowered sixth degree). However, perhaps a more satisfying theoretical explanation is that the CSSM is derived from the parallel minor scale (E-flat natural minor) with an altered fifth degree due to the chord (as shown in Figure 5.2), hence my preferred label of natural minor b5.

Regardless of whether it is derived directly from the E-flat major DSS or from the parallel minor, I do not see any good reasons for identifying this kind of CSSM as derived from the B/C-flat acoustic scale, a type of scale that some scholars have deemed to be important in Fauré's music, and that countless scholars have identified in the music of Debussy and Ravel.[96] Apparent acoustic-scale CSSM in Fauré is discussed further below (and this discussion will also include an example of CSSM with yet one more type of potential augmented-sixth chord, a re-spelled French sixth applied to the tonic chord, shown in Example 5.11).

[96] For example, see Gervais 1971 and Orledge 1983, though they both refer to it as the "Vachaspati mode." Tait (1989) also discusses this scale in the music of Fauré. Others refer to this scale type as the "overtone" scale, "Lydian-mixolydian," "Lydian b7," or "Lydian dominant."

Example 5.5. Fauré, Piano Quartet No. 1 in C Minor, Op. 15, mvt. II (1876–1879), string parts collapsed

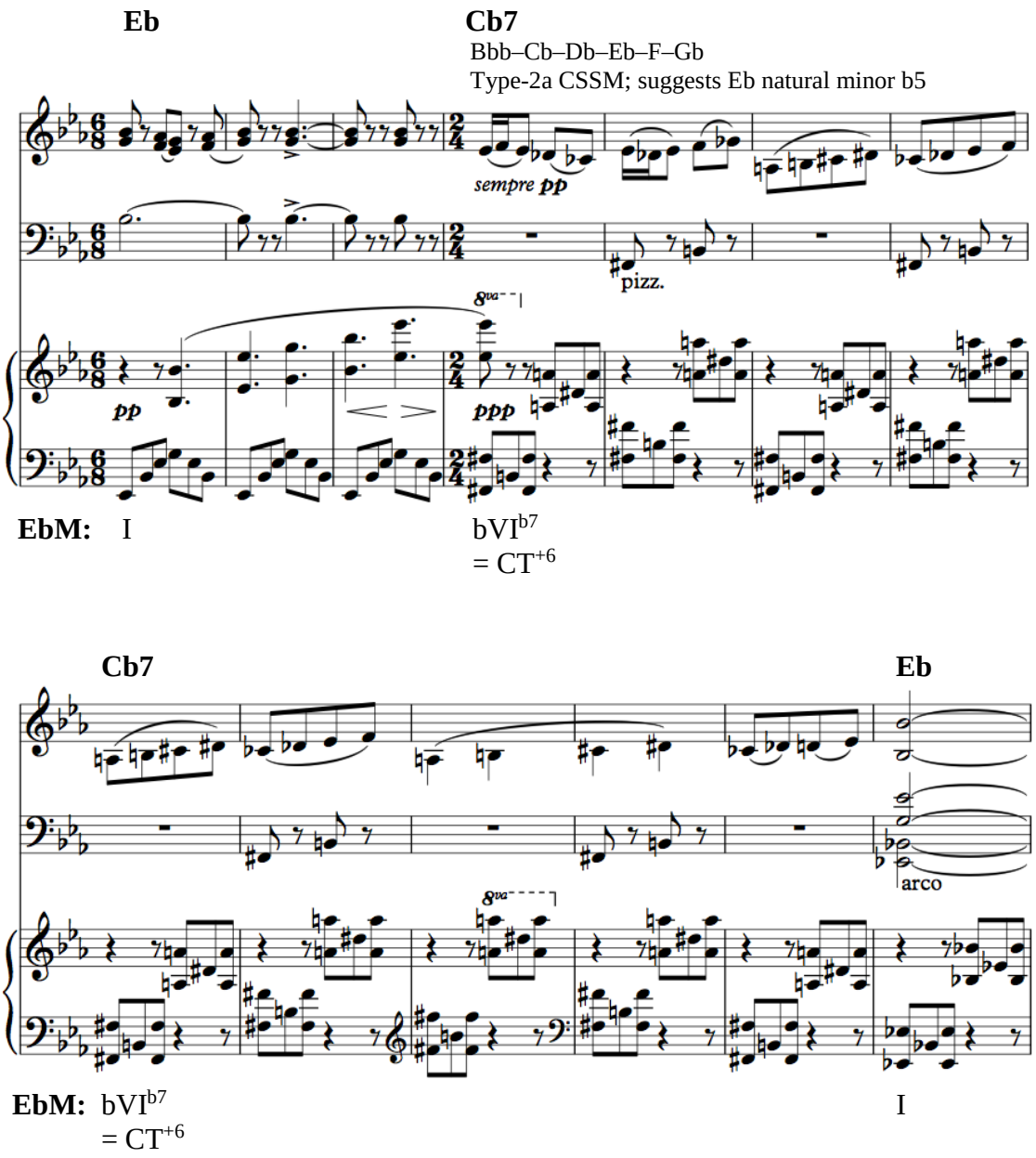


Figure 5.2. A possible derivation of the "Eb natural minor b5" CSSM in Example 5.5

Parallel minor DSS (Eb natural minor)	Eb	F	Gb	Ab	Bb	Cb	Db	Eb
	↓	↓	↓	↓	↓	↓	↓	↓
bVI^{b7} chord	Eb	↓	Gb	↓	Bbb	Cb	↓	Eb
	↓	↓	↓	↓	↓	↓	↓	↓
Resulting altered CSSM (Eb natural minor b5)	Eb	F	Gb	(Ab)	Bbb	Cb	Db	Eb

The resulting chord-CSSM sonority of this Cb7 chordal zone seems to be of aesthetic importance in this passage. Immediately prior to the excerpt shown here in Example 5.5, Fauré alternates essentially the same Cb7 and Eb materials two times, making the Cb7 zone shown in Example 5 the third such iteration. For this third iteration, a remarkable nine measures are spent on this single chord—a type of chord that in the music of earlier composers is usually rather brief—and these measures primarily consist of repeated melodic fragments. Rather than developing a long melody and progressing toward a goal, these nine measures are spent dwelling obsessively on one peculiar chord-CSSM sonority. And, as explained above, it is a notably euphonious sonority when considering the highly-chromatic nature of the chord. Given its aesthetic function in this passage published in 1879 (and possibly composed as early as 1876), we might speculate whether such Type-2 scenarios are the origins of Debussy's and Ravel's frequent pairings of major–minor-seventh chords with supposed acoustic-scale CSSM. Contrary to how most scholars characterize it, perhaps Debussy's and Ravel's acoustic-scale material has major/minor origins.[97]

Apparent Lydian CSSM in Fauré's Music

Fauré's obvious love of sonorities that most listeners describe as "Lydian" is evident in seemingly the majority of his works. One could certainly find over a hundred occurrences of these sonorities throughout his oeuvre. They are an especially distinct part of his tonal language, and a full investigation of them could justify an entire study of its own. Though Fauré's Lydian sonorities are mentioned by many scholars, these mentions

[97] Tymoczko (1997; 2004; 2011) in particular has discussed supposed acoustic-scale material in the music of Debussy and Ravel. Though its semitone-displacement relations to diatonic and harmonic minor scales are central to many of his analyses, he does not propose the historical origin that I do here.

are usually very brief and do not add much beyond the mere identification of the sonorities[98], and the longer discussions of them have not addressed them from a CSSM perspective.[99] By considering these sonorities from the perspective of CSSM, however, we can discover some fascinating compositional techniques and theoretical principles. Furthermore, apparent Lydian CSSM can be understood as another instance of Fauré's proclivity toward relatively euphonious CSSM, as the Lydian scale is arguably more euphonious than the major scale. Returning to jazz chord-scale theory, recall that one of the fundamental premises of George Russell's *Lydian Chromatic Concept* is that the Lydian scale—not the major scale—"sounds in closest unity" with the major triad, and is also the "parent scale" of the major triad (2001, 1).[100] Also recall his celebrated remark that "the major scale *resolves* to its tonic major chord" whereas "the Lydian scale *is* the sound of its tonic major chord" (Russell 1959, iii–iv). Regardless of whether one agrees with Russell, however, almost all Western musicians can probably recognize *something* special about the Lydian scale that encourages such descriptions.

After some preliminary theoretical considerations below, I discuss several examples of Fauré's apparent Lydian CSSM in this section, considering the compositional or theoretical derivation of each example, as well as its contributions to tonal color and function in the passage at hand.

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[98] For example, see Gervais (1954) 1971, particularly the section titled "Appoggiature 'lydienne'" on pp. 36–37.

[99] For example, see Sobaskie 1999.

[100] These quotes are from p. 1 of Russell's most recent (2001) edition of *The Lydian Chromatic Concept*, the first chapter of which is dedicated to making these points (pp. 1–9). Therein, he compares the Lydian and major scales, using the overtone series, stacks of thirds, stacks of perfect fifths, and more to support his idea.

Theoretical Considerations

For the purposes of Fauré's music, I define a *Lydian sonority* as any distinct collection (or segment) of notes, the *scalar* and *chordal* notes of which all belong to a single Lydian scale (collection) and include its #4 scale degree, and that can reasonably be heard in terms of the scale degrees of this Lydian scale. Thus, a distinct melodic segment or a chordal zone comprising scalar and chordal notes of [C E F# G] could constitute a Lydian sonority if it can reasonably be heard in terms of C-Lydian scale degrees—even if only very locally. For this particular hearing to be "reasonable" would require that 1) the notes of this sonority are all heard as either scalar or chordal and 2) that no notes outside of the C Lydian scale (even those occurring prior) are heard both as A) scalar or chordal and as B) potentially coalescing with the sonority in question.[101] If notes outside of the C Lydian scale occur at the same time, they must be heard either as sub-scalar or as part of a separate distinct sonority.[102] Furthermore, Lydian sonorities, as I use the term here, cannot be identified on the basis of pc content alone; their identification always depends on how various aspects of their musical context encourage a Lydian scale-degree hearing.

Lydian CSSM, then, is defined here as any CSSM (thus within a single chordal zone) that is part of a Lydian sonority, the musical context of which must reasonably allow for a Lydian scale-degree hearing—even if only very local. Therefore, the identification of Lydian CSSM always entails a Type-4 scale-degree hearing; but when it

[101] Cf. the concept of scalar "porosity" in Martins 2013. Put simply, scalar porosity allows for other notes to "fill in" the scalar "holes" of a collection, giving the impression of a new scale.

[102] Martins (2013) also explains properties that allow two concurrent groups of notes to be heard as belonging to separate scalar entities, resulting in polyscalarity.

is understood as compositionally or theoretically derived from major/minor sources I call it *apparent* Lydian CSSM, which will primarily be understood as either Type 1 or Type 2.[103]

While Fauré might have sometimes used Lydian CSSM on its own terms rather than as derived from or dependent on major/minor sources, most—if not all—of his Lydian CSSM can be convincingly explained as derived from major/minor sources, thus as only *apparently* Lydian. Analysts of his music, therefore, should be aware of the different ways in which Lydian CSSM can be derived from major/minor sources. Table 5.1 shows all of the possible Type-1 and Type-2 derivations of Lydian CSSM from traditional major/minor sources, and Example 5.6 shows generic examples of each. Remember that Type-2 CSSM is derived by altering the DSS according to notes in the chord that are chromatic. For instance, Example 5.6 shows how a bIII chord in the key of C major yields an E-flat Lydian scale when the tonic C major DSS is altered so as to include the chromatic chordal notes of E-flat and B-flat (in place of E and B). Note also that the three major-scale Lydian derivations are found on consecutive fifth-related chord functions (IV, bVII, and bIII)—as are the minor-key Lydian derivations (bIII, bVI, bII, and bV). Fauré seems to have been aware of these potential Lydian-CSSM derivations, as Table 5.2 shows how his music takes advantage of all of the associated chord functions. I now turn to some specific examples of these.

[103] I do not mention the idea of Type-3 apparent Lydian CSSM because it would rely heavily on imagination, and I am not aware of any examples in classical repertoire that would call for such an interpretation. As a hypothetical example, if, in the key of C major, a V chord were embellished with apparent G Lydian CSSM, this CSSM could potentially be interpreted as derived from D major or B minor.

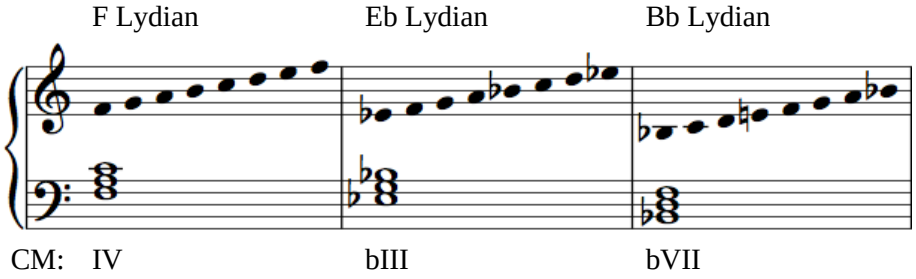
Table 5.1. Type-1 and Type-2 scenarios for complete-scale apparent Lydian CSSM for major triads within traditional major/minor key contexts

CSSM type	Deep scale	Chord	CSSM from chord root	CSSM from global tonic
1	Major	IV	Lydian	Major
	Natural minor	bVI	Lydian	Natural minor
2	Major	bIII	Lydian	Dorian
		bVII	Lydian	Mixolydian
	Natural minor	bII	Lydian	Phrygian
		bV	Lydian	Locrian
	Harmonic minor	bV	Lydian	Locrian
	Melodic minor	bIII	Lydian	Dorian

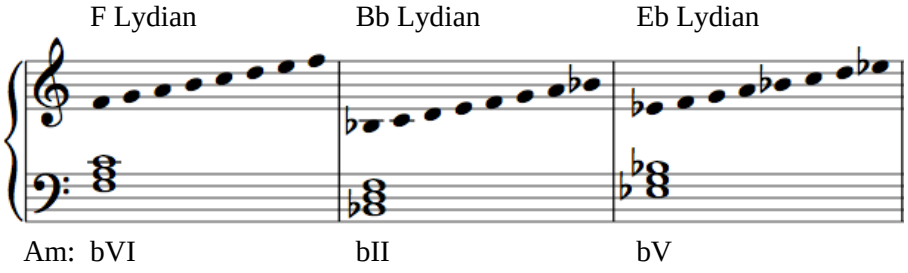
Chain of fifths: IV – bVII – bIII – bVI – bII – bV

Example 5.6. Generic examples of the apparent Lydian CSSM scenarios listed above in Table 5.1

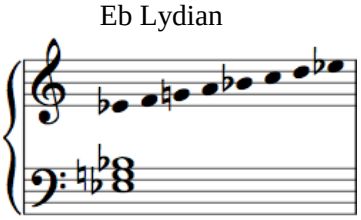
Examples derived from a C major deep scale:



Examples derived from an A natural minor deep scale:



Derived from A harmonic minor:



Derived from A melodic minor:

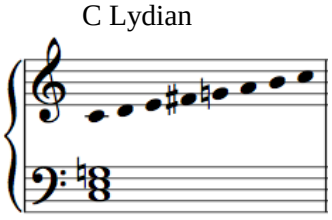


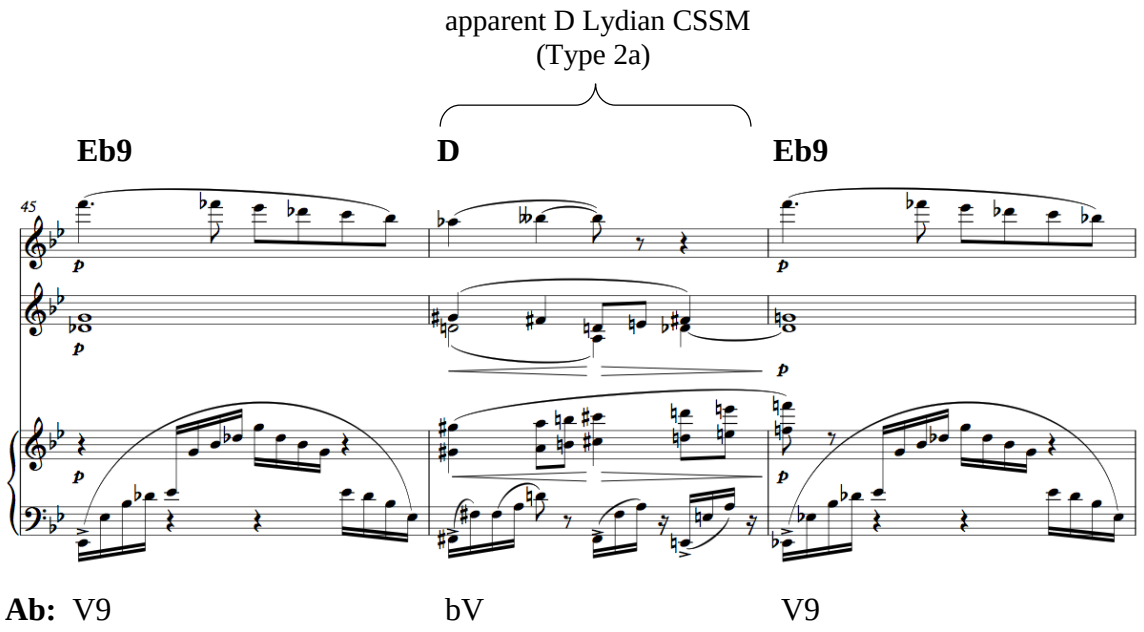
Table 5.2. Some examples of apparent Lydian CSSM with various chords in Fauré's music

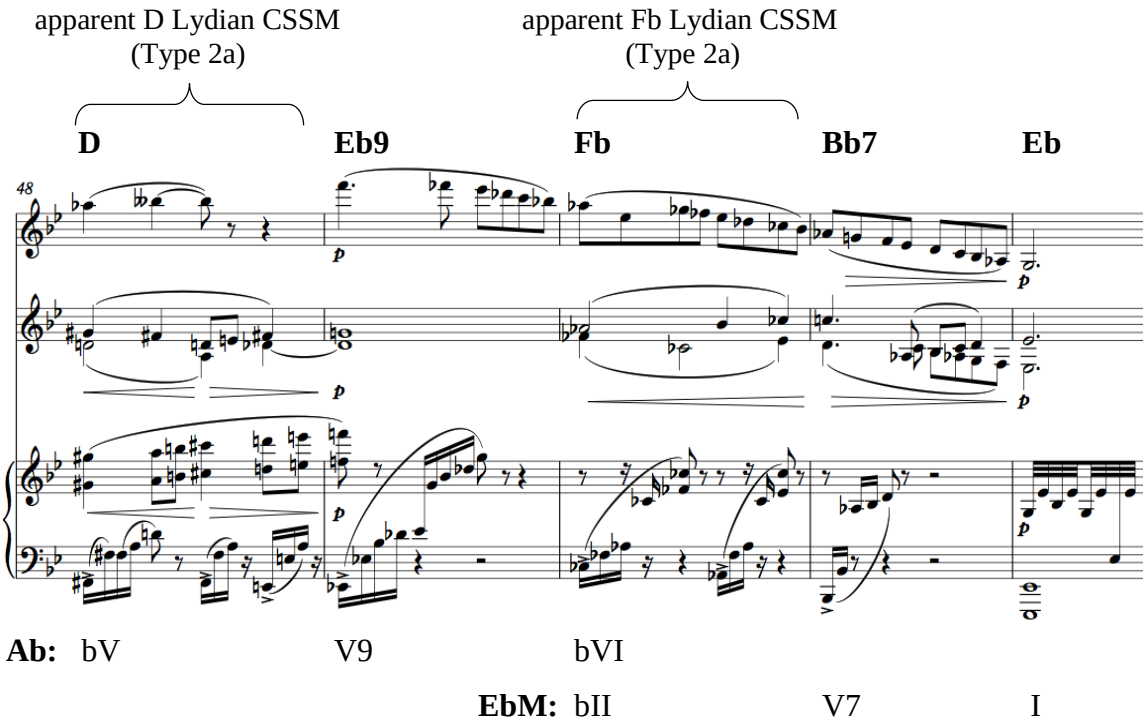
Chord	Composition	Opus	Mvt	Measures	Number of scalar intervals used
bII	Piano Quartet #2	45	I	50, 175	7/7
	Nocturne #3	33/3		33	1/7
	Impromptu #1	25		42	5/7
bIII	Prelude #1	103/1		2, 4	0/7
	Nocturne #6	63		66, 68, 73, 75	3/7
IV	Nocturne #3	33/3		45, 47	2/7
bV	Piano Quartet #2	45	I	46, 48, 171, 173	7/7
	Ballade	19		132, 134, etc.	5/7
	"L'aube blanche"	95	V	12	1/7
bVI	Impromptu #1	25		44, 46	7/7
	Piano Quartet #2	45	II	59–67, 76–83	7/7
	Nocturne #6	63		65, 67, 72, 74	3/7
	"L'aube blanche"	95	V	16	1/7
bVII	"L'aube blanche"	95	V	14	1/7

Examples of Apparent Lydian CSSM

Fauré's Piano Quartet No. 2 in G Minor, Op. 45 (1886), contains some particularly clear examples of Lydian CSSM. Example 5.7, from the exposition of the first movement, begins in the midst of a highly chromatic passage, itself within a broader context of E-flat major (the exposition's secondary key area). Allusions to the key of A-flat (mixed major/minor) emerge out of the chromaticism beginning around m. 42 and become clearer with the Eb9 chords in mm. 45, 47, and 49. Each of these Eb9 measures is followed by a measure of apparent Lydian CSSM. Measures 46 and 48 clearly articulate all the pcs of D Lydian as scalar notes, and m. 50 clearly articulates all of the pcs of F-flat Lydian as scalar notes. Keeping in mind the six possible major/minor derivations of Lydian CSSM, the Lydian CSSM in these measures actually helps reveal and confirm what otherwise are rather unclear chord functions. The apparent D Lydian

Example 5.7. Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mm. 45–52 (string parts collapsed)





CSSM of mm. 46 and 48 is perfectly consistent with the obscure chord function of bV in the key of A-flat (mixed major/minor), and the apparent F-flat Lydian CSSM of m. 50 is perfectly consistent with the function of bVI in the key of A-flat *as well as* bII in the ultimate key of this passage, E-flat (again, depending on major/minor mixture). Figure 5.3 spells out exactly how the apparent D Lydian derives from the key of A-flat.[104] In this way, Fauré neatly surrounds the E-flat V9 chord with chords rooted on the two half-step neighbors of D and F-flat, which both happen to support Lydian CSSM. This further develops the motive of adjacent or consecutive half-steps, which is significant throughout the movement. In Example 5.7, one can also see the motive in the melody of the Eb9 measures (F–Fb–Eb), the melody's crossing from Eb9 into D-Lydian measures (Bb–Ab–Bbb), and in the deeper structural line of F–Fb–Eb–D–Eb that underlies the melody of this excerpt.

Figure 5.3. The supposed derivation of the bV "D Lydian" CSSM shown in Example 5.7

Parallel minor DSS (Ab natural minor)	Ab	Bb	Cb	Db	Eb	Fb	Gb	Ab
	↓	↓	↓	↓	↓	↓	↓	↓
bV chord	↓	Bbb	↓	↓	Ebb	↓	Gb	↓
	↓	↓	↓	↓	↓	↓	↓	↓
Resulting altered chord-scale (= Ab Locrian)	Ab	Bbb	Cb	Db	Ebb	Fb	Gb	Ab
Re-spelled for convenience (= G# Locrian or D Lydian)	G#	A	B	C#	D	E	F#	G#

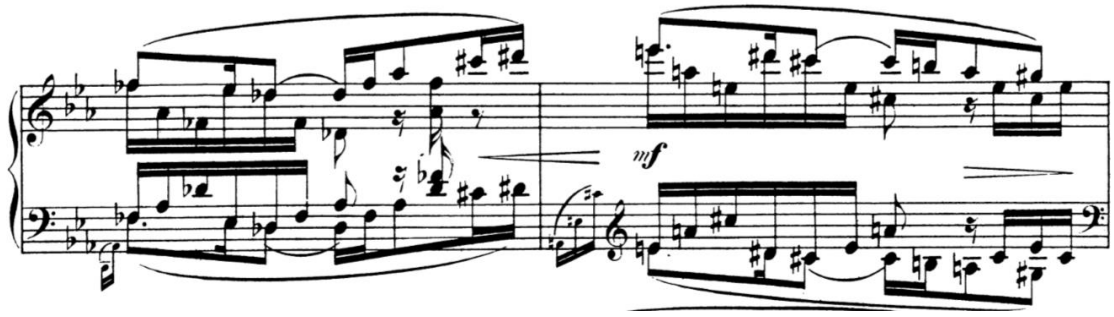
[104] When A-flat natural minor is altered so as to conform to its bV chord, it becomes A-flat Locrian, which is equivalent to D Lydian. If one considers the key to be A-flat *major*, the D-Lydian CSSM can still be derived through the Type-2a principle, using additional scalar borrowing from the parallel minor. Compare these explanations to Tait's (1989) explanations of other apparently Lydian passages in Fauré's music. Importantly, the CSSM suggests that the chord functions as bV and *not* as #IV. Thus, in a key of A-flat, the chord would more properly be spelled as Ebb, and the CSSM as Ebb Lydian (= Ab Locrian), but Fauré obviously chooses spellings that are easier to read.

In the midst of heavy chromaticism, these D-major and F-flat-major harmonies risk sounding like free-floating, keyless major triads. This may account for the stronger likelihood of Lydian scale-degree hearings of these measures, despite their probable major/minor derivations described above. However, that the CSSM of these chords is apparently Lydian rather than simply major-scale signals that they do not function as even local tonic harmonies, and that their functions are actually much richer.[105] Furthermore, Fauré's use of horizontal (rather than vertical) CSSM for these harmonies gives them the extra help they might need in order to be convincingly integrated into the A-flat and E-flat key contexts.

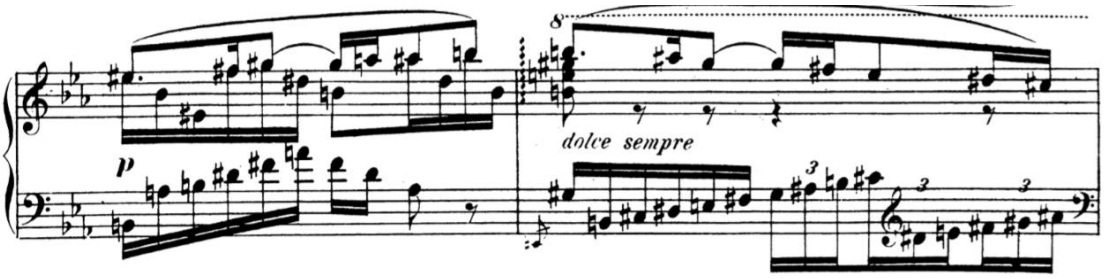
Fauré's Impromptu No. 1 similarly uses apparent Lydian CSSM on bVI and bII in close proximity to each other. And, as in the previous example, the bII Lydian CSSM serves a pivot role in the Impromptu. The passage given in Example 5.8 is entirely in the key of A-flat major. While mm. 42–44 might allude to IV – V7 – I in E major, the apparent E Lydian CSSM in m. 44 negates this and instead points to its derivation from the global tonic key of A-flat. Furthermore, the first four measures of this excerpt (mm. 41–44) could also allude to i – VI – VII^7 – III in the key of C-sharp/D-flat minor. The apparent A Lydian CSSM in m. 42 is consistent with all three key contexts: the "actual" bII function in the key of A-flat, the IV function in the alluded-to key of E major, and the VI function in C-sharp/D-flat minor. In any case, this example shows, along with the preceding example, how Fauré often seems to maximize his opportunities for Lydian sonorities, and specifically Lydian CSSM. It also shows how, more than serving just a

[105] These chord-scale pairings might also problematize popular ideas about chromatic harmony such as Brown, Dempster, and Headlam's (1997) "#IV/bV hypothesis" and the common assumption of major-triad/major-scale conflation (as discussed in Cohn 2011, for example).

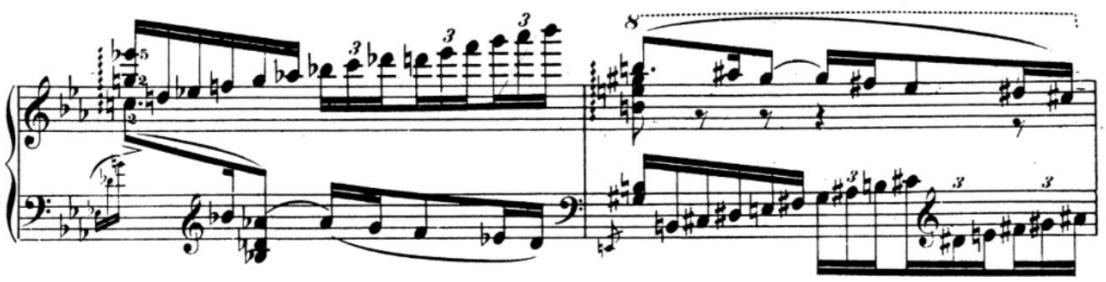
Example 5.8. Fauré, Impromptu No. 1 in E-flat Major, Op. 25, mm. 41–46



AbM: iv = bII (Type-2a CSSM, = "A Lydian")



= $bIII^{b7}$ (Type 2, = "B acoustic"?) = bVI (Type-2a CSSM, = "E Lydian")
= V7/bVI



V7 (Type-1 CSSM, Ab major) = bVI (Type-2a CSSM, = "E Lydian")

coloristic function, Lydian CSSM allows Fauré to engage in some interesting games of *Mehrdeutigkeit*.

Immediately following this excerpt is another V7 in A-flat; therefore the final three measures of this excerpt and the following V7 also demonstrate substantial scalar

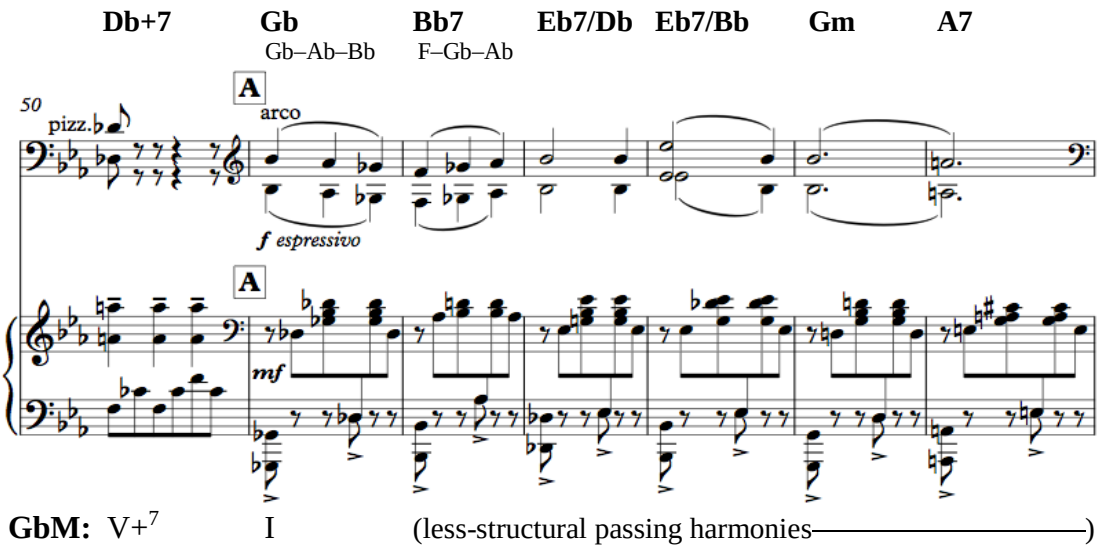
shift (by three accidentals, between 7-flat and 4-flat diatonic scales) and Fauré's typical technique of alternating between two contrasting local scalar structures.

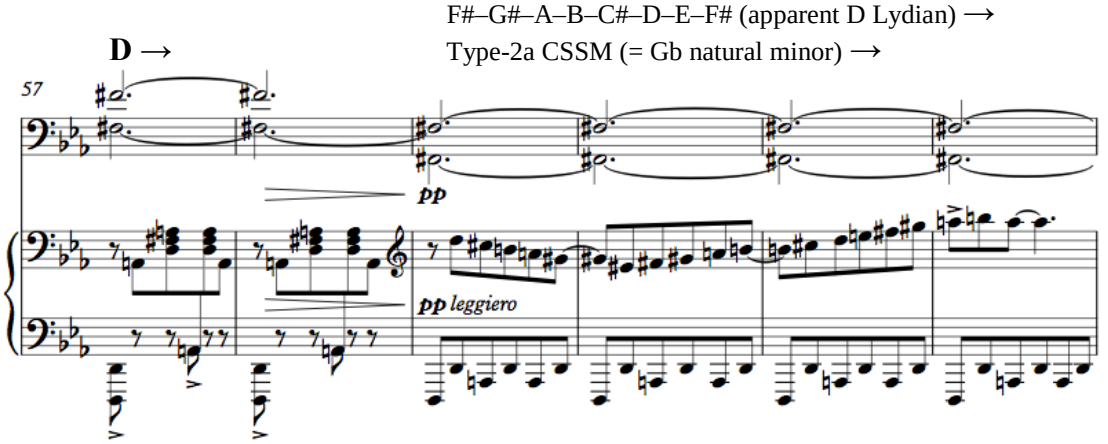
In Example 5.9, again from the Second Piano Quartet, the apparent D Lydian CSSM in mm. 59–66 is puzzling at first glance, but it makes sense when understood as enriching the bVI function within the deeper key of G-flat major (or G-flat variable major/minor). If in the key of G-flat major, the bVI "Lydian" CSSM would require additional alterations beyond those required by chromaticism in the chord, hence the label of "Type 2a" in Example 5.9; but if understood as in a variable major/minor key, this apparent Lydian CSSM is simply Type 1. Despite a chord progression that hardly suggests the key of G-flat, the apparent D Lydian CSSM is but one clue that supports such an interpretation. Thematic and formal features suggest that GbM and DM are the two structural harmonic pillars of this passage. At a deeper structural level, mm. 51–83 simply exhibit two Fauré-like alternations between GbM and DM, and the descending major-third motion between two major triads hearkens back to one of the most prominent themes in the first movement of this quartet. Furthermore, while GbM clearly initiates this new section at m. 51 with the introduction of the movement's second prominent theme, the DM zones are obviously prominent because of their sheer durations of eleven measures (mm. 57–67) and twelve measures (mm. 74–85), respectively.

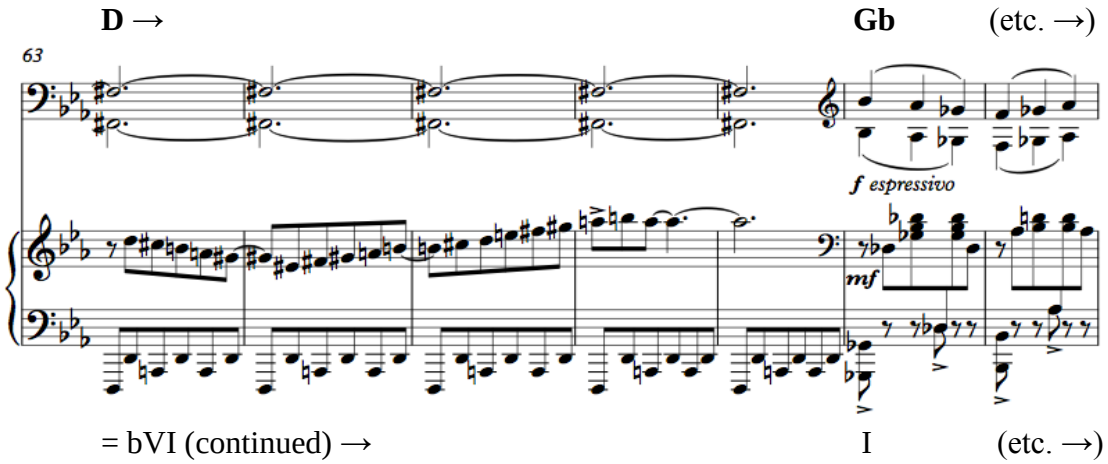
The non-D-Lydian G-naturals in the chords that lead into the D-Lydian zone (Eb7, Gm, and A7 in mm. 53–56[106]) do not negate this interpretation; these chords are just chromatic connectives between the more structural (and alternating) G-flat and D

[106] To interpret the Eb7 in mm. 53–54 as $VI^{7/\#}$ in G-flat major also links it to the first movement of this Quartet, in which the secondary theme area features a prominent alternation between I and $VI^{7/\#}$ in the key of E-flat major (mm. 32–34). This corresponding passage uses an unmistakably similar melody, and it similarly features passing chords en route to the $VI^{7/\#}$ and a direct return to the tonic chord.

Example 5.9. Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mvt. II, mm. 50–69 (string parts collapsed)







zones of this passage. I am not arguing for a *key area* of D Lydian, which would require different preceding chords. And although the progression of Gm – A7 – DM does allude to the key of D major (not Lydian), the apparent D Lydian CSSM reveals that its D-major-triad chordal zone should be understood as bVI within the broader key of G-flat major. In other words, what I have referred to as apparent D Lydian CSSM is more properly understood as G-flat natural minor, the parallel minor of the tonic of this passage. Interestingly, this interpretation gains even further support when one notices that the lowest note of this CSSM, F#4 (mm. 60, 64, 77, and 81), reinforces its derivation from the global tonic key of G-flat, and this connection is strengthened by the sub-scalar lower neighbor E#4 that precedes it (in mm. 60 and 64) as it resembles the F-natural in the opening melodic span of F4–Gb4–Ab4–Bb4 in m. 51 (and m. 68).

This section ends with a table of further possible scenarios for major-triad/Lydian-fourth pairings, but those that would not yield complete Lydian scales (Table 5.3). The mere presence of a Lydian fourth that embellishes a major triad might give the impression of apparent Lydian CSSM, and Fauré exploits many of these additional possibilities in his music. Underneath the table in Table 5.3 is a summary of how these scenarios extend the chain of fifth-related chord-roots that was begun in Table 5.1.

CSSM Suggesting Other Non-Major/Minor Scales

Other Apparent Church Modes

In addition to apparent Lydian CSSM, Fauré also seems to have deliberately exploited opportunities for apparent Dorian and Phrygian CSSM (though not nearly as often as Lydian), and examples of these could be studied in ways analogous to those

Table 5.3. Type-1 and Type-2 scenarios for major triads with Lydian fourths, but not a complete Lydian scale (cf. Table 5.1)

CSSM Type	Key/DSS	Major Triad
Type 1	Harmonic minor	bVI
	Melodic minor	IV
Type 2	Major	bI
		bII
		bV
		bVI
	Natural minor	bI
		bbIII
		bIV
		bbVII
	Harmonic minor	bI
		bbIII
		IV
		bbVII
	Melodic minor	bI
		bV
		bVI
		bbVII

Chain of fifths: IV – (bVII – bIII) – bVI – bII – bV – bI – bIV – bbVII – bbIII

utilized in the above section for Lydian CSSM. Table 5.4 shows which key-chord scenarios provide opportunities for Type-1 and Type-2 apparent Dorian and Phrygian CSSM. Note that fewer opportunities exist for Dorian, and this might speak to its less frequent appearance in Fauré's music. The number of possible scenarios for both Dorian and Phrygian would probably increase if minor–minor-seventh chords are used (as the minor seventh could help "pull" certain scale degrees into place). Rather than looking at examples of these apparent church-mode sonorities, however, I will now turn to examples of apparent acoustic-scale, octatonic, and whole-tone CSSM, as these scale-types are more strongly identified as non-major/minor.

Table 5.4. Key-chord scenarios that yield Type-1 and Type-2 apparent Dorian and Phrygian CSSM

Local Chord-Scale Pairing	**CSSM Type**	**DSS: Minor Triad**	**Local Tonic Scale**
Minor triad, Dorian scale starting on chord root	1	major: ii	major
		natural minor: iv	natural minor
	2	major: v	mixolydian
		natural or harmonic minor: bvii	Phrygian
Minor triad, Phrygian scale starting on chord root	1	major: iii	major
		natural minor: v	natural minor
	2	natural minor: ii	Dorian
		melodic minor: $^{(M)}$iii	major
		major: #iv	Lydian #1 (C#–D–E–F#–G–A–B–C#)
		harmonic minor: v	natural minor
		natural minor: $^{(M)}$vi	mixolydian
		major: vii	Lydian

Apparent Acoustic-Scale CSSM

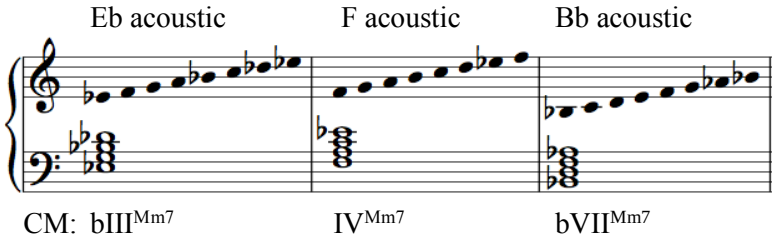
Fauré's penchant for apparent acoustic-scale sonorities has been mentioned by several scholars (most notably Gervais [(1954) 1971]; Orledge [(1979) 1983]; and Tait [1989]), and I have already discussed one example (Example 5.5) in the sub-section on Fauré's treatment of augmented-sixth chords. Table 5.5 shows all of the possible Type-1 and Type-2 scenarios for complete acoustic-scale CSSM with major–minor-seventh chords, and Example 5.10 shows generic examples of each. Note that Table 5.5 exhibits the exact same set of fifth-related chord-roots as those in Table 5.1 (which showed scenarios for complete-scale Lydian CSSM). Table 5.6 then lists the remaining possible Type-1 and Type-2 scenarios that yield Lydian fourths with major–minor-seventh chords.

Table 5.5. Type-1 and Type-2 scenarios for complete apparent acoustic-scale CSSM built on the roots of major–minor-seventh chords, and generic examples

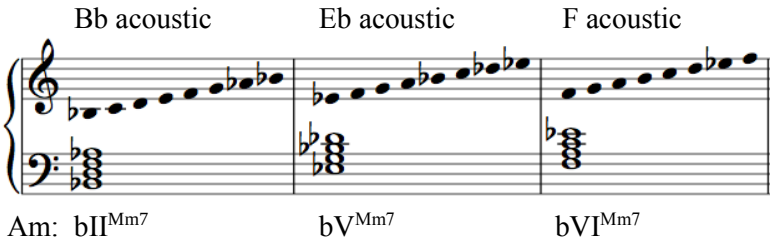
CSSM type	Key/DSS	Mm7 chord	Scale from chord root	Scale from tonic
Type 1	Melodic minor	IV^{Mm7}	Acoustic	Melodic minor
Type 2	Major	$bIII^{Mm7}$	Acoustic	Dorian b2
		IV^{Mm7}	Acoustic	Melodic minor
		$bVII^{Mm7}$	Acoustic	Major-minor (C–D–E–F–G–Ab–Bb–C)
	Natural minor	bII^{Mm7}	Acoustic	Phrygian b1 (Cb–Db–Eb–F–G–Ab–Bb–Cb)
		bV^{Mm7}	Acoustic	Locrian b4 (C–Db–Eb–Fb–Gb–Ab–Bb–C)
		bVI^{Mm7}	Acoustic	Natural minor b5
	Harmonic minor	IV^{Mm7}	Acoustic	Melodic minor
		bV^{Mm7}	Acoustic	Locrian b4
	Melodic minor	$bIII^{Mm7}$	Acoustic	Dorian b2

Example 5.10. Generic examples of the apparent acoustic-scale CSSM scenarios listed above in Table 5.5

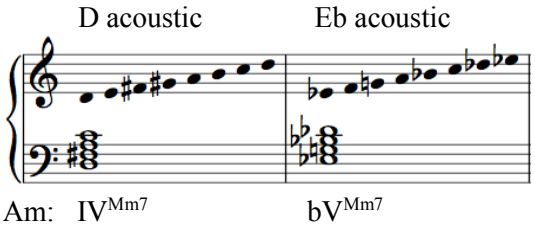
Examples of acoustic-scale CSSM derived from a C major deep scale:



Examples of acoustic-scale CSSM derived from an A natural minor deep scale:



Derived from A harmonic minor:



Derived from A melodic minor:

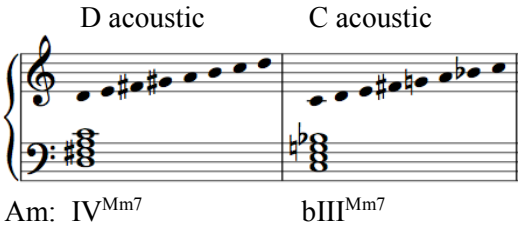


Table 5.6. Type-1 and Type-2 scenarios for major–minor-seventh chords with Lydian fourths, but not a complete acoustic scale

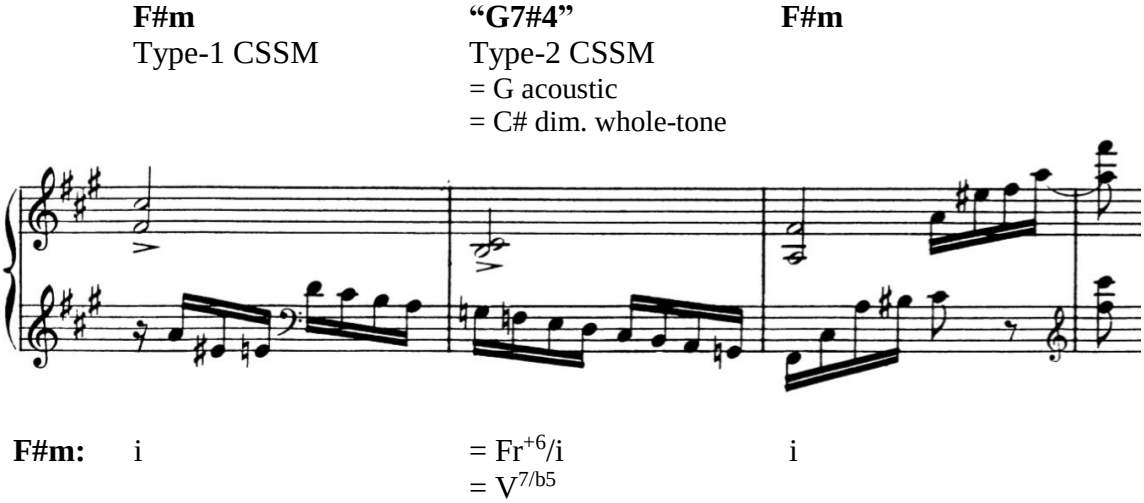
CSSM type	**Key/DSS**	**Mm7 chord**
Type 1	(none)	
Type 2	Major	bI^{Mm7}
		bII^{Mm7}
		bV^{Mm7}
		bVI^{Mm7}
	Natural minor	bI^{Mm7}
		$bbIII^{Mm7}$
		bIV^{Mm7}
		$bbVII^{Mm7}$
	Harmonic minor	bI^{Mm7}
		bII^{Mm7}
		$bbIII^{Mm7}$
		bVI^{Mm7}
		$bbVII^{Mm7}$
	Melodic minor	bI^{Mm7}
		bII^{Mm7}
		bV^{Mm7}
		bVI^{Mm7}
		$bbVII^{Mm7}$

Example 5.8 contains a potential instance of apparent acoustic-scale CSSM, in m. 43. If the melodic interval of E#–F# is deemed scalar rather than sub-scalar, it demonstrates the Type-2 apparent acoustic CSSM created by a $bIII^{b7}$ chord in a major key (as listed in Table 5.5). The CSSM of this excerpt suggests that if the global tonic of the passage is spelled as A-flat, then the chords of mm. 42–44 are most properly spelled as BbbM, Cb7, and FbM, respectively. Therefore, the questionable interval of E#–F# in m. 43 is "actually" F–Gb (relative to the global key of A-flat), and because F already belongs to the tonic DSS, it may reasonably be understood as a scalar note, which then leads to a chordal note (Gb).

However, several more-convincing examples of apparent acoustic-scale CSSM can be found in Fauré's works. Example 5.11 shows one of particular historical importance, and it is found in a piece that almost approaches a study in apparent acoustic-scale CSSM: the fifth Impromptu, Op. 102 (published in 1909). The apparent G acoustic scale in m. 43 could potentially demonstrate the bII^{b7} chord's ability to create Type-2 acoustic-scale CSSM within a natural minor DSS, as listed in Table 5.5; however, the identity of the chord in m. 43 of this example is somewhat more complicated. G, B, and C# are the most apparent chordal notes, but the CSSM suggests that F must be a chordal note as well—at least theoretically—because nothing else would clearly justify the alteration of the tonic note F#. Though such chords are rather common in late-Romantic-era music, they are usually spelled as French augmented-sixth chords. The chord in Example 5.11 clearly falls in this tradition, however, as it exhibits the typical dominant function and ambiguity of chordal root (which could appear to be either G or C#). The complete-scale Type-2 CSSM all but proves the possibility of altered tonic scale degrees—a concept that might otherwise seem dubious—and it also suggests a convincing historical origin for what is known in jazz as the "diminished whole-tone" (or "altered" or "super Locrian") scale.[107]

[107] Built on C, the diminished whole-tone scale is [C–Db–Eb–Fb–Gb–Ab–Bb–C] (spellings often vary). Jazz chord-scale theory often describes it as the seventh mode of melodic minor, but this says nothing of its origins and its functions. In jazz it is typically prescribed and used for dominant-functioning V^7 chords, where it is built on the chord root. The scale in m. 43 of Example 5.11 matches this description entirely if the chord root is interpreted as C#, meaning a C# diminished whole-tone scale for a type of dominant-functioning V^7 chord in F# minor. However, because the CSSM suggests that it derives from lowering the tonic and second degrees of the tonic F# natural minor scale, the chord is better explained as a type of bII^{b7}, which in turn might derive from the more common French augmented-sixth built on the lowered second degree (itself most likely deriving from the Phrygian cadence of $v^{Ø4/3}$ to i [cf. Ellis 2010], altered so as to include a raised-seventh leading tone, thus bringing us back to a possible chord root of ^5, or C# in this example). Therefore, the Type-2 CSSM in Example 5.11 as well as the diminished whole-tone scale in jazz might both defy their historical origins, which would instead yield a Type-2 "harmonic" or "melodic" Phrygian scale (i.e., Phrygian with a major seventh degree) built on the tonic note.

Example 5.11. Fauré, Impromptu No. 5 in F-sharp Minor, Op. 102, mm. 42–45



To conclude this brief sub-section, apparent acoustic-scale CSSM naturally arises out of a set of major/minor-based key-chord scenarios that is very similar to the set of Lydian-yielding scenarios. Fauré seems to have been aware of these scenarios and his apparent acoustic-scale CSSM seems to be primarily derived from such major/minor sources. Further study is needed, however, to determine whether he may have used the acoustic-scale as a direct (Type-4) resource for melodizing major–minor-seventh chords (as Debussy, for example, seems to have used it[108]). If so, such melodization could possibly serve to indicate a generic "non-V^7" function—particularly for major–minor-sevenths that are not in any clear key.

[108] See Tymoczko 1997; 2004; and 2011 for examples. Furthermore, note that Debussy's music is often better understood as using scales the way previous composers used chords. Tymoczko (2011, ch. 9) refers to this as "scale-first" composition—as opposed to "chord-first" composition.

Octatonic CSSM

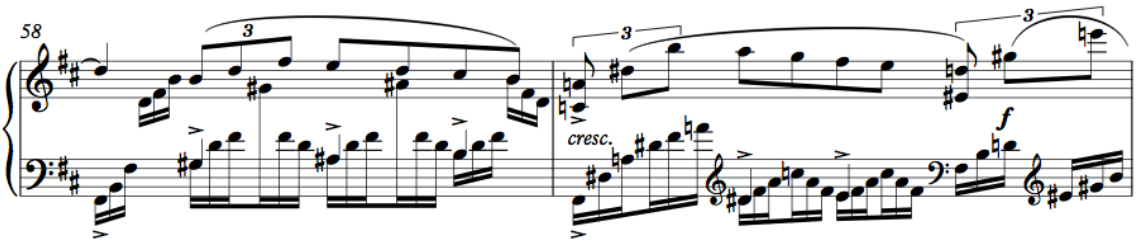
Just as I hypothesize that Fauré did not use Lydian or acoustic-scale materials directly and rather derived them from traditional major/minor sources, the same appears to be mostly true of his apparent octatonic CSSM. Example 5.12 shows an indisputable instance of octatonic-scale CSSM, which is somewhat rare for Fauré. Interestingly, however, this example effectively demonstrates somewhat of a historical narrative of the evolution of octatonic CSSM in classical music. In Chapters III and IV, I showed that the conventional type of CSSM for #iv$^{\circ 7}$ (or vii$^{\circ 7}$/V) chords for Baroque through early-Romantic composers was Type-2 CSSM suggestive of a "melodic minor #4" scale (possibly variable). Chopin appears to be the first to use Type-4 octatonic CSSM as an alternative in his F Minor Piano Concerto (Example 3.14). This form of octatonic scale is extremely similar to the corresponding melodic minor #4, and it could even be described as "melodic minor split 5." Fauré's CSSM for the sustained #iv$^{\circ 7}$ in Example 5.12 (beginning in m. 60) begins as Type 2, but it avoids using the raised fourth (E#) as an unequivocally scalar note (the D–E# intervals in the left-hand part could be interpreted as chordal), and it instead emphasizes the perfect fourth, E-natural, in the upper melody, which creates a chord-CSSM conflict (E against E#) and might be interpreted as reflecting the variability that is so common in such key-chord scenarios (e.g., Example 3.20). In any case, the first half of m. 61 takes the next careful step toward octatonicism. While not initially introducing any new pcs, it negates the potential variable scalar space by articulating D–E–F as a scalar interval pathway (the traditional variable melodic minor #4 would not use E–E#/F [pcs 4–5] as a scalar interval because both pcs would be

Example 5.12. Fauré, Nocturne No. 2 in B Major, Op. 33/2, mm. 58–65

Bm/F#
F#–G#–A#–B–C#–D–E–F#
Type 1, B melodic minor

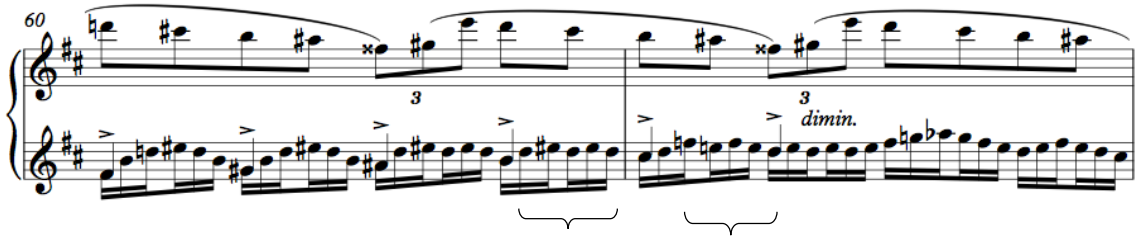
D#°7/F#
C–D#–E–F#–G–A–B
Type 3 (E harmonic minor)

E#°7/F#



E#°7/F# →
F#–G#–A#–B–C#–D–E
(Type 2cv, B mel. min. with variable ^4)?

A#–B–C#–D–E–F–G–Ab
Type 4, octatonic$_{1,2}$?

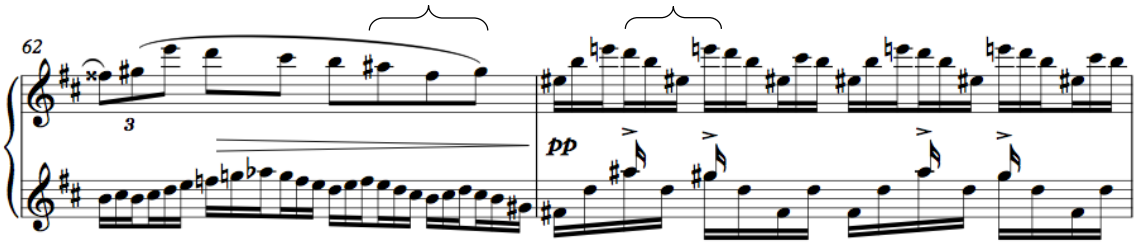


variable structure supported…

…and negated

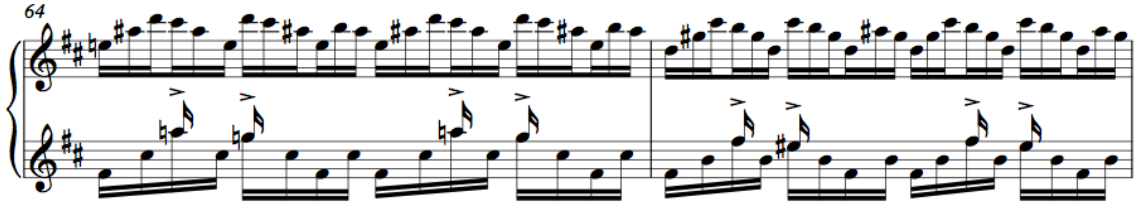
E#°7/F# →
The last remaining octatonic$_{1,2}$
scalar interval (G#–A#) is hinted at…

…and confirmed (lower staff).



A#°7/F#
G–A, C#–D (Type 1)

E#°7/F#
E#–F#, B–C# (Type 2)



placeholders of scale degree 4). The change of spelling from E# to F-natural is of course another hint of the impending octatonicism.

The chordal and scalar material of m. 60 is already extremely close to being octatonic; in terms of pc content, F# would only need to be displaced to G. However, even G belongs to the variable DSS of B minor. A more reliable indicator of octatonicism in such a situation would be the articulation of E#–G (pcs 5–7) as a scalar interval, which would skip over the crucial perfect-fifth degree of F#. Just as traditional Type-2 augmented-sixth CSSM retains from the key a perfect-fifth scale-degree boundary, which Fauré breached with his Type-3 and Type-2 natural minor b5 treatments of the chord (Examples 5.2–5.5), Fauré breaches a similar perfect-fifth boundary in the second half of m. 61 with the articulation of F–G as a scalar interval. Furthermore, the suggestion of G–Ab as scalar further negates the pathways of B variable minor. Therefore, true octatonicism is safely assumed by the end of m. 61, and the last remaining scalar interval of G#–A# (8–T) is finally confirmed in m. 63.

This "historical narrative" of the evolution of octatonic CSSM, as I have described it, is fittingly expressed as a sort of breakthrough (and perhaps also breakdown) in this excerpt. The gradual rise in register from m. 55 to m. 61 and the ascending melodic sequencing from m. 58 to m. 60 both contribute to a sense of climax in m. 61—the exact point at which traditional melodic minor material finally transforms into unequivocally octatonic material. Once the octatonicism is achieved, the obsessive melodic repetition in mm. 60–62 and a calming down in m. 62 leads into an other-worldly liquidation at m. 63. The dominant pedal of F#, which had conveniently vanished since the downbeat of m. 60 to allow for the emergence of the octatonicism, returns at

this liquidation point, and the traditional key of B minor gradually returns in the following measures. To identify this rare appearance of octatonic CSSM in Fauré's music as "Type 4" is perhaps misleading, as Fauré is so careful to only gradually extract it from traditional major/minor materials.

2. Analysis of a Complete Piece: Fauré's Nocturne No. 3 in A-flat Major, Op. 33, No. 3

I now turn to an analysis of Fauré's Nocturne No. 3 in A-flat Major (1882) with the aim of demonstrating all that the study of CSSM can offer to a longer analysis. I have chosen this piece because of its relatively clear framework of chordal zones, its harmonic interest, its exploitation of ambiguity, and its abundance of intriguing scalar material, much of which presents challenges to the analyst. In this sense, it serves as somewhat of a test-run for the analytical and theoretical ideas developed in the previous chapters of this study.[109]

The piece exhibits a mostly conventional ternary form with the first "A" section spanning mm. 1–27, the middle "B" section spanning mm. 28–67, and the final "A" section spanning mm. 68–91, which lead into a coda for the remaining measures of 92–110. Though many different keys are briefly alluded to throughout the piece, none besides the overall tonic key of A-flat major is established for more than a few measures. The analysis that follows proceeds in the order of each section, but I skip the final "A" section because, from a CSSM perspective, it is essentially identical to the first "A."

The parallel periods that carry the main theme and begin each "A" section (mm. 1–8 and 68–75) are the only parts of the piece exceeding one structural chord per

[109] Though the analysis that follows presents several excerpts from the Nocturne, readers are encouraged to consult a complete score of the piece, which is available for free at <www.imslp.org>.

measure. These are the most traditional-sounding parts of the piece, and, not surprisingly, they also have the least CSSM per chord. Outside of these passages, a minimum one-measure duration for every chordal zone combined with Fauré's innovative harmonic language provides many opportunities for interesting CSSM in this piece.

CSSM in the "A" Sections

CSSM's Contribution to Tonal Color in Measures 9–16

Though the opening eight measures of the piece contain very little CSSM due to the high rate of chord change, the remainder of the section offers much of interest. And though mm. 9–16 might be dismissed as simply alternating between the keys of A-flat and E major, thus exhibiting only Type-1 CSSM, closer consideration reveals that the CSSM makes essential contributions to a recurring motive of pentatonic sets, thereby creating significant tonal colors. As shown in Example 5.13, the total chordal and scalar pc content of mm. 9 and 13 can be described as the "Eb9 pentatonic" set, and that of mm. 10/14 is [Ab C Eb F G]. Despite chromatic chordal activity, mm. 11/15 eventually articulate a clear E major pentatonic scale, and, in light of the preceding three measures, one will inevitably discern the B9 pentatonic set in mm. 12/16.[110] This motive of pentatonicism helps make the shift from A-flat major to E major all the more striking and colorful. The two major scales in their completion share three common scalar pcs (1, 3, and 8) and one common scalar pc interval (1–3). Because the pentatonic set of mm. 10/14 excludes pc 1 and that of mm. 11/15 excludes pc 3, the resulting set progression from [03578] to [1468E] is more jarring than would be a progression from the complete A-flat

[110] I describe the E major pentatonic structure in mm. 11/15 as a scale because all of its scalar intervals are articulated as such. The other pentatonic structures in these measures are described merely as sets because their potential scalar intervals are not all convincingly articulated as such.

major set to the complete E major set. Notice also how the "0357" pitch sets of [Bb4 Db5 Eb5 F5] and [C5 Eb5 F5 G5] articulated by the melody of mm. 9–10/13–14 set up the relatively modern effect of shifting [C Eb F G] up a half step to [C# E F# G#] in the E major pentatonic CSSM of mm. 12/15—what may have prompted Orledge ([1979] 1983, 250) to describe these measures as demonstrating "tonal sidestepping."[111] Furthermore, the relatively euphonious nature of pentatonic sets as well as their associations with exotic, idyllic, and religious ideas helps to distance this passage further from the mundane and create a more special sense of tonal color.[112] This passage shows that even what is understood as Type-1 CSSM sometimes deserves careful attention. The type labels certainly do not say everything important about CSSM, and they are not supposed to.

A Hybrid Scalar Ascent and Effects of CSSM on Functional Meaning

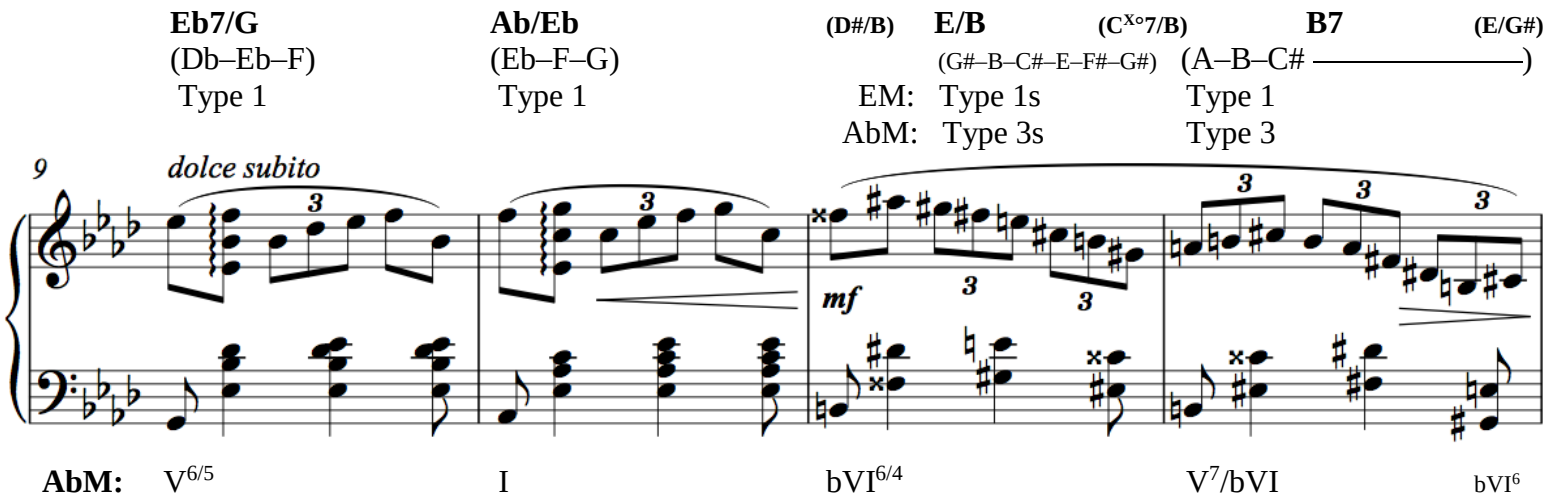
As shown in Example 5.14, measures 17–27 exhibit a long scalar ascent through a gauntlet of different harmonies en route to the structural authentic cadence of this "A" section at m. 23. This ascending melody does not follow just one scale or scalar space, but rather weaves through different chordal zones so as to create the effect of a long hybrid scale, [B C# D# E F# G A B C D E F# G#/Ab Bb C Db Eb F G], the last portion of which finally settles into the tonic A-flat major scalar space (in mm. 21–22).[113] Rather than the melody being the conceptual basis of the passage and being harmonized, the

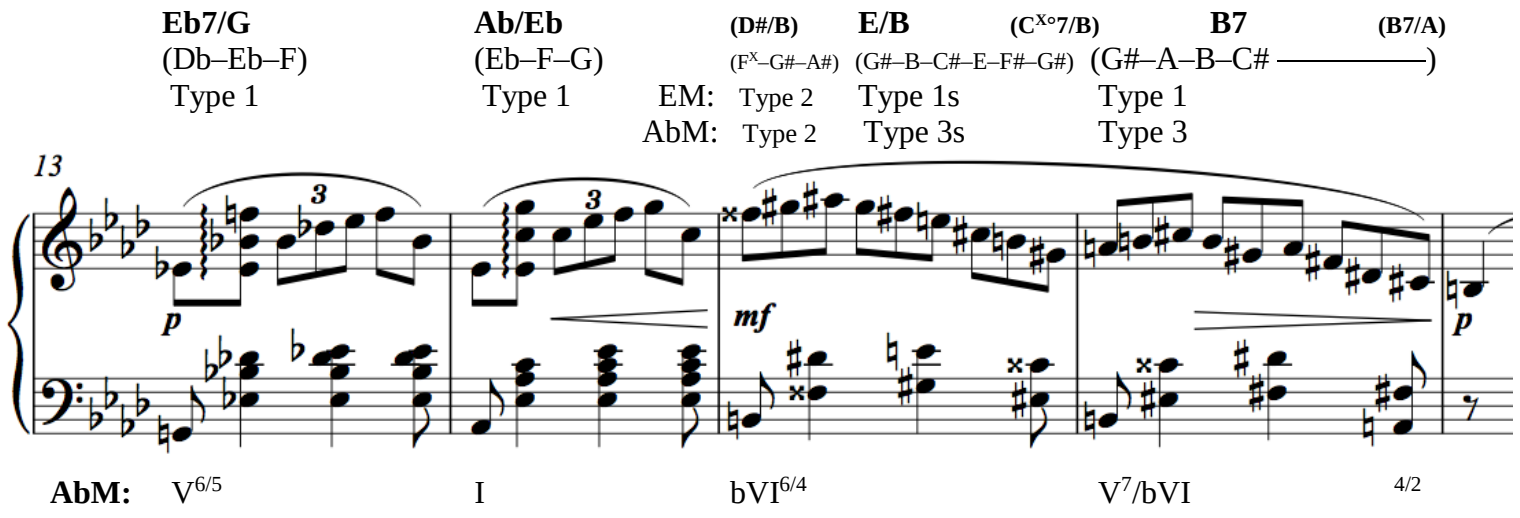
[111] "Sidestepping" is incidentally also a term used to describe similar techniques in jazz, where they are much more common. In jazz, sometimes the term "side-*slipping*" is used instead.

[112] Regarding these associations with pentatonicism, see Day-O'Connell 2007. While he essentially discusses only the familiar major pentatonic set, I believe my point here still resonates with this passage of music.

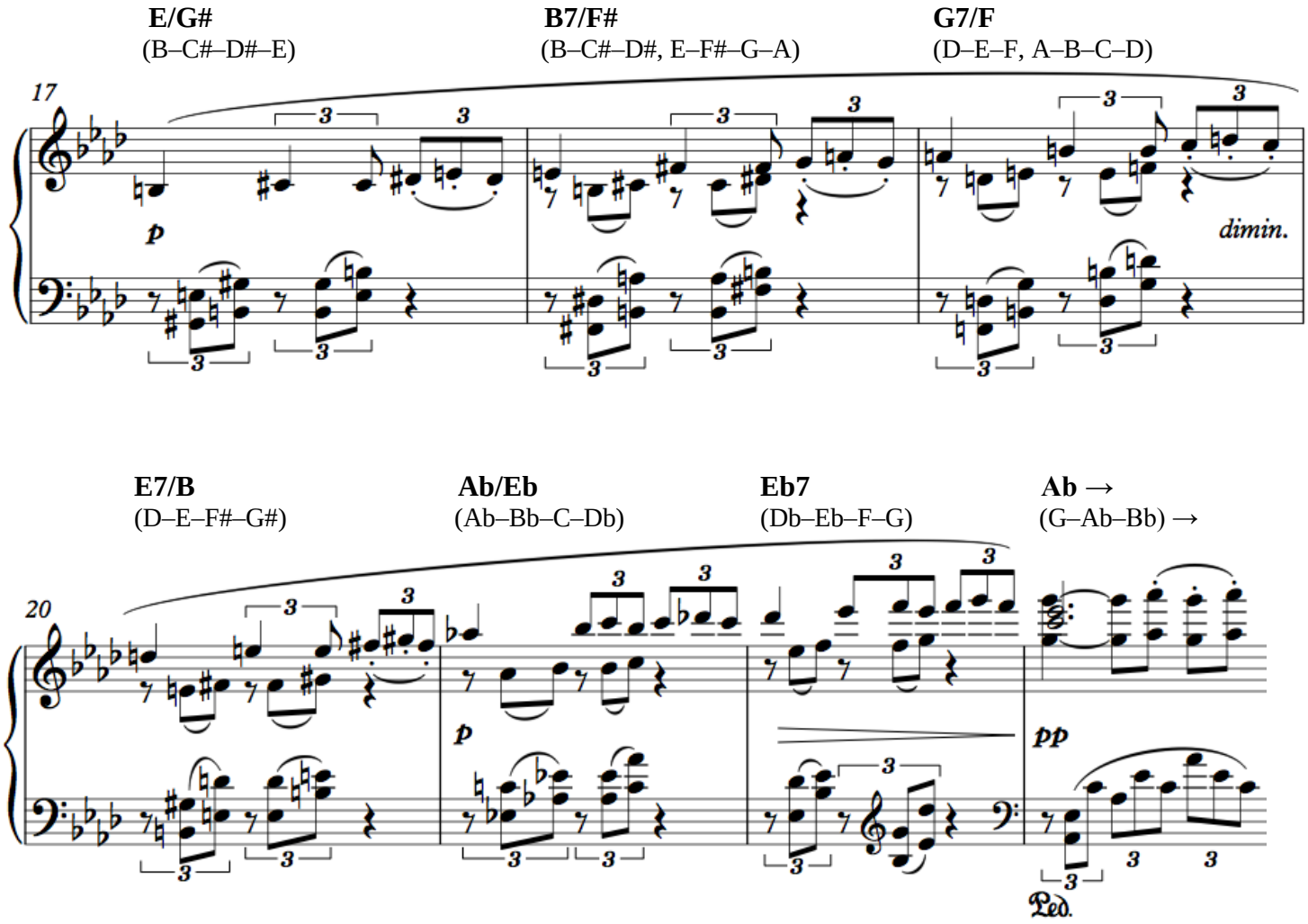
[113] The third movement of Fauré's much later Piano Trio in D Minor, Op. 120, contains an exceptionally brilliant passage (the entirety of Rehearsal 7) that is somewhat reminiscent of this passage of the Nocturne.

Example 5.13. Fauré, Nocturne No. 3 in A-flat Major, Op. 33/3, mm. 9–16





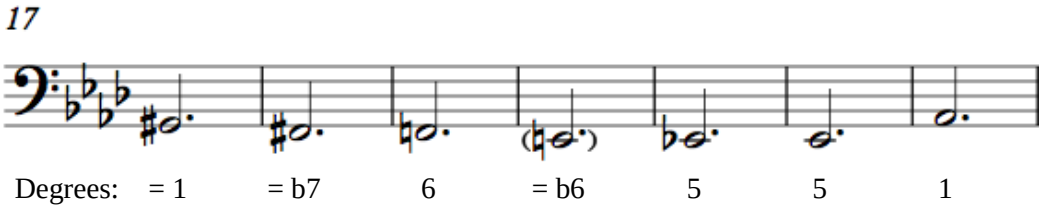
Example 5.14. Fauré, Nocturne No. 3 in A-flat Major, Op. 33/3, mm. 17–23



AbM: = Ger^{+6} V$^{6/4}$——————7/5/3 I

melody is composed of six segments of CSSM corresponding to the six chords it encounters. The passage appears to be based instead on the stock bass progression of scale degrees 1–b7–6–b6–5 (shown in Example 5.15), which also reappears in the beginning of the coda, discussed later. From this bass progression, Fauré seems to have deliberately chosen a harmonic path (from E major back to A-flat) that is both deceiving and colorful. The melody could be described as taking advantage of this chord progression, enriching each chord along the way, and exhibiting colorful scalar shifts across each of the first five measures (mm. 17–21).

Example 5.15. Stock bass progression underlying mm. 17–23 of the Nocturne



The CSSM in this passage also contributes to questions of functional meaning. The first two chords of E major and B7 will be immediately understood as I and V^7, but the following chords and the CSSM of the B7 measure (m. 18) complicate this. Why does the B7 chordal zone contain a G-natural in its CSSM instead of the expected G-sharp?[114] Is it merely an anticipation of the following G7 chord?[115] Is it merely following the four-flat key signature? Or is it saving the surprise of F#–G#/Ab for the return to the tonic

[114] Regarding the expectation of G-sharp, I have noticed two different professional pianists misread this measure as containing a G-sharp instead of a G-natural. To my knowledge, all editions of the score indicate G-natural, and one of the aforementioned pianists was reading from a score that indicated G-natural.

[115] Salley (2007) discusses similar anticipations of a chord in jazz music—situations in which the anticipation creates a conflict with its concurrent chord.

scale at m. 21? Any of these speculations are possibly true. However, it also points to the potential for mm. 18–20 to allude to the key of A minor (with its traditionally variable sixth and seventh scale degrees). The resulting progression would be II#7–bVII7–V7, which makes sense as a II–V elaboration, and the bVII7–V7 portion of which occurs just before recapitulation in this piece and is a favorite of Fauré's. In this key context, the CSSM of the B7 chord would be simply Type 2. Another possible interpretation is simply V^7 in the key of E minor, which would mean Type-1 CSSM. In any case, the CSSM suggests that we cannot simply regard this as a keyless voice-leading chord, even if the determination of one absolute key is not possible.

The G7 chord in m. 19 with its CSSM is perhaps most suggestive of the key of C major, adding yet another possible key to this passage, but its CSSM is also consistent with the keys of A minor and E minor. Furthermore, the E7 chord of m. 20 functions as a traditional German augmented-sixth (except for its unusual bass note of B, which reflects Fauré's career-long penchant for creating highly disjunct bass lines and unconventional chord inversions, and which here might be explained simply as a practical means of moving the left-hand chords up in register throughout mm. 19–22). However, here is another example of Fauré's function-obscuring augmented-sixth-chord CSSM. The CSSM of this E7 might suggest a V^7 function in A minor, thereby maintaining scalar euphony throughout this entire ascent (as opposed to a conventional Type-2 treatment, which would yield a "0125" tetrachord of D–Eb–Fb–G).

This E7 CSSM is also significant for creating an E9 pentatonic set, which is reminiscent of the dominant-ninth pentatonic sets in mm. 9/13 and 12/15. This then leads one to notice that the CSSM of m. 22 creates an Eb9 pentatonic set. Though some of

these recurrences of set quality might be merely coincidental, the ones that I point out seem to contribute significantly to the tonal character of this piece, and it is also possible that Fauré was consciously experimenting with some of these sonorities. Moreover, the 0246 structure of the E7 CSSM is motivically significant for a number of reasons. As shown in Figure 5.4, the earlier melody of mm. 9–13 suggests an underlying melodic line of Eb–F–G–Ab–A–B–C#–Eb, the final ascent of which articulates a 0246 structure, and which occurs over the deeper succession of B7–Eb7, which is very similar to the E7–Ab progression in mm. 20–21. Both of these moments involve an ascending 0246 line (although the first is at a deeper level), the highest note of which achieves resolution concurrent with what could be called a German-augmented-sixth chord transformation (although the first is at a deeper level). We will also see that the 0246 motive is prominent in other situations later in the piece.

Figure 5.4. Melodic line underlying mm. 9–13 of the Nocturne, exhibiting a 0246 motive in mm. 12–13

m.:	9	10	11	12	13
	| Eb–F	| F–G	| F^{x}–G# (= G–Ab)	| A——B–C#	| Eb
	$V^{6/5}$	I	bVI	V^{7}/bVI	$V^{6/5}$

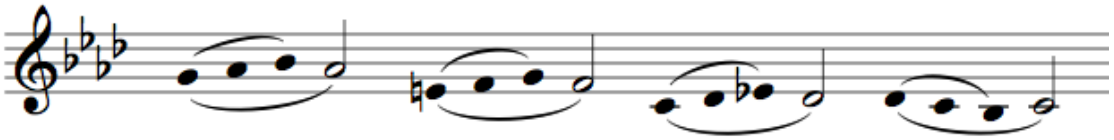
CSSM in the Middle Section

Poignant Half-Steps and Lydian and Octatonic Sonorities in Measures 28–43

Measures 28–43 comprise two differently harmonized instances of what is basically the same melody, the underlying structure of which is shown in Example 5.16. While the first harmonization, in mm. 28–35 (Example 5.17), exploits poignant half-step

sonorities—partly with the help of CSSM, the re-harmonization in mm. 36–43 seems to emphasize whole-tone-related sonorities (Example 5.18). Remarkably, both harmonizations allude to the same octatonic collections in their central four measures (30–33 and 38–41, respectively), but with different chords. However, to speak of CSSM's contributions to the sonorities is potentially misleading here, as the melodic line seems to be the conceptually prior material and the chords seem to be conceptually subsequent additions. Nevertheless, the scalar material that occupies each chordal zone does participate in the octatonic sonorities as well as other effects in these passages.

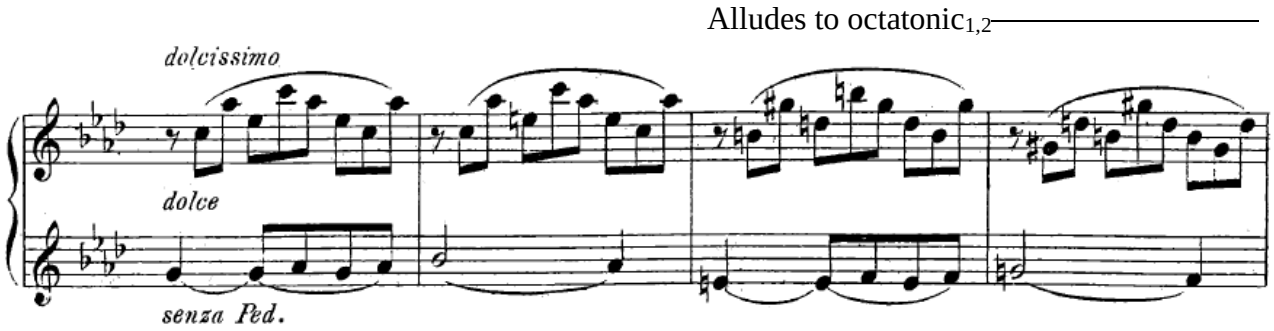
Example 5.16. Melodic sequence underlying mm. 28–42 of the Nocturne



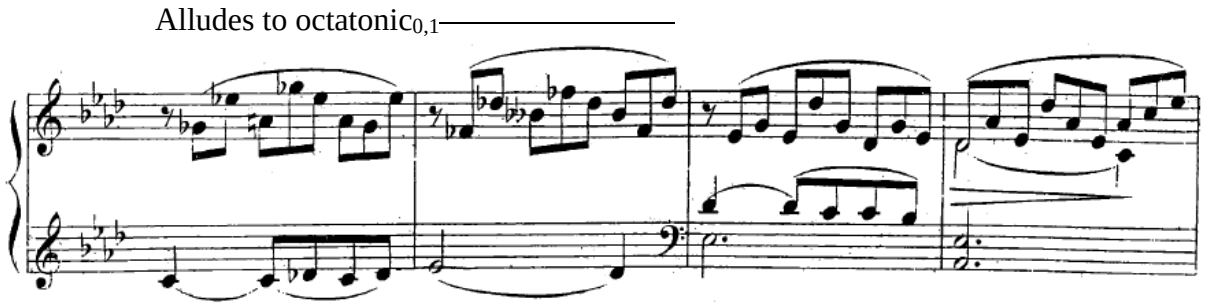
Measure:	28	29	30	31	32	33	34	35
Measure:	36	37	38	39	40	41	42	

Measure 33 also contains an instance of apparent Lydian CSSM, though only a Lydian suspension (Eb–Db), and this creates just one of the several poignant half-steps in the passage (Eb suspended against Fb). This means that m. 33 could be understood in reference to three different sonorities, collections, or orientations: the highly-local apparent Bbb Lydian, the octatonic$_{0,1}$ suggested by the entirety of mm. 32–33, and the global key of A-flat major, in which this chord is a conventionally functioning Neapolitan. Similarly, m. 40 can be understood as a highly-local apparent acoustic-scale sonority, part of the octatonic$_{0,1}$ suggested by mm. 40–41, and in reference to the global key of A-flat major.

Example 5.17. Measures 28–35: the first harmonization of the melody summarized in Example 5.16

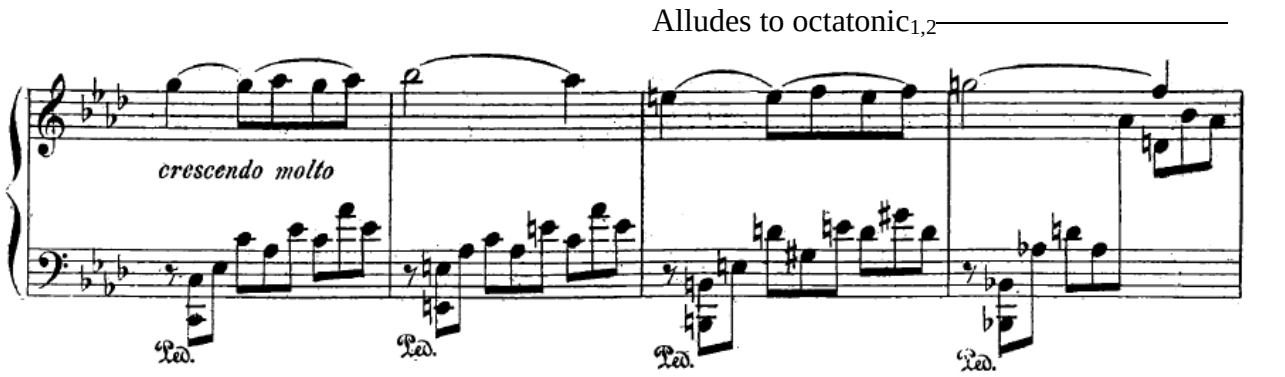


AbM: I I+ V^7/bII or CT^{+6}/I vii°^{7}/bII or CT°^{7}/I

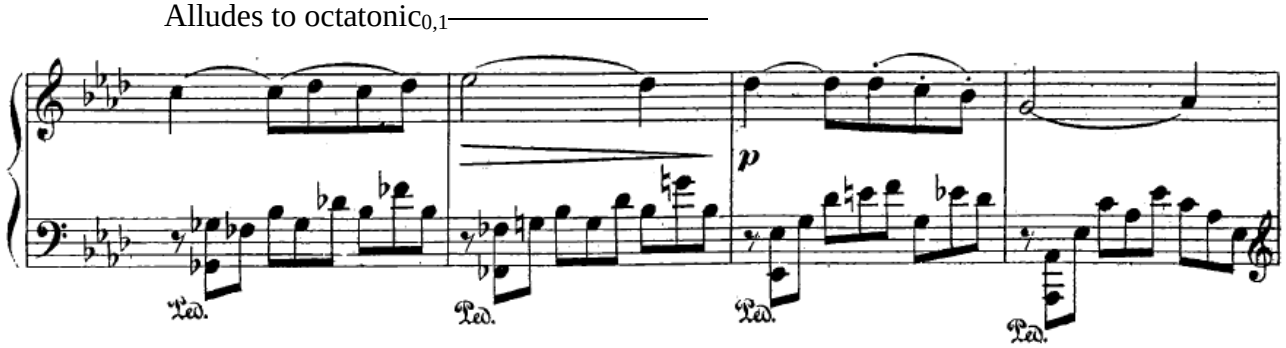


Ab: CT°^{7}/bII bII V^7 I

Example 5.18. Measures 36–43: second harmonization of the melody summarized in Example 5.16



AbM: I I+ V^7/bII or CT^{+6}/I $II^{7/\#3}$



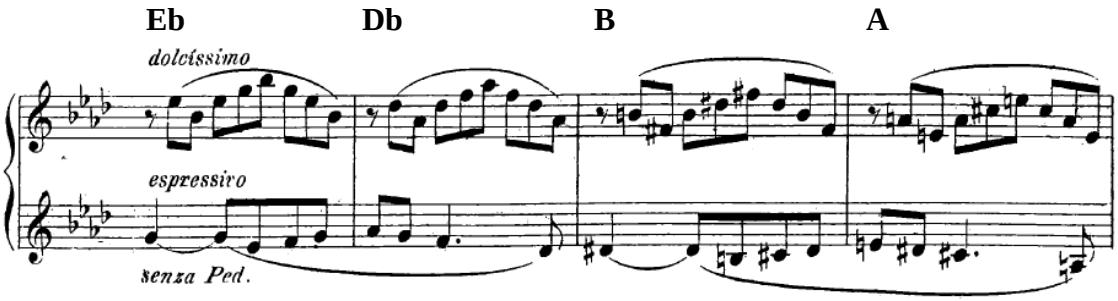
Apparent acoustic CSSM

AbM: $bVII^{b7}$ $vii^{\circ 4/2}$ V^7 I

CSSM's Contribution to Coherence in an Otherwise Post-Tonal Chord Succession

Fauré is known for his innovative chord successions that still manage to maintain ties with traditional principles of major/minor tonality. Measures 44–48 feature a succession of five major triads separated by descending whole-steps: Eb–Db–B–A–G. Though these chords alone seem to step outside traditional tonality, their CSSM binds the first four chords into two pairs (see Example 5.19), which then point to a traditional tonal derivation. If Fauré really wanted the sound of five independent triads, he could have melodized them each with Type-3 locally-major CSSM. Rather, the apparent Lydian CSSM of mm. 45 and 47 indicates that they relate to their respective preceding measures as Type-1 CSSM. Given the immediately preceding authentic cadence in A-flat (m. 43), the Eb and Db triads that initiate this passage (mm. 44–45) are best understood as simply V and IV in A-flat, but as perhaps exploiting their locally apparent mixolydian sound (as well as the highly-local apparent Lydian in m. 45). The two-measure idea is sequenced down a major third in mm. 46–47, referring back to the same local change of key (A-flat major to E major) that took place in mm. 9–16 (Example 5.13), as well as the melodic motion from Ab to E-natural across mm. 29–30 and 37–38. The resulting whole-tone descent then alludes to the 0246 motives of the "A" section and the whole-tone-related sonorities of the preceding passage in mm. 36–43.

Example 5.19. Measures 44–47 of Fauré, Nocturne No. 3



Apparent Lydian — Apparent Lydian

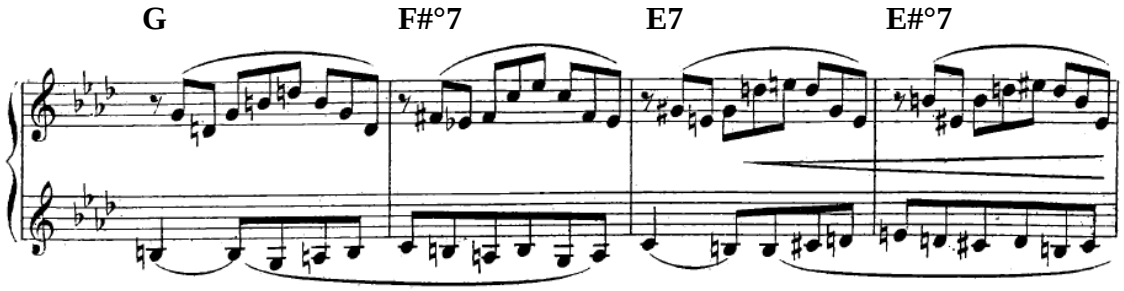
AbM: V — IV — **EM:** V — IV

(Eb mixo.: I — VII — **B mixo.:** I — VII)

Scalar Alternation and *Mehrdeutigkeit* Toward a Climax and the Recapitulation

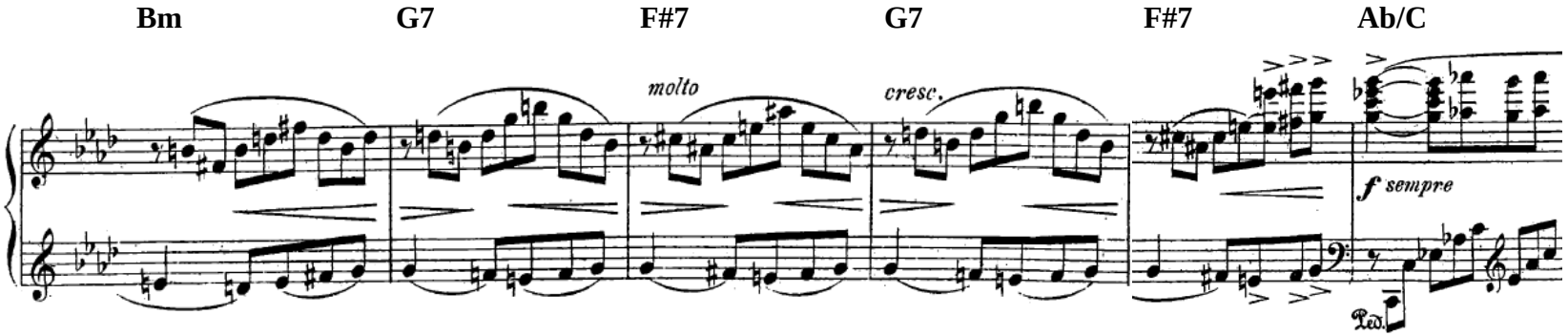
Once Fauré begins to repeat the triad-pair material from mm. 44–47 for a third time at m. 48 (sequenced down another major third to begin on G), he begins to build energy toward a climax at m. 57. Through this rather ambiguous climbing chord succession, shown in Example 5.20, CSSM provides hints as to changing functional meanings. The CSSM of mm. 48–49 strongly suggests G major, but that of the E7 chord in m. 50 suggests a significant change of scale in the midst of the chordal zone. The C–B *pianto* motive that begins the measure, due to the E7 context, strongly suggests A minor, but the scalar C# that soon follows forces a reinterpretation of the chord into the key of B minor. In cases such as this, the chordal zone of E7 is appropriately regarded as containing two distinct segments of CSSM: a single interval (C–B) that is Type 1 in A minor, and the following B–C#–D material that is Type 1 in B minor. Whereas Example 3.15 (from Chopin's Polonaise-Fantaisie) showed an example of a pivot chord, the pivot function of which is locally concealed by Type-4 octatonic CSSM (which does not point

Example 5.20. Measures 48–57 of Fauré, Nocturne No. 3



G: I vii°^{7} **Bm:** IV^{7} CT°^{7} (vii°^{7}/V)

Am: vii°^{7}/V V^{7}———



Bm: i (cad6/4) = Ger^{+6} V^{7} = Ger^{+6} V^{7}

AbM: vii°^{7} I^{6}

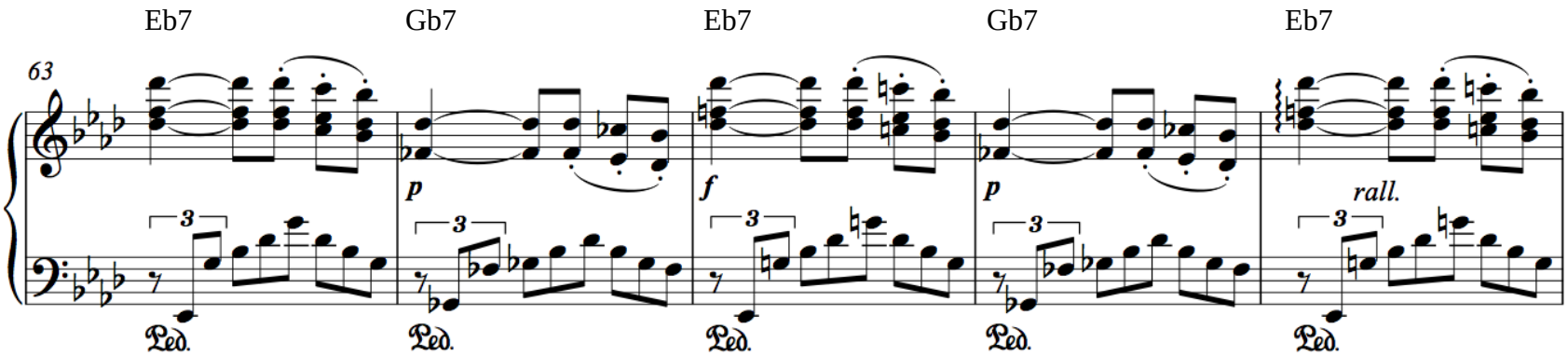
to either the first or the second key), the E7 in Example 5.20 is a pivot chord, the pivot function of which is *explicitly revealed* by its two distinct segments of CSSM.

Once again, in mm. 53 and 55, Fauré undermines the traditional function of what on a deeper level are conventional German augmented-sixth chords. The descending-step motive emphasizes the F–G scalar interval that nearly negates the key of B minor; however, the CSSM of E–F–G in these measures is best identified as Type 2 because it does not contain the scalar C-natural that would suggest Type-3 C major.[116] In any case, by spelling the chords of mm. 53 and 55 as major–minor-sevenths instead of augmented-sixths, Fauré enables the scalar interval of F–G, which allows a more prominent scalar alternation with the F#7 measures: a traditional augmented-sixth spelling would have yielded a Type-2 descending motive of G–F# for mm. 53 and 55, and the resulting lack of contrast across mm. 53–56 would spoil the building of energy toward the climax at m. 57.

Measures 57–67, which constitute the climax of the piece leading to the recapitulation, begin with the same tonal material as mm. 36–43 but end with another new scalar alternation, shown in Example 5.21. Interestingly, although Fauré could have used Type-2 apparent acoustic-scale CSSM for the Gb7 chords—as he did for the Gb7 chord just a few measures earlier (m. 61)—he chose instead to use a scalar C-flat. The resulting CSSM could be interpreted as Type 2a (A-flat natural minor), Type 3 (C-flat major), or—less likely—as Type 4 (G-flat mixolydian). In any case, here again Fauré uses CSSM to create a stronger scalar shift, which adds more color and drama to this final passage before the recapitulation at m. 68.

[116] However, when considering the clearly deliberate ambiguity of measure 57, which at first sounds more like an arrival to C minor than A-flat major (continuing a series of allusions to C minor that run throughout the piece), we might look back at the G7 chords as also alluding to the key of C (major/minor) and thus as embellished with Type-3 CSSM.

Example 5.21. Scalar alternation in mm. 63–67, setting up the recapitulation, which immediately follows



Ab:	V^7	$bVII^{b7}$	V^7	$bVII^{b7}$	V^7
CSSM:	Ab major (Type 1)	Ab nat. min. (Type 2a) Cb major (Type 3) Gb mixo. (Type 4)	Ab major (Type 1)	Ab nat. min. (Type 2a) Cb major (Type 3) Gb mixo. (Type 4)	Ab major (Type 1)→

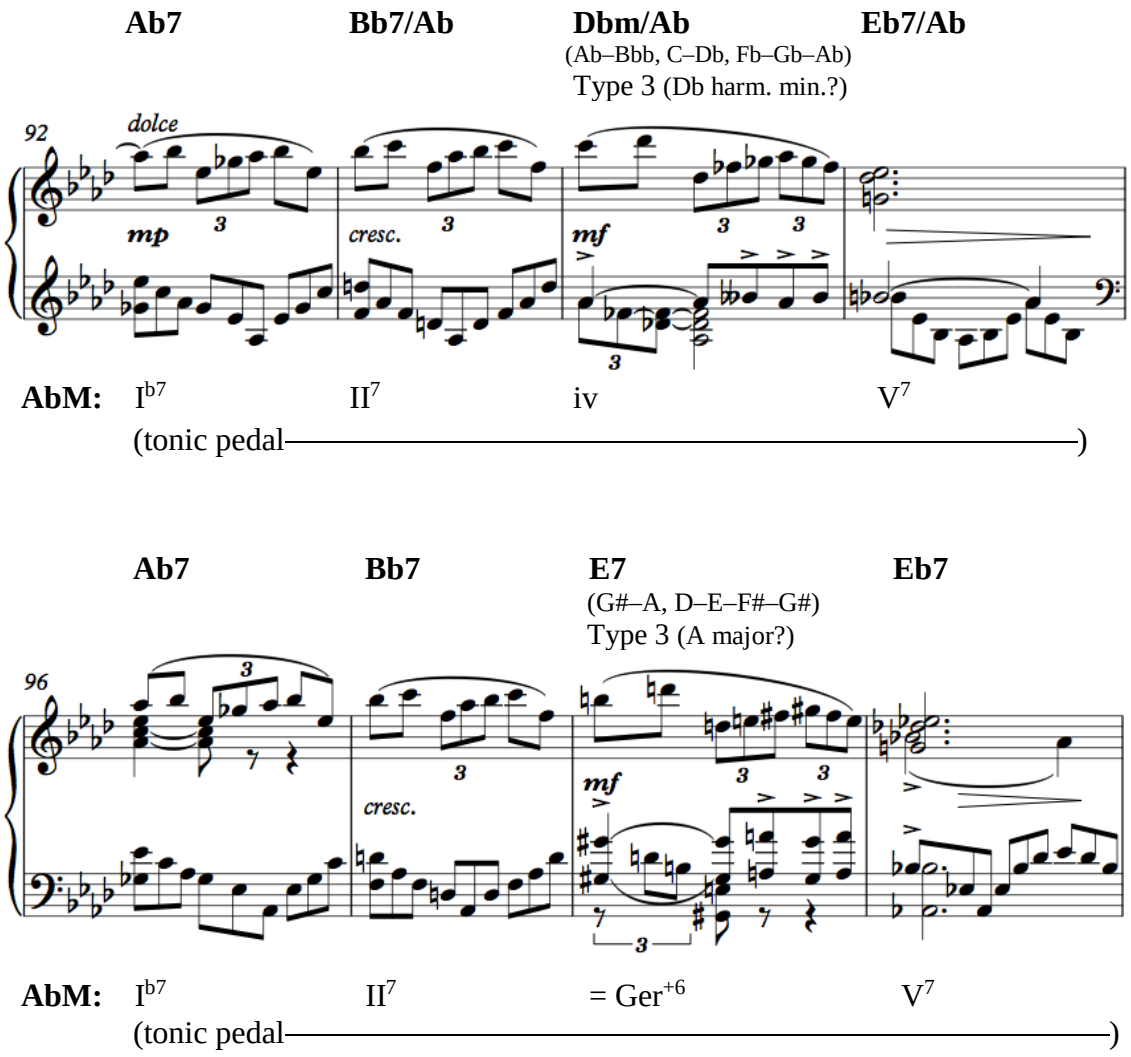
CSSM in the Coda

Because the return of the "A" section (mm. 68–91) does not significantly differ from the first in terms of CSSM, I now turn to the coda (mm. 92–110). Measures 92–99, shown in Example 5.22, repeat a four-measure idea reminiscent of mm. 9–16 (and 76–83) and feature similar dominant-ninth pentatonic sonorities. Furthermore, the CSSM in m. 94 uses the same C#–E–F#–G# segment as that in mm. 11/15 and 78/82, but now with a D-flat minor chord rather than E major. The inner-voice melody of Ab–Bbb–Bb across mm. 94–95, which is repeated in mm. 98–99 as G#–A–Bb, could be dismissed as mere sub-scalar passing motion between two chordal notes, but in both cases the middle note potentially carries significant tonal meaning. In m. 94 it could be interpreted as scale degree 6 in Type-3 D-flat harmonic minor CSSM, and, similarly, in m. 98 it could be interpreted as the tonic degree in Type-3 A major CSSM. The chord-CSSM pairings of these two measures at least allude to these other keys, and both measures create a strong sense of scalar shift regardless. The significance of the CSSM for the Ger^{+6} aspect of m. 98 was already discussed in Section 1 of this chapter (Example 5.2).

Summary of and Broader Perspectives on CSSM in the Third Nocturne

I have shown how CSSM makes numerous significant contributions to tonal color and functional meaning in Fauré's Nocturne No. 3. Though not every measure of the piece contains noteworthy CSSM, a large percentage of measures do; and although not all of the CSSM should be understood as conceptually following the concurrent chords (some of the melodies instead seem conceptually prior to the chords, as in mm. 28–43), the methods for analyzing CSSM presented in this study reveal important key-chord-melody interactions that might otherwise go unnoticed or misunderstood.

Example 5.22. Measures 92–99 of Fauré, Nocturne No. 3



As mentioned at the beginning of this analysis, the primary theme of the piece (mm. 1–8 and 68–75) exhibits the only measures in the entire piece with more than one structural chord per measure and thus contains the least amount of CSSM per chord in the piece. One gets the sense that Fauré began with this relatively traditionally-styled theme as a mere point of departure and only after it was free to explore sonorities in his usual style with longer chordal zones, which allow for more CSSM. Besides the statements of the primary theme, the end of the coda (mm. 102–110) also exhibits very little CSSM, and this appropriately reflects the state of calm and simplicity at the piece's end.

Looking at the nature of the CSSM throughout the piece, one will notice that substantial scalar shifts—particularly Fauré's characteristic scalar alternations—generally occur most in energy-building passages and at climaxes. In the "A" sections, the slower-paced scalar shifts between A-flat major and E major in mm. 9–16 (and 76–83) prepare the listener for the more frequent scalar shifts of the long melodic ascent of mm. 17–23. The increasing frequency of scalar shift nicely contributes to the gradual increase of tonal and rhetorical intensity toward the perfect authentic cadence that concludes the "A" sections proper (in mm. 23 and 90). And in the "B" section, the two instances of scalar alternation (at mm. 53–56 and 63–67) clearly serve to heighten the intensity of approaching the piece's strongest climax (m. 57) and approaching the recapitulation (m. 68). One further point regarding the nature of CSSM throughout the piece is that most of the apparently non-major/minor CSSM seems to occur in the "B" section, and this perhaps agrees with the relatively exploratory role of middle sections.

3. Summary of Chapter V

This chapter has explored a number of topics regarding Fauré's use of CSSM as demonstrated throughout his works: CSSM's contributions to tonal color, CSSM's contributions to functional meaning (whether serving to obscure or to reveal deeper-level functions, and possibly alluding to others), Fauré's innovative treatments of potential augmented-sixth chords, his frequently occurring apparent Lydian CSSM, his apparent acoustic-scale CSSM, his creation of other kinds of apparently non-major/minor CSSM, and his tendency to use what could be called relatively euphonious types of CSSM more than earlier composers. These issues are also discussed as they arise in his third Nocturne, and additional observations are made regarding the role of CSSM in this piece overall.

In contrast to earlier CSSM techniques, Fauré melodized his augmented-sixth chords in two possibly new ways (beginning in 1879 or earlier): with the major scale in which the +6 chord could be a V7, and with apparent acoustic-scale CSSM, presumably derived through Type-2 principles. Not only does this change the meaning of augmented-sixth chords, but it also points to possible origins of acoustic-scale usage. Acoustic-scale material (which became popular with Debussy and Ravel) might have its origins in traditional major/minor scalar material.

Fauré also took advantage of various key-chord scenarios that yield apparent Lydian and apparent acoustic-scale CSSM. However, more study is needed to determine whether these kinds of CSSM were always derived from traditional major/minor sources or if Fauré actually used such chord-scales directly. Furthermore, Lydian chord-scales might serve a generic function of signifying non-tonic status of the chord, and acoustic chord-scales might signify non-V7 status.

Perhaps more questions are raised than answered in this chapter. This composer case study is only preliminary in every aspect. Further analysis and research is needed in order to arrive at clearer reasons for some of Fauré's choices of CSSM. Likewise, the historical implications suggested in this chapter all await verification from further research and analysis of late-nineteenth- and early-twentieth-century music.

CHAPTER VI

PRACTICAL APPLICATIONS

This chapter deals with the musical skills that are traditionally labeled "practical," namely composition, improvisation, aural skills (including sight singing), and performance. Addressing each skill in turn, I suggest how the study of CSSM can contribute. In the first section, concerning composition and improvisation, I discuss different techniques for creating different types of CSSM, the exploration of new CSSM possibilities, and new ideas for expanding the tonal fabric of a composition. In the next section, concerning aural skills, I discuss the teaching of lesser-known scale types (as found in CSSM in the classical repertoire) and the implications of CSSM for potential changes in tonic orientation. In the final section, which addresses performance applications, I discuss the benefits of practicing lesser-known scale types and the implications of CSSM for intonation.

1. Applications to Composition and Improvisation

Perhaps the most obvious practical benefits from a study of CSSM are in the domains of composition and improvisation. Neither classical composition pedagogy nor classical improvisation pedagogy has acknowledged CSSM in any substantial way, and therefore they have lacked guidelines for the creation of scalar embellishments in various harmonic situations. While this lack of guidelines is often not a problem (for example, if one wishes to embellish diatonic chords using only Type-1 CSSM), it can be a problem when a composer or improviser encounters chromatic chords. In better situations, the composer or improviser finds an *ad hoc* solution through intuition or some vague reasoning, usually not knowing what other options exist or the broader principles he or

she might want to follow. In worse situations, the composer or improviser might melodize a challenging chord with scalar material that does not coalesce with the chord (possibly conflicting with it unintentionally), or might succumb to mere arpeggiation or "one-size-fits-all" chromaticism. One can find evidence of these latter two circumventions in pedagogical materials and even in the classical repertoire itself. For example, Vincent ([1947] 1951, 29) discusses how earlier classical composers apparently struggled with the scalar melodization of Neapolitan chords, noting that they "solved the problem by avoiding…ascending or descending scale passages at such points." I will even suggest that much of the classical repertoire is unfortunately limited in its scalar depth—partly because of such circumventions. A reiteration of Tymoczko's (2011, 307) comment is also appropriate here: "While nineteenth-century chordal procedures can be stunningly sophisticated, the exploration of modality and nondiatonic scales tends to be relatively cautious by comparison."

The Four CSSM Types as Compositional Techniques

The four CSSM types proposed in Chapter III (Figures 3.1 and 3.2), more than just concepts for analysis, can be used as techniques for composition and improvisation. Although not all four types apply to every harmonic situation, almost any chord can accommodate a choice of two or more CSSM types. However, different types should not be chosen simply at random; one must be aware of which types are representative of the desired style in any given harmonic situation and aware of the different expressive implications of each type. Table 6.1, below, lists a very general and preliminary set of such associations and expressive implications. Some of these characteristics might vary greatly depending on the context, the kind of chord being embellished, and the number of

scalar intervals used in the CSSM—as well as the nature of those intervals used, but such a chart could potentially be useful for those just becoming familiar with the idea of CSSM.

Table 6.1. General expressive functions and stylistic associations of each CSSM type

Type Number:	Effect on Tonal Coherence:	Display of Tonal Function:	Emphasis on Local Chord:	Degree of Tonal Color:	Styles or Eras:
1	Strengthens	Reveals function	Minimal	Minimal, unless variable or conflicting	All, but most common in Baroque and Classical eras
2	Strengthens	Reveals function	Medium	Medium–high	Baroque, Classical, Romantic
3	Potentially distracts from	Generally obscures function	High	Varies, but generally medium	All
4	Often weakens or distracts from	Generally obscures function	High	Generally high	Romantic, Impressionistic

Other Possible CSSM Techniques

Thinking more in terms of a composer's thought processes than in terms of theoretical ideals, one can imagine several other reasonable techniques for creating CSSM. Figure 6.1 presents a way of organizing and labeling a wider range of possible compositional techniques for creating CSSM. It assumes that a composer must first choose some kind of source material and can then choose to modify the source material in a number of optional ways, as desired. The compositional techniques implied by the

previously presented four CSSM types and their possible special features can all be arrived at through different combinations of source material and modifications listed in Figure 6.1, but the list also allows for many additional possibilities.

Figure 6.1. A larger list of possible techniques for composing CSSM

Possible source materials:

1. The concurrent DSS
2. A new major/minor-based scale related to the concurrent chord
3. A new non-major/minor-based scale related to the concurrent chord
4. A scale fragment that is somehow related to the concurrent chord
5. Scalar intervals that are somehow attached to the concurrent chord

Possible subsequent modifications:

A. Minimal alteration (usually for a chromatic chord, but possibly just for color)
B. Alteration through parallel borrowing
C. Introducing variability (if it was not already part of the source material)
D. Distribution adjustment
E. Articulating a scalar subset or superset of the chosen source material

Whereas the four types assume one of the first three source materials listed here, composers might also think in terms of "incomplete" scalar materials such as a scalar fragment (for example, a Dorian tetrachord) or mere intervals. Source material #5 in this list could also be thought of as direct techniques such as filling in a chord gap with one equidistant note or adding whole-step neighbors above every chordal note, for example. (These kinds of techniques are reminiscent of those prescribed in Schillinger's *Kaleidophone* [1940], as discussed in Chapter II.) And whereas the four types and four special features allow only for modifications A, B, C, and E in Figure 6.1, composers might also employ modification D ("distribution adjustment"), which involves moving a scale degree by a half step so as to create a more even scalar-pc distribution. Some of the

examples of CSSM shown in Chapters III and V and labeled as Type 2a, in particular, might have been consciously arrived at through a simple distribution adjustment rather than a theoretical borrowing from a parallel scale, for example.

The numbers and letters preceding each source material and modification in Figure 6.1 can be used as abbreviated labels for different compositional procedures. For example, the compositional procedure labeled "2AD" involves selecting a major/minor-based source scale related to the concurrent chord, altering it so as to match chromaticism that is supposedly in the chord, and then adjusting the distribution of intervals as desired.

Not every possible combination of source material and modifications is practically valuable, however. Some modifications are inapplicable to certain source materials, and some combinations of modifications would be counter-productive. Nevertheless, Figure 6.1 or a similar organization of possible compositional techniques could be a helpful resource for composers and improvisers.

Scale Syllabi for Classical Styles

Another format through which the study of CSSM can help composers and improvisers is the "scale syllabus" used in jazz chord-scale theory. As shown in Table 2.1 of Chapter II, popular jazz scale syllabi basically prescribe different scale types to be used for each of the chord qualities that jazz improvisers might encounter. In a similar fashion, Tables 6.2, 6.3, and 6.4 present "classical scale syllabi," though only for major triads, minor triads, and major–minor-seventh chords, respectively. They take a perspective that is unusual for classical music theory by identifying the various scalar structures that happen to occur on the roots of the aforementioned chord qualities as found in various functional contexts. One could create additional scale syllabi for other

chord qualities based on the three syllabi presented here. A set of such syllabi covering all of the chord qualities one might encounter in classical music could be pedagogically useful as well as of music-theoretical interest.

Partly with pedagogical interests in mind, these scale syllabi employ two terms that are not regularly used elsewhere in this study: *keyscale* and *chordscale*. A keyscale is simply the theoretical complete scale that represents the supposed key of the passage at hand, but in the context of these syllabi it functions more importantly as a source scale for CSSM. Unlike the similar concept of DSS, the concept of keyscale does away with references to structural levels, and it suggests a simple, fixed (non-variable) scale rather than a more complicated variable scalar space. A chordscale, then, is the theoretical complete scale that is specific to a single chord and that can be manifested through CSSM; this is essentially the same meaning that the term has in jazz chord-scale theory. These two terms are well suited to pedagogical purposes because their meanings are more immediately clear than the terms used elsewhere in this study.

Somewhat like the more complicated jazz theory approaches presented by Russell (1959; 2001), Nettles and Graf (1997), and Mulholland and Hojnacki (2013), the syllabi in Tables 6.2–6.4 also acknowledge the specific key-chord scenarios that yield each chordscale option (shown in the third column of each syllabus) rather than simply listing possible chordscales for a particular chord quality with no further justification. However, unlike jazz approaches, and more in line with the present study, the chordscale options listed here are restricted to those that are non-conflicting, of seven distinct pcs, and derivable from Type-1 and Type-2 principles from the four traditional keyscales of major, natural minor, melodic minor, and harmonic minor. This approach is of course far

from perfect, but these limitations can be seen as somewhat of an exercise in seeing how far we can get when dealing only with traditional keyscales, traditional chords, and traditional chordscale derivations. These scale syllabi do not allow for the possibility of Type-2a alterations that are not derivable from one of the four traditional keyscales, and Type-3 scenarios are not shown because they would simply mimic one of the chordscales already listed. For example, a Type-3 major scale built on the root of any non-tonic major triad simply mimics the Type-1 principle of a major scale built on the root of a tonic major triad; and a Type-3 treatment of a V/V chord that yields a mixolydian scale built on the chord root mimics the Type-1 principle of a mixolydian scale occurring on the root of a V chord in a major key (already listed in the mixolydian portion of Table 6.2).

All roman numerals in Tables 6.2–6.4 are described in one universal way that is independent of keyscale. For example, an E-flat major triad would be "bIII" whether in C major, C natural minor, or any other keyscale on C. This admittedly treats the major keyscale as primary, but it seems to be the most practical compromise. Certain roman numerals the roots of which lie on a major scale degree are preceded with the cautionary sign "(M)"—particularly when within minor keyscales (and thus chromatic). For example, an E minor triad within the keyscale of C natural minor would demonstrate the chord labeled here as "natural minor: $^{(M)}$iii."

Notice that the chordscales listed in these syllabi are substantially different from those listed for the same chord qualities in the jazz scale syllabus of Table 2.1 (from Aebersold 2000), thus reflecting different purposes and different musical styles (though, sometimes the same chordscale is described by different names, as in the case of "Lydian #2" in Table 6.2 and "6th Mode of Harmonic Minor" in Table 2.1). My Tables 6.2 and 6.3

Table 6.2. The twelve chordscales occurring on the roots of **major triads** in Type-1 and Type-2 scenarios (if limited to traditional major and minor keys)

Chordscale (from chord root)	**CSSM Type**	**Keyscale(s): Major Triad**	**Chordscale (from tonic)**
Major	1	major: I	major
		natural minor: bIII	natural minor
	2	melodic minor: I	major
		harmonic minor: bIII	natural minor
		melodic minor: bVII	Dorian
Lydian	1	major: IV	major
		natural minor: bVI	natural minor
	2	natural minor: bII	Phrygian
		major or melodic minor: bIII	Dorian
		natural or harmonic minor: bV	Locrian
		major: bVII	mixolydian
Mixolydian	1	major: V	major
		natural minor: bVII	natural minor
	2	major: II	Lydian
		natural minor: IV	Dorian
		harmonic minor: bVII	natural minor
Acoustic	1	melodic minor: IV	melodic minor
	2	harmonic minor: IV	melodic minor
Major-minor (C–D–E–F–G–Ab–Bb–C)	1	melodic minor: V	melodic minor
	2	natural minor: I	major-minor
		major, melodic minor, or harmonic minor: $^{(M)}$VI	major #1
Phrygian M3 (C–Db–E–F–G–Ab–Bb–C)	1	harmonic minor: V	harmonic minor
	2	natural minor: II	Dorian #4
		major or melodic minor: III	major #5
		major: #IV	Lydian #1 #6
		natural minor: V	harmonic minor
		natural minor: $^{(M)}$VI	mixolydian #1
		major: $^{(M)}$VII	Lydian #2
Lydian #2	1	harmonic minor: bVI	harmonic minor
	2	natural minor: bI	natural minor b1 b5
		melodic minor: bV	Locrian M6
		major or melodic minor: bVI	harmonic minor
Harmonic major	2	harmonic minor: I	harmonic major
Lydian #2 #6 (C–D#–E–F#–G–A#–B–C)	2	major: bII	major b2 b6
		natural minor: bIV	natural minor b1 b4
		major: bV	mixolydian b2 b5
		natural or harmonic minor: bbVII	Phrygian b4 dim7
Lydian #6	2	melodic or harmonic minor: bII	harmonic Phrygian
Mixolydian b2	2	melodic or harmonic minor: II	melodic minor #4
Phrygian M3 dim7 (C–Db–E–F–G–Ab–Bbb–C)	2	melodic or harmonic minor: #IV	minor #1 #4 aug6 M7

Table 6.3. The twelve chordscales occurring on the roots of **minor triads** in Type-1 and Type-2 scenarios (if limited to traditional major and minor keys)

Chordscale (from chord root)	**CSSM Type**	**Keyscale(s): Minor Triad**	**Chordscale (from tonic)**
Natural minor	1	natural minor: i	natural minor
		major: vi	major
	2	melodic minor: v	Dorian
		melodic or harmonic minor: $^{(M)}$vi	major
Melodic minor	1	melodic minor: i	melodic minor
	2	major: i	melodic minor
		natural or harmonic minor: biii	natural minor b5
		melodic minor: bvii	Dorian b2
Harmonic minor	1	harmonic minor: i	harmonic minor
Dorian	1	major: ii	major
		natural minor: iv	natural minor
	2	major: v	mixolydian
		natural or harmonic minor: bvii	Phrygian
Phrygian	1	major: iii	major
		natural minor: v	natural minor
	2	natural minor: ii	Dorian
		melodic minor: $^{(M)}$iii	major
		major: #iv	Lydian #1
		harmonic minor: v	natural minor
		natural minor: $^{(M)}$vi	mixolydian
		major: vii	Lydian
Dorian b2	1	melodic minor: ii	melodic minor
	2	harmonic minor: ii	melodic minor
Dorian #4	1	harmonic minor: iv	harmonic minor
	2	melodic minor: iv	harmonic minor
Phrygian b4 (C–Db–Eb–Fb–G–Ab–Bb–C)	2	major or melodic minor: #i	major #1 #5
		natural or harmonic minor: $^{(M)}$iii	harmonic major
		melodic minor: $^{(M)}$vii	melodic minor #4
Melodic minor #4	2	natural minor: bii	Phrygian b4
		major or melodic minor: biii	Dorian b5
		major: iv	harmonic major
		natural or harmonic minor: bv	Locrian dim7
		natural minor: bvi	natural minor b1
		major: bvii	mixolydian b2
Minor #4 aug6 M7 (C–D–Eb–F#–G–A#–B–C)	2	melodic or harmonic minor: bii	harmonic Phrygian b4
Phrygian b4 dim7 (C–Db–Eb–Fb–G–Ab–Bbb–C)	2	major: #ii	Lydian #2 #6
		natural minor: #iv	Dorian #1 #4
		major: #v	major #2 #5
		natural or harmonic minor: $^{(M)}$vii	harmonic minor #4
Phrygian dim7	2	melodic or harmonic minor: #iv	melodic minor #1 #4

Table 6.4. The six chordscales occurring on the roots of **major–minor-seventh chords** in Type-1 and Type-2 scenarios (if limited to traditional major and minor keys)

Chordscale (from chord root)	**CSSM Type**	**Keyscale(s): Mm7 Chord**	**Chordscale (from tonic)**
Mixolydian	1	major: V^{Mm7}	major
		natural minor: $bVII^{Mm7}$	natural minor
	2	major or melodic minor: I^{Mm7}	mixolydian
		major: II^{Mm7}	Lydian
		natural or harmonic minor: $bIII^{Mm7}$	Phrygian
		natural minor: IV^{Mm7}	Dorian
		melodic or harmonic minor: $bVII^{Mm7}$	natural minor
Acoustic	1	melodic minor: IV^{Mm7}	melodic minor
	2	natural minor: bII^{Mm7}	Phrygian b1
		major and melodic minor: $bIII^{Mm7}$	Dorian b2
		major and harmonic minor: IV^{Mm7}	melodic minor
		natural and harmonic minor: bV^{Mm7}	Locrian b4
		natural minor: bVI^{Mm7}	natural minor b5
		major: $bVII^{Mm7}$	major-minor
Major-minor	1	melodic minor: V^{Mm7}	melodic minor
	2	natural or harmonic minor: I^{Mm7}	major-minor
		major, melodic minor, or harmonic minor: $^{(M)}VI^{Mm7}$	major #1
Phrygian M3	1	harmonic minor: V^{Mm7}	harmonic minor
	2	natural minor: II^{Mm7}	Dorian #4
		major or melodic minor: $^{(M)}III^{Mm7}$	major #5
		major, melodic minor, or harmonic minor: $\#IV^{Mm7}$	Lydian #1 #6
		natural minor: V^{Mm7}	harmonic minor
		natural minor: $^{(M)}VI^{Mm7}$	mixolydian #1
		major: $^{(M)}VII^{Mm7}$	Lydian #2
Acoustic #2	2	natural minor: bI^{Mm7}	natural minor b1 b5 dim7
		melodic minor: bV^{Mm7}	Locrian b4 M6
		major, melodic minor, or harmonic minor: bVI^{Mm7}	harmonic minor b5
Mixolydian b2	2	melodic or harmonic minor: II^{Mm7}	melodic minor #4

list more chordscale possibilities for unaltered major and minor triads than Aebersold's syllabus, but his lists more chordscale possibilities for unaltered major–minor-seventh chords than my Table 6.4 does.[117]

The scale syllabi shown above list only traditionally complete scales. Providing CSSM guidelines through a complete-scale approach has the obvious advantage of reducing a very large amount of CSSM options into just a few general options per chord. However, a more specific approach that lists smaller scalar structures (particularly those that are actually used in examples from the repertoire) could also be helpful in other ways. Although some musicians will hear the CSSM of the Ebm: II^6 chord in m. 26 of Example 3.12 (Bach, Prelude in E-flat Minor) merely as "the Fb major scale" despite the local absence of Db and Eb and their surrounding scalar intervals, others will discern unique qualities in the various subsets of a supposed complete scale. In other words, for some purposes (such as the desire to recreate a very specific tonal effect), one might want to prescribe more specific scalar interval sets such as the major pentachord (as seen in m. 26 of Example 3.12). If a composer vaguely had in mind only the sound of this kind of major-scale subset for embellishing a Neapolitan chord, but was simply never aware of the exact scalar structure underlying that sound, a scale syllabus that lists only complete scales could potentially lead the composer *further* from his or her original goal, as the use of major scale degrees 6 or 7 in such a situation would spoil the originally desired sound.

[117] One could also construct scale syllabi in terms of specific chord functions, as indicated by conventional roman-numeral labels. Additionally (or alternatively), one might identify general principles of common-practice-style CSSM in terms of chord functions. I am currently underway with these projects, but they were not ready to present in this document.

Moreover, the complete-scale approach sometimes misleads student jazz performers, for example, to feel a need to present every note of the chordscale chosen for a given chord. Those involved in jazz education will be familiar with the undesirable sound of a student improviser trying to squeeze entire scales over each chord. Therefore, composers or improvisers using the scale syllabi presented in Tables 6.2–6.4 must keep in mind that these complete scales should merely serve as *guides* to CSSM. Not only are incomplete-scale presentations perfectly acceptable, but they may also be embellished with sub-scalar material (in the form of sub-scalar neighbor or passing notes, for example). For instance, if embellishing a bII chord in the key of C, the composer or improviser who chooses to use Db-major CSSM might only use the first five scale degrees or might also use a G-natural as a sub-scalar passing note. The chordscale prescription only serves as a starting point.

To illustrate the potential uses of a scale syllabus further, Table 6.5 presents a hypothetical chord progression along with various complete-scale options available to the composer or improviser. Of course, some of these options will be inappropriate for certain contexts or stylistic goals, but this simple diagram might help some to see how many choices might exist for just one short chord progression, and it might also serve as a model for more specific diagrams.

Table 6.5. A hypothetical chord progression (occupying the first row) and complete-scale CSSM options for its embellishment (CSSM types in parentheses)

C: I	**IV**	**bII^{6}**	**vii°^{7}/V**	**Ger^{+6}**	**V^{7}**	**I**
C major (1)	C major (1)	C major (1c)	C major (1c)	C major (1c)	C major (1)	C major (1)
C Lydian (4)	F major (3)	C major b2 b6, possibly variable (2 or 2cv)	C melodic minor #4, possibly variable (2 or 2cv)	C harmonic minor #4, possibly variable (2 or 2cv)	C natural, harmonic, melodic, or variable minor (3, 3c, 3v, or 3cv)	C Lydian (4)
		C Phrygian (2a)	G harmonic minor, possibly variable (3 or 3cv)	C natural minor #4, possibly variable (2a or 2acv)	G major (3c)	
		Db major (3)	Octatonic $_{2,3}$ (4)	C natural minor b5 (2a)		
				Db major (3)		

Exploring Other Type-2 Complete Scales

The German augmented-sixth (Ger^{+6}) chords involved in the musical examples in Chapter III (Examples 3.6–3.8) are all spelled in the conventional way, with a minor sixth degree, tonic, minor third, and raised fourth. However, some Ger^{+6} chords are spelled with raised second degrees instead of minor thirds, and some augmented-sixths (of any type) are spelled with lowered fifth degrees instead of raised fourths. These variations in spelling are sometimes used to illuminate voice-leading and sometimes merely for ease of reading; however, if Type-2 CSSM is involved, chord spelling becomes potentially even more important. If all chromatic chordal notes are understood to imply alterations of the DSS, their exact spelling will indicate which scale degrees they represent, and this will make a difference in the pc (not just spelled-pitch) content of Type-2 CSSM.

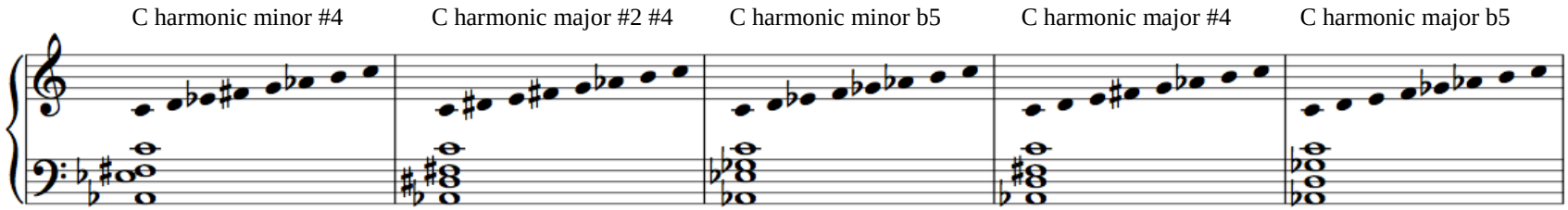
Figure 6.2 shows various spellings of augmented-sixth chords and common-tone diminished-seventh chords (which also lack a single, standardized spelling) in major- and minor-key contexts and their potential Type-2 complete scales. This suggests an exciting potential for exploring other interesting Type-2 complete scales. Although some of the scales listed here may seem bizarre, they all adhere to a musically reasonable principle. If harmonic minor #4, with its two augmented seconds and two consecutive semitones, is clearly used in Mozart and Schubert, the use of these other scales is plausible.[118] So far in my analytical experience, from this list I have only found examples of harmonic minor

[118] While harmonic minor #4 contains two consecutive half steps, violating the rules for scale structure suggested by Pressing (1978) and Tymoczko (1997), notice also that the scales listed in Figure 6.2 that contain a b5 and a major scale degree 7 violate Tymoczko's (2004) suggested rule that two adjacent scale steps should not exceed a major third.

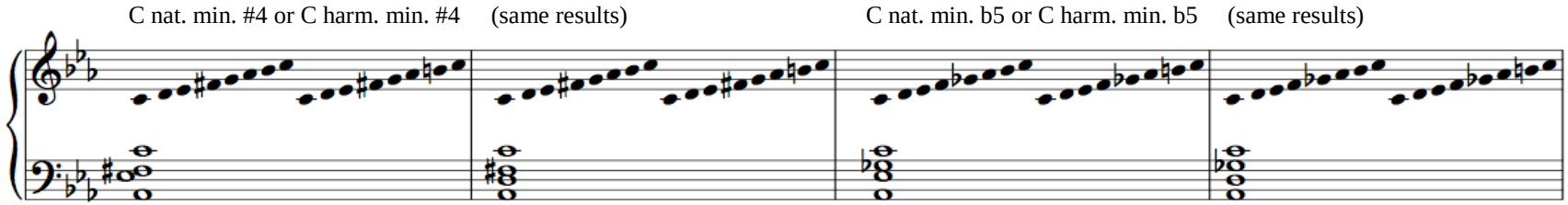
Figure 6.2. Different spellings of +6 and CT°^{7} chords and the complete scales that result from Type-2 CSSM

Augmented-Sixth Chords

Within the key of C major:

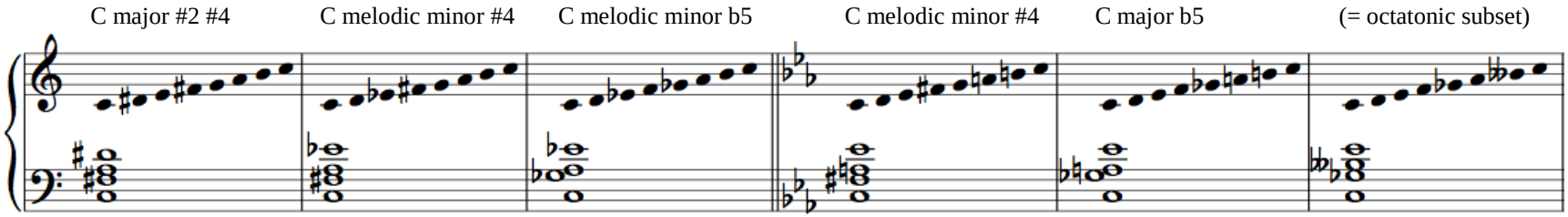


Within the key of C minor:



Common-Tone Diminished-Seventh Chords

Within the key of C major: ***Within the key of C minor:***



#4, natural minor #4, and natural minor b5 for augmented-sixth chords; and only melodic minor #4 for CT°7 chords and vii°7/V chords.[119] Whether the other possibilities ever occur in the classical repertoire is yet to be determined by further research. Regardless, the Type-2 principle is important in that it gives more significance to the spelling of chromatic chords. Because the pc content of such scales depends on chord spelling, Figure 6.2 also shows how different optional spellings of chromatic chords can have real aural consequences when embellished with Type-2 CSSM.

These explorations might also reveal the historical origins of some otherwise enigmatic scales—and not just in classical music. For example, in modern jazz, the diminished whole-tone scale (C–Db–Eb–Fb–Gb–Ab–Bb–C if built on C—although spelling often varies considerably—and also known as the "altered" scale or "super Locrian") is commonly used over dominant-seventh chords that resolve in the traditional way through descending-fifth root motion. For example, the C diminished whole-tone scale spelled above might be used over a C7 chord in the progression C7 – F. It is a classic favorite amongst jazz musicians because of its exceptionally potent sound, but its exact historical and theoretical origins have long been a mystery. Prompted by Type-2 explorations as in Figure 6.2, I have found good reasons to suspect that it originated from Type-2 CSSM applied to a tritone-substitution dominant-seventh chord in the context of a minor key. For example, if the C7 – F progression mentioned above were replaced with Gb7 – F, as is very common in jazz, and the underlying key during the Gb7 were understood as F minor (as is also a very common technique in jazz), a properly spelled Gb7 chord (Gb Bb Db Fb) embellished with Type-2 CSSM would create the complete

[119] See Chapters III and V as well as appendix C for specific examples.

scale [Fb Gb Ab Bb C Db Eb Fb], which is equivalent to the C diminished whole-tone scale and is commonly used for C7 – F and Gb7 – F progressions in jazz. This is almost exactly what happens in Fauré's Impromptu No. 5 from 1909 (as shown in Example 5.11), though in F# minor and with what might be called a French augmented-sixth chord built on G and with the augmented-sixth interval spelled as a minor seventh.[120]

Exploring Complete Scales That Result from Variability

Examples of variable CSSM in classical music (such as those shown in Examples 3.2, 3.7, 3.20, and 4.4) suggest principles that today's composers could explore further. Consider chord-specific complete scales containing augmented seconds. Analytical evidence from the previous chapters suggests the following two principles:

1) If the lower note of any scalar augmented second is a chord tone, the upper note of that augmented second can be lowered a half step so as to:
    a. provide a whole-step upper neighbor to the chord tone or
    b. provide whole-step passing motion into or away from the chord tone.

2) If the upper note of any scalar augmented second is a chord tone, the lower note of the augmented second can be raised a half step so as to:
    a. provide a whole-step lower neighbor to the chord tone or
    b. provide whole-step passing motion into or away from the chord tone.

From these principles, one can explore pc variations that are not necessarily found in the repertoire. Figure 6.3 demonstrates by listing all of the possible pc variations of the C harmonic minor #4 scale (chosen for its two augmented seconds) as if it were

[120] Possibly incipient examples of the modern diminished whole-tone scale are found as early as 1879 in Fauré's Piano Quartet in C Minor, Op. 15, and Franck's Piano Quintet in F Minor. Tymoczko (1997, 149) suggests that this scale might be traced to Ravel, but also provides a tetrachord-based explanation for it. He also mentions the relevance of the French augmented-sixth chord, but not the Type-2 derivation that I suggest.

embellishing a Ger^{+6} chord in the key of C (major or minor). The original scale is listed at the top with notes eligible for variation in italics. If one considers selected portions of the variable scalar material synchronically, it is possible to observe five different combinations of pc variation (shown in boldface), which approximates the idea of five different complete scales in addition to the original. Keep in mind, however, that the scales with variations are not to be treated freely; each varied note must be treated according to the melodic principles described above. For example, with scales listed in Figure 6.3 that involve the varied note E, a neighbor motion of D-E-D would not be appropriate because the variation (from the chordal note E-flat) presumably would not serve to modify what would have been an augmented second, and because the newly created whole step is not anchored to a chordal note.

Although the lowering of scale degree #4 by half step in an augmented-sixth-chord context was shown in Example 3.7 and the minor-seventh scale degree option was shown in Example 3.8, I have not shown an example of the raising of the minor third scale degree so as to become a major third degree. However, this happens in augmented-sixth-chord contexts twice in the third movement of Mozart's Piano Sonata No. 6 in D Major, K284. Measure 6 of Variation VII (in a minor key) and m. 28 of Variation XII (in a major key) both feature a characteristic melodic motion from scale degree #4 to 5, the #4s of which are embellished with whole-step lower neighbors (meaning major-third degrees). Like some other relatively bold examples of CSSM in the classical repertoire, these lower neighbors in Mozart's K284 have caused some disagreement between different editions (cf. the discussion of Example 3.12), but they follow a logical principle that is inferred from ample evidence elsewhere.

Figure 6.3. The C harmonic minor #4 scale and five possible pc variations if embellishing a Ger^{+6} chord in the key of C

C	D	*Eb*	*F#*	G	Ab	*B*	C	= harmonic minor #4
C	D	**E**	F#	G	Ab	B	C	= harmonic major #4
C	D	Eb	**F**	G	Ab	B	C	= harmonic minor
C	D	Eb	F#	G	Ab	**Bb**	C	= natural minor #4
C	D	**E**	F#	G	Ab	**Bb**	C	= Lydian b6 b7
C	D	Eb	**F**	G	Ab	**Bb**	C	= natural minor

For the purpose of further compositional exploration, one could also try relaxing the principles listed above so as to omit the stipulation that pc variations must be in the service of a chord tone—so as to allow for other possible complete scales. Using the same scenario of a Ger^{+6} chord in the key of C, this relaxation would make the note A-flat eligible for variation. The resulting three new possibilities are shown in Figure 6.4. Once again, the original scale is listed at the top with notes eligible for variation in italics. Although the previous chord-tone stipulations were relaxed, each varied note should still be treated as a whole-step neighbor or passing tone to or from the other note in the original augmented-second interval. For example, the A-naturals that are introduced in Figure 6.4 should be used for the purpose of creating whole-step motions in relation to B, but not G.

Figure 6.4. The C harmonic minor #4 scale and three additional possible pc variations allowed by relaxed principles

C	D	*Eb*	*F#*	G	*Ab*	*B*	C	= harmonic minor #4
C	D	Eb	F#	G	**A**	B	C	= melodic minor #4
C	D	**E**	F#	G	**A**	B	C	= Lydian
C	D	Eb	**F**	G	**A**	B	C	= melodic minor

Further Compositional Possibilities

CSSM not only creates more melodic possibilities, it can also create more harmonic possibilities. Just as conventional tertian chords are created from the major scale, new chords can be created *within CSSM*, thereby expanding it in a sense. In fact, one can imagine a theoretically infinite alternation of chords and scalar entities that expand on each other. A background tonic chord can be expanded with tonic scalar material, the tonic scalar material can be expanded with a relatively foreground chord progression (potentially introducing new pc content with chromatic chords), those chords can be expanded with their own CSSM (again potentially introducing new scalar pc-interval content), those scales can be expanded into chord progressions, and so on. Example 6.1 shows the tertian triads and seventh chords of the C harmonic minor #4 scale. These chords could be used to create progressions that prolong an unstable augmented-sixth chord without exiting the Type-2 CSSM that still reminds listeners of the augmented-sixth chord's deeper context.[121] Example 6.2 provides samples of such progressions that could prolong a Ger^{+6} chord within a local C harmonic minor #4 scalar space (the Type-2 properties of which could still point to a deeper key of C major). If

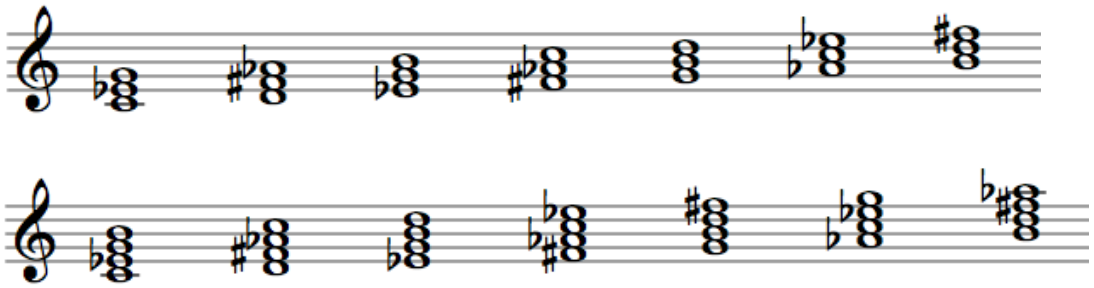
[121] Loya (2011) and Ott (1977) discuss related techniques and considerations as found in the music of Liszt.

given longer durations, any of these prolonging chords could then be embellished with its own new CSSM, potentially pushing the expansion of tonality even further. For example, if its duration were lengthened, the chord occurring on beat 4 of the first measure in Example 6.2 (which is treated as if the resolution of a double-suspension gesture) could be embellished with Type-4 hexatonic $_{2,3}$ CSSM, which does not conflict with the chord but adds yet another layer of tonal color. Or, consider the first chord progression on the second system of Example 6.2. The second chord in this progression, if its duration were lengthened, could be embellished with Type-4 whole-tone CSSM (WT_0).

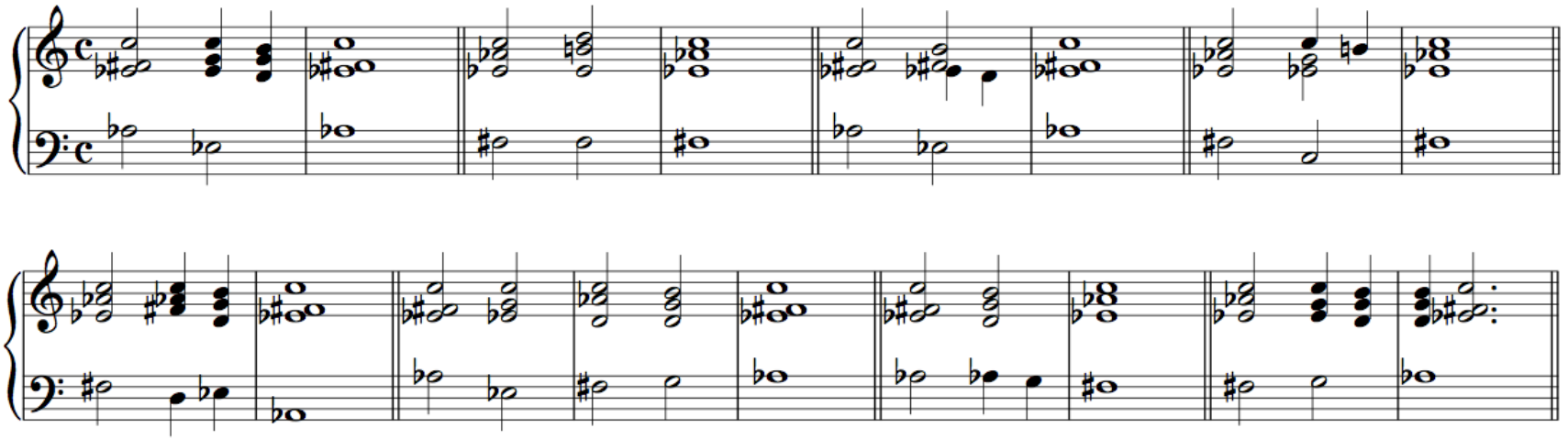
If such a prolonging chord were altered "chromatically" relative to the harmonic minor #4 scale (for the sake of closer voice leading, for example, or perhaps according to the principles of variable CSSM), it could be embellished with its own Type-2 CSSM, which would be an alteration of an already altered scale. In some situations, such secondary alterations simply cancel out the deeper ones, but if done carefully the resulting CSSM can be quite interesting. In order to ensure such interest, one can follow the guideline of altering a chord in a way that adds yet another chromatic note relative to the deeper key (in this case, relative to the deeper C major). Considering the first sample progression in Example 6.2, the chord at beat 4 of the first measure could be altered by changing its D to Db, which could then voice-lead down to a C in the next chord. If this altered chord were embellished with its own Type-2 CSSM, it could result in the complete scale of C harmonic Phrygian #4 [C Db Eb F# G Ab B C].

The harmonic-scalar experiments suggested here give us just a glimpse into a world of under-explored tonal possibilities. I plan to explore some of these possibilities in the form of actual compositions in future studies.

Example 6.1. Triads and seventh chords within a C harmonic minor #4 scalar space



Example 6.2. Basic chord progressions that prolong a Ger^{+6} chord within a C harmonic minor #4 scalar space



2. Aural Skills Applications

I have repeatedly mentioned that the study of CSSM can enhance musical appreciation, and I believe that a large portion of that appreciation involves aural skills (also known as ear training). The more aural details one can discern in music, the richer one's musical appreciation can be. Indeed, my primary motivation for this study has always been to highlight the variety of aural qualities (sometimes metaphorically described as colors, characters, moods, or flavors) presented in different examples and types of CSSM. In analyzing the examples presented in this study, I have found great musical pleasure in auralizing or singing every example of CSSM. Just as musicians have marveled for centuries in the unique qualities they perceive in the traditional church modes, we can do the same with different examples of CSSM. Along these lines, an obvious practical application is the singing and aural identification of 1) the different scalar structures created by CSSM and 2) the different types of CSSM. I address each of these in turn below.

Aural skills training in the classical domain has traditionally focused most attention on major- and minor-key melodic material, and in recent decades, most college-level music departments also teach a separate unit for "twentieth-century" aural skills that addresses scales associated with composers such as Debussy, Ravel, Stravinsky, and Bartók. These scales are often the diatonic church modes, the acoustic scale, major and minor pentatonic scales, the whole-tone scale, and the octatonic scale. However, the complete scales used for the embellishments of Neapolitan, $\text{vii}^{\circ 7}/\text{V}$, $\text{CT}^{\circ 7}$, and augmented-sixth chords are very rarely acknowledged and perhaps have never been taught in an aural skills setting. The harmonic minor #4 scale is sometimes presented as

an "exotic" or "folk" scale, but it is also important in classical repertoire, along with natural minor #4, for the embellishment of augmented-sixth chords. The melodic minor #4 scale is rarely mentioned (by any name) in classical contexts, but it is suggested somewhat often within vii°^{7}/V and CT°^{7} chordal zones in the classical repertoire (see appendix C for examples).[122] Advanced musicians should also be aware of the two most common types of complete-scale Neapolitan CSSM: the tonic Phrygian scale and the major scale built on the root of the Neapolitan chord. Neapolitan chords are often embellished in a pentascale fashion, using the triad in its root-position shape along with passing tones between the root and third and between the third and fifth. The "Type-2" version of this pentascale is akin to a Lydian pentascale (e.g., C–D–E–F#–G) whereas the "Type-3" version is simply a major pentascale (e.g., C–D–E–F–G). Musicians who wish to advance their aural skills could practice singing and aurally identifying these scales and scalar fragments.

However, a potentially more important implication of CSSM for aural skills is its illumination of tonic orientation in various situations. Tonic orientation is an aural and cognitive phenomenon. In determining the CSSM technique most applicable to a given example, one is often prompted to decide what tonic orientations most appropriately apply to different event-hierarchical levels and different musical spans. I discuss issues of tonic orientation in Chapter III with respect to CSSM in Examples 3.17 and 3.18, showing that multiple tonic orientations are possible for certain moments. I argue that in some situations, the introduction of a new, temporary potential major scale as in m. 84 of

[122] Russell (1959; 2001) calls this scale "Lydian diminished," which is one of his principle scales (see Figure 2.1 of this study), but he does not point to any convincing examples of it in the classical repertoire. Loya (2011, 54) lists the scale as "melodic *verbunkos* minor" but it does not play any substantial role in the rest of the book.

Example 3.17 is not sufficient reason to change one's tonic orientation. In the case of Example 3.17, I find no good reasons to hear m. 84 as G major, despite that it is a more familiar label than "C major #4" (or C Lydian). The CSSM can be understood as the result of a Type-2 compositional technique, and its contextual treatment suggests that a continued tonic orientation of C throughout the passage is more aesthetically desirable and also easier to *hear*.

However, as scalar structures become increasingly removed from the DSS due to increasing levels of embellishment, the aural maintenance of the deeper key (including its tonic) becomes increasingly impractical. At some point, we inevitably switch our tonic orientation. In Example 3.18, although most musicians can probably hear the F7 chord in m. 162 in terms of the key of E-flat major (therefore, as a $II^{4/3}$ chord), it is much more difficult to hear the concurrent CSSM as E-flat major #4 (or Lydian) because of its opening emphasis on F and because it contains no internal indication of an orientation to E-flat (as opposed to the CSSM in m. 84 of Example 3.17, which does retain indications of the global tonic of C). Therefore, most musicians will probably inevitably switch their tonic orientation to Bb or even to F for mm. 162–163 of Example 3.18.

However, one might still maintain the tonic of E-flat by "putting it on hold," so to speak, and making a conscious effort to remember where this CSSM originally came from. One way to do this is to retrace the tonal path that led into the CSSM. In this example, starting from the perspective of the midst of the CSSM of mm. 162–163, one could trace in his or her memory back to the opening Fs and then auralize forward through the deeper-level F–Eb–D–Eb voice-leading that takes place through the remainder of this excerpt and is clearly heard in E-flat. To simply re-auralize the E-flats

within the CSSM as tonic notes, on the other hand, would be hierarchically and aesthetically inappropriate.

The difference between hearing a given instance of CSSM in terms of the DSS (which usually includes its tonic orientation) and hearing it in terms of a different orientation (including an absence of orientation) is expressed by my use of the terms horizontal and vertical. Types 1 and 2 are horizontal, and Types 3 and 4 are vertical. Finally, all of the aforementioned applications to aural skills are not only beneficial to the music-appreciation aspects of aural skills, but they can also aid the skill of sight singing (or, similarly, the skill of silently auralizing from a score). Of course, practicing lesser-known complete scales and scalar materials will prepare one for the encounter of those materials in a sight-singing context, but considerations of tonic orientation and horizontal versus vertical CSSM can help one find easier mental approaches to sight singing certain types of materials. For example, if one readily sees that a particular example of CSSM is Type 3 (especially if the CSSM does not create a complete scale as in m. 26 of Example 3.12 in Chapter III), he or she will readily know that it will be easiest to sing (or auralize) if imagined in terms of the appropriate temporary new major or minor tonic orientation.

3. Performance Applications

As with aural skills, performers can also benefit by simply practicing scales and scalar materials that are rarely addressed in classical music teaching. Instead of only practicing the major and traditional minor scales as most performers are limited to, advance performers could also practice the #4 scales of natural, harmonic, and melodic minor #4. Such practice would better prepare the performer physically (i.e., in terms of

motor or "muscle" memory) and mentally—as in the case of sight-reading—for the appearance of these scalar materials throughout the repertoire.

In Chapter III, and earlier in this chapter, I cited examples of CSSM that apparently caused some editors to question or even change certain notes. This points to another potential application of CSSM study for performers. Those who understand the principles of classical CSSM will be better equipped to decide which editions are correct and to spot typographical errors in music.

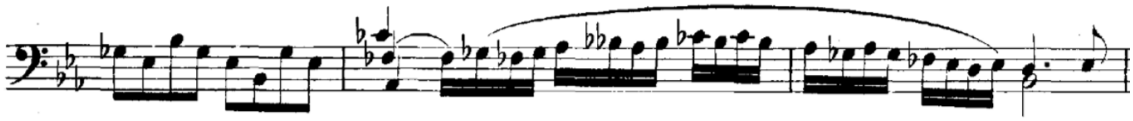
Another benefit to performers concerns intonation. Although I assume twelve-tone equal temperament throughout this study, the distinction of horizontal versus vertical CSSM could potentially affect performers' intonations of such material. For instance, cellists or violists performing Bach's D minor Cello Suite might become distracted by the local root-oriented E-flat Lydian aspect of mm. 69–71 of the Gigue, shown in Example 3.4 (in the section on Type 2 in Chapter III). A focus on this CSSM as E-flat Lydian could cause the performer to tune the A-naturals slightly higher than they should be, as they might be heard as local leading tones to the chordal fifth, Bb. But if the performer hears the CSSM as Type 2, hearing it as in the key of D, he or she will more likely keep the A-naturals tuned a pure perfect fifth above the tonic D, which would also help preserve tonal coherence and the essence of Type-2 in this passage. (Of course, this particular example is moot if the A-naturals are performed on an open string, but the broader principle remains relevant.)

To offer one more example of the influence of CSSM classification on intonation, consider the Prelude of Bach's Cello Suite No. 4 in E-flat major. Shown below in Example 6.3, mm. 80 and 81 present Type-3 CSSM with a Neapolitan chord, creating

what could be understood as a subset of the F-flat major scale. For this CSSM, the cellist (or violist or bassist), recognizing its Type-3 implications, should arguably tune the passing tones Gb and Bbb as if in a new F-flat major scale rather than in terms of the key of E-flat, as long as the deeper chord tones voice-lead appropriately as if in E-flat.

Example 6.3. J.S. Bach, Cello Suite No. 4 in E-flat Major, Prelude, mm. 79–81

Type-3 CSSM (suggests Fb major)



Eb: i bII^6 (iv) V

4. Summary of Chapter VI

This chapter has suggested a number of possible applications of the study of CSSM to composition and improvisation, aural skills, and performance. Of all of the potential benefits of the study of CSSM, those pertaining to composition are perhaps the most numerous and the most exciting. While the CSSM types proposed in Chapter III can be used as compositional techniques (and guidelines) for the melodization of chords, this chapter additionally presents a more elaborate list of possible techniques (shown in Figure 6.1). Furthermore, I have demonstrated how composers and improvisers can arrive at numerous possible scalar structures created by Type-2 techniques and different uses of scalar variability.

In the domains of aural skills and performance, the study of CSSM suggests many scalar structures beyond those typically studied in college-level institutions, and practicing these other structures could be beneficial. Furthermore, distinguishing between

horizontal and vertical types of CSSM can inform a performer's choice of tonic orientations imagined for different portions of music. Generally, orientation to the global tonic is more appropriate for horizontal CSSM and orientation to a local tonic (when implied) is more appropriate for vertical CSSM. These orientations can similarly inform performers' intonation of such material.

The ideas suggested in this chapter are admittedly only preliminary. Their potential practical value will only be realized with further developments, trials in real-life situations, and subsequent refinements.

CHAPTER VII

CONCLUSIONS AND IDEAS FOR FURTHER STUDY

1. Conclusions

Summary

I have shown in this study that jazz chord-scale theory—although currently a foreign concept to classical music theory—has profound implications for classical music and music theory in general. From a broader theoretical perspective, chord-scale theory is unique for drawing attention to the different types of the scalar material that embellish individual chords—what I call chord-specific scalar material, or CSSM. Classical music theory, aside from a few exceptions, has overlooked the importance of CSSM, and this is probably because most examples of it in classical music exhibit nothing beyond the concurrent major or minor key. However, this study has shown that most types of chords are subject to multiple types of CSSM in the classical repertoire.

Perhaps the primary argument of this study, then, is that classical music theory should simply pay more attention to what kinds of scalar materials happen to embellish chords (in all kinds of tonal music—not necessarily just that of the common-practice style or era), to the different kinds that have been used by composers and performers to embellish specific types of chords, and to the musical effects of those different kinds. This study presents concepts and methods for making these observations, and it has also made them in a small sampling of classical repertoire and in a more concentrated focus on the music of Fauré.

The four CSSM types presented in Chapter III are the first (and perhaps the most readily accessible) concepts that I offer for engaging with examples of CSSM in classical

music. The essential principles of each type have all been mentioned at different times by other scholars, and this supports the validity of those principles, but almost all of these existing discussions are brief, and none of these has attempted to provide a comprehensive means of understanding CSSM in classical music as I have attempted here.

While the CSSM types proposed in this study are sometimes referred to as categories of musical materials, they are more accurately understood as categories of musical understandings. One could alternatively define CSSM types in terms of "actual" musical materials, but the resulting categories would not completely match our intuitions. Similarly, one could create separate classification schemes for CSSM compositional technique, actual scalar pc or interval content, and theoretical or even historical derivations, but in each case these tend to refer back to the four general types of understanding that I propose here. In this way, the four types might be described as four general "meta-principles."

Perhaps the most significant music-theoretical contributions of this study are 1) its clarification of the key-chord-CSSM paradigm and the interactions that can occur between its component entities, and 2) its distinction between chordal, scalar, and sub-scalar materials in various zones of various structural levels of tonal music. Previous studies concerning scalar materials have not adequately considered their broader contexts and possible derivations, they have not realized the importance of recognizing different scalar materials on different structural levels, and they have often identified scalar materials in overly-assuming ways (such as assuming underlying scales based on the mere presence of their pcs). Another of the more significant theoretical contributions of

this study is its recognition of CSSM's many implications for tonal function (see Figure 5.1 and Table 6.1, for example).

Caveats

As explained in Chapter I, the study of CSSM does not apply equally well to all tonal music. In fact, it does not even necessarily apply to all of the music by the most represented composers in this study (Bach, Mozart, Chopin, and Fauré). The concept of CSSM is usually of little worth to four-part chorale textures, for example. And even in textures with longer chordal zones, a large percentage of these contain only Type-1 CSSM that is of little significance in itself.

Along these lines, the approaches used in this study could be said to favor certain kinds of music over others. While it does tend to place value on music with clearer and longer chordal zones and with a greater variety of scalar structures, none of this means that such music is somehow overall superior to other music.

I have arguably put too much emphasis on the supposed derivations of examples of CSSM. Of course, no theoretical derivations can ever be "proven" to be the "correct" ones; thus, one might give more attention to how examples of CSSM affect their musical contexts regardless of how they might be derived. However, derivations correspond to the way we see, hear, and understand an example of CSSM, and in this sense they could be said to affect our musical experiences.

Compounding the subjectivity—and lessening the reliability—of the CSSM analyses in this study is its heavy reliance on key and DSS. When key and DSS are less convincing for a given chord and its CSSM, we would probably be better served by focusing on aspects of the music that are more reliable and salient. For example, if the

derivation and functional implications of an example of CSSM are difficult to pinpoint due to the lack of a clear key or DSS, we could still discuss the structure of the local chord-CSSM sonority, the extent to which it encourages the sense of a local tonic or root pc, and the nature of its relationship to the surrounding chord-CSSM sonorities. Furthermore, just as neo-Riemannian theory has developed ways of understanding chord successions without recourse to keys, it could similarly develop ways of understanding chord-CSSM successions without recourse to keys or DSSs. For example, my study of CSSM in Fauré's music suggests that major-triad/Lydian-CSSM pairings as well as Mm7/acoustic-CSSM pairings are often used in what could be called a generic neighboring function, in which their local root note lies a half or whole step away from that of the preceding or following and seemingly-more-structural chord. And although I am now crossing into the territory of the following section of this chapter ("Ideas for Further Study"), one could even imagine a codification of neo-Riemannian transformations in which specific types of chord-CSSM pairings are the fundamental units.

Another caveat for this study is that scales and scalar spaces are inherently limiting concepts. Why should one scalar space be adhered to for any specified duration (such as the duration of a chordal zone)? Variable scalar spaces already reveal the reluctance of melodies to remain in just one mono-linear scalar pathway. Furthermore, the concept of a variable scalar space—which, to be sure, has been proposed by a number of other scholars—reveals music theory's interest in summarizing melodies in terms of a limited number of principles, or in understanding the diachronic in synchronic terms. Such approaches are not necessarily a problem as long as we remain aware of their

limiting nature and remain open to other approaches, and they do offer the benefits that come with any sort of generalization. Despite their limitations, I personally find concepts of scale and scalar space fascinating for their capacity to represent a rich variety of sonorities that we intuit from musical passages of various lengths. Scale-like entities have been celebrated for their various characters, qualities, and associated moods at least since Plato; and, as I explain further in the following section, the present study of CSSM encourages our engagement with increasingly nuanced entities.

2. Ideas for Further Study

This study prompts numerous ideas for further study. Because Chapter VI already proposes a number of avenues for compositional explorations I will focus here on three remaining areas of study: analysis, history, and music theory. I have selected a small number from each of these areas to describe below.

Analytical Study

Perhaps most obviously, CSSM could be analyzed in much more music, and statistics could be compiled for a variety of purposes. Analytical studies could focus on CSSM as found in the music of specific composers (as I have begun here with Fauré) or their major corpora, the music of particular time periods, particular musical styles, genres, geographic regions, or cultures. The present study was limited to classical music of the so-called common-practice era, but this scope could be greatly expanded. Extended-tonal music of the early twentieth century is a particularly rich area for study. The case study of Fauré's music begun here calls for a case study of the music of his student, Ravel, whose interesting variety of scalar materials has already been touched on by Tymoczko (1997; 2011). However, as one begins to study music that is less

traditionally "tonal," the assumptions and methods underlying the analytical approach offered here would need to be reconsidered. For example, if analyzing CSSM in post-bop jazz, a different classification scheme of CSSM types might be used—perhaps one in which the distinction of major/minor-based scalar material is de-emphasized, and perhaps one that includes one or more special CSSM types for recognizing different kinds of "outside" scalar material (referring to the technique known as "outside" playing that became popular in the 1960s).

The music of Liszt is another prime candidate for dedicated CSSM study, as numerous scholars have already discussed its rich variety of scalar materials (not necessarily chord-specific) through various approaches (Bárdos 1975; Forte 1987; Loya 2011; Satyendra 1997; Zeke 1986). Loya, in particular, has explored a number of fascinating cultural implications of Liszt's scalar materials, and such cultural considerations (which the present study has admittedly fallen short of including) could be valuably applied to many other CSSM studies as well.

Furthermore, although jazz chord-scale theory has recently reached a new standard of consistency and explanatory power with Mulholland and Hojnacki's *Berklee Book of Jazz Harmony* (2013; see Chapter II of this study), the approaches to CSSM that I have presented here could still shed additional light on the scalar materials found in modern jazz compositions and improvisations.

In addition to the study of chord-specific scalar material, one could analogously study chord-specific (and scale-specific) *sub-scalar* material in any given tonal repertoire. Admittedly, I have essentially dismissed sub-scalar material in this study as less important, but serious attention to different possible types of sub-scalar materials and

their relations to concurrent scalar and chordal materials could potentially yield fascinating discoveries—much like the present study of chord-specific scalar materials, which were previously dismissed as less important. As I have noted in earlier chapters, however, sub-scalar structures are limited (at least in a conventional definition tailored to classical music) to contiguities of half-steps. Their interest would lie in how many half-steps are involved and, more importantly, the different ways in which they might embellish various scalar and chordal materials. Such a study could be much more daunting in some ways, but it might also be simpler in other ways.

Historical Study

While many of the topics of analytical study proposed above could also be described as historical topics, the study of CSSM raises many additional historical questions, each of which could justify its own study. Though I have not found any mentioning of ideas clearly related to CSSM in literature before Schillinger, we should still seek to determine how classical composers might have spoken about such concepts. Composers as far back as J.S. Bach must have had some sense of the idea, as the musical examples shown in this study strongly suggest. Furthermore, the basic idea is a very simple one at its core. But, if mentioned, did any composers explicitly describe the Type-2 alteration process, for example, or the difference between Type-2 and Type-3 CSSM for a particular chord? For there to be no remarks along these lines seems almost impossible. In a broader perspective, one might also study the history of understanding chordal zones as potential containers for melody.

Rigorous study of composers' sketches, manuscripts, and revisions—as well as different editions of their music—could potentially reveal changes made to CSSM over

time, or possibly even changing attitudes about what form it should take. For example, I have already mentioned an example of CSSM in Bach's A-flat major Prelude from *WTC II* that caused confusion for some editors (see the discussion of Example 3.11).

Here, I have presented CSSM as theoretically understood in terms of complete "source" scales and a modern notion of key in which keys typically remain in place for long durations. But could have earlier solmization methods and different notions of key fostered different understandings of scales and scalar structure in music? Would any of these historical considerations suggest a conception of CSSM that is more historically appropriate than the conception presented in this study?

This study has not seriously considered the implications of older tuning systems for CSSM. Might have the tuning systems used or assumed by various classical composers influenced their choices of CSSM? Knowledge of which tuning systems certain composers typically used along with statistics of their CSSM choices could potentially reveal connections. For example, Bach, Mozart, and Beethoven melodized their Neapolitan chords with both Type-2 and Type-3 CSSM; perhaps they chose the type that yielded a more pleasantly-tuned local scale—a choice that would depend on what key and tuning system the given chord is in.

The final route of potential historically-oriented study I will suggest here is also one of the most obvious. One could attempt to study the origins and history of any particular CSSM type, scale type, or type of chord melodization. For example, what is the earliest surviving instance of a complete melodic minor #4 scale within a single chord? Is there an earlier example of complete-scale octatonic CSSM than that from Chopin's F Minor Piano Concerto, shown in Example 3.14? Or, more broadly, what are the earliest

musical examples that demonstrate the Type-2 principle of scalar alteration due to a chromatic chord? And, although I began to speculate about the history of augmented-sixth-chord CSSM in Chapter V, much more research is needed before any substantial conclusions can be made.

Music-Theoretical Study

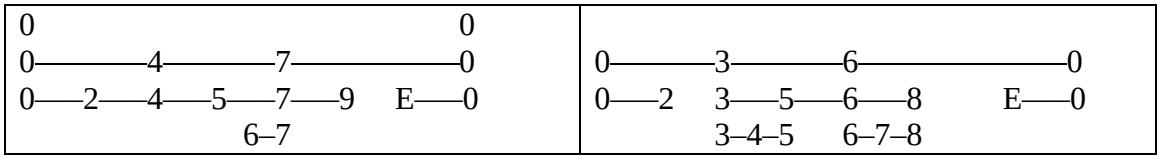
Finally, I will suggest two potential studies that are mostly music-theoretical. The first has already been alluded to above, and it concerns the concept of DSS. I have briefly discussed the concept and some of its implications in Chapters III and IV, but it could serve as the launching pad of a much larger study. Such a study could examine the very long history of DSS-like concepts in Western music (and potentially non-Western music), the assumptions underlying those concepts, and their influences on music composition. At its core, the study could investigate the validity of DSS-like concepts as they have been applied to classical music. To what extent are DSSs "actually" presented in classical music, and to what extent do they depend on imagination? And when can a DSS be appropriately identified as something other than traditional major or minor? Could we dispense with the problematic idea of DSS and find analytical methods that rely instead on the actual scalar (and perhaps also chordal and sub-scalar) intervals that occur on deeper levels?

A second potential theoretical study concerns tonal hierarchies. The relevance of tonal hierarchies to the present study was noted in the opening pages (in the discussions surrounding Example 1.1 and Figure 1.1) as well as in Chapter IV. Every chordal zone in a piece of music could be summarized in terms of tonal hierarchies that generalize the relationships between local chordal, scalar, and sub-scalar materials, as well as local tonic

notes if applicable. With this in mind, it is somewhat remarkable that conventional analysis of classical music typically acknowledges only the chordal and tonic levels of such local hierarchies. In other words, each local tonal-hierarchical structure can be understood as an abstract musical entity that represents the general sonority of each respective chordal zone in a piece of music. Music theory commonly speaks of chord qualities and scale qualities, but it should also speak of them in combination with each other (i.e., types of chord-CSSM pairings) and, further, as possibly affected by a tonic or root pc or by additional sub-scalar material.

Once we understand such tonal hierarchies as representing sonorities, we can begin to speak of sonority-types, which could be represented by tonal-hierarchy types, two examples of which are shown in Figure 7.1. When identifying the types according to pc-interval content rather than pc content, hundreds are possible, and this suggests that they might be somehow catalogued and categorized. The result would be somewhat of a catalogue of tonal sonorities—or a catalogue of tonal colors. Aided by such a catalogue, we could then potentially even devise methods for measuring "magnitudes" of tonal color (perhaps measuring the magnitudes of various tonal qualities exhibited in a given tonal-hierarchy type, somewhat reminiscent of interval vectors as used in set theory) and methods for measuring magnitudes of color change across a passage of music.

Figure 7.1. Two possible "tonal-hierarchy types," written with integer notation in which 0 could represent any possible pc. Dashes represent structural intervals.



APPENDIX A

ABBREVIATIONS AND SYMBOLS USED

+	augmented
°	diminished
ø7	half-diminished seventh chord
^	scale degree
CSSM	chord-specific scalar material
CT^{+6}	common-tone augmented-sixth chord
$CT°^{7}$	common-tone diminished-seventh chord
DSS	deep scalar space
Fr^{+6}	French augmented-sixth chord
Ger^{+6}	German augmented-sixth chord
ic	interval class
M	major
m	minor
m. / mm.	measure / measures
Mm7	major–minor-seventh chord
NCT	non-chord tone
P	perfect (unison, fourth, fifth, octave, etc.); or passing (note or chord)
pc	pitch class

Suffixes to CSSM type numbers (see Chapter III for more detailed definitions):

a	additional alterations (beyond those attributable to chromatic chordal notes)
c	conflict (between a chord and its CSSM)
s	subset or superset (completely scalar subset or superset of a more familiar scalar structure)
v	variable (scale-degree pathways within the same segment of CSSM)

APPENDIX B

SELECTED SCALE NAMES USED

Name used in this study	**Example starting on C**	**Names used elsewhere**
acoustic scale	C–D–E–F#–G–A–Bb–C	overtone scale Lydian b7 Lydian dominant Lydian-mixolydian Vachaspati mode
diminished whole-tone	C–Db–Eb–Fb–Gb–Ab–Bb–C (spelling sometimes varies)	altered scale super Locrian Locrian b4
harmonic major	C–D–E–F–G–Ab–B–C	
harmonic minor #4	C–D–Eb–F#–G–Ab–B–C	Gypsy Gypsy minor Hungarian Hungarian Gypsy *verbunkos* minor
harmonic Phrygian	C–Db–Eb–F–G–Ab–B–C	Neapolitan minor
HW octatonic [“half-whole” octatonic]	C–Db–Eb–E–F#–G–A–Bb–C (spelling varies)	HW diminished
Locrian b4	C–Db–Eb–Fb–Gb–Ab–Bb–C	diminished whole-tone altered scale super Locrian
major-minor	C–D–E–F–G–Ab–Bb–C	Picardy Aeolian mixolydian b6 *Kuruc*
melodic minor	C–D–Eb–F–G–A–B–C (refers only to the traditional “ascending” form unless specified otherwise)	
melodic minor #4	C–D–Eb–F#–G–A–B–C	Lydian b3 Lydian diminished melodic *verbunkos* (minor)
natural minor	C–D–Eb–F–G–Ab–Bb–C	Aeolian pure minor
natural minor #4	C–D–Eb–F#–G–Ab–Bb–C	*verbunkos* aeolian
octatonic$_{0,1}$	C–Db–Eb–E–F#–G–A–Bb–C (spelling varies)	
octatonic$_{1,2}$	C#–D–E–F–G–Ab–Bb–B–C# (spelling varies)	
octatonic$_{2,3}$	C–D–Eb–F–Gb–G#–A–B–C (spelling varies)	octatonic$_{0,2}$
WH octatonic [“whole-half” octatonic]	C–D–Eb–F–Gb–G#–A–B–C (spelling varies)	diminished WH diminished

APPENDIX C

LIST OF NOTEWORTHY EXAMPLES OF CSSM IN

CLASSICAL REPERTOIRE

For ease of comparison, all chords and scales are labeled as if in a key-of-C context. When harmonic function is unclear, a lead sheet chord symbol with a root of C is given instead. The musical examples listed are not necessarily in the key of C. Variability and chord-CSSM conflicts are indicated along with scale names or the example listing when applicable.

Chord (as if in key of C)	**CSSM**	**Examples from classical repertoire that either articulate or suggest the scale or CSSM in the key context listed**	**Number of scalar intervals used in each example**
Type 2			
CM: bII	C major b2 b6	Liszt, Hungarian Rhapsody No. 13 in A Minor, S. 244/13, mm. 37–38, 41–42	7/7 (m. 42)
Cm: bII	C Phrygian	Bach, Violin Partita No. 1 in B Minor, BWV 1002, IV. Double (Presto), m. 6	4/7
		Bach, Cello Suite No. 2 in D Minor, BWV 1008, Gigue, mm. 69–71	5/7
		Beethoven, Piano Sonata in F Minor, Op. 57, mvt. III, mm. 24–25, 32–33	6/7
		Mozart, Piano Sonata in F, K533/494, mvt. III. Rondo, m. 64	3/7
		Fauré, Impromptu No. 3 in A-flat, Op. 34, mm. 125–132	7/7
CM: #ivø^{7}	C major #4 (= C Lydian)	Mozart, Piano Sonata in F, K533/494, mvt. I, m. 84	7/7
CM: vii°^{7}	C harmonic major	Chopin, Ballade No. 4 in F Minor, Op. 52, mm. 63–64	6/7
		Chopin, Polonaise-Fantaisie, Op. 61, mm. 51–55	7/7
CM: vii°^{7}/V	C melodic minor #4	Bach, Cello Suite No. 4 in E-flat, BWV 1010, Prelude, mm. 49–50, 56	7/7
	C major #4 variable b3/3	Bach, Prelude in D Major, *WTC I*, BWV 850, m. 33	8/9
Cm: vii°^{7}/V	C melodic minor #4	Beethoven, String Quartet No. 2 in G, Op. 18/2, mvt. IV, mm. 48–49	4/7
	C melodic minor **(conflicting)**	Fauré, Nocturne No. 2 in B, Op. 33/2, m. 60	6/7
Cm: CT° over ^5 pedal	C natural minor variable 4/#4 **(conflicting)**	Mozart, Piano Concerto No. 21 in C, K467, mvt. I, mm. 122 and 123	7/9
Cm: CT^{+6}	C natural minor b5	Fauré, Barcarolle No. 3 in G-flat, Op. 42	6/7
CM: CT°^{7}	C melodic minor #4	Mozart, Piano Sonata in F, K533/494, mvt. III (Rondo), mm. 164–165	6/7

Cm: Fr^{+6}/i	= Db acoustic	Fauré, Impromptu No. 5 in F-sharp Minor, Op. 102, m. 43	7/7
CM: Ger^{+6}	C harmonic minor #4	Mozart, Piano Sonata in F, K533/494, mvt. I, m. 86	7/7
		Chopin, Mazurka No. 5 in B-flat, Op. 7/1, mm. 45–51	4/7
Cm: Ger^{+6}	C harmonic minor #4	Schubert, Piano Sonata in A, D664, mvt. I, m. 64	7/7
	C natural minor #4	Chopin, Piano Concerto No. 1 in E Minor, Op. 11, mvt. II, mm. 77–78	7/7
		Chopin, Ballade No. 2 in A Minor, Op. 38, mm. 69–71	5/7
		Mozart, Piano Concerto No. 21 in C, K467, mvt. I, mm. 120–121	6/7
		Schubert, Piano Sonata in A, D664, mvt. III, m. 113	7/7
Type 2a			
Cm: bI^{Mm7}	= Cb acoustic	Fauré, Impromptu No. 3 in A-flat, Op. 34, mm. 105–112	6/7
CM: bII	C Phrygian	Fauré, Impromptu No. 1 in E-flat, Op. 25, m. 42	5/7
		Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mvt. I, mm. 50 and 175	7/7
		Sibelius, Violin Concerto, Op. 47, mvt. III, 5^{th} and 7^{th} measures from end	7/7
CM: iv	C natural minor	Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 164–165	7/7
CM: bV	C Locrian	Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mvt. I, mm. 46, 48, 171, 173	7/7
CM: bVI	C natural minor	Fauré, Impromptu No. 1 in E-flat, Op. 25, mm. 44 and 46	7/7
		Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mvt. II, mm. 59–67 and 76–83	7/7
CM: $bVII^{Mm7}$	C natural minor	Fauré, Nocturne No. 3 in A-flat, Op. 33/3, mm. 64, 66	(2+2)/7
CM: $bvii^{mm7}$	C Phrygian	Rimsky-Korsakov, *Scheherazade*, mvt. III	7/7
CM: CT^{+6}	C natural minor b5	Fauré, Piano Quartet No. 1 in C Minor, Op. 15, mvt. II	5/7
Type 2/3 (ambiguous)			
C: V^7/V	C major #4 or G major	Mozart, Piano Sonata in F, K533/494, mvt. II, m. 19	7/7
		Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 162–163	7/7
CM: vii°^{7}/V	C melodic minor #4 or G harmonic major	Chopin, Polonaise-Fantaisie, Op. 61, mm. 51–55	7/7
Type 3			
CM: bII	Db major	Bach, *WTC II*, Prelude No. 17 in A-flat, BWV 886, m. 74	7/7
		Bach, Cello Suite No. 4 in E-flat, BWV 1010, Prelude, mm. 80–81	4/7

Cm: bII	Db major	Bach, *WTC I*, Prelude No. 8 in E-flat Minor, BWV 853, m. 26	4/7
		Beethoven, Piano Sonata in C-sharp Minor, Op. 27/2, III., mm. 33–35	7/7
		Mozart, Piano Concerto No. 26 in D, K537 • mvt. I, mm. 143, 327 • mvt. III, mm. 220–221	7/7
CM: ii^6	D melodic minor	Mozart, Piano Sonata in F, K533/494, mvt. III (Rondo), m. 130	7/7
		Mozart, Piano Concerto No. 26 in D, K537 • mvt. I, mm. 91–93, 110–111, 156–157, 190, 302–304, 340–341, 366 • mvt. III, m. 253	7/7
		Mozart, Piano Sonata in C, K545, mvt. I, m. 9	7/7
CM: $ii^{6/5}$	D melodic minor **(conflicting)**	Mozart, Piano Concerto No. 21 in C, K467, mvt. III, mm. 141–142	7/7
CM: IV	F major	Mozart, Piano Concerto No. 21 in C, K467, mvt. I, mm. 173, 182, 361, 368	7/7
		Mozart, Piano Concerto No. 26 in D, K537: • mvt. I, mm. 89, 300 • mvt. III, mm. 83, 210, 234	7/7
CM: iv	F melodic minor	Mozart, Piano Concerto No. 26 in D, K537, mvt. I, m. 381	7/7
CM: V	G major	Mozart, Piano Concerto No. 26 in D, K537 • mvt. I, mm. 175, 310 • mvt. III, m. 207	7/7
Cm: V	G major	Mozart, Piano Concerto No. 26 in D, K537: • mvt. I, mm. 281, 283, 285 • mvt. III, mm. 182–183	7/7
CM: V^7	G major **(conflicting)**	Mozart, Piano Concerto No. 20 in D Minor, K466, mvt. I, mm. 344–345	7/7
		Mozart, Piano Concerto No. 21 in C, K467, mvt. III, mm. 147, 398	7/7
		Mozart, Piano Concerto No. 26 in D, K537: • mvt. I, m. 112 • mvt. III, mm. 85, 236	7/7
Cm: V^7	G major **(conflicting)**	Mozart, Piano Concerto No. 26 in D, K537, mvt. I, mm. 253, 257, 261	7/7
CM: bVI	Ab major	Beethoven, String Quartet No. 1 in F, Op. 18/1, mvt. III, Trio, mm. 5–14	7/7
Cm: bVI	Ab major	Beethoven, String Quartet No. 2 in G, Op. 18/2, mvt. IV, mm. 46–47	4/7
		Fauré, Piano Quartet No. 1 in C Minor, Op. 15, mvt. IV, mm. 5–6	7/7
Cm: bvi	Ab natural minor	Fauré, Piano Quartet No. 2 in G Minor, Op. 45, mvt. II, rehearsal G	7/7
CM: bvi^{mm7}	Gb major	Fauré, Piano Quintet No. 2 in C Minor, Op. 115, mvt. III, m. 6	3/7
Cm: bvi^{mm7}	Ab natural minor	Fauré, Nocturne No. 6 in D-flat, Op. 63, m. 81	7/7
CM: vi	A melodic minor	Mozart, Piano Concerto No. 21 in C, K467, mvt. I, m. 172, 181, 360, 367	7/7
CM: V^7/ii	D melodic minor	Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 118–120	7/7

CM: V^7/iii	E melodic minor	Chopin, Ballade No. 1 in G Minor, Op. 23, mm. 120–122	7/7
CM: V7/V	D major **(conflicting)**	Beethoven, Cello Sonata No. 2 in G Minor, Op. 5/2, m. 23	7/7
CM: Ger^{+6}	Db major	Fauré, Ballade in F-sharp, Op. 19, mm. 132, 134	7/7
		Fauré, Nocturne No. 3 in A-flat, Op. 33/3, m. 98	(3+1)/7
Cm: Ger^{+6} (or $Ger^{\circ 3}$)	Db major	Fauré, Piano Quartet No. 1 in C Minor, Op. 15, mvt. IV, mm. 29–31	7/7
		Fauré, Nocturne No. 6 in D-flat, Op. 63, mm. 38, 41	(1+2+2)/7
Voice-leading major triad	Major scale built on chord root	Fauré, Nocturne No. 6 in D-flat, Op. 63, m. 42; mm. 86–87	4/7; 7/7
Type 4			
Cm: vii°^{7}/V	F# WH octatonic	Chopin, Piano Concerto No. 2 in F Minor, Op. 21, mvt. I, mm. 98–99	8/8
		Chopin, Polonaise-Fantaisie, Op. 61, mm. 128–131	8/8
		Fauré, Nocturne No. 2 in B, Op 33/2, mm. 61–63	8/8
C	C Lydian	Grieg, *Lyric Pieces Vol. VI*, Op. 57, No. 6, mm. 28–35	4/7

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