

ANALYZING HARMONIC POLARITIES: A TONAL NARRATIVE  
APPROACH

by

STEPHEN WHALE

A dissertation submitted to the Graduate Faculty in Music in partial  
fulfillment of the requirements for the degree of Doctor of Musical Arts,  
The City University of New York

2019

© 2019

STEPHEN WHALE

All Rights Reserved

Analyzing Harmonic Polarities: A Tonal Narrative Approach

by

Stephen Whale

This manuscript has been read and accepted for the Graduate Faculty in Music in satisfaction of the dissertation requirement for the degree of Doctor of Musical Arts.

---

Date

---

L. Poundie Burstein

Chair of Examining Committee

---

Date

---

Norman Carey

Executive Officer

Supervisory Committee:

Scott Burnham

William Rothstein

Thomas Sauer

THE CITY UNIVERSITY OF NEW YORK

## ABSTRACT

Analyzing Harmonic Polarities: A Tonal Narrative Approach

by

Stephen Whale

Advisor: Scott Burnham

This dissertation aims to develop an approach to analyzing common-practice repertoire based on the dynamic interplay of centripetal and centrifugal forces. It aims at interpreting various kinds of chromaticism and modulation in terms of the interaction of forces moving away from the tonic or principal key (centrifugal) and those returning to it (centripetal). Centripetal forces also correspond to the force of cadential substantiation of keys, not only the principal key, which I call temporal-centripetal force; temporal-centrifugal forces correspond to the phenomena of tonal instability, of motion through multiple regions.

The dynamic interplay and counterbalancing of these forces is a core concern of the dissertation. In chapter 1 I build upon Arnold Schoenberg's visionary metaphor for modulation as a struggle and a competition between the tonic and its regions, imagined as a sovereign ruler and his subjects. The tendencies of the regions generate centrifugal forces; the ruling tonic's desire to subjugate them correspond to centripetal forces. What I call temporal-centripetal forces correspond to the possibility for temporary centripetal forces to be generated by a region, which becomes the ruler of its own realm. The crucial application to analyzing harmonic motion is that centripetal and centrifugal forces are dynamically interdependent; each requires the other in order to stimulate a living tonal narrative.

In order to measure centrifugal forces, the tonal narrative approach draws on Gottfried Weber and Schoenberg's maps of tonal space and Weber's elucidation of degrees of relatedness between keys, which are explored in chapter 2. Centrifugal forces divide into sharp and flat sides or types, which correspond to very general character and coloristic shades: sharp-centrifugal forces associate with brightening and greater activity and flat-centrifugal forces with darkening and sometimes passivity. In chapter 3, I explore how the harmonic motion of entire movements can be divided into distinctive functions that define their overall shape, such as intensifications (accumulations of dissonance or centrifugal force or both), culminations, counterbalancing of sharp- and flat-CF forces, and the attainment a complete tour of keys or regions in the tonal spectrum. This chapter also offers a hierarchy of key-area substantiation, determining the structural significance of regions appearing in tonal narratives.

Chapter 4 interprets sonata form in terms of centripetal and centrifugal forces unfolding in broad stages, which often correspond with formal parts but sometimes cross their boundaries. It examines the expansion of centrifugal trajectories in piano sonata development sections by Mozart and Beethoven; the culmination of this expansion is the complete traversal of the enharmonic circle in the *Waldstein* sonata (first movement). I analyze this development section in terms of the number of fundamental steps travelled from the subordinate key to the point of furthest remove.

Chapter 5 develops a hermeneutic reading of Schubert's sonata D. 894/i; centrifugal and centripetal forces are matched to pastoral/epic expressive modes identified in this movement by Robert Hatten. This work also features an immense modulatory trajectory around the enharmonic circle, corresponding to an epic narrative journey into the tonal underworld. A remarkable aspect of the development section is the transient recurrences of passages returning to the pastoral mode

and centripetal forces; these provide a welcome contrast and respite from the inexorable flatward trajectory. The conclusion of the dissertation briefly offers some applications of analyzing harmonic polarities to piano performance, drawing particularly on aspects of touch and technique discussed by Boris Berman.

## ACKNOWLEDGEMENTS

This study would not have been possible without the advice, feedback, and wisdom of various people. I would like to thank my advisor Scott Burnham, for sharing with me his insight into the inner workings of the repertoire covered in this dissertation. His suggestions and questions helped me very much in developing the analytical method presented here. William Rothstein had an invaluable input into this study, pointing me towards Schoenberg's writings on harmony at an early stage of the project. I am very appreciative for his insightful and rigorous comments and suggestions, which helped me refine and improve both the dissertation's theoretical ideas and their expression. I would like to also thank the two other members on the committee, Poundie Burstein and Thomas Sauer for their very useful suggestions for clarifying the expression of the ideas of the dissertation, and situating it in the scholarly context.

I would also like to thank Lauri Suurpää of the Sibelius Academy, Finland, for his insightful suggestions on developing a hierarchy of key definition. I am most appreciative for conversations I have with Andrew Moylan, Farkhad Khudiyev, and Domenic Salerni, my fellow musicians and friends, about the topics covered in this dissertation; these contributed significantly to the development of the analytical approach.

Finally, I would like to thank my wife, Elisa Uusimäki, for her loving support and patience throughout the process and her advice on the dissertation itself.

## TABLE OF CONTENTS

Introduction.....	1
Chapter 1: Archetypal Models and Founding Concepts Shaping Tonal Narratives.....	7
1.1. Archetypal tonal narrative as interplay between centrifugal and centripetal forces.....	7
1.2. The energetics perspective: imperfect/perfect duality and harmonic motion.....	15
1.3. The tonal spectrum divided into sharp and flat sides.....	22
1.4. Schoenberg's centrifugal functions.....	31
1.5. The <i>telos</i> of fixed vs. kinetic tonality.....	42
Chapter 2: Degrees of Spatial Centrifugal Force and the Tonal Spectrum.....	49
2.1. Degrees of vertical-harmonic dissonance.....	50
2.2. Five fundamental relations.....	64
2.3. Weber and Schoenberg's classification of regional dissonance/distance.....	77
2.4. Multiple tonal spectra and reference points.....	89
2.5. The tonal spectrum as a synthesis of Weber and Schoenberg's maps.....	94
2.6. Goethe's color wheel as a metaphor for the tonal spectrum.....	107
Chapter 3: Tonal Narrative Functions and Key/Regional Hierarchy.....	117
3.1. Introduction to tonal narrative functions.....	117
3.2. Intensification.....	123
3.3. Culminations.....	126
3.4. Counterbalancing sharp and flat sides/directions.....	143
3.5. Spatial completeness: circumscribing the key.....	154
3.6. Simultaneity of centrifugal/centripetal forces.....	158
3.7. Summary of tonal narrative functions.....	161
3.8. Regional hierarchy.....	164
3.8.1. Regional hierarchy in fixed-tonic sections.....	167
3.8.2. Regional hierarchy in kinetic-tonic sections.....	178
3.9. Hybrid regions.....	187
Chapter 4: Alternating CP/CF Stages and Expanding Trajectories in Piano Sonatas by Mozart and Beethoven.....	192
4.1. A model of sonata form in alternating CP/CF stages.....	194
4.2. Typical appearances of the parallel minor and its role in counterbalancing processes.....	209
4.3. Expansion of centrifugal trajectories in the development.....	234
4.4. Substantiation of the point of furthest remove.....	250
4.5. The complete traversal of the enharmonic circle: the apotheosis of <i>Durchführung</i> .....	254
4.6. Conclusion to chapter 4.....	267



Chapter 5: Centripetal/Centrifugal Trajectories, Counterbalancing, Completeness, and Hermeneutic Polarities in Schubert's D. 894/i.....	271
5.1. Correlation between pastoral/epic expressive modes and CP/CF forces in D. 894/i.....	272
5.2. The overall form of D. 894/i in alternating CP/CF stages.....	277
5.3. The emergence and expansion of sharp-CF force in the exposition.....	284
5.4. Degrees of remoteness, "pastoral oases," and systemic agents of coherence in the development.....	293
5.5. Resolution of the most salient chromatic tones in the recapitulation.....	307
5.6. Conclusion to chapter 5.....	310
Conclusion.....	311
Glossary.....	324
Bibliography.....	333

## LIST OF MUSICAL EXAMPLES

Example 1.1. Mozart Sonata in F Major, K. 533/i, exposition, group of subordinate themes: expanded cadential progression leading to EEC, mm. 80-89.....	36
Example 1.2. Beethoven, Piano Sonata, op. 7, second movement in C major, middle section first part (mm. 25-37).....	40
Example 1.3. Chopin, Mazurka in A Minor, op. 59/1.....	43
Example 1.4. Descending 5ths with seventh chords in A minor.....	46
Example 2.1. Chord progressions with chromatic dissonances.....	60
Example 2.2. J.S. Bach, Partita in C Minor, mm. 25-29.....	63
Example 2.3. Chopin, Ballade in G Minor, op. 23, mm. 179-195.....	71
Example 3.1. Mozart Sonata in A Minor, K. 310, i, Exposition: primary theme and transition, mm, 1-22.....	121
Example 3.2. Development section: preliminary phase with modulatory leap (mm. 50-58), main centrifugal phase (mm. 58-70), and centripetal phase (mm. 70-79).....	137
Example 3.3. Recapitulatory transition, mm. 88-103.....	147
Example 3.4. Mozart, Piano Sonata K. 310/ii in F Major, mm. 61-72.....	171
Example 3.5. Roman numeral analysis of Beethoven op. 7/i, second subordinate theme (S <sup>2</sup> : mm. 59-93).....	173
Example 4.1. Mozart, Piano Sonata in F Major, K. 332/i. Stage II: CF (Transition).....	216
Example 4.2. Mozart, K. 533/i: second subordinate theme.....	230
Example 4.3. Recapitulatory transition (mm. 154-169).....	231
Example 4.4. Mozart, K. 570/i, development section, centrifugal phase (mm. 81-100).....	236
Example 4.5. Mozart, K. 576/i, development section, centrifugal phase. Progression of regions notated as triads.....	237
Example 4.6. Beethoven, op. 53/i, development. Progression of regions: each region notated as a triad. Rhythmic durations correspond to hierarchy of regions. Figures in bold refer to regions, italics refer to relations between regions.....	258
Example 5.1. Schubert, D. 894/i, opening thematic statement and episode in contrasting region (mm. 1-17).....	285
Example 5.2. Schubert, D. 894/i, second part of stage III: CP/CF(CF).....	290
Example 5.3. Schubert, D. 894/i, development section, mm. 65-115.....	295
Example 5.4. Roman numeral analysis of development section.....	298-300

## LIST OF TABLES AND FIGURES

Figure 1.1. Schoenberg's Chart of Regions, showing increasing flat- and sharp-CF forces.....	29
Table 1.1. Schoenberg's centrifugal functions summarized in terms of local/global and fixed-/kinetic functions.....	33
Table 2.1. Quantz's three classes of dissonance, labels mine.....	53
Table 2.2. Table of seven classes of vertical consonance, dissonance and local chromaticism, arranged from most consonant and diatonic to most dissonance and chromatic.....	57
Figure 2.1. Major tonic: close regions on sharp and flat sides, divided into four areas.....	73
Figure 2.2. Minor tonic: close regions on the sharp and flat sides, divided into four areas.....	74
Figure 2.3. Weber's <i>Tonartenverwandtschaften</i> (Table of key relations).....	78
Table 2.3. Weber's classification of keys in terms of degrees of relatedness/remoteness with respect to C major as tonic.....	79
Figure 2.4. Schoenberg's Chart of the Regions.....	82
Table 2.4. Schoenberg's classification of the regions.....	83
Table 2.5. Categorization of regions based on a major tonic, according to degrees of centrifugal force. Uses scale-degree names adapted from Schoenberg's chart of regions.....	97
Table 2.6. Categorization of regions according to degrees of CF-force based on C major as principal tonic. Major regions in capital letters, minor in small letters.....	97
Table 2.7. Categorization of regions according to degrees of CF-force including sub-degrees based on generative triad commonality.....	98
Figure 2.5. Gottfried Weber's <i>Tonartenverwandtschaft</i> , reduced and annotated with four degrees of spatial centrifugal force on sharp and flat sides, based on five fundamental relations.....	100
Figure 2.6. Tonal spectrum organized around a major tonic (T). Scale degree symbols show the relationships.....	101
Table 2.8. Classification of regions based on a minor tonic, according to degrees of centrifugal force. Uses scale-degree names adapted from Schoenberg's chart of regions.....	102
Table 2.9. Classification of regions based on A minor as tonic.....	102
Figure 2.7. Tonal spectrum organized around a minor tonic (t).....	102
Figure 2.8. Mozart, Sonata in F Major, K. 533/i, represented on the tonal spectrum.....	104
Figure 3.1. Mozart, K. 310/i, transition, mm. 9-22: progression of regions on the tonal spectrum.....	123
Table 3.1. Four types of culmination: centrifugal, centripetal, and their combinations.....	133
Table 3.2. Form chart indicating intensifications and culminations in Mozart's K. 310/i.....	134
Figure 3.2. Development section, mm. 50-79. Progression of regions represented on the tonal spectrum.....	141
Figure 3.3 (right) Recapitulatory transition represented on tonal spectrum.....	147
Figure 3.4. Overview of K. 310/i. Counterbalancing of the sharp and flat sides and directions, using color scheme based on Goethe's color wheel.....	150
Table 3.3. Spectrum of regional definition and substantiality; regional hierarchy for fixed-tonic sections.....	177
Table 3.4. Chart of regional hierarchy in the development section of Beethoven, op. 7/i.....	186

Table 3.5. Regional hierarchy for kinetic-tonic sections (such as development sections).....	187
Table 3.6. Regional hierarchy combining fixed- and kinetic-tonic sections.....	187
Table 4.1. Kollmann's presentation of sonata form in four subsections.....	196
Figure 4.1. Diagram representing sonata form in seven alternating CP/CF stages, building upon Ratner's archetypal key-area form.....	200
Table 4.2. Summary of sonata form in seven stages alternating centripetal and centrifugal forces.....	208
Figure 4.2. The tonal narrative of K. 332/i in seven CP/CF stages.....	225
Figure 4.3. The tonal narrative of K. 533/i in seven CP/CF stages.....	227
Figure 4.4. Overview of Beethoven, op. 7/i in eight CP/CF stages (see fig 4.3 caption for explanation of symbols).....	241
Figure 4.5. Beethoven, op. 53/i, development: progression of structural regions, showing flat- and sharp-CF distances and trajectories.....	258
Figure 5.1. Overview of Schubert, Piano Sonata in G Major, D. 894/i, showing seven alternating CF/CP stages, structural regions, and modulatory trajectories.....	280
Fig. 5.2. Schubert, D. 894/i, development section, progression of regions shown on the tonal spectrum.....	295

*Every chord, then, that is set beside the principal tone has at least as much tendency to lead away from it as to return to it.*

—Arnold Schoenberg, *Theory of Harmony*

## Introduction

This dissertation aims to develop an approach to analyzing undulations and oscillations in chromaticism, key-area dissonance, and key-area substantiation in repertoire of the common practice period. The approach is founded on the dynamic interplay of tonal polarities, which combine to form an archetypal tonal narrative. This *tonal narrative* is generated through the conflict and balance between centrifugal and centripetal forces. The tonal narrative is itself based on two distinct spectra: a tonal spectrum divided into sharp and flat sides and a spectrum of degrees of tonicization and key-area establishment. Utilizing this primary model and two spectra, the *tonal narrative approach* aims at reexamining sonata form (with some observations about other forms) in terms of fluctuations of centrifugal and centripetal forces manifested at distinct levels: from local chromatic harmony to the global progression of key areas (regions).

This approach draws upon previous studies identifying crucial archetypal landmarks in tonal forms, for example Leonard Ratner's *point of furthest remove*<sup>1</sup> and the *essential sonata closure* of James Hepokoski and Warren Darcy, interpreting them in terms of culminations of centrifugal and centripetal forces.<sup>2</sup> It also develops the conception of modulations as structural dissonance, fundamental to Charles Rosen's writings, relating this to Schoenberg's idea of centrifugal force.<sup>3</sup> Exploring the distinction between three kinds of structural dissonance, or three

---

<sup>1</sup> This concept is introduced in the chapter "Sonata Form" in Leonard Ratner, *Classic Music: Expression, Form and Style* (New York: Schirmer, 1980), 225-28.

<sup>2</sup> James Hepokoski and Warren Darcy, *Elements of Sonata Theory: Norms, Types and Deformations in the Late Eighteenth Century Sonata* (New York: Oxford University Press, 2006).

<sup>3</sup> Rosen writes: "Modulation is nothing else than the transference of dissonance to a higher plane, that of total structure." See Rosen, *The Classical Style*, expanded edition (New York: W.W. Norton, 1997), 26. In his *Sonata Forms*, Rosen also introduces the corollary concept of *dissonant section*: "The exposition of a sonata form presents the thematic material and articulates the movement from tonic to dominant in various ways so that it takes on the character of polarization or opposition. The essential character of this opposition may be defined as a large-scale

kinds of centrifugal force, is another core concern in this approach. The first concerns progressions outlining a prevailing key that are enriched or intensified by foreign tones; the second regards the opposition of two (or more) cadentially confirmed key areas, usually associated with themes; and the third concerns passages modulating continually through more transient and incompletely defined key areas. The development of these types draws upon Schoenberg's four centrifugal functions listed in the chapter on modulation in *Theory of Harmony*;<sup>4</sup> it also draws upon Rosen's characterization of the three main sections of sonata form as opposition, intensification, and resolution.<sup>5</sup> Finally, the counterbalancing processes between tonal opposites, such as centrifugal/centripetal forces and sharp/flat regions of the tonality, constitute another basis for interpreting tonal form as a *tonal narrative*. This builds upon Schoenberg's notion of the *musikalische Gedanke* arising from such balancing processes, as well as Rosen's interpretation of key relations and local chromaticism in sonata form as the balancing of the sharp and flat sides of the tonality, a perspective that is also found in Rameau's writings on modulation.<sup>6</sup>

This study begins with a chapter outlining the primary models and fundamental concepts in the tonal-narrative approach. Schoenberg's basic model of the dynamic interplay of centrifugal and centripetal forces will be introduced. I will then situate it as a continuation of the

---

dissonance: the material played outside the tonic (i.e., in the second group) is dissonant with respect to the center of stability, or tonic. Sonata style did not invent this concept of *dissonant section*, but it was the first style to make it the generating force of an entire movement." See Rosen, *Sonata Forms*, rev. ed. (New York: W.W. Norton, 1988), 229, 244.

<sup>4</sup> Arnold Schoenberg, *Theory of Harmony*, trans. Roy Carter (Berkeley: University of California Press, 1978), 152-53.

<sup>5</sup> *Ibid.*, 17-18.

<sup>6</sup> Rosen discusses the appearance of subdominant and flat-side keys in the first part of the recapitulation, after the return of the main theme, which Rosen calls "secondary development." See Rosen, *Sonata Forms*, 288-93. See also Jean-Phillipe Rameau, *Decoding Rameau: Music as a Sovereign Science: A Translation with Commentary of Code de musique pratique and Nouvelles réflexions sur le principe sonore (1760)*, trans. Mark Howard (Liberia Musicale Italiana: Lucca, 2016), 432.

"energetics" approach to harmonic theory and analysis, which emphasizes the energetic interdependence between dissonance and consonance, imperfect and perfect sonorities.<sup>7</sup> I make a connection between the dynamic relationship between these fundamental dualities and those of centrifugal and centripetal forces in Schoenberg's writings. I will then introduce the tonal spectrum, divided into sharp and flat sides, with regions ranging from close to remote. I will also introduce the four kinds of structural dissonance, called centrifugal functions.

Chapters 2 and 3 investigate two main perspectives of centrifugal motion: the tonal-spatial and the event-temporal respectively. For the tonal-spatial aspect, five fundamental relations will be identified and defined as the closest-related keys. The combination of these fundamental relations will constitute the basis for dividing all possible regions in the tonal spectrum into four degrees of key-area dissonance: close, moderately remote, fully remote, and very remote. I will compare the tonal spectrum metaphorically to Goethe's theory of color; this emphasizes the bright (sharp) and dark (flat) sides of tonal space. Goethe's elaboration of how many colors arise from this polarities will provide a metaphor for the increasing key-area dissonance of regions from the tonic.<sup>9</sup>

Chapter 3 divides into two parts: the first introduces the tonal narrative functions; the second elucidates a spectrum of degrees of tonicization and regional (key-area) definition or substantiation. The tonal narrative functions include intensifications, the culminations to which they lead, counterbalancing, turning points, and spatial completeness. They group further into three general analytical perspectives that should be combined to form a comprehensive analysis. The first is the dynamic-curve approach, which focuses on the dissonance/consonance,

---

<sup>7</sup> See Lee Rothfarb, "Energetics," *Cambridge History of Western Music Theory*, ed. Thomas Christensen (Cambridge: Cambridge University Press, 2002), 927-55. This will be elaborated upon in section 1.2.

<sup>9</sup> Johann Wolfgang von Goethe, *Scientific Studies*, trans. and ed. Douglas Miller (New York: Suhrkamp, 1988/1810), 155-298.



centrifugal/centripetal polarity and the process of accumulation toward and away from culminations. Culminations will be differentiated into centrifugal, centripetal, and combinations of the two forces. The second approach focuses on a second type of polarity: that of two sides around a center. This perspective focuses on the alternation, contrasting and counterbalancing of sharp and flat shades of centrifugal force with respect to that center. The third approach concerns circularity and completeness of harmonic motion and interprets tonal narratives in terms of a striving for comprehensive representation of the tonal spectrum. It is associated with a solar approach to key relations, prevalent in the Baroque era, but prevailing in the classical era in the key organization of some rondo movements and echoed in the *tour-of-keys* aspect of development sections.<sup>10</sup> The solar perspective envisions a central tonic "sun" surrounded by regions in all directions forming a circular arrangement, contrasting with the polar focus of the dynamic-curve approach. Each of the three approaches can be associated with aspects of foreground harmonic progressions. For example, the dynamic curve approach is associated with the fluctuations of consonance and dissonance in a progression; the polarity around a center with T-S-D-T functional interpretations of harmony; and the circular/completeness approach with circle-of-fifths progressions and the theory of fundamental progressions based on scale degrees.<sup>11</sup>

The second part of chapter 3 elucidates a spectrum of degrees of tonicization and key-area substantiation. It draws on Ratner's four degrees of regional definition or rhetorical emphasis and Caplin's differentiation of key hierarchy in sonata form, particularly regarding keys in the development section. I treat regional hierarchy separately for tonally stable (fixed-tonic)

---

<sup>10</sup> See William Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart and Beethoven* (New York: Oxford University Press, 1998), 195-96.

<sup>11</sup> These associations are influenced by Dahlhaus' interpretation of the history of harmonic theory from Rameau to Riemann in Carl Dahlhaus, *Studies on the Origin of Harmonic Tonality*, trans. Robert O. Gjerdingen (Princeton: Princeton University Press, 1990), 7-65.

and tonally unstable (kinetic-tonic) passages and sections. For tonally unstable passages, the initiating and goal regions of modulatory trajectories will be considered to be structurally significant.

Chapters 4 and 5 trace the expansion of the range of spatial-centrifugal force, particularly in development and other modulatory sections, from the moderately remote regions, to the most remote regions, to the extraordinary cases of modulations moving through the remote regions, penetrating the enharmonic seam to completely traverse the circle of fifths. Chapter 4 focuses on sonata-form movements by Mozart and Beethoven, and draws on each of the three analytical approaches introduced in chapter 3. The counterbalancing of the sharp and flat sides will be explored as a significant aspect of tonal narratives. In particular, the use of parallel minor and related regions in the expository and recapitulatory transitions (Rosen's secondary development), for example in Mozart's Piano Sonata in F Major, K. 533 (first movement), will be investigated as a flat-side counterbalancing to sharp-side relations. The parallel and relative relations will be explored as gateways to the more remote regions of the tonal spectrum, as catalysts for the intensification and expansion of the range of spatial-centrifugal force in the development section.

The final section (4.5) of chapter 4 presents an extraordinary modulatory phenomenon: the traversal of the enharmonic circle. While Beethoven modulates to very remote regions in the earlier sonatas, such as the flat mediant's flat submediant ( $A\flat$  major) in the first movement of Piano Sonata in A Major op. 2/2, in those pieces there is a reversal of direction, a harmonic backtracking to return to the global tonic. A transcendent solution is realized in the *Waldstein* sonata. This solution draws on the dual nature of the tonal system: an infinitely proliferating harmonic universe based on natural tuning that is simultaneously unified by the systemically centripetal force of equal temperament, which limits the number of tones in the octave to twelve. In the first

movement of the *Waldstein* (in C major), the modulations move in the flat direction to an apparent region of furthest remove, the flat mediant minor (E $\flat$  minor); however, the modulations continue in the flat direction, pushing through the enharmonic seam to return to the tonic.

An immense modulatory trajectory traversing the enharmonic circle also appears in Schubert's Piano Sonata in G Major, D. 894, first movement, which I will analyze in chapter 5. In this development section, the key at the apparent point of furthest remove (flat mediant minor: B $\flat$  minor) is established emphatically, and returns in the last part of the section, setting up a paradox of centrifugal and centripetal forces. Furthermore, the modulations from the initial appearance of the key move in the flat direction and completely traverse the circle of fifths in order to return to B $\flat$  minor, which, according to the flat direction of modulation, is also C $\flat\flat$  minor, an extremely remote relation to the principal key.

I will also present a hermeneutic reading of this movement, based partly on Hatten's identification of pastoral and epic expressive "modes" or large-scale generic polarities. I aim to show how these correlate with centripetal and centrifugal forces and the interactions between them. This movement's colossal modulatory trajectory around the enharmonic circle corresponds to an epic narrative journey into the tonal underworld. A remarkable aspect of the development section are the transient recurrences of passages returning to the pastoral mode and centripetal forces; these provide a welcome contrast and respite from the inexorable flatward trajectory. The conclusion of the dissertation briefly offers some applications of analyzing harmonic polarities to piano performance, drawing particularly on aspects of touch and technique discussed by Boris Berman.<sup>12</sup>

---

<sup>12</sup> See Boris Berman, *Notes from the Pianist's Bench*, 2nd ed. (New Haven: Yale University Press, 2017).

## Chapter 1

### Archetypal models and founding concepts shaping tonal narratives

#### 1.1 Archetypal tonal narrative as interplay of centrifugal and centripetal forces

The archetypal narrative of tonal motion, or *tonal narrative*, is generated through the vital interaction of centrifugal and centripetal forces. The peaceful authority of the tonic key is disrupted by centrifugal forces moving away from and challenging its authority; these are counteracted and balanced by centripetal forces aiming to reestablish the tonic key. Centrifugal forces build towards a culmination, the attainment of the most distant key area or harmony; this represents a turning point in the form where centripetal forces gradually increase until they overcome the centrifugal ones, restoring order to the tonal narrative. The balance between these opposing forces is the basis for the *musikalische Gedanke*, the platonic Idea or tonal purpose of the work. Centrifugal and centripetal forces constitute the fundamental and defining polarity of this approach, and form the basis for tonal narratives.<sup>13</sup>

This model originates in some of Schoenberg's writings on the aesthetics of tonality, particularly in the chapter "Modulation" from *Harmonielehre* (1922) and the unfinished manuscript *Der musikalische Gedanke und die Logik, Technik, und Kunst seiner Darstellung*. The latter manuscript was edited and published posthumously with commentary by Schoenberg's student Patricia Carpenter and her own student Severine Neff (1995). In Schoenberg's original text from the manuscript, he describes the archetypal tonal narrative in terms of rest, contrast,

---

<sup>13</sup> This summary is based on Severine Neff's presentation of what I am calling Schoenberg's "archetypal tonal narrative" in Neff, "Schoenberg as Theorist: Three Forms of Presentation," in *Schoenberg and His World*, ed. Walter Frisch (Princeton: Princeton University Press, 1999), 58-61.

and unrest, involving a "state of rest being placed into question by contrast" and becoming doubtful through contradictory elements. The state of unrest continually builds, leading to the "attainment of a climax" after which the state of rest is restored: the method by which this is restored is the real *Gedanke* or purpose of the composition.<sup>14</sup> Carpenter and Neff present Schoenberg's model in their introductory commentary to the *Musikalische Gedanke* publication using the terms centripetal and centrifugal as alternatives for rest and unrest, respectively:

Such tonal functions present a set of balanced forces. Those close to or having the potential to move toward the tonic are termed *centripetal*, those far from or moving away from it are *centrifugal*. Schoenberg viewed tonality as a necessary conflict, a battlefield upon which the struggle between centripetal and centrifugal forces is played out.<sup>15</sup>

The authors identify passages from *Theory of Harmony (Harmonielehre)* as a basis for articulating Schoenberg's model, most of which come from the remarkable chapter "Modulation." Here, tonality is conceived as a struggle for power and influence between the tonic and its regions — key areas of varying degrees of relatedness to the tonic. The tonic is imagined as a supreme monarch ruling over a kingdom, with the regions as his subjects, ultimately subordinate to him. These subjects, however, harbor their own ambitions for independent power, being rulers of smaller districts themselves, and have the potential to challenge the authority of the tonic ruler. The activation of the regions' desires for independence and power is a centrifugal force, creating large-scale unrest or *key-area dissonance* (dissonance between regions) by challenging the tonic and moving away from it. Opposing this is the

---

<sup>14</sup> Arnold Schoenberg, *The Musical Idea and the Logic, Technique and Art of its Presentation*, trans. and commentary by Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995), 20-21, 62-63.

<sup>15</sup> From Carpenter and Neff's commentary in Schoenberg, *The Musical Idea*, 62.

centripetal force of the global tonic's own "urge to dominate" the regions, to consolidate and centralize its power over the entire tonal realm.<sup>17</sup>

Later in the passage, Schoenberg ascribes to these opposing forces equal importance and influence upon the unfolding of tonal motion:

Every chord, then, that is set beside the principal tone has at least as much tendency to lead away from it as to return to it. And if life, if a work of art is to emerge, then we must engage in this movement-generating conflict. The tonality must be placed in danger of losing its sovereignty.<sup>18</sup>

The conflict between centrifugal (CF) and centripetal (CP) forces generates tonal motion: this dynamic interplay is a necessary condition for the emergence of a living work of art. The dissonance and contrast created by modulations to the regions and the methods by which the tonic reasserts its centrality are essential to the vitality of the tonal narrative. These modulations and returns, as well as more local chromaticism, create fluctuations in centrifugal forces: waves of varying gradations of *key-area dissonance* and *key-area substantiality* or *endurance*. The two aspects are distinct: centrifugal force as key-area (i.e. regional) dissonance concerns the degree of distance, difference or conflict between regions, while centripetal force as key-area endurance refers to the degree to which a region of the tonal spectrum is established or confirmed, that is, the degree to which it is tonicized at more local or global levels.

Schoenberg's concept of regions interprets all keys appearing in a given piece as segments or parts of an overall tonality organized around the principal key as "tonic," the single tonic for the movement. All keys are considered *regions* that function primarily as a harmonic contrast with respect to the one tonic of the piece, even while temporarily acting as though they

---

<sup>17</sup> See Arnold Schoenberg, *Harmonielehre* (Wien: Universal Edition, 1922), 182-86; Arnold Schoenberg, *Theory of Harmony*, trans. Roy Carter (Berkeley: University of California Press, 1978), 150-53.

<sup>18</sup> Schoenberg, *Theory of Harmony*, 151.

were independent tonalities.<sup>19</sup> Schoenberg represents these relationships on his Chart of the Regions, which will be explored in section 1.3 and chapter 2.<sup>20</sup>

A region consists of the same components as a key, but the minimum requirements for its presentation are less than those required for the expression of a key. A region consists of its major or minor scale, including its generative triad, ascending and descending leading tones, and potentially its own harmonic degrees based on its scale.<sup>21</sup> A region is more clearly established by a progression featuring each of the terms of the functional-syntactical model, tonic—pre-dominant—dominant—tonic (T-PD-D-T). However, a region can still be implied by chords featuring its leading tones, without the appearance of the tonic chord itself. The appearance of two distinct chords in the functional model is sufficient to express the region; these include progressions such as V7-I, V-VI, IV-V, and II-V.<sup>22</sup> The triads may appear in any position. In this study, progressions presenting the three distinct terms of the T-PD-D-T syntactical archetype will be referred to as a *harmonic cycle*, which is considered more complete than progressions involving only two distinct functions (such as tonic-dominant alternations).

---

<sup>19</sup> Schoenberg writes: "The concept of regions is the logical consequence of the principle of *monotonicity*. According to this principle, every digression from the tonic is considered to be still within the tonality, whether directly or indirectly, closely or remotely related. In other words, there is only *one tonality* in a piece, and every segment formerly considered as another tonality is only a region, a harmonic contrast within that tonality." See Arnold Schoenberg, *Structural Functions of Harmony*, ed. Leonard Stein, rev. ed. (New York: W.W. Norton, 1954), 19.

<sup>20</sup> The tonal narrative approach allows for regions to relate to secondary keys or other structural regions in addition to or instead of the principal key, for example in the latter section of a sonata exposition or the development section. In these cases, the secondary key or structural region becomes a temporary reference point for a temporary spectrum.

<sup>21</sup> The tonal narrative approach defines leading tones of a region as those tones that ascend or descend by half step to the central triad (local tonic triad) of that region. Therefore, in major there is one ascending leading tone, scale degree 7, and one descending leading tone, scale degree 4. In minor, based on the typical definition given above, the ascending leading tone is the raised seventh degree, and the descending leading tone is scale degree 6.

<sup>22</sup> Schoenberg writes: "Artificial dominants, artificial dominant seventh chords, and artificial diminished seventh chords are normally used in progressions according to the models V-I, V-VI, and V-IV." See Schoenberg, *Structural Functions*, 16.

The essential distinction between the two aspects of centrifugal and centripetal force is based on the dichotomy between tonal-spatial and event-temporal perspectives, as defined for example by Patrick McCreless.<sup>25</sup> The first aspect of centrifugal/centripetal force is based on a map of tonal space, with gradations of dissonance between regions measured according to the difference or conflict between the *scale content* of the regions, the common tones shared by their generative triads, and the interval between the roots of the regions.<sup>26</sup> This is referred to as *spatial-centrifugal force*. The second aspect of centripetal/centrifugal force focuses on the realization of harmonic events in time: in particular, the degree to which regions are established or confirmed as key-areas and the degree of completeness with which they are presented. This temporal aspect also generates a key-area hierarchy, where certain regions govern other, subordinate ones, which may then temporarily govern even more subordinate regions.

These two closely related aspects of larger-scale harmonic motion shape the tonal narrative, creating distinctions between tonally stable and unstable phrases, phrase-groups or sections, and forming the basis for form-functional models such as those developed by William Caplin (drawing upon Schoenberg and Ratz's work).<sup>27</sup> Temporal-centripetal forces establish a prevailing key and bring it toward cadential substantiation; they generate tonally stable passages

---

<sup>25</sup> McCreless writes: "From its inception in ancient Greek musical theory, Western thought about pitch has been concerned with, on the one hand, a pitch or pitch-class inventory existing in tonal space, and on the other, the real-time distribution of elements of that inventory in actual music." He draws on contemporaneous research in the psychology of music characterizing the two perspectives as *tonal hierarchies* and *event hierarchies*. McCreless then suggests equivalent, less formal terms: tonal space and event space. I propose the alternate terms tonal-spatial and event-temporal to emphasize the dichotomy between spatial and temporal perspectives, which is also suggested by the quote above. That the real-time elements are represented in an analytical "event space" seems self-evident. See Patrick McCreless, "Syntagmatics and Paradigmatics: Some Implications for the Analysis of Chromaticism in Tonal Music," *Music Theory Spectrum* 13/2 (1991): 147-78.

<sup>26</sup> These criteria draw upon Weber's justification for his four nearest relations to the tonic (upper, lower dominants, relative and parallel regions) as represented in his *Tonartenverwandtschaft*. They will be explored further in 2.2 below.

<sup>27</sup> Caplin, *Classical Form*. For example, on p. 139 Caplin characterizes the formal function of the development as one of maximum tonal instability, compelling a counterbalancing restoration of stability: "As a formal function, the development generates the greatest degree of tonal and phrase-structural instability in the movement and thus motivates a restoration of stability (to be accomplished in the recapitulation)."



or sections. Temporal-centrifugal forces disrupt or depart from the prevailing key to generate tonally unstable passages or sections. Temporal-centripetal force can be generated around any key, not only the principal key for a movement. The most tonally stable passages are oriented around a single key-area, while the more tonally-unstable passages feature continual modulations through multiple regions. Phrases or sections exhibiting temporal-centripetal force feature tonic-centralization, while those expressing temporal-centrifugal force involve a decentralization of the tonal narrative.

This suggests a polarity between types of *tonicity*: *fixed* versus *kinetic tonicity*. These terms are equivalent to "tonal stability" and "tonal instability" respectively. I propose new terms here owing to the general meaning of the stability/instability polarity: it could refer to many kinds of spatial- or temporal-centripetal/centrifugal forces at various levels. Fixed tonicity refers to any phrase or section governed by a single key, so that a single tonic reigns throughout and temporal-centripetal forces prevail. In fixed tonicity, the governing key may be challenged through chromaticism originating from glimpses of other regions, but it is not overcome. In kinetic-tonic passages, temporal-centrifugal forces prevail; the tonal narrative passes through multiple regions, none of which governs the whole passage or section. Not all regions, however, are equally subordinate and ephemeral; some regions emerge with temporary governing function over the most subordinate, fleeting regions. For example, passages of kinetic tonicity often feature modulatory sequences, where the initiating region governs the subsequent regions. Half-cadential arrivals and other goals of modulatory motion also have a governing function over regions leading toward them. Ultimately, this type of passage or section is based on the principle of continual motion through multiple tonics so that the tonics are constantly changing: tonicity is fluid and kinetic.

A very remote region, such as the flat mediant minor, generates a strong, even maximum degree of spatial-centrifugal force regardless of how substantially it is established as a region. If it appears as part of a continually modulating passage moving through tonicized regions, then the temporal-centrifugal force is also very high. This is the case, for example, in the development section of Beethoven's *Waldstein* sonata (first movement in C major), where the flat mediant minor (E $\flat$  minor) appears in the midst of continual sequential modulations and is only briefly tonicized in mm. 124-25 before moving on to the next region. On the other hand, in Schubert's Piano Sonata in G Major, D. 894/i, the development section begins to modulate from the dominant (D major) through fleeting tonicizations of its parallel region (D minor) and C minor, both of which lead to a climax on a B $\flat$  minor harmony, the global flat mediant minor, which is then established by a progression prolonging the tonic and semi-confirmed by a half-cadential cycle (mm. 73-75).<sup>28</sup> This then creates a simultaneity of a strong spatial-centrifugal force, operating at a deeper level, and a more local temporal-centripetal force, due to the semi-confirmation of B $\flat$  minor. These situations will also be referred to as paradoxes of tonal motion and simultaneities of centrifugal and centripetal force.

The tonal narrative and its primary polarity of centrifugal and centripetal forces synthesize the tonal-spatial and event-temporal aspects of tonal motion. The basis for the tonal-spatial perspective is a tonal spectrum of varying grades of regional (key-area) dissonance, where the degree of dissonance is proportional to the difference or conflict between key-areas or regions. The spectrum is generated from a central tonic, based on two pairs of opposed relations: upper/lower dominants and parallel/relative major-minor, making four fundamental, generative relations. The spectrum is arranged as a lattice, with the vertical dimension based on ascending

---

<sup>28</sup> Note the long duration of the measures: a 12/8 time signature in moderato tempo.

and descending fifths (starting with the two dominants) and the horizontal dimension alternating parallel and relative major-minor relations. The vertical dimension is founded on Rameau's gravitational model, presented in *Génération harmonique*, where the tonic is a center of gravity surrounded by dominant above and subdominant below. Each dominant is equally strongly attracted to the tonic in opposite directions, which holds the whole system in an equilibrium.<sup>29</sup> The parallel/relative pair constitute the closest major-minor relations between a tonic and its regions, but each relates in an opposite way (this will be explained below in section 1.3). The spectrum divides into the sharp and flat sides, based on whether the diatonic collection of a region features more sharps or flats than the principal key.<sup>30</sup>

The event-temporal perspective is based on a spectrum of degrees of key-area substantiality, influence, and endurance, in other words, degrees of *tonicization*. The spectrum differentiates waves of harmonic motion into dimensions or levels of varying scope: a local dimension of harmonic progression, with fleeting centrifugal forces generated by local chromaticism; a global dimension consisting of substantiated, governing key-areas; and a middleground that includes the transient, subordinate, dependent key-areas, particularly those in modulatory passages. Each of these dimensions is generated by degrees of temporal-centripetal/centrifugal force, but each also manifests spatial-centripetal/centrifugal force. These

---

<sup>29</sup> Rameau first conceived of the subdominant in *Nouveau système de musique théorique* (1726) and introduced the tonic-centric gravitational model in *Génération harmonique* (1737). This model contrasts with the earlier mechanistic model, which presents a chain of dissonant dominants (defined as any non-tonic harmony descending by fifth in the fundamental bass) leading to a consonant tonic. This model pervades the *Traité* (1722). In the gravitational model, subdominant, tonic and dominant are represented by the triple proportion 1:3:9 respectively, since each harmony is the third harmonic of the previous one. The tonic is understood as the center of the "mode" or tonality, to which our desires (as experiencers of music) are drawn. See Deborah Hayes, *Rameau's Theory of Harmonic Generation; An Annotated Translation and Commentary of Génération harmonique by Jean-Phillipe Rameau* (Ph.D. dissertation, Stanford University, 1968), 139. See also the original: Jean-Philippe Rameau, *Génération harmonique ou traité de musique théorique et pratique* (Paris: Prault fils, 1737), 109. Rameau's model is discussed in Thomas Christensen, *Rameau and Musical Thought in the Enlightenment* (Cambridge: Cambridge University Press, 1993), 189.

<sup>30</sup> The raised seventh degree in minor keys is counted as part of the diatonic collection as a quasi-diatonic element crucial to the change in color between the regions (see 2.1 and 2.2. below).

levels then combine to form the concrete manifestation of the piece in all its tonal details, in sound and notation.

## **1.2. The "energetics" perspective: the imperfect/perfect duality and harmonic motion**

The three levels of tonal motion — global, local, and middleground — are themselves generated by the dynamic interaction, conflict, and counterbalancing between the fundamental polarities: centrifugal/centripetal; sharp/flat sides of the tonal spectrum; and governing/subordinate key-areas. Every passage emphasizing one force potentially motivates and challenges the opposing force to shape a later passage; the greater intensity of one stimulates an equivalent intensity in the other. This approach imagines each of these polarized forces, aspects, and levels of tonal motion to be inner energy flows, always interacting, combining, or being in conflict with one another, ultimately shaping the outer manifestation of the score. This situates it as part of a tradition of "energetics" in tonal analysis.

In his discussion of energetics, Lee Rothfarb identifies a thread of musical interpretation that focuses on the dynamic interplay between tones and the motion they generate.<sup>31</sup> While the term applies more narrowly to a group of theorists operating in the early twentieth century in the German-speaking world, such as Ernst Kurth and Arnold Schering, Rothfarb elucidates an energetics orientation moving through the history of music theory as well as between nations: from the ancient Greek philosophers, to late medieval counterpoint treatises, to eighteenth- and nineteenth-century harmonic theory in France (Rameau and Fétis) and A.B. Marx's dynamics of form. Though not identified in Rothfarb's broad overview, an energetics orientation also

---

<sup>31</sup> Rothfarb, "Energetics," 927-55.

underlies some of Arnold Schoenberg's writings on harmony and tonality, particularly the chapter "Modulation" from *Harmonielehre*.<sup>32</sup>

A common theme in Rothfarb's presentation of this strand of music theory is the important role played by the alternation and transformation of musical opposites or contrasting elements in generating musical motion and ensuring its vitality. For the ancient Greeks, change was the source and cause of musical motion, which gave music its ethical power. Aristoxenus identified a significant type of change: the shifting *dynamieus* or dynamics of the tones in a melody, a unique functional quality of the notes determined by their place in the tetrachord. In Rothfarb's subsequent examples of an energetics perspective in writings about harmony and tonality, a fundamental duality emerges as the basis for change. For late medieval theorists, this was between perfect and imperfect consonances, while by the eighteenth century it was between consonance and dissonance. If we understand consonance and dissonance in the broad, conceptual sense as stability versus instability, agreement versus disagreement between the tones, the perfect/imperfect duality can be considered as a manifestation of consonance/dissonance, as Rothfarb suggests.<sup>33</sup> Consonance/dissonance, in the broader sense, functions as a fundamental polarity that also generates the centrifugal/centripetal polarity that primarily shapes more global levels of the tonal narrative.

---

<sup>32</sup> David Bernstein points to the energeticist rhetoric in Schoenberg's model of harmonic motion as the dynamic interplay of tension and release, centrifugal and centripetal tendencies, quoting a passage from *The Musical Idea* that "one might imagine to be by Ernst Kurth." See David Bernstein, "Nineteenth-Century Harmonic Theory: the Austro-German Legacy," in *Cambridge History of Western Music Theory*, 806.

<sup>33</sup> The words consonance and dissonance derive from the Latin *consonare* and *dissonare*. The former originally meant "sounding together," while the latter meant "sounding apart." By the sixteenth century, the medieval Latin word *dissonantia* was already associated with "disagreement, discrepancy, incongruity, inconsistency"; meanwhile, the medieval Latin *consonantia* was already associated with agreement and "a pleasing combination of sounds." See *Online Etymology Dictionary*, "consonance," [https://www.etymonline.com/word/consonance#etymonline\\_v\\_28696](https://www.etymonline.com/word/consonance#etymonline_v_28696) and "dissonance," [https://www.etymonline.com/word/dissonance#etymonline\\_v\\_29694](https://www.etymonline.com/word/dissonance#etymonline_v_29694) (accessed October 8, 2018). Leonard Ratner also explains consonance and dissonance in terms of agreement and disagreement between tones in his textbook *Music: The Listener's Art*, 2nd ed. (New York: McGraw-Hill, 1966), 67.

By the fourteenth and fifteenth centuries, counterpoint treatises were founded on a basic distinction between the dynamic qualities of harmonic intervals: imperfect and perfect consonances. Imperfect consonances are less stable, transient, more dissonant in the sense proposed here; requiring and even demanding resolution to the perfection, stability, and permanence of perfect consonances. The two types of intervals are in a dynamic relationship: the imperfect consonances "seek," "demand," or "require" resolution to perfect ones. Ugolino of Orvieto (1430-1442) imagined this even more passionately: an imperfect sonority "ardently burns" to achieve perfection, "to which it is driven."<sup>34</sup> Alternatively, a discrete passage of counterpoint must begin with a perfect consonance, but in order to create satisfactory motion it needs to proceed through imperfect consonance(s) before returning to a perfect consonance to conclude. Good counterpoint demands musical motion, generated by the change and transformation between different varieties of intervals, not only between imperfect and perfect consonance, but also different kinds of imperfect ones, where a perfect consonance would disrupt the continuity of tonal motion.

Notably, around 1320 Marchetto of Padua considered thirds, sixths, and tenths, which were soon to be considered imperfect consonances, to be "permissible dissonances" and discussed their tendency and requirement to resolve to consonances.<sup>35</sup> This points to the interchangeability of the imperfect/perfect and dissonance/consonance dichotomies, or at least to a spectrum incorporating the two opposing pairs. By the time of Rameau's harmonic theory, the spectrum of perfect and less perfect sonorities had expanded to incorporate dissonances such as

---

<sup>34</sup> Rothfarb, "Energetics," 931. David E. Cohen points to the dynamic interplay between imperfect/perfect sonorities and dissonance/consonance as the basis for goal-directed harmonic motion in Cohen, "The Imperfect Seeks its Perfection!: Harmonic Progression, Directed Motion, and Aristotelian Physics," *Music Theory Spectrum* 23/2 (2001): 139-69, esp. 143.

<sup>35</sup> Cohen, "The Imperfect Seeks its Perfection," 149.

sevenths and augmented fourths/diminished fifths. As the most unstable, imperfect element within diatonic harmony, the dissonant seventh becomes the prime motivator for the resolution of a perfect cadence, with its falling fifth in the fundamental bass. The dissonance generates momentum for the harmonic progression by challenging the stability of the tonic. David E. Cohen illuminates the connection between late medieval contrapuntal theory and Rameau's concept of the dissonant seventh chord as the prime motivator of harmonic motion: the duality of dissonance and consonance is an expansion of the duality of imperfect and perfect consonances; the relationship between the opposing poles in each pairing is analogous. In both cases the more unstable, less perfected element is compelled towards the more stable, perfected element, generating harmonic motion toward a conclusion: "Rameau's explanation of harmonic progression thus incorporates (and finds new meaning in) the traditional doctrine that consonant (or 'perfect') sonorities provide 'repose' to the ear and are therefore inherently conclusive, while dissonant (or 'imperfect') sonorities must (in some sense) 'move on' to other sonorities, and ultimately to one that is 'perfect'."<sup>36</sup>

The next stage in the expansion of the energetic conception of consonance and dissonance involves chromatic alterations to the diatonic scale, particularly when they form chromatic harmonies in a chord progression. Fétis used a special label for these altered tones, calling them "attractional," and characterized them as "agitations, impassioned movements, nervous crises expressed by the contact of diverse tonalities and the alternation of consonance and dissonance."<sup>37</sup> Fétis' understanding of local chromatic harmonies suggests a conflict between key-areas: the primary key and one of its regions, whose own leading tones infiltrate and disrupt the prevailing key. A non-tonic harmony that is embellished by a chord featuring leading tones

---

<sup>36</sup> Cohen, "The Imperfect Seeks its Perfection," 145.

<sup>37</sup> Quoted in Rothfarb "Energetics," 934-35.

from its own region, commonly called "tonicization," is a basic example of the contact between two contrasting key-areas.<sup>38</sup> In this case, the primary key clearly anchors the harmonic progression while the region generates chromatic harmony through its leading tones, intensifying dissonance with local centrifugal force.

In "Modulation" from *Harmonielehre*, Schoenberg finds a common principle underlying harmonic progressions, local chromatic harmony, modulation to new keys, and modulatory movement through multiple regions. His unified interpretation of various levels of harmonic motion uses imagery focused on the interplay of dynamic forces, thus situating it as a continuation of the "energetics" perspective that Rothfarb identifies in late medieval counterpoint treatises, Rameau, and Fétis. Schoenberg presents the unfolding of tonal motion as a struggle for power and influence between the tonic and regions of the tonality. As discussed briefly in the previous section, the tonic is imagined as a supreme monarch ruling over a kingdom, while the regions are his "subjects," governors of the various "districts." The monarch continually aims to assert or consolidate his authority, which is inevitably challenged by his subordinates, who are sometimes able to claim victories, expand their territory, and assert their own independent power. The regions of the tonality are at the same time dependent and independent; some regions, such as the dominant and subdominant, have particularly strong wills to assert their independence.<sup>39</sup> The regions' assertion of independent power and influence over the tonal narrative is an essentially centrifugal force, operating at different levels of substantiality. The tonic's "urge to dominate" the regions, to consolidate its central power over the kingdom, and to

---

<sup>38</sup> Schenker first used and defined the term *Tonikalisierung* in *Harmony* (1906). Mann and Jonas translated the term as tonicalization. Roger Sessions was the first to use the term tonicization in *Harmonic Practice* (New York: Harcourt & Brace, 1951).

<sup>39</sup> Schoenberg, *Theory of Harmony*, 151



bring the regions back into a state of full dependence (for example as functional harmonies within a tonic-key cadential progression): these comprise the essence of centripetal force.

The centrifugal and centripetal forces are potentially equally influential in shaping the tonal narrative, from the surface of harmonic progressions to more substantial modulations: "Every chord, then, that is set beside the principal tone has at least as much tendency to lead away from it as to return to it." Just as in late-medieval counterpoint treatises, where imperfect consonances are required in between perfect consonances in order to generate satisfactory motion, the alternation and interplay of centrifugal and centripetal forces are necessary to generate various levels of tonal motion, animated by the life-force: "if life, if a work of art is to emerge, then we must engage in this movement generating conflict."<sup>40</sup> In the same way that Rameau considered the dissonant seventh to be the prime cause or primary motivator of any harmonic progression, Schoenberg advises that the centrifugal force of the regions, the activation of their "appetites for independence" and "tendencies to mutiny," is necessary to generate a living work of art, a thriving tonal motion. The interdependent interaction between dissonance and consonance, which generates the vital momentum of harmonic progressions, is transformed and expanded into a dynamic interplay between centrifugal and centripetal forces that generates the larger modulations of the tonal narrative.

The opposing centrifugal and centripetal forces are also interdependent: the strength of one motivates the opposite force to an equivalent degree. Schoenberg speculates that the centrifugal forces issuing from the regions' ambitions for self-establishment are motivated as much by the centripetal force of the global tonic as from their own tendencies. Centripetal force on a global scale cannot function without an equal and opposing centrifugal force to challenge

---

<sup>40</sup> Ibid., 151.

and depart from the tonic: "The tyrant's urge is not satisfied without the ambition of its subjects." This works in the same way in Rameau's theory of harmonic progression: the centripetal force defining a tonic can only be established by a dominant chord with added dissonance, a requirement just as essential as the need for a dissonance, the origin of centrifugal force, to resolve to a consonance.

Schoenberg describes in metaphorical language how the genuine departure from the tonic key in modulation needs to be matched by a corresponding centripetal force. The strength of the centripetal exertions must match the degree of substantiality that the region attains. For example, in sonata form, the subordinate key is confirmed by cadential progressions in the exposition, often multiple and expanded ones, including the essential expositional closure (as will be discussed in sections 1.4 and 3.3). This region has generated a high degree of key-substantiality in the tonal narrative, a middleground centripetal force that needs to be counteracted by a larger global centripetal return and confirmation of the principal key. The need for a larger global centripetal force can explain the re-composition in the second half of some recapitulations to include even more expanded cadential progressions, and also the function of many codas and codettas, often consisting primarily of cadential material and/or tonic prolongation. This is evident in forms of differing sizes, from Brahms, op. 119/2 in E minor (each section closing with codettas prolonging tonic harmony) to the finale of Beethoven's fifth symphony. For Schoenberg, the greater the degree to which a region establishes itself as a key-area, the more emphatic the victory of the tonic-monarch: "The greater the lead the fundamental grants those that are breaking away from it, so much the more impetuous must be the seven-league strides

with which it overtakes and captures them. The greater the exertion, the more overwhelming the effect of victory."<sup>41</sup>

Schoenberg also hears a connection between the inherent motion in any chord progression, the intensified force of a progression where chromatic harmonies elaborate a basic key-defining progression, and modulation that genuinely departs from the tonic key: "any other chord placed beside the fundamental, even if it does not actually bring about a modulation, leans nevertheless in that direction." Schoenberg hears the origins of modulation in the local chromaticism arising from leading tones to the regions: "if we follow the tendencies of the subordinate chords,<sup>42</sup> we see the necessity and the possibility of the digressions [*Ausweichungen*], of modulations."<sup>43</sup> The substantial centrifugal force expressed by modulation is an expansion of local chromaticism, which is itself an intensification of dissonance — bringing us back to the idea of centrifugal force as an expansion of dissonance.

### 1.3 The tonal spectrum divided into sharp and flat sides

Centrifugal forces operating at different dimensions of the tonal narrative, whether global, local, or middleground, branch off into a sharp or flat direction/shading; this is determined by the change in diatonic collection as an increase in either sharps or flats. This recognition of sharp and flat energetic forces can be traced back, once again, to Jean-Philippe Rameau (1683-1764),

---

<sup>41</sup> Schoenberg, *Theory of Harmony*, 152. A league was a unit of measurement common in medieval times referring to the distance one can walk in an hour (for example, around three kilometers). Magical footwear called "seven-league boots" allowed the wearer to leap seven-leagues with each step allowing them to cover massive distances. They appear in the second part of Goethe's *Faust*: Mephistopheles uses them at the beginning of Act 4. Johann Wolfgang von Goethe, *Faust: Part Two*, trans. Philip Wayne (Middlesex: Penguin, 1959), 216.

<sup>42</sup> The "subordinate chords" seems to refer to any non-tonic harmony. Their "tendencies" would refer to their leading tones, giving rise to the idea of regions as harmonies of the key (whether closer or more remotely related) expanded into key-areas through their leading-tones, with the possibility of further substantiation (through cadential confirmation, etc.). Regardless of how far these regions (i.e. key-areas) are established as apparently independent keys, they are still dependent regions of the global tonal spectrum. See Schoenberg, *Structural Functions*, 19-21.

<sup>43</sup> Schoenberg, *Theory of Harmony*, 152.

who in the mid-eighteenth century recognized changes in the psychological effect of keys based on the sharp or flat direction of the modulations with respect to a global tonic.<sup>44</sup> He also perceived an intensification of such affects in proportion to the increasing distance travelled on the circle of fifths. For the early twentieth-century theorist Ernst Kurth (1886-1946), all local chromatic intensifications, modulations, and modulatory intensifications are imagined as the subtle fluctuations in energetic tensions of a sharp or flat quality. While Donald Francis Tovey (1875-1940), as an Englishman, had a more empiricist approach to analysis than his continental (particularly German) counterparts, he too imagined key relations in terms of their brighter and darker shades corresponding to their sharp or flat orientation with respect to a global tonic key.<sup>45</sup> The sharp and flat qualities and the degree of intensity of the modulations described by these musicians can be charted on a tonal spectrum, which will be introduced later in this section.

The basis for Rameau's understanding of the sharp and flat sides of a tonic based on perfect fifth relations is his above-mentioned conception of the tonic as a center of gravity, surrounded by the dominant above and subdominant or *sous-dominante* below. Furthermore, in his later writings such as *Observations sur notre instinct pour la musique*, Rameau identified a general opposition of character between sharps and flats, with sharps interpreted as a "sign of strength and joy" and flats a "sign of softness and weakness."<sup>46</sup> Since the dominant contains a sharp and the subdominant a flat with respect to the tonic scale, the dominant is also associated with strength and joy, and the subdominant respectively with softness, tenderness, and weakness. He also recognized an order of magnitude based on the number of steps on the circle of fifths in

---

<sup>44</sup> This is discussed by Rita Steblin in Steblin, *A History of Key Characteristics in the Eighteenth and Nineteenth Centuries* (Ann Arbor, MI: UMI Press, 1983), 103-4.

<sup>45</sup> See, for example, Donald Francis Tovey, "Harmony," in *The Forms of Music: Articles from the Encyclopaedia Britannica* (Oxford: Oxford University Press, 1957), 44-71; Tovey, "Tonality in Schubert," in *Mainstream of Music and Other Essays* (New York: Oxford University Press, 1949), 134-159.

<sup>46</sup> Rameau, *Observations sur notre instinct pour la musique* (Paris: Prault fils, 1754), quoted in and translated by Steblin, *A History of Key Characteristics*, 103-4.

the dominant and subdominant "directions," corresponding to an increased number of sharps or flats on each side and motivating intensification of the character associated with each side:

Let us remember that the side of the dominant, that is of the rising fifth, is rightly the side of strength, so that the more fifths there are in going up, the more this strength increases; the same reasoning holds conversely for softness, on the side of the subdominant.<sup>47</sup>

While the discussion of key character and color in the mid-eighteenth century focused on absolute qualities of keys, here Rameau was referring particularly to modulations within a piece and degrees of relatedness to a global or principal key. He also noted the importance of synchronizing affect and key relation. In order to create "grand art," the composer is advised to choose either the sharp or the flat side, with the distance on the circle of fifths proportional to the intensity of joy or sadness to be expressed.

The figure most firmly associated with the energetics approach, Ernst Kurth, understood chromaticism as the infiltration of chromatic leading-tone energy into a diatonic, stable harmonic progression. These energetic forces brighten or darken the harmony, respective to the sharp or flat alterations to the diatonic collection, creating fluctuations of centrifugal force. Kurth developed three concepts regarding the coloring or "chromaticization" of harmony:

*Farbentönung* (tone-coloration), *Klangschattierung* (harmonic shading), and *Farbenkontraste* (contrasts of harmonic color).<sup>48</sup> *Farbentönung* refers to the chromatic coloration of diatonic

tones by the streaming forces of sharp or flat leading-tone energy. An example of

*Klangschattierung* is the use of the minor subdominant in a major key or the Phrygian II in major or minor keys, commonly known as "modal mixture." While this basic device can be understood

---

<sup>47</sup> Steblin, *A History of Key Characteristics*, 104.

<sup>48</sup> Discussed in the chapter "Energetic Harmony" in Lee Rothfarb, *Ernst Kurth as Theorist and Analyst* (Philadelphia: University of Pennsylvania, 1988), 167-89. The phrase "chromaticization of harmony" is my own, not from Kurth or Rothfarb. The term aims to capture Kurth's notion that a diatonic progression has elements transformed into chromaticism, through the incursion of leading-tone energy, a force distinct from that of the progression itself.

merely as a borrowing or interchange between modes, Kurth emphasized the dynamic coloristic aspect, describing it as a tonal "darkening" into subdominant "flat-key regions."<sup>49</sup>

*Farbenkontraste* refers to contrasts between larger harmonic spans such as expanded tonicizations and transient key-areas. In his insightful analyses of passages from Wagner's Ring cycle, Kurth makes connections between key relations and the text to highlight brightening or darkening. For example, in the opening of Siegfried, the titular character sings about the shadowy forest, which is set in E $\flat$  major (alternating tonic and subdominant); following this his attention turns to the sun and clouds and their glittering reflection, at which point the music brightens to D major (a change of five sharps, hence a large motion in the sharp direction).<sup>50</sup>

In his essay "Harmony," Donald Francis Tovey makes a similar connection between sharp/flat key relations and bright/dark, with respect to a global tonic. He perceives an action/retirement character contrast between the dominant and subdominant directions: "It is an indisputed fact that modulations in the dominant direction have an effect of action while modulations toward the subdominant have an effect of retirement."<sup>51</sup> The bright/dark duality intensifies for more distant relations resulting from the parallel modal interchange to major and minor respectively. Regarding flat-side relations borrowed from minor he writes: "To move from a major tonic to relations from the tonic minor, such as the flat mediant and submediant, is to pass into deep and warm shadow. Such modulations form purple patches in Mozart's second subjects."<sup>52</sup>

---

<sup>49</sup> Ernst Kurth, *Romantische Harmonik und ihre Krise in Wagners "Tristan"* (Berlin: M. Hesse, 1923), 143. The original text is: "eindunkelndes Hinüberwinden gegen die Be-Tonartsregionen."

<sup>50</sup> See Rothfarb's insightful summary in *Ernst Kurth as Theorist and Analyst*.

<sup>51</sup> Tovey, "Harmony," 61.

<sup>52</sup> *Ibid.*, 61.

An example of such a "purple patch" is in the second group of Mozart's Piano Sonata K. 332/i (in F major). After the initial theme of this group, there is a switch from the dominant key to its parallel minor, which is established by a descending-fifths sequence and chromatically enriched half cadence (mm. 58-67). This introduces harmonies of the flat mediant (m. 64) and submediant (m. 65) via the (local) tonic minor. In his later sonata K. 533/i (also in F major) there is a longer and more elaborate passage in the global parallel minor, in the recapitulatory transition (154-68). This time the flat submediant, as well as the subdominant minor are both tonicized, further emphasizing the deep and warm color associated with these regions.

Contrasting with this are relations from a major tonic to the major interchange (parallel major) of the mediant and submediant, which are "extremely bright," a comparative degree of brightness matching the darkness of more distant flat-side relations. One of Beethoven's crucial innovations in the key organization of sonata form was his use of the mediant major as a substitute for the dominant. Rosen interprets this as an intensification of sharp-side color in the global tonal narrative, with the mediant major having four sharps more than the global tonic, compared with the dominant having only one.<sup>53</sup> Beethoven first used this in the Sonata in G Major op. 31/1, where the second group begins in B major, the mediant chromatically intensified to major, before switching for the next phrase to B minor, the diatonic mediant. In the *Waldstein* Sonata in C major, Beethoven modulates to E major for the second group, and this time remains in the key, establishing and confirming the region as a substantial key-area. Throughout the

---

<sup>53</sup> Rosen interprets Beethoven's use of the mediant major as secondary key in sonata form as an intensification of the tonic-dominant polarity: "The mediants for Beethoven were not primarily coloristic episodes, as they were for Mozart, but a harmony of greater tension than the more ordinary dominant. Beethoven replaced the polar opposition of the dominant with a mediant, and established it with equivalent weight." Charles Rosen, *Romantic Generation* (Cambridge, MA: Harvard University Press, 1995), 244.

second group, the texture gradually becomes more brilliant and luminous, further emphasizing the character of this chromatic sharp-sided relation to the global tonic.

The most distant third-relations are the parallel minors of the flat mediants; these are a double parallel minor relation to a major tonic, since the flat mediants are themselves borrowed from the parallel minor. These are even darker than the "warm shadows" of the flat mediant and submediant regions: Tovey hears "extreme depths" in these "double changes from a major tonic."<sup>54</sup> Charles Rosen points out a vivid example of such "extreme depths" of harmonic color in Mozart's Trio in E Major, K. 542.<sup>55</sup> It arises as an intensification, a darkening, of an already "purple patch" in the second group in B major: a cadential progression moves deceptively and chromatically to its flat submediant (G major), which is then established very transiently as a key; this is followed by a mode switch to G minor, also established fleetingly. With respect to the governing B major, this region evokes an intensely dark shade, as its remote flat submediant minor. The harmony then shifts to B major's own dominant chord, before a perfect authentic cadence reestablishes B major (the global dominant) as a substantial key.<sup>56</sup>

Rameau's characterizations of sharp and flat keys, Kurth's conceptualization of bright and dark shading in chromatic harmony, and Tovey's perception of the varying intensity of key-colors all point to a spectrum of tonal space divided into flat and sharp sides. What would be the generative relations of such a spectrum? In Rameau's discussion above, the basis is the circle of

---

<sup>54</sup> Tovey, "Harmony," 61.

<sup>55</sup> Rosen discusses this piece in *Romantic Generation*, 238-40.

<sup>56</sup> Aldwell and Schachter refer to this phenomenon as "double mixture." They identify three types of mixture, simple, secondary and double mixture. Simple mixture refers to borrowing harmonies from the parallel mode. Secondary mixture refers to switching the quality of the triad without using scale degrees from the parallel mode. The most complex and remote kind of mixture is double mixture which combines simple and secondary mixture. In the example mentioned in the text, the G major harmony and region is simple mixture with respect to the B major key; the alteration to minor is an application of secondary mixture that generates G minor as a double mixture harmony and region. Edward Aldwell and Carl Schachter, *Harmony and Voice Leading*, 3rd ed. (U.S.A.: Thomson & Schirmer, 2003), 540-46.



fifths ascending and descending, while Tovey also highlights the interchangeability of major and minor on a common tonic (the parallel relation) as a significant catalyst for intermediate and more remote relations. Rameau (among other theorists) also explored the *entrelacement* (interlacing) of the relative major and minor, due to their shared diatonic collections (differing only by the raised seventh degree of minor) and the common tones between their triads.<sup>57</sup> One model of tonal space that combines these four relations was presented by Schoenberg in his *Structural Functions of Harmony: The Chart of the Regions*. This map is generated by the following four fundamental relations: the upper and lower dominants (with mode preserved) and the two most basic opposite-mode relations, relative and parallel (see figure 1.1). The dominants are presented above and below the tonic respectively, while the relative and parallel are to the left and right of the tonic respectively. All other regions are generated through alternation of relative and parallel minor/major moving horizontally.<sup>58</sup>

Schoenberg's chart is very similar to Gottfried Weber's *Tonartenverwandschaften* (table of key-relations, see figure 2.3). Both maps generate all regions from the same four fundamental relations.<sup>59</sup> Weber's chart presents the key-relationships using letter names, while Schoenberg primarily presents his chart of regions employing names for the scale degrees that emphasize their upper/lower dominant, mediant/submediant, or parallel relationships to the tonic. Schoenberg presents the chart of regions organized around both major and minor tonics, also giving examples with C major and A minor as tonic. Weber's chart has C major in the middle but no particular tonic is specified.

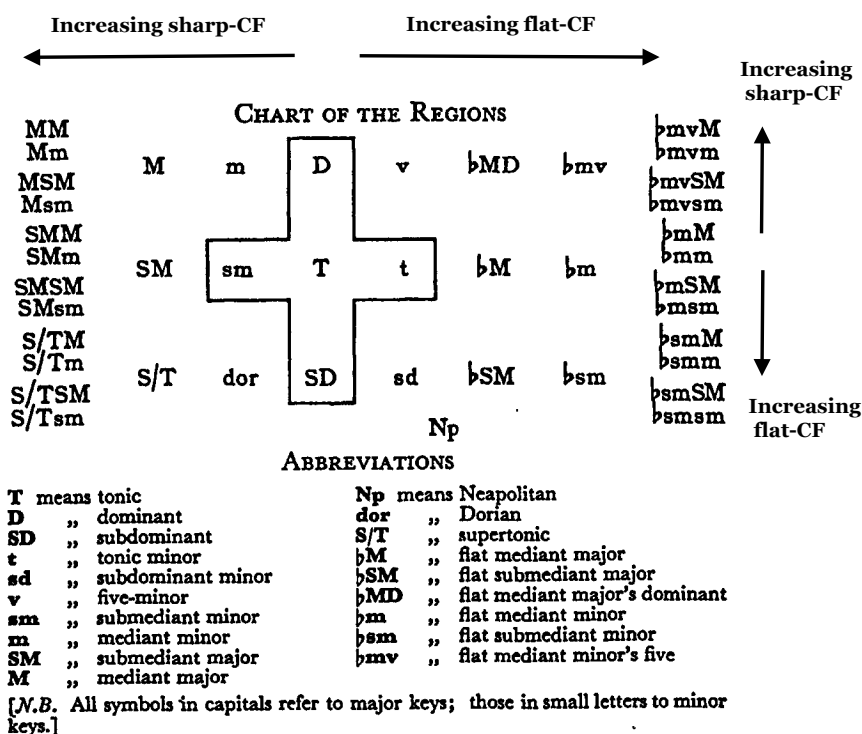
---

<sup>57</sup> For example, Rameau discusses this in *Génération harmonique*.

<sup>58</sup> Schoenberg, *Structural Functions*. The chart for major is presented on p. 20, the one for minor on p. 30.

<sup>59</sup> This table appears on p. 320 of Warner's translation: see Weber, *An Attempt at a Systematically Arranged Theory of Musical Composition*, 320.

Figure 1.1. Schoenberg's Chart of Regions, showing increasing flat- and sharp-CF forces<sup>60</sup>



Another significant difference between the charts is that Weber's map extends the fifth-relations in the vertical axis in both directions until reaching the enharmonic tritone: F sharp and G flat at the top and bottom of the chart. Contrastingly, in Schoenberg's chart there are only single rows above and below the tonic, with the exception of the Neapolitan/Phrygian II relation. This implies that relations of a region to the tonic can only involve a single fifth-relation, combined with any number of parallel and relative relations. I am not aware of any secondary literature that has previously made this distinction between Weber's and Schoenberg's maps.

The expansive dimensions of Weber's lattice and use of letter names for keys invites the reader to choose the relevant tonic and infer the most closely related regions. On the other hand, in Schoenberg's more tightly constructed chart, with scale-degree terminology, he marks the four

<sup>60</sup> Schoenberg, *Structural Functions*, 20.

closest, most direct regions with a cross shape. The polarity of relative and parallel (opposite-mode) relations is represented by their placement on opposing left and right sides of the cross; this polarity is founded on the contrasting ways in which relative and parallel regions are fundamentally related to the tonic. For the relative it is through overall similarity of scale content, while for the parallel it is the parallelism of scale structure, the identity of scale degrees 1, 2, 4, 5, and 7. This will be discussed further in chapter 2.

The Chart of the Regions for a major tonic is shown in figure 1.1, with the sharp and flat sides marked. Moving leftwards, relative minor alternates with parallel major, thus key-area dissonance intensifies on the sharp side; moving rightwards, the parallel minor alternates with the relative major, so that the key-area dissonance increases on the flat side. Each step up or leftwards represents an increase in one degree of sharp-centrifugal force (which is centrifugal force on the sharp side); each step down or rightwards an increase of one degree of flat-centrifugal force. Certain diagonal steps also count as an increase of one degree of CF-force: those involving the diatonic major-third relation, such as T to m or t to  $\flat$ SM. This is counted as a fifth fundamental relation, which will be discussed in chapter 2. Keeping the sharp and flat directions of the chart in mind, we can locate Tovey's bright and shadowy mediant and their intensified variants on the chart. For example, the darker shades of the flat mediant and submediant, borrowed from the tonic minor, are in the second column to the right of the (major) tonic; correspondingly, the bright mediant and submediant majors, parallel majors of closer mediant minor relations, are in the second column to the left. All of these regions generate two degrees of centrifugal force. The more remote key-color relations, the flat mediant *minors*, are in the third column, generating three degrees of CF-force.

#### 1.4 Schoenberg's four centrifugal functions

In addition to taking on sharp and flat shades, centrifugal and centripetal forces divide into spatial and temporal types, and spatial-centrifugal and -centripetal forces manifest at local and global levels. Schoenberg effectively encapsulates these distinctions (without using the terms that I employ here) in the four functions of chromaticism and modulation that he lists in *Theory of Harmony*; this list follows the metaphor of political power dynamics developed in the first few pages of the Modulation chapter.<sup>61</sup> Centrifugal and centripetal forces evolving over the course of a movement change forms between local-spatial, global-spatial, and temporal forms. I will refer to these functions to highlight the changing nature and scope of centrifugal forces in a particular passage or section, both in terms of a generic form such as sonata form and in particular pieces. My explanations of the centrifugal functions draw upon the terminology that Schoenberg uses later in *Theory of Harmony* and *Structural Functions of Harmony*. They also draw upon Charles Rosen's distinction between modulation as opposition and intensification in sonata form to clarify the distinction between functions 2 and 3.<sup>62</sup> My adaptations of Schoenberg's centrifugal functions are as follows:

1. Passages where the tonic key prevails, normally established or confirmed by a cadence at the end of the phrase. Centrifugal force manifests locally through harmonies containing foreign tones, which are ascending or descending leading tones from the regions. These chromatic harmonies, however, do not overcome the tonic key, which "is finally victorious." Schoenberg calls this an "extended cadence" here and an "enriched cadence" in *Structural Functions*.<sup>63</sup> I call this function *chromatic enrichment* or *chromatic intensification of the prevailing key*

---

<sup>61</sup> Schoenberg, *Theory of Harmony*, 152-53.

<sup>62</sup> Rosen, *Sonata Forms*, 17-18.

<sup>63</sup> Schoenberg, *Structural Functions*, 25-28.

2. Modulation from the tonic key to one of its regions, which is cadentially established so that it generates a "new tonality." This region challenges the principal tonic, appearing for some time to be an independent, governing tonality. Its independence turns out to be illusory, however, and its ruling influence is transient. Ultimately it is still a region of the global tonality (or tonal spectrum) organized around the principal tonic, expressing more substantially the tendencies of the regions of this tonal spectrum. I call this function *modulation as opposition* or *modulation between fixed keys*.

3. The tonic does not appear definitively and does not endure; instead, it is challenged by modulatory movement through multiple, transient regions. Tonal centricity is weakened, decentralizing the tonal narrative. Eventually victory may go to one of these rivals (the regions), for example, through cadential establishment, but it is also possible that no region triumphs. I call this function *modulatory intensification* or *modulatory movement*.

4. There are no defined tonics, not even very local and fleeting tonics, due to the lack of recognizable key-defining progressions that assert the authority of the tonic. The laws upon which this harmonic motion is based do not issue from any central source, or at least not from a single fundamental tone. Schoenberg calls this "roving harmony" in *Structural Functions* and I retain the same designation.<sup>64</sup>

Schoenberg's centrifugal functions encapsulate two crucial conceptual distinctions between different kinds of centrifugal forces. The first distinction differentiates local chromaticism from global modulation or modulatory movement. It separates the first function, chromatic intensification of a prevailing key, from the second and third functions. The second distinction differentiates passages or sections that are primarily fixed-tonic (tonally stable) or

---

<sup>64</sup> Schoenberg, *Structural Functions*, 3, 164-65.

fixed-key from those that are kinetic-tonic (tonally unstable). Fixed-tonic passages are governed by a single key, while kinetic-tonic passages depart from the prevailing key and move through multiple regions, for example, in modulatory transitions and development sections. Fixed-tonic passages generate temporal-centripetal force; kinetic-tonic passages combine temporal- and spatial-CF forces. The fixed-/kinetic-tonic polarity differentiates the first two functions, chromatic intensification of the prevailing key and modulation as opposition, from the third function, modulatory intensification. These distinctions are summarized in table 1.1.

Table 1.1. Schoenberg's centrifugal functions summarized in terms of local/global and fixed-/kinetic functions

<b>Schoenberg's numbering of the functions</b>	<b>Name</b>	<b>Local/global CF force</b>	<b>Fixed/kinetic</b>
<b>1</b>	Chromatic intensification of prevailing key	Local	Fixed
<b>2</b>	Modulation as opposition	Global	Opposition between two fixed-tonic sections
<b>3</b>	Modulatory intensification	Global	Kinetic

In the first function, chromatic enrichment of the prevailing key, the harmonic progressions define and circumscribe a single key, which governs the phrase or section. This creates a clear, strong temporal-centripetal force, which is not lessened by the local-centrifugal force of secondary (applied) dominants, mixture chords, and augmented sixth chords. For example, composers often enrich strong cadential progressions with augmented sixths or leading-tone seventh chords leading to the dominant. These chromaticize (color) and intensify the harmonic progressions; ascending and descending leading tones from regions that are foreign to

the prevailing key generate a local spatial-CF force.<sup>65</sup> The root progressions, however, continue to circumscribe the key, with cadential progressions creating a strong temporal-CP force.

Schoenberg considers chromatic enrichment of the prevailing key to be generated in two different ways throughout his *Theory of Harmony* and *Structural Functions*. First, he derives four foreign or artificial ascending leading tones and one descending leading tone from the modes sharing a scale with a (major) tonic key. In the tonal narrative approach, the foreign ascending leading tones create sharp-centrifugal force and the foreign descending leading tones create flat-centrifugal force. In *Theory of Harmony*, Schoenberg explains the foreign leading tones as arising through the principle of imitation, particularly of the ascending leading tone of the Ionian, a semitone below the tonic.<sup>66</sup> The descending leading tone (B $\flat$  in C major), comes from both Dorian imitating the sixth degree of Aeolian, which descends by semitone to its fifth degree, and Lydian imitating the fourth degree of Ionian, which descends by semitone third degree. These imitations lead to the reduction of modes to two: major, including Ionian, Lydian, and Mixolydian; and minor, including Aeolian, Dorian, and Phrygian, each with ascending leading tones below their tonic. In *Structural Functions*, these modes become regions; with respect to a major tonic the Mixolydian becomes the dominant, the Lydian the subdominant, Aeolian the submediant, the Phrygian the mediant, while the Dorian retains its modal name (shortened to **dor**).<sup>67</sup> In the tonal narrative approach, I consider the foreign tones from the regions to generate centrifugal forces: fleeting or local ones in the case of chromatic

---

<sup>65</sup> Schoenberg uses the term "nondiatonic" in *Theory of Harmony* to refer to tones foreign to the prevailing key's diatonic scale which are derived from the closely related modes. In *Structural Functions of Harmony*, he uses the terms "substitutes" and "artificial leading tones" to refer to the same phenomenon. I use the terms "chromatic" and "foreign" to highlight the otherness of tones foreign to the diatonic scale of the prevailing key. See Schoenberg, *Theory of Harmony*, 175-79 and Schoenberg, *Structural Functions of Harmony*, 15-19.

<sup>66</sup> See Schoenberg, *Theory of Harmony*, 95, 175-79

<sup>67</sup> See Schoenberg, *Structural Functions*, 21-22.

intensification of the prevailing key and middleground or global forces when regions are established and confirmed to varying degrees.

The second way in which Schoenberg discusses chromatic enrichment of the prevailing key arises from the ability of the tonic to become the dominant of a minor key, namely its minor subdominant.<sup>68</sup> Schoenberg generalizes this principle further in *Structural Functions*, pointing to the fact that a dominant can introduce a major or minor triad; this "potency of the dominant" enables the interchangeability of major and minor regions on the same tonic.<sup>69</sup> The tonal narrative approach considers this second kind of chromatic enrichment, or modal mixture, to generate local flat-centrifugal force with respect to a prevailing major key.

Late in the *Theory of Harmony*, Schoenberg praises the extensive use of local chromatic harmony enriching and enhancing progressions that ultimately circumscribe the prevailing key, calling it *Stufenreichtum*.<sup>71</sup> This term refers to the chromaticization of various harmonic degrees of the key in order to color and enrich the progressions. A composer guarantees harmonic quality and interest by enriching the degrees of a prevailing key rather than presenting tame progressions in a large number of different keys: "harmonic richness does not come by using a great many keys, but by making the richest possible use of the degrees. ... Rich, varied use of the degrees (*Stufenreichtum*) is thus the most essential feature of harmonic art."<sup>72</sup>

In classical sonata form movements, this function often appears in the group of subordinate themes in expositions and throughout the recapitulations. Foreign tones often enrich expanded cadential progressions leading to the strongest cadential confirmation of the subordinate key. *Stufenreichtum* generates fleeting spatial-centrifugal forces while the cadential

---

<sup>68</sup> See Schoenberg, *Theory of Harmony*, 222.

<sup>69</sup> See Schoenberg, *Structural Functions*, 51.

<sup>71</sup> Schoenberg, *Theory of Harmony*, 370.

<sup>72</sup> *Ibid.*, 370.



progression simultaneously creates a very strong temporal-centripetal force around the subordinate key. This occurs in Mozart's Piano Sonata K. 533/i (in F major) where the predominant phase of the progression (mm. 82-87) leading to the *essential expositional closure* (m. 89) moves through multiple harmonies intensified by foreign leading tones from the dominant (of the subordinate key, C major), forming its leading tone seventh and the augmented sixth chord (see example 1.1). This local centrifugal force intensifies the pre-dominant phase of the progression and expands the cadential progression that most emphatically substantiates the subordinate key.

Example 1.1. Mozart Sonata in F major, K. 533/i, Exposition, group of subordinate themes: expanded cadential progression leading to EEC, mm. 80-89. Accidentals and numbers next to roman numerals indicate altered thirds or fifths and added sevenths etc. above the root; figured bass above the numerals refer to literal intervals above the bass. The bullet sign refers to an omitted root.<sup>73</sup> "P" means passing.

79

C: ii <sup>6</sup>/<sub>5</sub> V7 <sup>6</sup>/<sub>4</sub> I <sup>6</sup>/<sub>4</sub> P <sup>7</sup>/<sub>3</sub> II# <sup>9</sup>/<sub>7</sub> (LT<sup>o</sup>7)

83

C: P <sup>6</sup>/<sub>4</sub> II# <sup>9</sup>/<sub>7</sub> P <sup>6</sup>/<sub>4</sub> II# <sup>b9</sup>/<sub>b5</sub> (Aug 6th)

87

C: V<sub>4</sub><sup>6</sup> <sup>5</sup>/<sub>3</sub> I

<sup>73</sup> The use of a bullet sign to show the omitted or absent root follows David Damschroder's notation; see Damschroder, *Harmony in Schubert* (New York: Cambridge University Press, 2010), 4-5.

The simultaneity of temporal-centripetal and local-centrifugal forces is expressed by the analytical symbols. The roman numerals by themselves express the root progressions and their diatonic origins; they essentially represent the temporal-centripetal force of harmonies outlining a single key. On the other hand, the accidentals show the incursion of foreign tones into the progression, generating fleeting sharp- and flat-centrifugal forces.

My names for the second and third functions draw upon Charles Rosen's distinction between the differing kinds of structural dissonance in sonata form. The exposition presents an *opposition* between the subordinate and principal keys, so that the part of the exposition from the arrival at the subordinate key to its conclusion becomes a structurally dissonant section.<sup>74</sup> On the other hand, the development features intensification of this opposition, a more continual growth of centrifugal force leading to the most distant region, which generates a maximum of spatial-centrifugal force. Ratner calls this the "point of furthest remove."<sup>75</sup>

The distinction between modulation as opposition and modulatory intensification can be further clarified in the light of Schoenberg's usage of the word "modulation" as opposed to "modulatory." In *Structural Functions*, Schoenberg defines modulation as involving two factors: first, the definitive departure from the original key for a considerable period of time, and second, the establishment of the new key both harmonically and thematically.<sup>76</sup> This definition suggests modulation between fixed keys rather than modulatory motion through multiple regions. When discussing the type of continual centrifugal motion through various regions occurring in

---

<sup>74</sup> See Rosen, *Sonata Forms*, 18, 229, 244.

<sup>75</sup> Ratner, *Classic Style*, 225-26. The point of furthest remove will be discussed in detail in section 3.3.

<sup>76</sup> Schoenberg, *Structural Functions*, 19.

transitions and development sections, which he calls *Durchführungen*, he refers repeatedly to "modulatory movement."<sup>77</sup>

For the second function, modulation between fixed keys or modulation as opposition, centrifugal force expands from the local to the global level of harmonic motion. Modulation as opposition involves modulation from one cadentially confirmed region (such as the tonic key) to another cadentially confirmed region. For example, the sonata exposition, based primarily on modulation as opposition, presents the opposition of the principal and subordinate keys, with the principal key governing the first part and the subordinate key the second, often larger part. Each of these two parts is fixed-tonic, and the parts are usually connected by a modulatory transition. Chromatic enrichment of the harmony and momentary digressions indicating regions, the first function, often enhance the tonal narrative, particularly in the group of subordinate themes. Yet a single key prevails in each section: they are fixed-tonic sections. Therefore, each section features a strong temporal-centripetal force, even while a spatial-centrifugal force is generated at the global level and often also the local level. Schoenberg describes this aspect of the sonata exposition in *Fundamentals of Musical Composition*: "though some parts modulate and others express a (related) contrasting tonality, apart from the transitions, everything stands solidly within the region of a definite tonality. In other words, the harmony is essentially stable."<sup>78</sup>

While the second function may include a modulatory transition between the two established regions, the third function refers to the modulatory part itself, often expanded into a whole section. The third function, modulatory intensification, generates both temporal- and spatial-centrifugal forces; the tonal narrative modulates mostly continually through multiple

---

<sup>77</sup> He uses this term in the later chapter "Progressions for Various Compositional Purposes," detailing the harmonic functions and features distinctive to each type of formal part. See Schoenberg, *Structural Functions*, 139-64, esp. 145.

<sup>78</sup> Schoenberg, *Fundamentals of Music Composition*, 201.

regions that are only fleetingly indicated or suggested. The modulatory-movement function is also kinetic-tonic, since it moves through many fleeting tonics. This contrasts markedly with the modulation-as-opposition function, featuring the opposition of two fixed-tonic sections.

The prototypical example of the third function is the development section of sonata form. For this reason, in the later *Structural Functions of Harmony*, Schoenberg insists on the German term *Durchführung* for this part, which leaves the subordinate key and features continual modulations "leading-through" a multiplicity of regions, usually including remote regions, before returning to the tonic key.<sup>79</sup> Furthermore, modulatory movement is typically in a single sharp or flat direction, forming a continual outward linear motion leading to the point of furthest remove before reversing direction. Modulatory intensification generally generates the most centrifugal force of all the functions. In the overall evolution of centrifugal forces in a tonal narrative, the local centrifugal force embellishing the temporal centripetal force of the prevailing key and the global centrifugal force created by modulation between fixed keys intensify to become the third function, modulatory movement and intensification.

Many forms in the nineteenth century were expanded through incorporation of the *Durchführung* aspect of sonata form. Beethoven, Schubert, and Chopin expanded large ternary forms by incorporating modulatory intensifications into the middle section, for example, Beethoven in the C major second movement of the Piano Sonata op. 7 (see example 1.2). In this interior section, the tonal narrative moves flat-centrifugally to the flat submediant (A $\flat$  major, mm. 25-28) with regions descending by thirds to the flat submediant's subdominant (D $\flat$  major, mm. 33-34). It leads back centripetally to V of the tonic key, which is implied at m. 37 but only

---

<sup>79</sup> Schoenberg writes: "This movement through the regions is much better *characterized* by the term *Durchführung*, which means the themes which have not modulated in the first division are now *geführt durch* (led through) contrasting regions in modulatory procedure." See Schoenberg, *Structural Functions*, 145.

clearly stated at m. 50. Chopin's ballades also involve extensive tonic-kinetic sections that evolved from the sonata *Durchführung*. These are all examples of Schoenberg's third function, involving strong tonic-kineticism, which combines both temporal- and spatial-centrifugal force.

Example 1.2. Beethoven, Piano Sonata, op. 7, second movement in C major, middle section, first part (mm. 25-37)

The image shows a musical score for the first part of the middle section of the second movement of Beethoven's Piano Sonata, op. 7. The score is in C major and 4/4 time. It consists of four systems of music. The first system starts at measure 25, marked 'pp' and 'sempre tenuto'. The second system starts at measure 30, marked 'f'. The third system starts at measure 35, marked 'sf' and 'staccato'. The fourth system ends at measure 45, marked 'pp'. The score includes various musical notations such as dynamics, articulation, and fingering.

The fourth function, roving harmony, expresses super-kineticism, since there are no tonics upon which the progression may be anchored. At the same time, the notion of spatial-centrifugal force becomes nullified, even irrelevant, because the concept of dissonance between regions requires at least an implied region that can be measured against the principal key or structural region serving as a reference point. Schoenberg cites a part of the development section

of Beethoven's op. 2/3/i (mm. 97-110) as an example of roving harmony.<sup>80</sup> Here, though there are consonant chords and major-minor seventh chords, no key-indicating or establishing progression (for example, a dominant-tonic progression) appears. Even fragments such as IV-V, which would imply a region, do not appear in this progression. I read such passages as generating a very strong centrifugal force, but without being able to register a spatial-centrifugal force that might lead to a "point of furthest remove." The roving-harmony function is quite uncommon in the repertoire covered in this dissertation, and when it does appear, it usually operates for a shorter passage. Hence, in the remainder of this study I usually refer to three rather than four centrifugal functions.

Schoenberg's centrifugal functions provide a foundation for understanding the temporal perspective on the interplay of centrifugal and centripetal forces. They are also the basis for understanding the dynamics of large-scale form, with larger sections and subsections based on each of the three centrifugal functions. For example, in sonata form, the exposition manifests the modulation-as-opposition function, while internally, the group of subordinate themes often features chromatic intensification of the prevailing key (the subordinate key).

The recapitulation resolves the large-scale centrifugal force generated by the subordinate key in the exposition by replaying the group of subordinate themes in the tonic; it negates modulation as opposition by remaining in the principal key. Composers often recompose parts of the recapitulation, however, in order to generate an even stronger and more comprehensive chromatic intensification within the prevailing principal key than has occurred earlier in the movement. In some movements, the centrifugal forces in the recapitulatory transition may match or come close to the global maximum of centrifugal force generated in the development section,

---

<sup>80</sup> Schoenberg, *Structural Functions*, 165.

by the point of furthest remove and the trajectory leading towards it. This occurs in Mozart's K. 332/i and K. 533/i, which will be analyzed in section 4.2.

### **1.5 The *telos* of fixed versus kinetic tonality**

Having discussed Schoenberg's centrifugal functions as a combination of distinctions between local- and global-centrifugal force and between fixed and kinetic tonality, let us now focus on the latter polarity and how it shapes and forms the basis for the temporal dimension of tonal narratives. We have discussed how parts of the form feature one or the other type of tonality. While each part of the form functions primarily as either opposing type of tonality, often composers temporarily suggest or give a hint of the opposite function within the section. This helps create much of the nuance, dramatic power, and distinctiveness of a tonal narrative. For example, the opening theme of Chopin's Mazurka in A Minor, op. 59/1, circumscribes the tonic key (mm. 1-12, see example 1.3), leading toward a chromatically intensified dominant harmony at m. 9 and concluding with a clear cadential progression completed by a PAC (mm. 11-12). Yet, its overall fixed-tonic nature is counteracted by indications of the mediant and dominant major regions, the latter by a chromaticized cadential progression (mm. 8-10). The succession of indicated regions, and the presence of the dominant of the dominant's leading tone (A $\sharp$ ) in the augmented sixth chord at m. 8, point toward an expansion of local chromatic intensification (Schoenberg's first function) by intimations of modulatory intensification (the third function). The dominant, however, is only transiently indicated as a region before the harmony descends by fifths to the subdominant (which is also chromatically emphasized), which leads the cadential progression (mm. 11-12).

Example 1.3. Chopin, Mazurka in A minor, op. 59/1

**Moderato.** Fr. Chopin, Op. 59.

The persistence of fixed-tonality throughout this progression points toward the main organizing principle of such phrases or sections: that of circumscribing a key and leading toward a cadence. Four regions are indicated or glimpsed in this theme: the mediant, major dominant, the dominant of the dominant (via the augmented sixth chord of the dominant key), and the subdominant. These suggestions of kinetic tonality greatly widen the centrifugal range of the theme. Yet the initial turn to the flat side, with the mediant approached by its flatted sixth degree (mm. 4-8), is complemented by the twist to the sharp side, which is then drawn back to the other side of the key, the subdominant. This oscillation between the sides of the key, particularly the articulation of the dominant and subdominant, originates from the centripetal force of fixed tonality, culminating in the completion of the cadence. The organizing principle of fixed-tonality is based around articulation of degrees of the key, which can be understood in terms of Rameau's model of upper/lower dominants surrounding the tonic. The principle can be alternatively conceived in terms of progressions following the syntactical phases of T-PD-D-T. This syntactical model embraces both diatonic progressions featuring degrees 4-5-1 in the bass that clearly oscillate between the flat and sharp sides, as well as progressions where the pre-



dominant phase is chromaticized. This chromaticization can generate sharp-CF forces, as in the applied V7 of V (owing to the foreign F $\sharp$  in C major); flat-CF forces, as in the minor subdominant in a major key (owing to the foreign A $\flat$  in C major); or sharp- and flat-CF forces, as in the augmented sixth chord (owing to the foreign F $\sharp$  and A $\flat$  in C major).

The *telos* or purpose of fixed-tonic passages, then, is the arrival at the tonic, having successfully fulfilled the T-PD-D-T phases that circumscribe at least three degrees of the key. In the works of the composers discussed here, the real *telos* of larger sections based on the fixed-tonic principle is a particularly strong cadential arrival following an expanded cadential progression, one that is stronger and more key-defining than the previous progressions. This represents a culmination of temporal-centripetal force: a force substantiating a region in the tonal narrative as a governing key (centripetal and centrifugal culminations will be explored in section 3.3). This can be the principal key, which would generate both temporal- and spatial-centripetal forces, but it can also be a region of the tonality confirmed as subordinate key. The latter phenomenon generates a simultaneity of temporal-centripetal and spatial-centrifugal force.

In this study, I define culminations as maximums of centripetal or centrifugal force for the whole movement or a section. These maximums could be of either spatial or temporal aspects of the two opposed forces. Notably, culminations rarely involve exclusively one force: often the opposite force complements it in some way. For example, the culmination of temporal-centripetal force may be complemented by the global spatial-centrifugal force of a non-tonic key; the culmination of spatial-centrifugal force, which is generated by the point of furthest remove and the trajectory leading to it, often occurs with a half-cadential arrival and standing on the (local) dominant, generating a slight temporal-centripetal force. I will differentiate four types of culminations in section 3.3.

The organizing principle of kinetic-tonic passages opposes that of fixed-tonic ones. While the principle of fixed-tonic phrases or sections consists of circumscribing and cadentially defining the prevailing key, kinetic-tonic passages are based on the principle of uniformity/repetition, which disrupts and transcends the asymmetric structure of a diatonic key.<sup>81</sup> Applied in the broadest sense, this results in modulatory movement in a single (sharp or flat) direction, transcending the boundaries of the prevailing key: unidirectional centrifugal motion. The modulatory or chromatic sequence manifests the law of uniformity more exactly, featuring modulatory motion in a single direction between regions connected by a uniform interval or interval pattern, leading toward a remote goal region.

The law of uniformity is found in, and may even originate from, the diatonic sequence. This would suggest that kinetic-tonicity essentially expands the basic harmonic sequence to larger dimensions of harmonic motion. Fétis made this connection by conceiving of even diatonic sequences as momentarily suspending the listener's grasp of the prevailing key (tonality). He wrote: "The mind, absorbed in the contemplation of the progressive series, momentarily loses the feeling of tonality...The attention of the musical sense is diverted from the feeling of tonality by symmetry of movement and succession."<sup>83</sup> In an archetypal fixed-tonic phrase such as a sentence, the presentation generates centripetal force through tonic prolongation. The continuation often features a diatonic harmonic sequence, such as by falling fifths, which initially generates a slight centrifugal force that delays and gently opposes the cadential principle. By remaining within the limits of the diatonic scale, however, the sequence ultimately becomes centripetal, leading toward the cadential dominant. In a minor key, for

---

<sup>81</sup> Richard Cohn explains the law of uniformity or repetition in Cohn, *Audacious Euphony: Chromatic Harmony and the Triad's Second Nature* (New York: Oxford University Press, 2012), 47.

<sup>83</sup> François-Joseph Fétis, *Complete Treatise on the Theory and Practice of Harmony*, trans. Peter M. Landey (Hillsdale, NY: Pendragon, 2008/1844), 27.

example, the descending-fifths progression from the tonic features mostly perfect fifths in the flat direction. Once it reaches VI, however, the fifth must change from perfect to diminished in order to arrive at the diatonic ii, which also flips its root to the sharp side, leading to the upper dominant (see example 1.4).

Example 1.4. Descending 5ths with seventh chords in A minor

The musical notation shows a descending fifth progression in A minor. The bass line consists of the notes A, E, B, and C. The treble line shows chords: A7, E7, B7, and C7. An annotation 'Aug. 4th/ dim 5th' is placed above the interval between B and C. Below the bass line, an arrow labeled 'Roots: Flat direction' points from A to E. Another arrow labeled 'VI' points from E to B. A third arrow labeled 'Switch to sharp side' points from B to C.

On the other hand, a modulatory or centrifugal sequence<sup>84</sup> maintains the law of uniformity, so that the interval between roots or regions is constant, no longer conforming to the seven-tone limits of the diatonic scale. Instead of making a limited circuit of the harmonic degrees on the sharp and flat sides of the key, it exceeds the borders of the prevailing key, continuing in a single sharp or flat direction toward the goal of the centrifugal sequence.

Kinetic-tonic sections often involve one or more modulatory sequences, centrifugal sequences that move through multiple regions unbound to any prevailing key. Some kinetic-tonic passages present a variety of intervals between regions, but a single direction of modulation is maintained through a series of three or more regions. These unidirectional centrifugal motions also oppose the circular limits of fixed tonality by adhering to a uniformity of direction, just as modulatory sequences adhere to a uniformity of direction and a particular interval between

<sup>84</sup> Meaning a "real" sequence as opposed to a "tonal" one.

regions. Therefore, they are called *modulatory phases*, referring to the modulatory intensification extending from an initial region in a single direction to the goal region where the modulatory movement changes direction. The goal region that travels the furthest and covers the most tonal distance is the point of furthest remove and culmination of spatial-centrifugal force. I name other goals of modulatory phases or sequences that do not clearly cover the most distance for the movement "far-out points" (FOPs), borrowing Taruskin's term.<sup>86</sup>

Whether it is a modulatory sequence or phase, a kinetic-tonic passage or section has a distinct *telos* that contrasts with and opposes the *telos* of a fixed-tonic unit. Its organizing principle is unidirectional modulatory movement, in contrast to the circular navigation, or oscillation between sides, that organizes fixed-tonicity. The goal of the passage is not a cadence of the initial region, but instead the arrival at the remote goal region. Often this is not a local tonic harmony but the chromatically emphasized dominant of a half-cadential progression, further emphasized through prolongation.

### *Conclusion to chapter 1*

The founding polarities of the tonal narrative approach are centripetal and centrifugal forces, which transfer consonance and dissonance to a deeper structural level. These forces are interdependent and equally important in shaping tonal narratives. Further polarities emerge from the founding polarities, adding expressive layers, complexity, and nuance to tonal narratives.

First, CP/CF forces divide into spatial and temporal types. Spatial-centrifugal forces are

---

<sup>86</sup> Taruskin uses the term throughout his *History of Western Music*, referring to remote harmonies or regions, whether or not they are measured as maximally remote from some reference point. See, for example, Richard Taruskin, "Chapter 11: The Composer's Voice," and "Chapter 12: The First Romantics," in *Music in the Seventeenth and Eighteenth Centuries*, Oxford University Press (New York, 2010). Retrieved 1 Apr. 2019, from <http://www.oxfordwesternmusic.com.ezproxy.gc.cuny.edu/view/Volume2/actrade-9780195384826-div1-12005.xml> and <http://www.oxfordwesternmusic.com.ezproxy.gc.cuny.edu/view/Volume2/actrade-9780195384826-div1-11004.xml>.

generated by the difference, dissonance, or conflict between regions; spatial-centripetal forces by the commonality between regions and motion returning to the principal key. Temporal-centripetal forces are generated by harmonic progressions outlining a prevailing key; they correspond to degrees of cadential definition, degrees to which a region is substantiated. Temporal-centripetal forces can be generated around any region, not only the principal key; they create fixed-tonic passages or sections. Temporal-centrifugal forces work against and disrupt the establishment of a single key; they are generated by movement through multiple regions, which create kinetic-tonic passages or sections.

Spatial-centrifugal forces split into two main harmonic shades or directions, sharp and flat. They further divide into fifth and third/parallel relations. Spatial-centrifugal and -centripetal forces also manifest at local, middleground, and global levels, which are generated by levels of regional substantiation or endurance (temporal-centripetal force). The various combinations of spatial and temporal, local and global centrifugal and centripetal forces are encapsulated in Schoenberg's three centrifugal functions: chromatic intensification of the prevailing key (*Stufenreichtum*), which combines temporal-centripetal force with local centrifugal force; modulation as opposition, which combines global centrifugal and temporal-centripetal force; and modulatory intensification, which combines both spatial- and temporal-centrifugal force at a global level.

Chapter 2 will examine degrees of spatial-centrifugal force, based on the difference in scale content between regions, the common tones between their generative triads, and the intervals between regions' roots. It will draw upon both Weber and Schoenberg's theories of tonal distances between keys or regions as well as the generation of their maps of tonal space, the Table of Key Relations and the Chart of the Regions respectively.

## Chapter 2

### Degrees of Spatial-Centrifugal Force and the Tonal Spectrum

This chapter examines degrees of vertical dissonance and centrifugal force, presenting a tonal spectrum of regions organized around a principal tonic. The regions will be classified according to four or more degrees of centrifugal force from the central term. The chapter begins by presenting degrees of vertical dissonance, acting as a model for degrees of centrifugal force between regions: regional dissonance. The more strongly dissonant chords are shown to be also chromatic to a prevailing key, thus pointing to the connection between stronger dissonance and centrifugal force.

The tonal narrative approach identifies five fundamental and closest relations based on three criteria for measuring regional dissonance: scale-content similarity, common tones between generative triads, and the interval between regions' roots. I group the latter two criteria together and refer to them as *generative-triad commonality*. Four of these fundamental relations also generate Weber's and Schoenberg's maps of tonal space: upper/lower dominants, parallel and relative major-minor. The final fundamental relation is the region built on iii of a major key and VI of a minor key: the diatonic major-third relation. The two common tones that its generative triad shares with the principal tonic triad and other similarities to the relative region constitute the main reasons for considering it a fundamental relation.

Weber's and Schoenberg's criteria for classifying regions based on degrees of remoteness, i.e. spatial-centrifugal force, will be examined. The tonal narrative approach follows Weber by counting the number of fundamental relations between regions in order to identify the degrees of

remoteness between them. This study differs from Weber's because it includes the diatonic major-third relation as a fifth fundamental relation.

I will then discuss the utilization of multiple spectra, so that centrifugal force is measured from the most recent or subsequent structurally emphasized region. Structural emphasis can take two forms: firstly, through cadential confirmation; secondly, as initiating or goal regions in modulatory sequences or phases. The tonal spectrum is then compared metaphorically to Goethe's theory of color generation and archetype of color: the color wheel. The color wheel acts as a metaphor for the tonal spectrum itself; the generation of various colors from two basic colors, yellow and blue, compares with processes of modulation. Just as the intensification of basic colors culminates for Goethe in pure red, modulatory intensification culminates in a far-out point (FOP) or point of furthest remove, at remote parts of the tonal spectrum where the sharp and flat sides converge.

### **2.1. Degrees of vertical-harmonic dissonance and local chromaticism**

In the first of Schoenberg's four functions of chromaticism and modulation, a diatonic progression establishing the tonic key is intensified by chromaticism, or "elaborations of the secondary tones, however remote."<sup>88</sup> Ernst Kurth imagined these local chromaticisms to arise from a streaming, dynamic force of leading-tone energy, infiltrating diatonic progressions and brightening or darkening them.<sup>89</sup> In the tonal narrative approach, this is interpreted as a foreground tilting or leaning of the prevailing key-area to the sharp or flat side: the beginnings of centrifugal force. At the same time, the chromatic chords — applied dominants, leading tone sevenths, augmented sixths, or mixture chords — are usually also dissonant chords. The

---

<sup>88</sup> Schoenberg, *Theory of Harmony*, 152-53.

<sup>89</sup> Lee Rothfarb, *Ernst Kurth as Theorist and Analyst* (Philadelphia: University of Pennsylvania, 1988), 167-68.

chromaticism represents an intensification of the diatonic dissonances to varying degrees, and gives them "markedness" with respect to diatonic dissonances.<sup>90</sup> In diatonic progressions, the prime motivators of vital motion are the dissonant dominant chords in tandem with the motion of the *basse fondamentale*, according to Rameau's model.<sup>91</sup> Local chromaticism provides an intensification of this prime motivation and signifies the stirrings and beginning of centrifugal force. These fleeting centrifugal leanings provide glimpses of key areas that have the potential to become manifested in larger tonal motions: modulations which establish regions as key areas, fulfilling to a certain extent their own yearnings and ambitions for independence and influence on the tonal narrative.

Thus, the local chromatic harmonies act as a bridge between chordal dissonance in diatonic progressions and dissonance substantiated and transferred to a deeper level through modulation. Chromatic dissonances are an intensification of diatonic ones; at the same time, they are intimations of the larger centrifugal motion of modulation. This suggests a congruity or parallelism between levels of tonal motion, from the foreground fluctuations of dissonant and consonant harmonies, to the local-centrifugal forces generated by chromatic intensification of a prevailing key, to modulations that establish a region in opposition to the principal key, or modulatory movement through multiple regions. At each level of motion, the fluctuations and trajectories can be perceived more vividly by establishing degrees of intensity. The following section aims at establishing degrees of chordal dissonance, which will be used as a starting point

---

<sup>90</sup> McCreless discusses chromaticism as "marked" with respect to diatonicism, drawing upon Robert Hatten's elucidation of the concept of markedness and its application to harmony and character. See McCreless, "Syntagmatics and Paradigmatics," 163-64. See also Robert Hatten, *Musical Meaning in Beethoven: Markedness, Correlation and Interpretation* (Bloomington, IN: Indiana University Press, 1994), 34-44.

<sup>91</sup> Dahlhaus writes that Rameau's "first principle is the correlation between the resolution of the dissonance and the progression of the fundamental bass." See Dahlhaus, *Harmonic Tonality*, 32.



for a more extensive investigation of the degree of closeness or remoteness between the principal tonic and its regions: grades of spatial-centrifugal force as dissonance between regions.

The markedness of chromatic tones and chords with respect to diatonic ones, both consonant and dissonant, was stressed by C.P.E Bach in his *Versuch* of 1753. Bach first notes that dissonances should be played louder than consonances, a principle repeated in many performance treatises before and after him.<sup>92</sup> After noting that deceptive progressions may also be brought out, he then suggests that any chromatic tones, i.e. "tones lying outside the key," should be emphasized, regardless of whether they are consonant or dissonant, while diatonic tones, "those which lie within the key," can be played *piano*.<sup>93</sup> This suggests a layering of emphasis, with dissonance and consonance being a basic distinction and chromaticism as an addition of emphasis whether to a dissonant or consonant chord. When chromatic or foreign tones are added to a dissonant chord, already played louder, this emphasis is intensified.

At this point in the text, Bach makes reference to Johann Joachim Quantz's lucid elaboration of gradations of dissonance in his *Versuch einer Anweisung die Flöte Traviersiere zu*

---

<sup>92</sup> In his advice to accompanists in 1752, Johann Joachim Quantz writes as follows: "To excite the different passions, the dissonances must be struck more strongly than the consonances. Consonances make the spirit peaceful and tranquil; dissonances disturb it." Furthermore, too many consonances are like an "uninterrupted pleasure," they "would eventually cause the ear distaste and displeasure if they were not now and then mingled with disagreeable sounds such as those produced by dissonances." This is yet another articulation of the principle of interdependence of consonance and dissonance, the necessity for balancing between them. See Quantz, *Essay of a Method for Playing the Traverse Flute*, trans. Edward R. Reilly, 2nd ed. (Boston: North-Eastern University Press, 2001), 254. Daniel Gottlob Türk also gives the same advice to pianists in his 1789 treatise; see Türk, *School of Clavier Playing*, trans. Raymond H. Hagg (Lincoln, NE: University of Nebraska Press, 1982). Türk's treatise, as William J. Mitchell points out, was modelled in some respects on C.P.E. Bach's. See Mitchell, "Modulation in C.P.E. Bach's *Versuch*," *Studies in Eighteenth-Century Music: A Tribute to Karl Geiringer on His Seventieth Birthday*, ed. H. C. Robbins Landon and Roger E. Chapman (New York: Da Capo, 1970), 333-42. According to Chopin's student Jan Kleczynski, the master instructed his piano students to play dissonances more strongly, along with longer notes, high notes and syncopations: "A long note is stronger, as is also a high note. A dissonance is likewise stronger, and equally so a syncopated note." These were to be considered general rules, the exceptions to which would be marked by the composers. See Jean-Jacques Eigeldinger (ed.), *Chopin: Pianist and Teacher as Seen by his Pupils*, trans. Naomi Shohet, Krysia Osostowicz and Roy Howat, 3rd ed. (New York: Cambridge University Press, 1986), 42.

<sup>93</sup> C.P.E. Bach, *Essay on the True Art of Playing Keyboard Instruments*, trans. William J. Mitchell (New York: W.W. Norton, 1762/1949), 163, 164.

*Spielen* (1752).<sup>94</sup> In a chapter offering instruction for accompanists, Quantz begins by advising the accompanist to play dissonances more strongly than consonances. He then goes on to reflect that just as the unpleasant emotion associated with dissonance varies, so should the degree of strength with which it is struck: "Since, however, the displeasure cannot always be of the same vehemence, some of the dissonances have more effect, and so must be struck with greater force than the others."<sup>95</sup> This leads Quantz to identify three grades of strength, which should be played *mezzo forte*, *forte* and *fortissimo*, with increasing dynamics corresponding to increasing dissonance strength (see table 2.1 below).<sup>96</sup>

Table 2.1. Quantz's three classes of dissonance; labels mine. "Second" without quality specified means major or minor; fifth or fourth without quality specified means perfect.

Class	Example of harmony in major key
<b>Class I: Mild dissonances</b>	
The second with the fourth	ii 4/2
The fifth with the major sixth	ii 6/5
The major sixth with the minor third	vii 6/3
The minor seventh with the minor third	ii 7
The major seventh	IV7
<b>Class II: Medium dissonances</b>	
The second with the augmented fourth	V 4/2
The diminished fifth with the minor sixth (minor seventh with major third?)	V 6/5 V 7
<b>Class III: Strong dissonances</b>	
The augmented second with the augmented fourth	vii <sup>o</sup> 4/ #2
The minor third with the augmented fourth	vii <sup>o</sup> #4/3
The diminished fifth with the major sixth	vii <sup>o</sup> #6/5
The augmented sixth	VI #6
The diminished seventh	vii <sup>o</sup> 7
The major seventh with second and fourth	vii <sup>o</sup> 6/3 or V7 over $\hat{1}$

<sup>94</sup> See Bach, *Essay*, 163, note 32. According to Mitchell, C.P.E. Bach only accepts Quantz's theory in the broad sense, but has reservations about the particulars of the categorization.

<sup>95</sup> Quantz, *Essay*, 255.

<sup>96</sup> Based on Quantz's table in his *Essay*, 256.

Quantz's first group of mildly dissonant chords consists of those which contain seconds and sevenths but no tritone with the bass, for example, the minor and major seventh chords and their 6/5 and 4/2 positions. The second group contains the inversions of the dominant seventh chord. In the list that presents the figured bass chords organized into classes, he leaves out the dominant seventh in root position, but in the accompanying text he makes the distinction between the aforementioned class-one dissonances and another group which does include the "minor seventh chord with a major third."<sup>97</sup> This ambiguity may be due to the inclusion of the diminished six-three chord in class one, where the tritone is between the upper voices and not with the bass, which is technically the same property of the dominant seventh in root position.

The third class of dissonances contains chords which for the most part are inversions of the diminished seventh chord, plus the augmented sixth chord. This suggests that the presence of the diminished seventh, its inversion the augmented second, or the augmented sixth in the chord qualify them as the most strongly dissonant chords, also taking into account intervals between upper voices. The closely related property of two tritones in the diminished seventh chord provides a logical reason to consider them stronger dissonances than the dominant seventh and its inversions, which only have one. For each of these chords, in any event, there are two or three augmented and/or diminished intervals, taking into account intervals between any pair of voices.

Another property of the diminished seventh, its inversions, and especially the augmented sixth chord, is that their formation requires alteration to the natural diatonic scale. This requires a nuanced approach to the raised seventh degree or leading tone in minor: while it serves a diatonic function by giving the chord on the fifth degree a stronger dominant function, it is also a

---

<sup>97</sup> Quantz, *Essay*, 255.

chromatic alteration of the natural scale.<sup>98</sup> Thus, the raised seventh degree has a dual identity: it is originally a chromatic alteration that has gained quasi-diatonic status. As the third of a dominant chord, the raised seventh degree functions diatonically, but at the same time it generates the leading-tone diminished seventh, which is a stronger dissonance due to the diminished seventh/augmented second created by the chromatic alteration of the natural seventh degree. Furthermore, when the dominant major functions as a region, its major third, the raised seventh degree of the tonic key, creates the effect of a combination of the parallel major with the dominant. As a region this is thus a slightly more remote relationship than the dominant minor with respect to the tonic.

This allows us to give a clear reason for Quantz's division between class two and three dissonances, which may be termed *medium* and *strong* or *intensified* dissonant chords. The dissonances in class two are all formed from tones from the natural diatonic scale, while those of class three (with the exception of the leading-tone diminished triad or dominant seventh inversion over a tonic pedal) require alteration to the natural diatonic scale (including the quasi-diatonic raised seventh degree in minor). The inherently chromatic quality of the defining diminished seventh and augmented sixth interval of these two chords gives them an added markedness and increased degree of dissonance. Not only are they strong and intensified dissonances, but they are also *chromatic-dissonant chords*.

Quantz's differentiation of degrees of dissonance correlate with C.P.E Bach's concept of performative emphasis. Just as Quantz considers the strongest dissonances to be chords

---

<sup>98</sup> Early nineteenth century Viennese theorist August Swoboda, a student of Abbe Vogler, emphasized the chromaticism of the raised seventh degree in minor, calling it inessential (*zufällig*), noting the difference between the softness of natural minor and the hardness of minor with raised seventh. This leads him to place diminished seventh chords, along with augmented sixths in a category called "Artificial Chords," implying a markedness with respect to "natural" dissonant chords. See Wason's discussion in Robert W. Wason, *Viennese Harmonic Theory from Albrechtsberger to Schoenberg and Schenker* (Ann Arbor, MI: UMI Research Press, 1985), 25-26.

containing chromatic tones, C. P. E Bach advises performers to emphasize chromatic tones over merely diatonic dissonances. I am not aware of previous theoretical literature having discussed C. P. E Bach and Quantz's differentiation of degrees of dissonance and the connection between them.

Quantz's identification of three degrees of vertically dissonant chords, which I have called mild, medium, and strong, can now be incorporated with the division of chords into diatonic/chromatic, as well as the perfect/imperfect division of consonance, to form seven categories of chords combining vertical dissonance and local chromatic harmony. They are arranged below from most consonant to most dissonant, with the upper three categories overlapping with the local centrifugal force (see table 2.2). The most consonant group consists of major and minor triads in root position, which are perfectly consonant. This is followed by the group of major and minor triads in six-three position, or imperfectly consonant chords. The first dissonant group comprises the diatonic, mildly dissonant chords, corresponding with Quantz's class one. This group includes the six-five position of minor and major seventh chords (such as the *ajoutée* or  $ii_5^6$ ). To these can be added the six-four position of consonant triads, though they may also be added as a borderline case to the group of imperfectly consonant chords, in accordance with Rameau's theory.

The next group of *medium diatonically dissonant chords* includes all diatonic chords featuring a tritone, whether between upper voices or with the bass: the dominant seventh and its inversions; also the diminished six-three chord. The defining diminished fifth or augmented fourth interval is considered a stronger dissonance than the major and minor seventh and second for two reasons, one based on voice leading, the other on harmonic generation. Firstly, it contains two dissonant tones that both must move by step, which in the major key are ascending

and descending leading tones (tendency tones) since they both move by semitone.<sup>99</sup> For the group of mild dissonances, only one of the tones in the dissonant interval needs to move by step. The second reason is based on the generation of intervals as composites of perfect fifths and major thirds. The diatonic seconds and sevenths can be generated through combinations of only two of these intervals, for example, the major ninth (or second by octave reduction) by two perfect fifths or the major seventh by perfect fifth and major third. The diminished fifth and augmented fourth, by contrast, require the combination of three intervals, for example, the augmented fourth via two ascending perfect fifths and a major third.<sup>100</sup>

Table 2.2. Table of seven classes of vertical consonance, dissonance and local chromaticism, arranged from most consonant and diatonic to most dissonance and chromatic

Class	Types of chords	Examples
<b>1. Perfectly consonant and diatonic chords</b>	Major and minor diatonic triads in 5/3 position	
<b>2. Imperfectly consonant and diatonic chords</b>	Major and minor diatonic triads in 6/3 and 6/4 position (in some cases)	
<b>3. Mild, diatonic and dissonant chords</b>	Chords containing a dissonant seventh (usually root and another voice) but no tritone between any voice	ii <sup>6</sup> <sub>5</sub> ; ii 7 IV 7
<b>4. Medium, diatonic and dissonant chords</b>	Chords containing a tritone between any voice, but that can be constructed from the notes of a natural diatonic scale.	V 7 and inversions vii <sup>6</sup> <sub>3</sub> ii <sup>6</sup> 7 and inversions vii <sup>6</sup> 7 in major
<b>5. Consonant but chromatic chords</b>	Vertically consonant chords that contain notes foreign to the diatonic scale of the prevailing key	bII 6 iv, i, bVI, bIII III#, VI#, II#

<sup>99</sup> Rameau called the ascending- and descending-leading or tendency tones the major and minor dissonance, respectively, following Zarlino, who noted that minor intervals tend to descend and major intervals to ascend. See Joel Lester, *Compositional Theory in the Eighteenth Century* (Cambridge, MA: Harvard University Press, 1992), 106-7.

<sup>100</sup> Moritz Hauptmann generated the tones of the major and minor scales in this manner. He claimed that "there are three intervals directly intelligible, the Octave, Fifth and Third (major), they are unchangeable." See Hauptmann, *The Nature of Harmony*, trans. W. E. Heathcote (London: Swan Sonnenschein & Co., 1888), 5, 33.

		(all for major keys)
<b>6. Medium dissonant chromatic chords</b>	Chords with the same vertical structure as class four, but containing a note(s) foreign to the diatonic scale of the prevailing key. Dominant seventh chords containing leading tones foreign to the prevailing key.	$\text{II}^7_{\#}$ $\text{VI}^7_{\#}$ $\text{III}^7_{\#}$ $\text{VII}^7_{\#}$ $\text{I}^7_{b7}$
<b>7. Strongly dissonant chromatic chords</b>	Chords that are constructed from alterations to any natural diatonic scale (not only of the prevailing key). Diminished seventh and augmented sixth chords.	$\text{vii}^{\circ 7}$ and applied $\text{vii}^{\circ 7}$ chords and inversions

The next group does not fit directly into the sequence of increasing dissonance, because it combines vertical consonance with chromatic tones, an expansion and intensification of vertical dissonance. This group of *chromatically consonant chords* includes the flat supertonic in its typical six-three and root positions, and consonant triads borrowed from the parallel key. Taking into account C.P.E. Bach's instruction that chromatic tones should be emphasized over diatonic ones, even when they are vertically consonant, this group may be considered parallel with the mild and medium diatonically dissonant groups. The chromatically consonant chords can be considered broadly similar in their degree of dissonance to the diatonically dissonant chords; however, this dissonance is of an opposite type: the latter are more vertically dissonant, i.e. dissonant in the literal sense; while the chords in the former group are dissonant against the diatonic scale of the key, a horizontalized dissonance.

Categorically more dissonant than the preceding three groups are *medium chromatically dissonant chords*, which include any harmonic degree of the key chromatically altered to become a locally functioning dominant seventh chord, including all its inversions, and also the diminished triad as a chromatic leading-tone chord. These are synonymous with applied or

secondary dominants. The appearance of any of these chords generates a local centrifugal force. Stronger dissonances are created, however, by the diminished seventh and augmented sixth chords and their inversions, which form the most dissonant group of *strongly chromatic dissonant chords*. Both these strongest and medium chromatically dissonant chords can be considered as chromatic intensifications of a diatonic dissonance; thus, they may also be called medium or strongly (chromatically) intensified dissonances. For example, the subdominant chord in six-three position in major can be chromatically transformed into the augmented six-three chord by raising its root a chromatic semitone and by lowering its bass a chromatic semitone to form a strong intensification of the motion to the dominant.

In order to demonstrate the intensifications of mild and medium diatonic dissonances to chromatic ones, let us consider the following progression in C major, where the tonic moves to the dominant via  $ii_5^6$  (example 2.1a). In example 2.1b, the bass of the  $ii_5^6$  is chromatically altered, becoming the leading tone of the dominant region. The  $ii_5^6$ , a mildly dissonant chord, becomes intensified by the raising of the bass a chromatic semitone to F $\sharp$ ; this ascending leading tone from the dominant region creates a very fleeting and slight sharp-centrifugal force that clashes with the prevailing C major key. In example 2.1c, one more note is altered: this time the D is raised a diatonic semitone to E $\flat$  to form a diminished seventh. The E $\flat$  is the descending leading tone from the dominant *minor* region, introducing a flat-centrifugal element that intensifies the chromatic dissonance further.

The interpretation of chromaticism as intensifications of diatonic chords builds on François-Joseph Fétis' impression that altered tones create "agitations and impassioned



movements" from the clash of "diverse tonalities."<sup>101</sup> The intrusion of leading tones from dominant major and minor regions into the prevailing C major tonality creates a sonority of maximal dissonance which is also a fleeting centrifugal force. Another intensified chromatic dissonance is the augmented sixth chord, shown in example 2.1d. In the context of a major tonic, the flattened sixth degree is borrowed from the minor subdominant or parallel minor, while the sharpened fourth degree is the leading tone to the dominant, as in the previous examples. The use of this harmony to approach the "point of furthest remove" in sonata developments points to the aligning of culminations of centrifugal force and dissonance on multiple levels. Alternatively, the use of both augmented sixth and diminished seventh chords in expanded cadential progressions that generate very strong temporal-centripetal forces suggests the paradoxical yet potent interdependence of local-centrifugal and temporal-centripetal forces.

Example 2.1. Chord progressions with chromatic dissonances

a) Diatonic progression      b) Leading-tone from dominant region      c) Ascending and descending leading-tones from dominant and parallel minor regions

#-CF      #/b-CF

d) Ascending and descending leading tones from dominant and subdominant minor regions

#/b-CF

<sup>101</sup> Quoted in Rothfarb "Energetics," 934-35.

The distinctions between diatonic, medium chromatic, and strongly chromatic dissonance are evident in the harmonic fluctuations in the openings of piano sonatas by Mozart, Beethoven, and Schubert. As an example, I turn to Beethoven's Sonata in F major, op. 10/2. The opening theme, a sentence (mm. 1-12), features one chromatic harmony, the tonic chord with added flat seventh degree in measure 7, resolving to the subdominant in the following measure. The presentation phrase (mm. 1-4) establishes the most basic harmonic consonance-dissonance fluctuation, I-V<sup>7</sup>-I, with the momentary tonic resolution initiating the continuation, with increasing momentum created by dissonances on the second beat of each measure: 5, 6 and 7. This seventh measure, where the applied dominant seventh appears, intensifies the diatonic dissonances of the previous measures, and the local apex of this four-measure segment of the continuation; this is echoed directly by the crescendo-diminuendo markings in the Schenker edition.<sup>102</sup> This generates a slight flat-centrifugal force at m. 7, which is counteracted by a stronger centripetal force as the phrase continues and establishes the tonic key area with a completed cadential progression (mm. 10-12).

The following phrase introduces a surprising intensified chromatic dissonance: an augmented six-five chord built on F, a sudden incursion of sharp-centrifugal force. In this situation, the augmented six-five chord begins as an implied applied dominant seventh to IV, by analogy with the first phrase. Yet the chromatic chord changes from being a medium to a strong dissonance when the function of the E<sub>b</sub> changes to D<sub>#</sub> upon the resolution to the E major harmony, implying the A minor region, tilted toward its dominant, in the manner of the *point of furthest remove* stereotype of development sections. As Charles Rosen points out, here

---

<sup>102</sup> Ludwig van Beethoven, *Complete Piano Sonatas, vol. 1*, ed. Heinrich Schenker (New York: Dover Publications, 1975), 108. Notably, the crescendo-diminuendo markings in the first edition peak one measure earlier.

Beethoven transforms the stereotype into a highly original gesture by introducing it much earlier in the form, already in the second phrase of the piece.<sup>103</sup> The implication of the mediant region (A minor), tilted toward its dominant, suggests a strong sharp-centrifugal force, since this region, E major, is remote from the global tonic, as the mediant's dominant major.

The presence of foreign descending leading tones borrowed from minor regions in chromatic diminished seventh and augmented sixth chords points to another main source of local chromaticism: mixture between parallel keys or "modal mixture." This brings up another paradox: that of consonant chromatic chords (mentioned above), which are vertically consonant but contain tones foreign to the scale of the governing key. In a major key, consonant chords may be borrowed from minor, for example, the minor tonic and subdominant, and the flat mediants, while various chromatic dissonances also appear through mixture, such as the minor subdominant with added sixth. In a minor key, the consonant major chord built on the flattened supertonic is a typical consonant but chromatic chord. This harmony can be understood with respect to the scale, originating from a temporary alteration to the Phrygian mode, which in minor is one step in the flat direction. This suggests another name for the chord, the Phrygian II chord.<sup>104</sup> It could also be conceived chordally, as an alteration of the subdominant to highlight its descending leading tone, which is also the flattened second degree of the prevailing key.<sup>105</sup> In both cases, this harmony shades the progression to the flat side. This shading is stronger when the flat supertonic or Phrygian II chord appears in the major key, since two tones are foreign to

---

<sup>103</sup> Rosen, *Classical Style*, 400.

<sup>104</sup> Aldwell and Schachter use this name; see Aldwell and Schachter, *Harmony*, 490-511. Their conception is based on Schenker's *Harmonielehre*. See Heinrich Schenker, *Harmony*, ed. Oswald Jonas, trans. Elizabeth Mann Borgese (Chicago: University of Chicago Press, 1954), 109-115.

<sup>105</sup> This is Riemann's conception of the  $\flat$ II harmony.

the key on its flat side. In both cases this is a fleeting centrifugal force, which may nevertheless influence larger dimensions of tonal motion.

Example 2.2. J.S. Bach, Partita in C Minor, Sinfonia, mm. 25-29

25

flat-CF force from sd

g: i bII

27

sharp-CF force from D

g: V<sup>7</sup> i V<sup>7</sup> i VI II<sup>9</sup><sub>5</sub> V<sup>6</sup><sub>4</sub>

29

sharp-CF force from D

g: (LT<sub>7</sub>/V) V<sup>7</sup> I<sub>4</sub>

The Phrygian II generates a potently contrasting effect when it precedes the leading-tone diminished seventh of the dominant region. Both harmonies usually appear in the pre-dominant phase of a harmonic progression, but they color it in opposite directions: the Phrygian II to the flat side and the dominant region's leading-tone seventh to the sharp side (with some added flat-side coloring from  $b\hat{3}$  in a major key). Paradoxically, the Phrygian II harmony is vertically consonant at the same time as generating significant centrifugal force through chromatic enrichment, while the leading-tone seventh is both chromatic and strongly dissonant. This occurs

in the Sinfonia of J. S. Bach's Partita in C Minor, in the measures leading to the half-cadential arrival that introduces the fugue (mm. 25-29). The first harmonic cycle moves to the Phrygian II in m. 26 for the pre-dominant phase, composed out for the entire long measure with figuration in both hands, generating local flat-CF force and a mysteriously somber affect. After moving through dominant and tonic phases in m. 27 it lands on the leading-tone diminished seventh of the dominant region. The dominant's ascending leading tone in the bass,  $\sharp\hat{4}$  of the prevailing C minor, generates a strong sharp-centrifugal force that counterbalances the flat-CF force from the Phrygian II. Affectively, the terrifying urgency of the sharp-CF force also contrasts with the somber and mysterious character of the Phrygian II harmony.

## **2.2. Five fundamental relations based on scale-content similarity and generative-triad commonality**

In order to meaningfully chart the trajectory of centrifugal force, particularly at middleground and global levels, it is necessary to identify degrees of key-area dissonance. This may be achieved by building upon the spectrum of consonant, diatonic, dissonant, and chromatic chords presented in the previous section. Just as chromatic dissonant chords can be considered intensifications of diatonic dissonances, regions whose generative triads are chromatic chords of the principal key create a stronger key-area dissonance and centrifugal force than those whose generative triads are diatonic chords of the principal key.<sup>107</sup> As a starting point, then, we may follow the typical eighteenth-century view that the "related keys" are those whose tonics are major or minor triads formed from the diatonic scale of the principal key.<sup>108</sup> This was Rameau's

---

<sup>107</sup> I will later occasionally use the phrase "generative triad of a region," as a synonym for "(local) tonic of a region," in order to distinguish it more clearly from the tonic of the principal key.

<sup>108</sup> Christensen notes this in his discussion of Rameau's views on modulation. See Christensen, *Rameau and Musical Thought*, 173.

view, and it was also adopted by some harmonic theorists into the nineteenth century, such as Emanuel Föster in his *Anleitung zum Generalbass*.<sup>109</sup> In the middle of the twentieth century, Donald Francis Tovey also considers the group of most closely related keys, which he calls "direct relations," those whose tonics are diatonic to the home key.<sup>110</sup> With respect to a major tonic, Tovey's "direct relations" includes two regions of the same mode as the tonic — the upper and lower dominants — and three regions of the opposite mode to the tonic — the submediant, the mediant, and the supertonic, which Schoenberg calls "dorian." With respect to C major, these regions would be G major, F major, A minor, E minor, and D minor.

This distinction between closer and more remote regions is based on one significant criterion for determining degrees of key-area dissonance: similarity of scale content. With respect to a major tonic's scale, the upper dominant's scale has only one tone foreign to the tonic's scale; the lower dominant also has only one tone foreign to the tonic. Similarly, the relative minor or submediant scale has only one tone foreign to the tonic scale: the raised seventh degree. The other two minor-mode relations, however, have slightly less scale similarity, with two notes foreign to the tonic, one from the "natural" minor collection plus the raised seventh degree. The maximally similar scale content of the two dominants and the relative or submediant region leads to the conclusion that these three would be the most fundamentally and closely related of the five diatonically related regions to the tonic key.

In his *Tonartenverwandtschaft*, or table of key relations, Gottfried Weber also identifies these three regions as the most closely related to the principal key because their scales are "most

---

<sup>109</sup> Wason, *Viennese Harmonic Theory*, 21-22.

<sup>110</sup> Tovey writes: "The basis of key-relation is that two keys are related when the tonic chord of one is among the common chords of another." By "common chords" he means the major or minor triads formed from the notes of the diatonic scale of the key. See Tovey, "Tonality in Schubert," 135.

alike," i.e., there is maximum similarity of scale content.<sup>111</sup> He adds a fourth relation based on a different kind of scale similarity that he calls "identity in the gross." While the first criterion simply compares the general similarity of scales and enumerates foreign elements, the second takes into account the structural parallelism of scale-degree functions.<sup>112</sup> The most fundamentally related region by this criterion is the parallel region, which has an identical tonic note. As a unison, the interval between the tonic and that of its parallel key is the maximum consonance. Furthermore, the second, fourth, fifth, and raised seventh degrees are not only common content between the scales, but the same degrees for both scales.<sup>113</sup> The dominant harmony is a common major chord due to the leading tone lent by the major to the parallel minor region.

At the same time, as Weber notes, there are two notes of difference or dissonance between the scales of parallel regions, the third and the sixth, thus creating a stronger conflict of harmonic color with the global key than that of the dominants or the relative key. If we include the lower seventh degree of minor, there are three foreign tones. The three foreign tones give it a paradoxical status as one of the four closest and most fundamental relations, while being at the same time a chromatic relation, since its tonic is a chromatic chord in the principal key. For example, C minor is a chromatic chord in C major. The eighteenth-century theorist Joseph Riepel also made a clear distinction between the five diatonically related regions and the chromatically related parallel relation. For Riepel, like Tovey, the most closely related regions are those whose own tonic chords are diatonic to the global tonic.

Riepel differentiated between the differing degrees of relatedness of various regions to the global tonic by invoking a metaphor of interpersonal relationships, comparing closer key-

---

<sup>111</sup> Weber, *Theory of Musical Composition*, 309-10.

<sup>112</sup> Bernstein uses this term in his discussion of Weber's harmonic theory in Bernstein, "Nineteenth-Century Harmonic Theory: the Austro-German Legacy," 778-811.

<sup>113</sup> Weber, *Theory of Musical Composition*, 311.

relationships to the hierarchy of inhabitants on an eighteenth-century farm. The major tonic is the master, while the dominant is the chief servant (*Oberknecht*) and the relative minor is the chief maid (*Obermagd*). The subdominant is characterized as a day labourer (*Tagelöhner*), while the relative minors of the subdominant and dominant, are given the lowest level in the hierarchy as underservants (*Unterläufferin*, *Untermagd*).<sup>114</sup> In contrast to these characterizations, the parallel minor is called *schwarze Gredel*, explicitly marked as being of darker complexion.<sup>115</sup> Eyton Agmon uses Riepel's incomplete and suggestive conception of the diatonic versus chromatic relations to the global tonic as the basis for his neo-Riepelian theory of key distance, interpreting the parallel relation as more distant from the tonic than all five diatonic relations.<sup>116</sup>

The tonal narrative approach follows Weber in counting the parallel key or region as one of the four most fundamental relations, owing to parallelism of scale structure. At the same time, the approach also recognizes the strength of the color change associated with this relation, darkening to minor and brightening to major. Patricia Carpenter makes the useful observation that the parallel major-minor relationship travels a significant distance of three steps on the circle of fifths, while moving only one step on the chart of the regions. She writes that the parallel relationship opens up "possibilities for easy entry into far-related areas."<sup>117</sup> Later in this study, I draw on this observation to show how the parallel minor acts as a gateway into the remote flat-side regions.

---

<sup>114</sup> This is summarized by Brian Hyer in "Tonality," in *Cambridge History of Western Music Theory*, 731. He notably omits the reference to *schwarze Gredel*, while Ratner and Agmon (see notes below) emphasize it. Hyer also notes the associations between the key relations and the genders of the farm inhabitants: major keys are male and minor keys are female.

<sup>115</sup> Leonard Ratner comments that this was a local nickname for a Swedish queen of swarthy complexion. See Ratner, *Classic Music*, 50.

<sup>116</sup> Eyton Agmon, *The Languages of Western Tonality* (Berlin: Springer, 2013), 217-24.

<sup>117</sup> See Patricia Carpenter, "Grundgestalt as Tonal Function," *Music Theory Spectrum* 5 (1983): 15-38, esp. 21.



We can now count the four regions in the central cross of Schoenberg's chart — dominant, subdominant, relative, and parallel minor — as both fundamental and close relations. Close relations are those that generate a moderate centrifugal force, compared with the stronger centrifugal force of all more remote regions. The fundamental relations comprise the basic units for determining degrees of remoteness for all the non-close regions; these more remote regions form categories based on the number of fundamental relations from the principal tonic.

The way in which the parallel region relates closely and fundamentally to the principal key, through parallelism of scale structure, can be generalized to apply to other relationships, particularly the diatonic major-third relationship. In contrast to similarity of scale content, which measures common/foreign tones between the scales of two regions, this second criterion for judging the closeness and remoteness of regions is based on two connected properties of the relationship between a region and the principal key or referential region: the common tones between their generative triads, and the consonance of the interval between the generative tones of each region. I call this criterion "generative-triad commonality."

Based on this second criterion, a fifth fundamental relationship can be added to the four that we have established. Turning back to the group of five diatonically related regions, there is the distinction between the three that have been established as fundamental and close to the principal tonic on account of their maximal scale-content similarity, and the two which are slightly less close due to their having two tones foreign to the principal tonic's scale: the mediant and supertonic regions of a major principal tonic. Of these, the mediant may also be considered a fundamental relation, while the supertonic may not. The dissonant interval between the supertonic region and the tonic, and the absence of common tones with the principal tonic triad, disqualifies it from consideration as a fundamental relation, while its status as one of the diatonic

chords of the tonic key allows it to be counted as a close, but not fundamental relation. On the other hand, there are three reasons for including the diatonic major third relation — mediant to a major tonic and submediant to a minor one — as a fundamental relation.

Firstly, and most importantly, a tonic major triad shares two out of three common tones with the generative triad of its mediant region (for example C major and E minor); a tonic minor triad shares two tones with the triad of its submediant region (for example G minor and E $\flat$  major). This means that these third-related regions display a high degree of generative-triad commonality to the principal key. The only other regions to have this special relationship to the tonic key are the relative (a diatonic minor-third relation) and the parallel. The parallel relation, due to parallelism in scale structure, features the highest generative-triad commonality with the principal key because the two common tones between their generative triads are also the same degrees. The diatonic major- and minor-third relations generate the second greatest generative-triad commonality, since these are the only two regions other than the parallel whose generative triads share two common tones with the principal tonic triad.<sup>118</sup>

The second reason concerns the consonance of the interval between the region's fundamental and the principal tonic: a major third, whether from the mediant to a major tonic or submediant to a minor tonic. This fulfils the second aspect of generative-triad commonality: the consonant interval between generative tones of the region and the principal key or reference region. The major third is the third most fundamental and consonant interval after the octave and the perfect fifth. It is more consonant than the minor third, the interval between the relative major and minor regions, since it is the fifth partial of the harmonic series. The diatonic major-third

---

<sup>118</sup> These double common-tone relations between opposite-mode triads are called P (parallel), R (relative), and L (Leittonwechsel) in Neo-Riemannian theory and form the basis for its analytical approach. See Cohn, *Audacious Euphony*.

relation can thus be paired with the diatonic minor-third relation: they are both diatonic third relations, and each of their generative triads share two common tones with the principal tonic triad.

The third reason draws on Richard Cohn's notion of voice-leading proximity and Hugo Riemann's invention of the term *Leittonwechsel* for this relation.<sup>119</sup> We have established the two common tones between the major tonic triad and its mediant, or a minor tonic triad and its submediant. The other, non-common tones are a semitone apart, the interval of maximum melodic attraction. Furthermore, this non-common tone in the diatonic major-third triad is the ascending leading tone (seventh degree) in a major tonic key or the descending leading tone in a minor tonic key. This suggests an especially strong connection between the regions, since the root or fifth of the *Leittonwechsel* triad becomes one of the most active tones in the tonic key. This is evident in direct modulations between major-third related regions such as E $\flat$  major leading back to G minor in Chopin's First Ballade, op. 23 (see example 2.3). In this situation, G minor is the principal tonic key and E $\flat$  major is its submediant. The modulation from the large middle section in E $\flat$  major to the final section in G minor happens directly from one tonic harmony to another, with a ten-measure E $\flat$  tonic pedal point (mm. 180-189) followed by four measures of G minor harmony (mm. 190-93), prolonged by simple figurations. After this

---

<sup>119</sup> Cohn's concept of key-distance is primarily based on the literal voice-leading distance from the tonic triad of one key to that of another, or simply between harmonies, of which one may be a tonic. Motion by a semitone constitutes one unit of *voice-leading work*, while a common-tone represents zero work. Note that the voices move in an idealized context, so that they move by the shortest possible distance. As a result, he considers the *Leittonwechsel* and parallel relations to be the closest ones, since their triads are separated by only one voice moving a semitone. The relative is slightly less close, even though only one voice moves, because it moves by whole tone, adding up to two units of voice-leading work. The chromatic mediants, whose fundamentals are a major third from the global tonic and whose tonic triads share common tones with the global tonic triad, are also considered to be a second degree of closeness to the tonic, because the other two voices both move by semitone, also adding up to two units of work. See Richard Cohn, *Audacious Euphony: Chromatic Harmony and the Triad's Second Nature* (New York: Oxford University Press, 2012), 6-8.

indication of the tonic key, it becomes re-established with the return of the theme over a dominant pedal (m. 194 onwards).

Example 2.3. Chopin, Ballade in G Minor, op. 23, mm. 179-95.

The image shows a musical score for Chopin's Ballade in G Minor, measures 179-195. The score is in G minor and 3/4 time. It features a piano accompaniment with a dominant pedal point in the bass. The right hand has a melodic line with various ornaments and dynamics. The score is divided into four systems: measures 179-182, 183-186, 187-190, and 191-195. Dynamics include 'con forza', 'ten.', 'sempre forte', 'riten.', 'dim. rallent.', and 'meno mosso'. The final measure (195) is marked 'pp sempre sotto voce'.

In Chopin's second ballade, the opening section presents the relation between F major as principal key and A minor as its mediant. The voice-leading proximity of these triads is exemplified by the way in which Chopin moves from F major through A minor to C major (mm. 18-22ff). Following a PAC in F major, he moves straight to the tonic chord of A minor, which is briefly established before moving to C major.

In summary, the tonal-polarity approach recognizes five regions that are fundamental and close to the principal key. This group consists of:

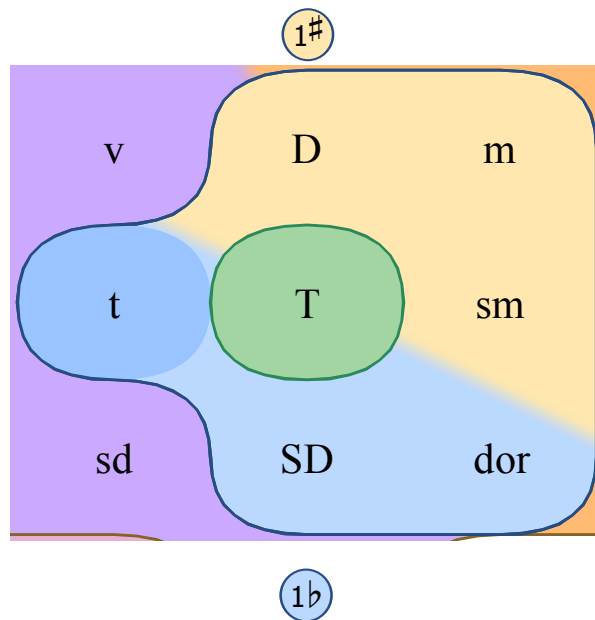
- 1) the upper and lower dominant regions, whose scales contain only one tone foreign to the principal tonic scale and whose generative triads share a common tone with the principal tonic triad. These regions display the maximum scale-content similarity to the principal key, and a moderate generative-triad commonality.
- 2) the third-related regions whose generative triads share two common tones with the principal tonic triad, and whose scales contain only one or two tones foreign to the principal tonic scale. These regions display the maximum or second-highest scale-content similarity, and the second-highest generative-triad commonality to the principal key.
- 3) the parallel region, whose generative triad shares two common tones with the principal tonic triad and whose degrees 1, 2, 4, 5, and 7 are identical in pitch and function to the principal tonic scale. This region displays the maximum generative-triad commonality with the principal key, but only the third-highest level of scale-content similarity.

The region whose root (own tonic) is a major second above or below a major or minor principal tonic respectively and whose generative triad is diatonic to the principal key is also considered a close relation. However, it is not regarded as a fundamental relation, because its generative tone is a dissonant second from the principal tonic. Thus, there are six close relations to a principal tonic, five of which are also fundamental relations owing to the above reasons. They generate a moderate centrifugal force with respect to the principal tonic, the lowest degree generated by a region in the tonal narrative.

Like all regions on the tonal spectrum, these are divided into the sharp and flat sides of the global tonic, based on sharp or flat changes to the diatonic collection. With respect to a major tonic, the dominant, submediant, and mediant are on the sharp side, while the subdominant and parallel minor are on the flat side (see figure 2.1). The submediant is taken to be a sharp-side

relation owing to its ascending leading tone (raised seventh degree). For example, with C major as tonic key, the submediant region, A minor, generates sharp-CF force through its G#. The supertonic or dorian region lies on both sharp and flat sides, generating both sharp and flat-CF force; it has one foreign tone that is on the sharp side of the tonic scale and one foreign tone that is on the flat side of the tonic scale. Assuming a C major tonic key, the foreign tones from its dorian region (D minor) would be its ascending leading tone, C#, and its descending leading tone, Bb.

Figure 2.1. Major tonic: close regions on sharp and flat sides, divided into four areas

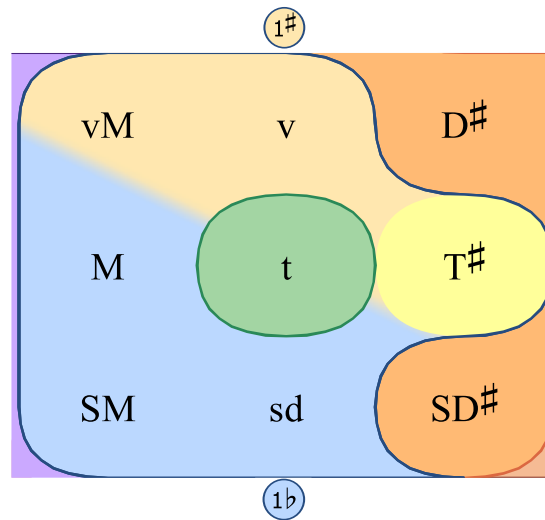


Yellow: sharp-side  
Blue: flat-side

Area	Regions	Abbreviations
Upper fifth (sharp-side)	Dominant	<b>D</b>
Lower fifth (flat-side)	Subdominant, supertonic (ii)	<b>SD, dor</b>
Third relations (sharp-side)	Mediant, submediant, supertonic	<b>m, sm, dor</b>
Parallel relations (flat-side)	Tonic minor, subdominant minor, dominant minor (latter two are intermediate relations)	<b>t, sd, v</b>

\* Note: the abbreviation **dor** means "dorian," and is another name for the supertonic (minor) region. This comes from modal associations: see Schoenberg's chart of regions.

Figure 2.2. Minor tonic: close regions on the sharp and flat sides, divided into four areas



Yellow: sharp-side  
Blue: flat-side

Area	Regions	Abbreviations
Upper fifth (sharp-side)	Dominant minor, dominant major, dominant's mediant	v, D#, vM
Lower fifth (flat-side)	Subdominant	sd
Third relations (flat-side)	Mediant, submediant, dominant's mediant	M, SM, vM
Parallel relations (sharp-side)	Tonic major, dominant major	T#, D#

\*Note: dominant's mediant is the subtonic, which can also be the mediant's dominant

With respect to a minor tonic the dominant and parallel major are on the sharp side, while the subdominant and both mediant are on the flat side (see figure 2.2). The subtonic is both on the sharp and flat side, analogous to the dorian with respect to a major tonic. The effect of the mediant being slightly to the flat side is evident in minor-mode sonata movements where the mediant is the normative subordinate key-area. To define the principal key, the raised seventh degree will be prominent as the third of the dominant chord; in the group of subordinate themes, in addition to the relative minor-major contrast, the formerly raised seventh degree is now a chromatic semitone lower, continually asserted and functioning as the dominant degree of the mediant region. For example, in A minor, the leading tone G $\sharp$  becomes G $\natural$  as the dominant

degree of C major. Therefore, for a tonal narrative whose principal tonic is A minor, a section in the mediant, C major, generates a slight flat-centrifugal force.

Four of the five fundamental relations (excluding the diatonic major-third relation) generate all the regions in Weber's and Schoenberg's maps in four directions, which might be compared with compass directions. This suggests four categories for the tonal spectrum, corresponding to the foundational relations. The categories or areas can be generalized as fifth and third relations, each occurring on the sharp and flat sides. The dominant and subdominant can be understood as fifth relations to the sharp and flat sides respectively, corresponding to the north and south directions. The submediant and mediant of a major principal key are third relations on the sharp side. The parallel minor can also be considered a third relation to the flat side for two reasons. First, because the third of its generative triad is the flattened third of the principal tonic, an inner-third relation; second, because the parallel minor acts as a gateway to more remote third relations to the flat side, such as the flat mediant and flat submediant, which are close relations of the tonic minor. On Weber's table, the third relations to the sharp side move eastwards, while the third relations to the flat side move westwards (Schoenberg's chart reverses the directions of what I am calling third relations).

In a major key, the "dorian" region combines a fifth relation to the flat side with a third relation to the sharp side. For example, in C major, **dor** is D minor, which can be reached via a subdominant move to F major and a submediant move to D minor or a submediant move to A minor followed by a subdominant move to D minor. Therefore, in this study **dor** will also be registered as **SDsm** (the submediant of the subdominant) or **smsd** (the subdominant of the submediant): these registrations show the connection of **dor** to the subdominant and submediant.



The four areas apply to all levels of harmonic motion: chord successions, chromatic intensification through the suggestion of various regions (tonicization), and the progression of regions in the larger-scale tonal narrative. The purpose for this division is to identify examples of spatial completeness, in sections or passages that circumscribe the principal key by moving through all four areas. This occurs, for example, in fixed-tonic passages that feature chromatic intensifications of harmonic progressions remaining in the principal key, touching on all four areas. Recapitulations of sonata forms often exhibit this feature. In such chromatically intensified passages or sections, the harmony spreads centrifugally outwards in all directions, while remaining centered in the principal key. This suggests the image, from the alchemical tradition, of a seed of gold or light in the center that spreads to fill and transmute the whole frame.<sup>120</sup> The concept of spatial completeness will be explored further in section 3.5.

In this study, the degree of centrifugal force generated by more remote regions will be measured according to combinations of the five fundamental relations: the fifth- and third-relations whose scales contain only one or two tones foreign to the principal key plus the parallel relation. Fundamental steps are fundamental relations that are combined to determine the distance between regions, whether consecutively or between regions across a larger modulatory trajectory in a single sharp or flat direction. The number of fundamental steps from the principal tonic to one of its regions, or from one region to another, generates a proportionate degree of centrifugal force. For example, the tonal narrative approach conceives of the flat submediant region (bSM) of a major principal key (T) as a combination of the parallel and a diatonic major-third relation, making two fundamental steps; this would be registered as PL in neo-Riemannian

---

<sup>120</sup> Ronald D. Gray, *Goethe the Alchemist: A Study of Alchemical Symbolism in Goethe's Literary and Scientific Works* (Cambridge: Cambridge University Press, 1952), 27-28.

language. This study classifies regions two fundamental steps away as moderately remote. Using the combination of fundamental steps as the criterion for determining the remoteness of regions aims to reflect either actual or implied processes of modulation, where remote regions, ranging from moderately to very remote, are arrived at via combinations of the fundamental relations, often including the parallel one.

In many cases, a modulation to a remote region can be understood as an intensification of what had typically been a close, parallel relation. For example, in his piano sonata first-movement forms, Mozart very commonly switches from the closely related dominant key ending the exposition to its parallel minor. In his last two sonatas, K. 570 and K. 576, the parallel minor relationship is intensified. In K. 570/i in B $\flat$  major, Mozart moves from the closely related dominant key that ends the exposition (F major) to its moderately remote flat submediant (D:  $\flat$ SM, D $\flat$  major). In K. 576/i in D major, Mozart moves from the dominant key the ends the exposition (A major) to its flat submediant's subdominant (B $\flat$  major); this is an even more remote relation because it lies three fundamental steps from the referential key, the global dominant.

### **2.3. Weber and Schoenberg's classifications of regional dissonance/distance**

The main criterion used for determining degrees of centrifugal force or remoteness in this study was also used by Gottfried Weber, who classified keys in his Table of Key Relations (see figure 2.3) according to numerical degrees of relatedness/remoteness. Weber's degrees draw upon only four fundamental relations, equivalent to those that generate the table itself. He also introduces a familiar analogy between key and family relations: there is a distinction between the closest key relations and all the others, analogous to the distinction between close or "nuclear" family and

extended family. Degrees of closeness can then be distinguished between different "extended family" relations.<sup>121</sup> The closest relatives to my closest family members are in a second-degree relationship to me; the degree of distance from the global tonic corresponds to the number of combinations of the fundamental or closest relations (of which there are four).<sup>122</sup> The tonal narrative approach develops Weber's classification system by adding another fundamental relation, the diatonic major-third relation discussed above.

Figure 2.3. Weber's *Tonartenverwandtschaften* (Table of Key Relations)

<i>C</i>	—	<i>a</i>	—	<i>A</i>	—	<i>f</i> ♯	—	<i>F</i> ♯	—	<i>d</i> ♯	—	<i>D</i> ♯	—	<i>b</i> ♯	—	<i>B</i> ♯	—	<i>g</i> ×
<i>F</i>	—	<i>d</i>	—	<i>D</i>	—	<i>b</i>	—	<i>B</i>	—	<i>g</i> ♯	—	<i>G</i> ♯	—	<i>e</i> ♯	—	<i>E</i> ♯	—	<i>c</i> ×
<i>B</i> b	—	<i>g</i>	—	<i>G</i>	—	<i>e</i>	—	<i>E</i>	—	<i>c</i> ♯	—	<i>C</i> ♯	—	<i>a</i> ♯	—	<i>A</i> ♯	—	<i>f</i> ×
<i>E</i> b	—	<i>c</i>	—	<i>C</i>	—	<i>a</i>	—	<i>A</i>	—	<i>f</i> ♯	—	<i>F</i> ♯	—	<i>d</i> ♯	—	<i>D</i> ♯	—	<i>b</i> ♯
<i>A</i> b	—	<i>f</i>	—	<i>F</i>	—	<i>d</i>	—	<i>D</i>	—	<i>b</i>	—	<i>B</i>	—	<i>g</i> ♯	—	<i>G</i> ♯	—	<i>e</i> ♯
<i>D</i> b	—	<i>b</i> b	—	<i>B</i> b	—	<i>g</i>	—	<i>G</i>	—	<i>e</i>	—	<i>E</i>	—	<i>c</i> ♯	—	<i>C</i> ♯	—	<i>a</i> ♯
<i>G</i> b	—	<i>e</i> b	—	<i>E</i> b	—	<i>c</i>	—	<i>C</i>	—	<i>a</i>	—	<i>A</i>	—	<i>f</i> ♯	—	<i>F</i> ♯	—	<i>d</i> ♯
<i>C</i> b	—	<i>a</i> b	—	<i>A</i> b	—	<i>f</i>	—	<i>F</i>	—	<i>d</i>	—	<i>D</i>	—	<i>b</i>	—	<i>B</i>	—	<i>g</i> ♯
<i>F</i> b	—	<i>d</i> b	—	<i>D</i> b	—	<i>b</i> b	—	<i>B</i> b	—	<i>g</i>	—	<i>G</i>	—	<i>e</i>	—	<i>E</i>	—	<i>c</i> ♯
<i>D</i> b <b>b</b>	—	<i>g</i> b	—	<i>G</i> b	—	<i>e</i> b	—	<i>E</i> b	—	<i>c</i>	—	<i>C</i>	—	<i>a</i>	—	<i>A</i>	—	<i>f</i> ♯
<i>E</i> b <b>b</b>	—	<i>e</i> b	—	<i>C</i> b	—	<i>a</i> b	—	<i>A</i> b	—	<i>f</i>	—	<i>F</i>	—	<i>d</i>	—	<i>D</i>	—	<i>b</i>
<i>A</i> b <b>b</b>	—	<i>f</i> b	—	<i>F</i> b	—	<i>d</i> b	—	<i>D</i> b	—	<i>b</i> b	—	<i>B</i> b	—	<i>g</i>	—	<i>G</i>	—	<i>e</i>
<i>D</i> b <b>b</b>	—	<i>b</i> b <b>b</b>	—	<i>B</i> b <b>b</b>	—	<i>g</i> b	—	<i>G</i> b	—	<i>e</i> b	—	<i>E</i> b	—	<i>c</i>	—	<i>C</i>	—	<i>a</i>

<sup>121</sup> Weber, *Theory of Musical Composition*, 316.

<sup>122</sup> In some languages, the phrase denoting key-relations in music includes the word for (human) family relations. In Finnish theories of harmony, for example, they are called *sävellajien sukulaisuus*, literally meaning "key family-relations" or "key-kinship." See Eino Linnala, *Soinnutuksen perusteet* [Fundamentals of Harmony] (Jyväskylä: Gummerus, 1950), 243.

Table 2.3. Weber's classification of keys in terms of degrees of relatedness/remoteness with respect to C major as tonic.

<b>Degrees of relatedness and remoteness</b>	<b>Keys as regions of C major</b> (capital letters refer to major keys, small letters to minor)	<b>Scale degrees symbols with respect to T</b> (major tonic) <sup>123</sup>
First	G, F, a, c	<b>D, SD, sm, t</b>
Second	A, Eb, D, Bb, f, g, e, d	<b>SM#, bM, DD, SDDS, sdb, vb, m, smsd</b>
Third	E, Ab, b, f#, bb, eb	<b>M#, bM, Dm, SM#sm, (sdb)<sup>2</sup>, bmb</b>
Fourth	B, c#, Db, ab, F#, Gb	<b>DM#, M#sm, sdbSM, bsmb, (SM#)<sup>2</sup>, bmbM</b>

Weber's classification of the remoteness of keys with respect to a C major tonic is presented in table 2.3. The second-degree relations to a global tonic include the supertonic major, mediant, and dominant minor as close relations to the dominant (taking C major as principal key: D major, E minor, and G minor as close relations to G major); the double subdominant, supertonic, and subdominant minor as close relations to the subdominant (B flat major, D minor, F minor as close relations to F major); the flat mediant as a close relation to the tonic minor (E flat major from C minor); and the submediant major as a close relation to the submediant (A major from A minor). Weber's third-degree relations to C major are those that are closely related to the second-degree relations. They include regions such as the mediant major and the submediant major's submediant as close relations to the submediant major (E major and F sharp minor as close relations to A major); the flat submediant and flat mediant minor as close relations of the flat mediant (A flat major and E flat minor from E flat major); the double

<sup>123</sup> These are based on combinations of fundamental relations from **T**, adapted from Schoenberg's Chart of the Regions. In many cases, these scale degree symbols only represent one possible derivation from **T**.

subdominant minor from the double subdominant (B flat minor from major); and the mediant's dominant from the mediant or supertonic major (B minor from E minor or D major).

The tonal narrative approach includes the diatonic major-third relation as a close or fundamental relation in order to solve problems with Weber's grouping of key-relations for the second and third degrees. Weber places the region based on the diatonic iii of a major key (E minor with respect to C major) in the same second-degree group with the two minor-third related regions based on triads chromatic to the same principal major key,  $\flat$ III and VI $\sharp$  (E $\flat$  major and A major with respect to C major). The triad of E minor shares two common tones with the triad of C major, while E $\flat$  major and A major's triads each only share one common tone with C major; furthermore, the root of E $\flat$  major and the third of A major are chromatic or foreign to C major while all the tones of the E-minor triad are diatonic to C major. These factors justify counting E minor as closer to C major than E $\flat$  major and A major, unlike in Weber's classification.

Weber also separates the regions based on what Kopp calls the four "chromatic mediants" into two different groups when there are compelling reasons to include them in the same group. The four chromatic mediants are those triads that share one common tone with the principal tonic triad, for example A major, E major, A $\flat$  major, and E $\flat$  major with respect to C major; the scales of the regions generated from these triads each share three or four tones in common with the principal tonic scale. These similarities would seem sufficient to place them in the same group.<sup>124</sup> In Weber's system, the regions generated from the minor third above or below the principal tonic (E $\flat$  and A major with respect to C major) are classified as second-degree relations, while those

---

<sup>124</sup> In David Kopp's theory of mediant relations, he calls those mediant relations that share zero common tones with the tonic triad "disjunct mediants." See David Kopp, *Chromatic Transformations in Nineteenth Century Music* (New York: Cambridge University Press, 2002), 10-11.

regions generated from tones a major third above or below the principal tonic are classified as third-degree relations. In the latter case, for example E and A $\flat$  major with respect to C major, the region requires three fundamental steps: dominant, relative, and parallel. The incorporation of the diatonic major-third relation or *Leittonwechsel* transformation would allow for all four chromatic mediant relations to be classified in the same group as second-degree relations.

Weber elucidates an important distinction between the second-degree relations of the supertonic major to the global tonic (e.g. D major to C major) and of the submediant major ( $\sharp$ SM) to the global tonic (T) (e.g. A major to C major). Weber considers A major to be more foreign to C major than D major, because A major's scale has one more note foreign to C major than D major's does. But A major is still in a second-degree relationship to C major through A minor, a close (first-degree) relation to both C and A major: the second-degree relationship between C and A major depends on the "identify in the gross," or scale-structural parallelism between A major and A minor.<sup>125</sup>

This distinction can be understood in terms of the two criteria introduced above for comparing the five fundamental relations: scale-content similarity and generative-triad commonality. D major's scale contains only two tones foreign to C major's; the high scale-content similarity between D major and C major justifies considering them second-degree or moderately remote relations. While A major has three tones foreign to C major, the common tone between their triads justifies considering it an equally remote rather than more remote relation than D major to C major, based on generative-triad commonality. In the following tables categorizing the remoteness of regions, a subcategory will be proposed that considers regions

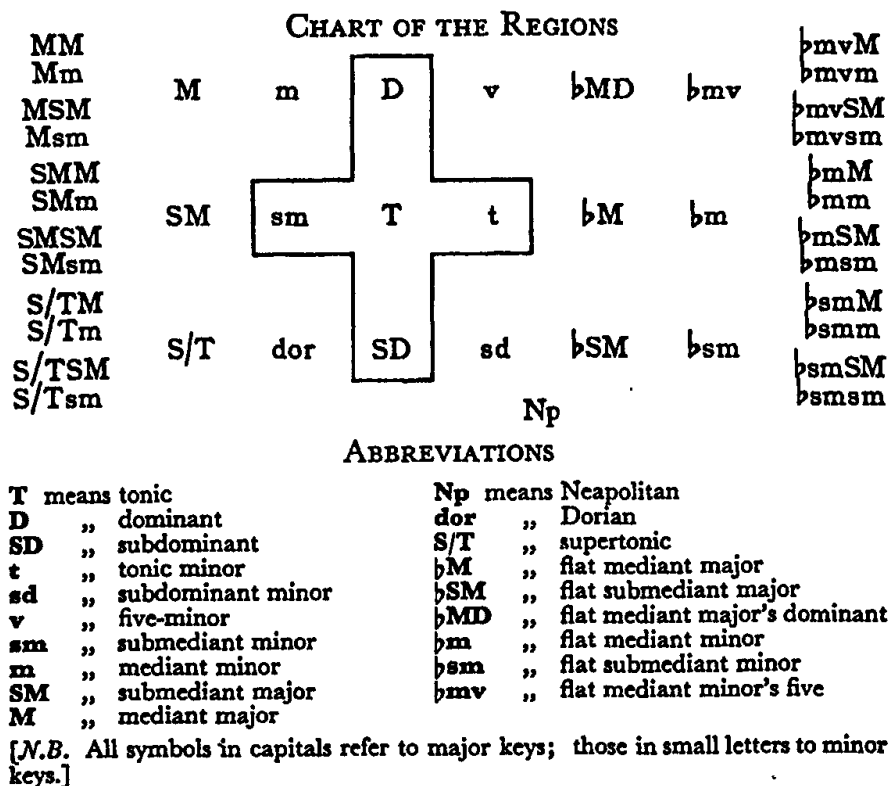
---

<sup>125</sup> Weber, *Theory of Musical Composition*, 317-18.

with higher generative-triad commonality to be slightly closer than other regions in the same larger category (see, for example, table 2.7).

In *Structural Functions of Harmony*, Schoenberg categorizes the regions into five classes from closest to most remote (see figure 2.4 and table 2.4).<sup>126</sup> While Schoenberg bases his chart on the same four relations as Weber's table, his criteria for classifying their distances differs from Weber. While Weber relied only on counting combinations of any the (four) fundamental relations to derive his degrees of relatedness, Schoenberg uses multiple criteria to determine his classes.

Figure 2.4. Schoenberg's Chart of the Regions



<sup>126</sup> The Chart of Regions appears on p. 20 and the classification of regions on pp. 68-69 of *Structural Functions*.

Table 2.4. Schoenberg's classification of the regions<sup>129</sup>

<b>Class</b>	<b>Regions (as related to T)</b>	<b>Regions for T = C major</b>
<b>1. Direct and Close</b>	SD, D, sm, m (t is counted as one of the four closest regions on p. 21)	F, G, a, e
<b>2. Indirect but Close</b>	A) Through common dominant: t, sd, v, SM, M B) Through proportional transposition: bM, bSM	A) c, f, g, A, E B) Eb, Ab
<b>3. Indirect</b>	b <sub>m</sub> , b <sub>sm</sub> , MM, M <sub>m</sub> , b <sub>sm</sub> SM, b <sub>smsm</sub>	eb, ab, G <sub>#</sub> , g <sub>#</sub> , F <sub>b</sub> , f <sub>b</sub>
<b>4. Indirect and Remote</b>	N <sub>p</sub> , dor, S/T, bMD, b <sub>mv</sub> ,	Db, d, D, B <sub>b</sub> , b <sub>b</sub>
<b>5. Distant</b>	MSM, M <sub>sm</sub> , SMM, SM <sub>m</sub> , SMSM, SM <sub>sm</sub> , S/TM, S/T <sub>m</sub> , S/TSM, S/T <sub>sm</sub> , b <sub>mv</sub> M, b <sub>mv</sub> m, b <sub>mv</sub> SM, b <sub>mv</sub> sm, b <sub>m</sub> M, b <sub>mm</sub> , b <sub>m</sub> SM, b <sub>msm</sub> , b <sub>sm</sub> M, b <sub>smm</sub>	C <sub>#</sub> , c <sub>#</sub> , C <sub>#</sub> , c <sub>#</sub> , F <sub>#</sub> , f <sub>#</sub> , F <sub>#</sub> , f <sub>#</sub> , B, b, D <sub>b</sub> , d <sub>b</sub> , G <sub>b</sub> , g <sub>b</sub> , G <sub>b</sub> , g <sub>b</sub> , C <sub>b</sub> , c <sub>b</sub> , C <sub>b</sub> , c <sub>b</sub>

Schoenberg implicitly makes a large-scale distinction between regions whose generative tones (local tonics) are consonant with the principal tonic and those which are dissonant. The former regions are all placed in classes 1. Direct and Close, 2. Indirect but Close, and 3. Indirect; the latter regions are placed in the most distant classes 4. Indirect and Remote, and 5. Distant. He gives the reason in the previous chapter, saying that "regions whose tonics differ by a major or minor second or augmented fourth (diminished fifth)" are "irreconcilably remote."<sup>130</sup> Schoenberg still considers these to be relations worthy of consideration, since "the imagination of the real artist is capable of overcoming even this obstacle."<sup>131</sup>

According to the brief descriptions of each category on pp. 68-69, Schoenberg bases his distinction between the three classes of close or less remote regions on scale-content similarity: regions in class 1 "share five (or six tones) in common with T [the principal tonic scale];" those

<sup>129</sup> Schoenberg, *Structural Functions*, 68-69.

<sup>130</sup> Schoenberg, *Structural Functions*, 65.

<sup>131</sup> *Ibid.*, 65.



in class 2 "have three of four tones in common with **T**;" but those in class 3 have a "negligible" number of tones in common with **T**.<sup>135</sup> Curiously, there is an inconsistency regarding which four regions he considers the closest to the principal tonic. In his initial presentation of the regions, Schoenberg follows the visual logic of the chart by considering the four regions in the central cross to be the closest to the (major) tonic: "the regions closest related to a tonic are those in the center of the chart: dominant region (**D**), subdominant region (**SD**), submediant region (**sm**) and tonic minor region (**t**)."<sup>136</sup> In the later presentation, however, the mediant has replaced the tonic minor in class 1, while the tonic minor moves to class 2: Indirect but Close (see table 2.4).

The reason for this may lie in Schoenberg's two methods of deriving regions from the principal tonic: (1) through the modes that share a common scale, which I will call directly related modes; (2) through the interchangeability of major and minor regions that share the same generative tone and dominant chord. The regions classified as "Direct and Close" (class 1) on pp. 68-69 are all regions based on the directly related modes; the tonic minor (parallel minor), while clearly a foundational relation for the chart itself, is related to the tonic major through interchangeability. Since the tonic minor resides in class 2. Indirect but Close, one can assume that Schoenberg considers the parallel major-minor relationship "close but indirect," while most of the regions derived from the modes are directly related. The **dor** region is also derived from the directly related modes; however, it is excluded from classes 1-3 on account of the dissonance of its root with the principal tonic.

The regions in class 2 are all either parallel relations to the regions in class 1 or close and direct relations of the tonic minor. Therefore, it includes the tonic minor, subdominant minor, and dominant minor through a common dominant (to the respective regions in class 1); the

---

<sup>135</sup> Schoenberg, *Structural Functions*, 68.

<sup>136</sup> See Schoenberg, *Structural Functions*, 21.

mediant and submediant majors, also through a common dominant to the respective mediants in class 1; and the flat mediant and submediant, as direct third relations to the tonic minor. In class 2, each of the four mediant regions' triads share a single common tone with the principal tonic triad. Other fundamental or direct relations applied to regions in class 1, for example the dominant of the dominant are again excluded based on the dissonance of their roots.

The intimate relationship between the indirect but closely related mediants in class 2 and interchangeability of major and minor is highlighted in the literature. For example, in Beethoven's *Waldstein* Sonata, first movement (in C major), the subordinate key area is the mediant major (E major). It is prepared in the transition by a dominant prolongation (mm. 23-34) that appears to introduce the mediant minor (E minor), since it presents the mediant minor scale and triad in mm. 23-29. The scalar material changes definitively from the mediant minor to major in m. 31; the latter region will govern the entire group of subordinate themes (mm. 35-74).<sup>137</sup> The same kind of derivation occurs in Beethoven's op. 2/2/i in A major. In this movement, the region that commences the development section is C major (122-29). This region relates to the key that concluded the exposition, E major, as its flat submediant. It is conspicuously prepared by a switch from E major to minor at the second ending of the exposition (mm. 118-21), highlighting the derivation of the flat submediant as a close third-relation to the tonic minor (of E major).

Schoenberg's class 2 forms a more coherent group than Weber's second and third degrees of relatedness, because it groups together the four chromatic mediant regions whose generative triads share a single common tone with the principal tonic triad. The generative triads of all

---

<sup>137</sup> In *Theory of Harmony*, Schoenberg discusses modulations to the "third and fourth circles [of fifths] upwards and downwards," including the conjunct chromatic mediant regions. The modulation from C major to A major (**SM**), for example, occurs through the common dominant between A minor and major. The modulation moves first to **sm**: V, with the minor elements becoming liquidated, preparing for the arrival of **SM**. See *Theory of Harmony*, 209-15.

regions in this group share one common tone with the principal tonic triad, except for the tonic minor, which shares two tones.

The distinction between classes 1-3 and classes 4-5 is especially apparent comparing classes 3 and 4. The regions in class 3 are derived from class 2 through modal interchange or enharmonic equivalence. They are all related by a consonant third to the principal tonic, whether by a real interval or its enharmonic equivalent. For example, modal interchange on the flat mediant and submediant generates the flat mediant minor (**bm**) and flat submediant minor (**bsm**). The other regions are registered as combinations of third-relations, such as **MM** and **Mm**. Their inclusion in the group is on the basis of their enharmonic equivalence to regions in the second class or the two remote mediants already generated by modal interchange: **MM** is enharmonically equivalent to **bM**, while **Mm** is enharmonically equivalent to **bsm**.

The two flat mediant minors have a special status as the most remote regions whose tonics are consonant intervals away from the principal tonic. While their scales share only one or two tones (including the raised seventh) with the principal tonic scale, their generative triads share one common tone with the principal tonic minor triad. When a tonal narrative reaches such remote regions, they generate a very strong centrifugal force; at the same time, they retain a faint thread back to the principal tonic via its parallel minor. Schubert's D. 894/i (in G major) illustrates this. In the development, B $\flat$  minor is significantly established early in the section. It returns late in the section (mm. 106-10), and the modulatory path back to the principal key confirms its relation as flat mediant minor on the global tonal spectrum. The passage in B $\flat$  minor, chromatically emphasizing its dominant, is transposed by a minor third into G minor. This happens to be the tonic-minor region (governing mm. 111-15), and the emphasis on its dominant becomes the preparatory dominant for the return of the principal key. The modulatory

path from the flat mediant minor to the principal key can be broken into three fundamental steps. For the first two steps, B $\flat$  minor (**bm**) connects to G minor (**t**) through the closely related B $\flat$  major (**bM**); the third step is the modal interchange of G minor to major. In this study, I place the flat mediant minor in the category of third-degree fully remote regions from the principal tonic in the tonal narrative approach. It is not in the most remote category of very remote relations, since the B $\flat$  tone connects the generative tone of **bm** to the generative triad of **t**, providing the faint thread back to **T**.

The regions in class 4, "Indirect and Remote," all have generative tones a dissonant second from the principal tonic.<sup>138</sup> They are also all connected to the global tonic through the subdominant: they are derived either as a combination of a lower fifth and a close third-relation, or of two lower fifths. The dorian (**dor**) region is understood as the subdominant's submediant minor (**SDsm**). The supertonic (**S/T**) counts as **SDSM**, rather than the double dominant, in accordance with the boundaries of the chart of regions, which does not extend vertically above the dominant or below the subdominant. The Neapolitan (**Np**) region, however, does exceed these boundaries; it is generated as the subdominant minor's submediant major (**sdSM**). Schoenberg allows for reinterpretation of the regions marked **bMD** and **bm $\nu$**  on the chart of regions, considering them to be the double subdominant (**SDSD**) and double subdominant minor (**sdsd**) respectively, which also exceeds the chart's boundaries. All the regions in class 5, "Distant," have generative tones a semitone (chromatic or diatonic) or tritone from the principal tonic. They are generated through close and chromatic third relations applied to regions in classes 2-4.

---

<sup>138</sup> Ibid., 69.

Comparing some of the regions of classes 4 and 5 with the flat mediant minors from class 3 reveals disparities due to Schoenberg's prioritization of generative-triad commonality over scale-content similarity in deciding the classes. The flat submediant minor from class 3 (A $\flat$  minor with respect to a C major global tonic) has a root (local tonic) which is consonant with the principal tonic; however, it has only one tone in common with the global tonic scale (the raised seventh).<sup>139</sup> Schoenberg places the dorian region into the more remote class 4, on account of the dissonance between its root and the principal tonic. This is despite the fact that it derives from the directly related dorian mode, that its scale contains only two tones foreign to **T** (one of which is the raised seventh degree), and that its triad is a diatonic triad in the principal key. Similarly, another region from class 4, the supertonic major (**S/T** in Schoenberg's nomenclature), also contains only two tones foreign to **T**. Schoenberg's classification of **dor** and **S/T** does not seem to value their high degree of scale-content similarity with the principal tonic scale, or how they could be derived from **T** via only two fundamental steps compared with the three fundamental steps connecting  $\flat m$  or  $\flat sm$  to **T**.

This study offers a balance between scale-content similarity and generative-triad commonality by counting the number of fundamental steps between a region and the principal tonic (or referential region) in order to determine the degree of centrifugal force generated. For example, in the tonal narrative approach, the supertonic major (**S/T**) is a second-degree or *moderately-remote* relation because it is generated by two fundamental relations, as the dominant of the dominant. This could be represented as **DD**. The mediant and submediant majors (**M** and **SM**) are also moderately-remote relations to the principal tonic, as parallel majors of the close

---

<sup>139</sup> I include the raised leading tone when counting foreign and common tones between scales. I consider enharmonic pairs such as B and C $\flat$  to be different tones for the purpose of determining regional distance or spatial-CF force.

mediants. The double dominant, **DD**, shares more scale-content with the principal key than the mediant majors, but **M** and **SM** display more generative-triad commonality, owing to the single common tone between their generative triads and the principal tonic triad. The same applies to the flat mediant and submediants, which are also second-degree, moderately-remote relations of the principal tonic because they are the close mediant relations of the tonic minor, a first-degree relation. The flat mediant and submediant minors (**bmb**, **bsmb**) generate an even stronger degree of centrifugal force because they are three fundamental steps from the origin. They are fully remote relations, as the parallel minor of the flat mediants, which are moderately-remote.

#### 2.4. Multiple tonal spectra and reference points

When analyzing kinetic-tonic passages especially, the degree of centrifugal force should correlate with the modulatory path. In a modulatory sequence, each modulatory move travels further away from the diatonic boundaries of the initiating region. The centrifugal force generated by the goal region is based on the number of fundamental steps measured from the initiating region, reflecting the modulatory path. For example, in the development section of Mozart's K. 533/i in F major, there is a modulatory sequence by ascending fifths from the initiating region, C minor, to the goal region A major, which functions as a chromatically intensified **d: V**. What degree of CF force does the goal region and the modulatory sequence overall generate? Tracing the modulatory path, the first step is an ascending fifth (mode preserved) from C minor to G minor; the second is an ascending fifth from G minor to D minor; the third and fourth steps are an ascending fifth plus parallel major, from D minor to A major.

In this case, we may apply the expanded dimensions of Weber's table of key relations, where the vertical lines are not restricted to a single fifth above and below the tonic, but rather

extend to as many as seven fifths in the sharp and flat directions. The use of letter names for keys and the wide dimensions of the lattice, in both vertical and horizontal dimensions, also invites the user to flexibly choose a tonic from any of the letter names: this allows for regions other than the principal tonic to be chosen as temporary central terms or points of origin from which to measure centrifugal force. Regions that govern a fixed-tonic passage, or articulate a modulatory phase as its initiating or goal region, generate temporary tonal spectra in which they function as the tonic or point of origin. These tonal spectra then connect back to the principal spectrum when large-scale centripetal motion elucidates the connection of remote modulatory goals to the principal tonic.

Schoenberg's chart of the regions, on the other hand, is based on the theory of monotonicity. In this conception, there is only one principal tonic. All regions appearing at any point in the piece are related back to that principal tonic on a single chart of regions for the entire piece.<sup>140</sup> This works well for large-scale relationships between keys that govern fixed-tonic passages, which are in opposition to one another. For example, it is useful to understand the relationship between the principal and subordinate keys (C and E major) in the *Waldstein* sonata as a second-degree, moderately remote mediant relationship that generates more centrifugal force than that between C and G major.

A passage or section in a governing key that is not the principal key of the piece may also involve chromatic enrichment that suggests other regions, which may even be fleetingly indicated. This manifestation of Schoenberg's first function, chromatic intensification of a prevailing key, is common in the group of subordinate themes in sonata expositions. This typical situation already reveals the problems of using a single tonal spectrum for analysis. Instead, the

---

<sup>140</sup> See Schoenberg, *Structural Functions*, 19-21.

subordinate key creates its own, temporary tonal spectrum. When the global dominant has already been established as the prevailing key of the group of subordinate themes, the V of V chord suggests the dominant region of the subordinate key; this region (in this context) does not relate directly back to the principal key as dominant of the dominant. There are often multiple regions suggested or indicated within the section in the subordinate key, so the subordinate-key spectrum has a significant role to play in the tonal narrative.

Kinetic-tonic passages or sections create a more complex system of relationships. The previously prevailing key, which may be a subordinate key, acts as a reference point for the first new region of the section. For example, in sonata form the centrifugal force of the first new region in the development is measured from the subordinate key that governed the second half of the exposition. At the beginning of the development section, the kinetic-tonic principle of modulatory movement in a single prevailing sharp or flat direction overcomes the cadential principle substantiating a single key. Therefore, in kinetic-tonic passages, special criteria may be used to determine which region acts as a reference point from which to measure the centrifugal force generated by regions in the sequence.

The initiating region marks the change from fixed- to kinetic-tonicality, from the cadential principle to the centrifugal sequential principle: therefore, it functions as the reference point and origin. The number of fundamental steps taken from the origin becomes the unit of measurement of centrifugal force, so that centrifugal force corresponds to an actual degree of modulatory movement. Therefore, the initiating region generates its own temporary spectrum, upon which the regions of the modulatory phase or sequence are represented. Crucially, the initiating region acts as one reference point for gauging the centrifugal force of the goal of the modulatory phase or sequence, often the culmination of centrifugal force.



Just as the initial region of a kinetic-tonic section and modulatory phase can be meaningfully related to the previously prevailing key, the goal region can also be usefully related forward to the next prevailing key (returning to prolonged fixed-tonicality). Typically, this is the principal key, since repertoire covered in the tonal narrative approach relies existentially on the reassertion of the principal key at the end of a kinetic-tonic section. The goal region might also be related to the previously governing key, as the most recent key to govern a fixed-tonic passage. This applies, then, to modulatory transitions in expositions that move to the dominant of the dominant as the goal of the short modulatory phase: this goal can be related to the previously established principal key.

The relationship of regions in kinetic-tonic passages may be summarized in the following statements:

- 1) A region in the middle of a modulatory sequence or phase relates only to the initiating and goal regions of the same sequence or phase.
- 2) An *initiating region* relates to both i) the previously governing key (confirmed cadentially), ii) the goal region of the same modulatory phase, and iii) the subsequent governing key (confirmed cadentially, this is often the principal key).
- 3) The *goal region* of a modulatory sequence or phase relates to i) the initiating region of its sequence/phase, ii) the previously governing key (established cadentially), and iii) the subsequent governing key (established cadentially).

This subject will be examined further in section 3.8.2, "Regional hierarchy in kinetic-tonic passages."

The tonal narrative approach aims to find a middle ground between concepts of key/regional relationships that emphasize or only admit relationships between temporally contiguous regions, and Schoenberg's monotonicity. Donald Francis Tovey's idea of key relationship is reflected in the use of temporary spectra organized around a confirmed subordinate key, and spectra based on initiating or goal regions of modulatory sequences: structural pillars of modulatory sections. For Tovey, key relations are only relevant between keys that are in temporal succession, directly following one another: "Key relationship is expressed only by the immediate contrast of the keys concerned."<sup>141</sup> Schoenberg's concept of monotonicity, on the other hand, relates all regions to the principal key of the piece, the one true tonic, as evident in his analyses of development sections in *Structural Functions of Harmony*.<sup>142</sup> The tonal narrative approach aims to combine and mediate between these two views, flavoring Schoenberg's monotonicity with an element of Tovey's sensitivity to relationships between temporally adjacent keys. Drawing on Schoenberg's monotonic view, this study allows for structurally emphasized regions to relate to the principal key despite not being in temporal succession. On the other hand, it ensures that non-structural regions only relate to those structural regions or prevailing keys to which they are in temporal contiguity. In the case of fixed-tonic sections, this means that a foreground region relates only to the prevailing key, whether this prevailing key is the principal key or a subordinate key. For kinetic-tonic sections, the foreground region usually lies in the middle of a modulatory sequence, and therefore only relates meaningfully to the initiating and goal regions of that particular sequence.

## **2.5. A tonal spectrum as a synthesis of Weber's and Schoenberg's maps**

---

<sup>141</sup> See Donald Francis Tovey, *Companion to Beethoven's Pianoforte Sonatas* (London: Associated Board, 1931), 7.

<sup>142</sup> Schoenberg, *Structural Functions*, 145-64.

The tonal spectrum for the tonal narrative approach synthesizes Weber's and Schoenberg's maps of tonal space. It uses scale-degree symbols to denote regions, as in Schoenberg's chart of the regions; I modify some of the symbols in order to show the degrees of centrifugal force more directly. Each symbol denoting a region will show the number of fundamental steps, corresponding to degrees of spatial-centrifugal force, through the addition of # and b where necessary. These symbols usually refer to the thirds of the generative triads; thus, they often match some roman-numeral representations of chromatic-harmonic degrees. For example, given a major tonic, I represent the mediant major as **M#** rather than **M** in order to show two fundamental steps in the sharp direction from **T**. **T** to **m** is one fundamental step, while **m** to **M#**, parallel minor to major, is a second fundamental step. This terminology clearly shows the degrees of spatial-CF force generated by each region; the number of units in each symbol denotes the degree of spatial-CF force. For example, if C major is **T**, then E minor is the mediant or **m** and E major is the mediant major or **M#**. E minor's scale has only two tones foreign to C major's scale, but E major's scale has four tones foreign to C major; the E-minor triad shares two common tones with the C-major triad, but the E-major triad shares only one common tone with C major. The symbol **m** shows that E minor is a close relation to C major, generating just one degree of spatial-CF force; the symbol **M#** shows that E major is a moderately remote relation from C major, generating two degrees of spatial-CF force.<sup>143</sup>

The tonal narrative approach adapts Weber's extended line of fifths in the vertical dimension. It allows for differently configured charts based on the centrifugal range or trajectory of a given section or piece. A standard chart will present two fifths above and below the tonic,

---

<sup>143</sup> Note that each unit in a relational symbol could consist of one or two letters; **m** is one unit meaning mediant just as **sm** is also one unit meaning submediant.

but this may be extended or reduced according to the situation; the same applies for the horizontal direction. This study also employs multiple spectra for measuring the centrifugal force generated by regions in a given passage. Regions governing a fixed-tonic section or initiating and goal regions (harmonic pillars) in modulatory sections generate their own tonal spectra in which the generative region becomes the temporary tonic or reference point. The principal spectrum unifies and subordinates the temporary spectra: most or all governing or structurally significant regions relate back to the principal tonic.

We have discussed above how modulation or modulatory motion is articulated in terms of a number of fundamental steps from the principal tonic, a governing region, or an initiating region. This articulation into fundamental steps differentiates regions into four or more degrees of remoteness from the tonic or reference point. This builds on Weber's differentiation of keys based on degrees of relatedness/remoteness.<sup>144</sup> For relations between prevailing keys (of fixed-tonic sections) three or four fundamental steps is a maximum because regions three steps from the reference point already include regions six or seven sharps or flats from the principal key on the circle of fifths, where the sharp and flat sides converge. In more extensive development sections, the number of fundamental steps travelled between regions sometimes exceeds four; analyses in chapter 4 and 5 will present modulatory trajectories travelling six, ten, and twelve fundamental steps to the point of furthest remove.

The emphasis on differentiating degrees of distance between regions as degrees of centrifugal force shares some common features with Patricia Carpenter's approach. One difference is that Carpenter's analyses stay closer to Schoenberg's original classification of the regions, while this study counts fundamental steps to ascertain distances between regions and to

---

<sup>144</sup> Weber, *Theory of Musical Composition* 309-12.

measure the centrifugal force of a modulatory trajectory. Another difference is that Carpenter's approach focuses on a *Grundgestalt* or basic tonal shape and its transformation throughout the piece, while the tonal narrative approach emphasizes the interplay of sharp and flat shades and trajectories.<sup>146</sup>

In this study, regions are divided into the following groups according to distance: *close*, *moderately remote*, *fully remote*, and *very remote*. Regions in modulatory trajectories exceeding four fundamental steps are considered extremely remote. The close regions generate a slight to moderate amount of centrifugal force, since they create a significant key-area dissonance against the principal tonic or reference point. Moderately remote regions generate a moderately strong centrifugal force, based on their greater key-area dissonance. Remote and very remote regions generate very strong and extremely strong centrifugal forces with respect to the reference point.

The regions for a major tonic are categorized and presented in three tables below, according to their degrees of centrifugal force from the reference point or principal tonic. In table 2.5, the regions are indicated with scale-degree letters. In table 2.6, C major is assumed to be the principal tonic, and the regions are indicated with letter names. In the first two tables, the regions are also differentiated according to the predominance of fifth- or third-relations. Table 2.7 presents the regions with sub-categories for degrees of spatial-CF force, according to generative-triad commonality. Sub-category (a) refers to regions with high or some generative triad commonality and (b) to regions with no generative triad commonality. As discussed above, degrees of generative-triad commonality correlate with the number of common tones between a

---

<sup>146</sup> See Carpenter, "Grundgestalt as Tonal Function," 15-38; and Carpenter, "A Problem in Organic Form: Schoenberg's Tonal Body," *Theory and Practice* 13 (1988): 31-63.

region's generative triad and the principal tonic triad, and consonance between the region's generative tone and the principal tonic.

Table 2.5. Categorization of regions based on a major tonic, according to degrees of centrifugal force. Uses scale-degree names adapted from Schoenberg's chart of regions.

Name	Degree of CF force	Sharp-side Fifth-relations	Sharp-side Third-relations	Flat-side Fifth-relations	Flat-side Third-relations
1. Close	Moderate	<b>D</b>	<b>m, sm, dor</b>	<b>SD, [dor]</b>	<b>t</b>
2. Moderately remote	Strong	<b>DD, [mv]</b>	<b>M#, SM#, mv</b>	<b>sdb, SDSD, vb</b>	<b>bM, bSM</b>
3. Fully remote	Very strong	<b>[D<sup>3</sup>]<sup>147</sup>, mv<sup>2</sup></b>	<b>M#sm, SM#sm, mD#</b>	<b>SD<sup>3</sup>, sdbsd</b>	<b>bmb, bsmb, bSMSD</b>
4. Very remote	Extremely strong	<b>m(D#)<sup>2</sup>, [D<sup>4</sup>]</b>	<b>(SM#)<sup>2</sup>, (M#)<sup>2</sup>, M#SM#, M#m</b>	<b>bSM(SD)<sup>2</sup></b>	<b>bmbM, bsmbM, (bSM)<sup>2</sup></b>

Table 2.6. Categorization of regions according to degrees of CF-force from C major as principal tonic. Major regions in capital letters, minor in small letters.

Category	Degree of CF force	Sharp-side Fifth-relations	Sharp-side Third-relations	Flat-side Fifth-relations	Flat-side Third-relations
1. Close	Moderate	G	e, a, d	F, d	c
2. Moderately remote	Strong	D	E, A, b	f, Bb, g	Eb, Ab
3. Fully remote	Very strong	[A], f#	c#, f#, B	Eb, bb	eb, ab, Db
4. Very remote	Extremely strong	F#, [E]	F#, G#, C#, g#	Gb	Gb, Cb, Fb

Table 2.7. Categorization of regions according to degrees of CF-force including sub-degrees based on generative triad commonality.

Main category	Sub-category (based on generative-triad commonality)	Sharp-side regions	Flat-side regions
---------------	--	--------------------	-------------------

<sup>147</sup> The inclusion of **D<sup>3</sup>** and **D<sup>4</sup>** here, which are equivalent to **SM#** and **M#**, is a special case only pertaining to modulatory sequences by ascending fifths.

1. Close	a) one or two common tones with principal tonic triad	<b>D, sm, m</b>	<b>SD, t</b>
	b) Zero common tones	–	<b>dor</b>
2. Moderately remote	a) One common tone with principal tonic triad	<b>M#, SM#</b>	<b>bM, bSM sdb, vb</b>
	b) zero common tones	<b>DD, mv</b>	<b>SDSD</b>
3. Fully remote	a) Consonant interval (minor third) from principal tonic note (small degree of generative triad commonality).	–	<b>bmb, bsmb</b>
	b) Dissonant interval from principal tonic note	<b>M#sm, SM#sm, mD#</b>	<b>sdbsd, bSMSD</b>
4. Very remote	All regions have zero scale-functional congruity	Same as table 2.5	Same as table 2.5

The group of close relations consists of the upper and lower dominants, the diatonic mediant, the parallel region, and the dorian region. The moderately remote, second-degree group consists of the parallel minors to tonic, subdominant, and dominant; all four regions generated from chromatic mediant; the double dominants and subdominants; and the regions built on a combination of dominant and the diatonic major-third relation. Those regions whose tonics are consonant with the principal tonic share a moderate degree of generative-triad commonality with it. Each of these regions' generative triads also shares a common tone with the principal tonic triad. The other regions in this group could be considered more remote on account of the absence of generative-triad commonality, based on the dissonance between their generative tones and the principal tonic (see table 2.7). They are included in this group due to their higher scale-content similarity with the principal tonic scale.

The group of fully remote regions includes some regions that share two or fewer tones in common with the principal key, such as the flat mediant minors discussed above. It also features

regions that have as many as three or four tones in common with the scale of the principal key, such as F# minor or C# minor with respect to C major as principal key. These regions, however, feature a generative tone that is strongly dissonant with the principal tonic, and share no common harmonies with the tonic key: there is a complete absence of generative-triad commonality. The very remote regions include only regions whose generative tones form strongly dissonant and chromatic intervals with the principal tonic.

In the tonal narrative approach, since regions are interpreted according to the combination of fundamental relations moving in a sharp or flat direction away from the reference point or principal key, they retain their identity based on the path of modulation. Schoenberg also emphasizes the need to express regions according to the path by which they are introduced when discussing Brahms' Third Symphony in the section on *Durchführungen*: "For a real understanding of the modulatory procedure it is necessary to "register" the regions according to the way they are introduced."<sup>148</sup> Thus, in relation to a C major principal tonic, Fb major is not automatically converted enharmonically to E major and considered only moderately remote, but it is very remote due to the four fundamental steps needed to reach it. Remote and very remote regions are therefore often interpreted as having a dual identity: one based on the modulatory path and one that connects it more closely to the principal key, due to the cohering power of equal temperament, which limits the octave to twelve semitones, and likewise the circle of fifths to twelve notes. The dual identity of regions forming enharmonic pairs will be explored in more detail in section 4.5.

It should be noted that the extension of the chart in the vertical dimension beyond two fifths pertains only to modulatory sequences or phases. In these cases, the centrifugal force

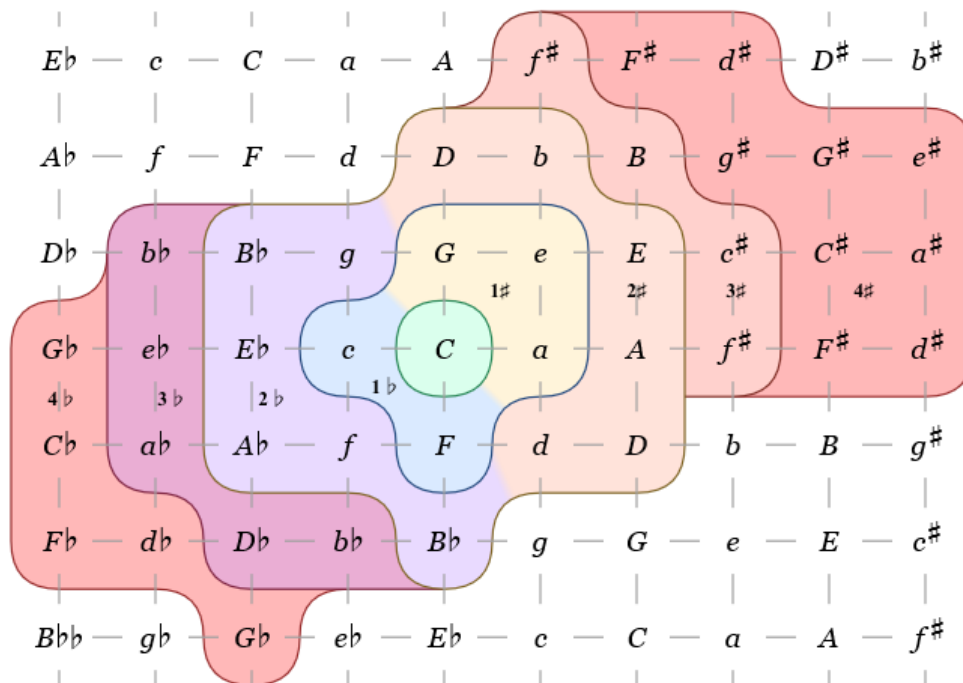
---

<sup>148</sup> Schoenberg, *Structural Functions*, 162.



should correspond to the number of modulatory steps in a particular direction, even if the region may be approached through fewer fundamental steps by another route. This applies to the chromatic mediant regions, such as E and A major with respect to a C major tonic. In a fixed-tonic situation, they almost always relate as moderately remote relations via the mediant plus parallel fundamental steps. In kinetic-tonic passages, they might be approached by three or four fifths, creating a stronger centrifugal force due to the modulatory path.

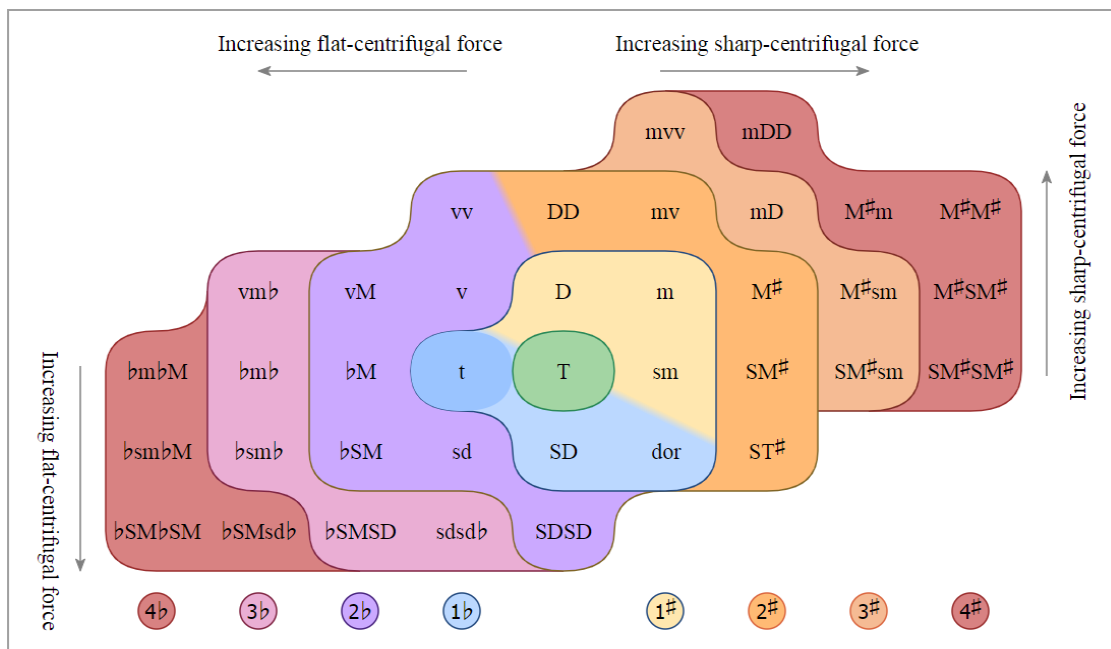
Figure 2.5. Gottfried Weber's *Tonartenverwandtschaft*, reduced and annotated with four degrees of spatial centrifugal force on sharp and flat sides, based on five fundamental relations



Here I present the regions visually on the spectrum, by combining the layout of Weber's Table of Key Relations with scale degree symbols from Schoenberg's Chart of Regions. Figure 2.5 below shows Weber's *Tonartenverwandtschaften*, annotated to show a C major principal tonic, and with degrees of spatial-centrifugal force based on number of fundamental steps, with

five rather than four fundamental relations recognized. The tonal spectrum of the tonal narrative approach substitutes the letter names with the scale degree names. This tonal spectrum also incorporates a color scheme that draws from Goethe's Theory of Color (*Farbenlehre*) and color wheel. The connections between Goethe's *Farbenlehre* and harmonic space will be elucidated in the following section.

Figure 2.6. Tonal Spectrum organized around a major tonic (T). Scale degree symbols show the relationships



Tables 2.8, 2.9, and figure 2.7 present the regions organized around a minor tonic. The criteria for determining degrees of remoteness are the same as for a major tonic.

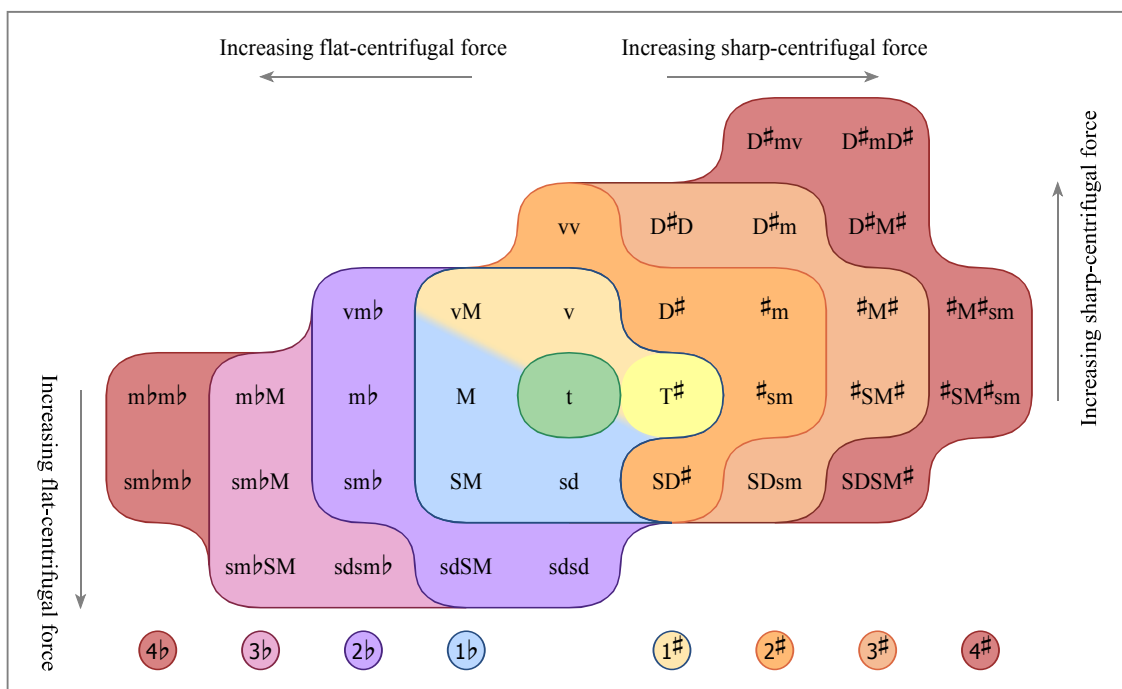
Table 2.8. Classification of regions based on a minor tonic, according to degrees of centrifugal force. Uses scale-degree names adapted from Schoenberg's chart of regions.

Degree of spatial CF-force, i.e. distance	Sharp-side regions	Flat-side regions
1. Close	v, vM, T#	sd, SM, M
2. Moderately remote	D#, SD#, #m, #sm, v <sup>2</sup>	mb, smb, sdSM, sdsd
3. Remote	#M#, #SM#, D#m, D# <sup>2</sup> , SD#sm	mbM, smbM, sdsmb, smbSM, vmb
4. Very remote	#SM#sm, #M#sm, D#mv, D#mD#	mbmb, smbmb

Table 2.9. Classification of regions based on A minor as tonic

Degree of spatial CF-force, i.e. distance	Sharp-side regions	Flat-side regions
1. Close	e, G, A	d, F, C
2. Moderately remote	E, D, c#, f#, b	c, f, Bb, g
3. Remote	#C, F#, g#, B, b	Eb, Ab, bb, Db
4. Very remote	d#, a#, d#, D#	eb, ab

Figure 2.7. Tonal Spectrum organized around a minor tonic (t)



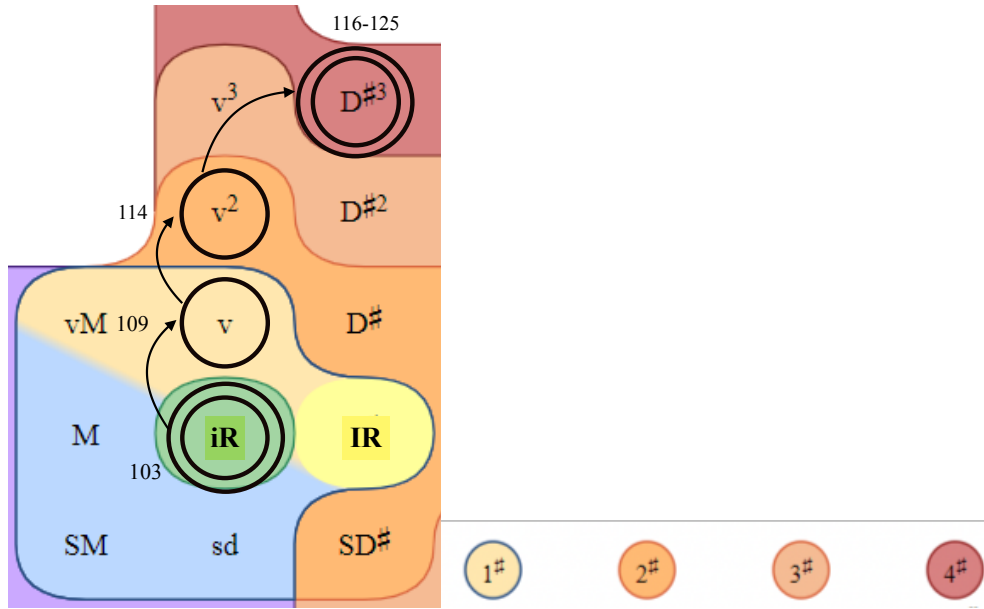
I now return to the development section of Mozart's K. 533, discussed briefly in section 2.4. Figure 2.8 represents two phases of the development section and the global progression of regions for the whole movement. The first phase is centrifugal, a modulatory sequence from the initiating region, C minor, to the point of furthest remove (PoFR) three fifths above. The spectrum on the left-hand side presents this first phase, based on **iR** as the reference point, a substitute for **t**. It extends three fifths in the vertical direction to accommodate the ascending fifth interval of the modulatory sequence. The second phase is centripetal, returning to the principal key. The spectrum on the right-hand side presents this centripetal phase, based on the principal tonic for the whole piece, **T** (F major). Circles denote the regions appearing in each phase, with measure numbers referring to their arrival. Double circles emphasize the structural significance of initiating and goal regions. The box around the principal tonic corresponds to its structural primacy. The thick line connects the PoFR with its generating region a fifth below, creating a hybrid region of local tonic and dominant (D minor and A major). Note that the measure number for the return to the tonic key precedes the beginning of the recapitulation, which is at m. 146.

The graph of the centrifugal phase shows how the modulatory sequence moves from the initiating region (C minor) by ascending fifths to G minor, which is close to C minor. I register this as **iR: v**, showing how G minor is the minor dominant of C minor. This differs from Schoenberg's more strictly monotonal reading of regions in development sections. Based on the analyses in the *Durchführung* section of *Structural Functions*, Schoenberg would have read the G minor with respect to the principal key (F major) as **dor**. As the middle region in a sequence of regions, G minor seems to relate more meaningfully to the region that initiated the sequence, C minor, than to the principal key; therefore, my interpretation follows Tovey's approach in

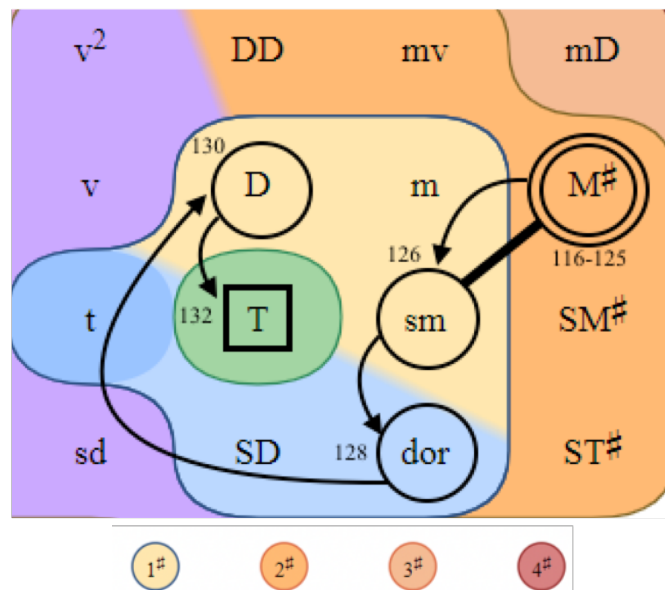
emphasizing the temporally contiguous relationship — the fifth relation from C minor to G minor.

Figure 2.8. Mozart, Sonata in F major, K. 533/i, represented on the tonal spectrum.

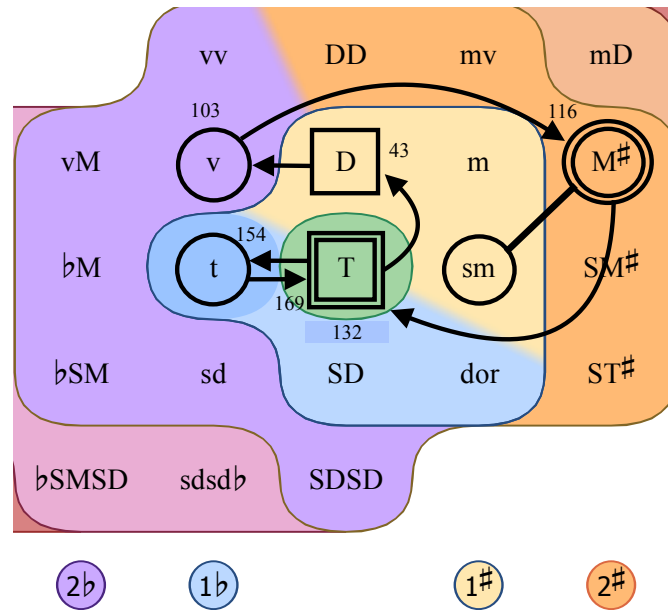
**a) Centrifugal phase:** modulatory intensification in sharp direction to PoFR  
**iR** = C minor



**b) Centripetal phase:** return from PoFR, **T** = F major



c) Global progression of regions, T = F major



The progression continues by ascending fifths from G minor to D minor, registered as **iR: v<sup>2</sup>**, a moderately remote relation to C minor, thus generating a stronger centrifugal force. The final modulatory step by ascending fifths happens within the context of D minor as a key, moving to **iR: v<sup>2</sup>: V**. Since it is chromatically emphasized and prolonged as a standing dominant, without any stronger confirmation of D minor as a prevailing key, the tonal narrative approach registers A major as **iR: v<sup>2</sup>D<sup>#</sup>**, meaning that it is three fifths plus the parallel major from the initiating region, making four fundamental steps, generating a very strong CF force. The progression of regions stops at the prolonged A major as **d: V** (mm. 116-25) and reverses direction from m. 126, therefore making it the goal of the centrifugal phase. The modulatory trajectory of four steps is the longest for the whole movement, making A major as **d: V** the point of furthest remove.

The centripetal phase returns by descending fifths, moving through the dominant in its major form back to the principal tonic (126-46). Since A major is the goal region of the modulatory sequence, it has structural significance; thus, we can read it with respect to the principal key as **M#**. This is further justified by the fact that the progression of regions leads by descending fifths back to the principal key, the next structural arrival. The progression of regions transfers the standard descending fifths progression (I)-iii-vi-ii-V-I to a middleground level, giving further justification for emphasizing A major as **M#**, a moderately remote third relation of the principal key on the sharp side.

When the initiating and goal regions are tracked back onto the principal spectrum (see figure 2.8.c), we notice that they are both moderately remote regions of the principal tonality, and that the overall trajectory moves from a moderately remote flat-sided region (**v**) to a moderately remote sharp-sided one (**M#**). The appearance of the tonic minor in the recapitulation is also notable; its flat-CF force balances the second-degree sharp-CF force of the **M#** goal of the development's modulatory sequence.

The full spectrum of degrees of tonal-spatial centrifugal force will now be presented in terms of a metaphorical comparison with Johann Wolfgang von Goethe's color wheel. For Goethe, all colors are derived from light and dark, represented by yellow and blue as fundamental colors; these correspond to the sharp and flat sides of the tonal spectrum, respectively. All other colors are then generated through a process of intensification of both light and dark sides; this process culminates in pure red, corresponding to the most remote regions of the tonal spectrum. This metaphor has been chosen for the dynamic and transformative manner in which the spectrum is generated, yielding an archetypal image that is at the same time enduring and engaged in a process of becoming.

## 2.6. Goethe's color wheel as a metaphor for the tonal spectrum

Some of the most compelling theories of harmony have strong metaphorical resonances with science and philosophy. For example, Thomas Christensen has elucidated how two of Rameau's archetypal harmonic models (discussed in chapter 1) draw upon Cartesian and Newtonian paradigms respectively. In the earlier model, dissonance and the descending-fifth resolution act as a causative force driving harmonic motion from a consonant tonic, through dissonant dominant chords, to another consonant tonic. This model draws on the mechanistic Cartesian philosophy that dominated the seventeenth century. In this paradigm, all matter exists in one of two states: inertia (rest) or motion. All phenomena in the universe can be reduced to mechanical cause-and-effect relationships involving matter impacting upon matter.<sup>149</sup> In the same way, Rameau's early model is founded on the mechanical process of dissonant dominants creating motion toward the inertia of consonant tonics.<sup>150</sup>

Contrastingly, Rameau's later model, which presents a central tonic surrounded by its upper and lower dominants, has clear resonances with Newton's theory of gravity. This model is based on the mutual attraction of these dominants to the central tonic, which holds the whole system in equilibrium. While the mechanistic model focuses on a clear succession of dissonant dominants towards a consonant tonic, the gravitational model focuses on the attractive nature of the tonic. For each harmonic model, the connections to science and philosophy that Christensen brings out highlight the fundamental aesthetic basis of each. Furthermore, the contrasting orientation of each model in representing harmonic meaning is emphasized by the opposing philosophical basis.

---

<sup>149</sup> Christensen, *Rameau and Musical Thought*, 103.

<sup>150</sup> *Ibid.*, 107.



The tonal narrative approach also draws upon a scientific-aesthetic paradigm as an aesthetic basis for analysis. The chosen paradigm is Goethe's science, particularly his Theory of Color (*Farbenlehre*). The tonal narrative approach is founded upon two principles that Goethe considered the driving forces of nature: polarity (*Polarität*) and intensification (*Steigerung*). These two forces manifest particularly strongly in Goethe's *Farbenlehre*. In this theory, all colors are generated from the fundamental polarity of light and dark represented by the basic colors yellow and blue. Green results from the mixture of the basic colors, but all other colors are generated through a process of intensification that leads toward pure red. This theory resonates metaphorically with the tonal spectrum organized into sharp and flat sides, emanating outwards from close to more remote regions, corresponding to an intensification of centrifugal force. While Goethe's theory of color has been rejected by modern science, the tonal narrative approach draws upon its aesthetic resonance with the process of harmonic generation and the tonal spectrum.

Goethe's science influenced Schoenberg's theories of tonal harmony and form, discussed above. Severine Neff has insightfully drawn attention to the connections between Goethe's science and some of Schoenberg's core concepts.<sup>151</sup> She points to Schoenberg's comment "I believe Goethe would be quite satisfied with me" upon discovering the germinal series for the third movement of his Wind Quintet op. 26, and remarks by Webern referring to Goethe's *Urpflanze* as a metaphor for thematic organicism, as evidence for Goethe's "exceptionally powerful influence on Schoenberg."<sup>152</sup> Neff also identifies Schoenberg's chart of regions as a musical equivalent to Goethe's *Urpflanze*: Schoenberg's chart presents an archetype of tonal

---

<sup>151</sup> Severine Neff, "Schoenberg and Goethe: Organicism and Analysis," in *Music Theory and the Exploration of the Past*, ed. Christopher Hatch and David Bernstein (Chicago: Chicago University Press, 2006), 409-36.

<sup>152</sup> Neff, "Schoenberg and Goethe," 409.

space. Goethe also used the terms centrifugal and centripetal, so integral to Schoenberg's concept of harmony, in his study of the metamorphosis of plants: centrifugal force is the outward growth into various structures such as the leaf or cotyledon, while centripetal force is the inward motion back to the central stem.

While such specific references from Schoenberg's pen may be scarce, Goethe's science was clearly a significant part of Schoenberg's intellectual climate in early twentieth-century Vienna, as John Covach points out.<sup>153</sup> Goethe's science was promoted in particular by Rudolf Steiner, who was a major participant in Viennese intellectual life from the late 1880s and wrote books developing Goethean science. The visual artist Wassily Kandinsky, who developed a friendship with Schoenberg, also studied Goethe's science intensively and refers to it in his book *Concerning the Spiritual in Art*, published in 1911.<sup>154</sup> Schoenberg corresponded with Kandinsky enthusiastically about the book, which drew connections between shades of color and sound, as expressions of "soul emotions too fine to be expressed in words."

In Goethe's *Zur Farbenlehre*, the full spectrum of color is generated from the foundational polarity of light and darkness. The basic colors are therefore yellow, which is the color emerging closest to light, and blue, which is the color closest to darkness. Yellow is generated when a bright light is viewed through a slightly turbid medium. Likewise, blue is created when darkness is viewed through a turbid medium filled with light. The perfectly balanced combination of blue and yellow generates green.<sup>155</sup>

---

<sup>153</sup> John Covach, "Schoenberg and the Occult: Some Reflections on the Musical Idea," *Theory and Practice* 17 (1992): 103, 107-9.

<sup>154</sup> The first edition of Schoenberg's *Harmonielehre* was published in the same year. Covach, "Schoenberg and the Occult," 103.

<sup>155</sup> Goethe writes: "The qualities on either side do not cancel one another when the opposites are mixed. If brought to the point of balance where neither side is particularly noticeable, the mixture will acquire a new specific quality for the eye; it will appear as a unity without a trace of combination. We call this unity green." See Goethe, *Scientific Studies*, 268.

The light/darkness polarity as a basis for color matches closely with the characterizations of Tovey, Rameau, and Kurth of key relations with respect to a global tonic. For these three theorists, keys also divide into a polarity of shading and mood. For Tovey and Kurth, regions on the flat side are dark, shadowy, and sometimes warm, becoming more so as their distance from the tonic increases. Regions on the sharp side are bright and active, with Tovey hearing an element of mysteriousness in the more remote sharp regions. Tovey also associates the dominant direction with activity and the subdominant direction with "retirement," while Rameau makes a similar distinction between the strength and joy of the dominant direction, and the softness and tenderness of the subdominant.<sup>156</sup> Goethe's comments in the sixth and final chapter of the first part of his *Farbenlehre*, "On the Sensory and Moral Effect of Colors," make a similar connection between light/dark and active/passive dualities:

The colors on the plus side are yellow, red-yellow (orange) and yellow-red (minium, cinnabar). They bring on an active, lively, striving mood.  
The colors on the minus side are blue, red-blue and blue-red. They bring an anxious, tender, longing mood.<sup>157</sup>

Since green is a combination of equal amounts of yellow and blue, it sits between them on the color wheel, representing a perfect equilibrium between them. This can be taken to reflect Rameau's model of the tonic as a center of gravity between upper and lower dominants. In harmonic progressions, too, motion through the subdominant and dominant areas of the key best define the central tonic, as in archetypal cadences posited by Moritz Hauptmann, August Halm,

---

<sup>156</sup> See Donald Francis Tovey, "Harmony," in *The Forms of Music: Articles from the Encyclopaedia Britannica* (Oxford: Oxford University Press, 1957), 61; Tovey, "Tonality in Schubert," 136-37, 143-44; Rameau, *Observations sur notre instinct pour la musique* (Paris: Prault fils, 1754), quoted in and translated by Steblin, *A History of Key Characteristics*, 103-4.

<sup>157</sup> Goethe, *Scientific Studies*, 279.

and Hugo Riemann.<sup>158</sup> Furthermore, in the classic key-defining progression, as conceived by Rameau, both lower and upper dominants are furnished with a dissonance borrowed from the other dominant. Here, harmonic motion moves from the tonic to the subdominant with added sixth, changing via *double emploi* to a supertonic seventh harmony, on to the dominant seventh resolving to tonic (I–IVadd6 = ii<sup>6</sup><sub>5</sub> –V7–I).<sup>159</sup> This further unites the flat and sharp sides in leading back to the tonic, just as combining blue and yellow generates green.

Goethe's description of green in the section quoted above also correlates strongly with the concept of tonic in tonality:

The eye finds physical satisfaction in green. When the mixture of the two colors which yield green is so evenly balanced that neither predominates, the eye and the soul come to rest on the mixture as if it were something simple. We cannot and will not go beyond it. Thus, green is often chosen for rooms where we spend most of our time.<sup>160</sup>

Goethe imagines green to be a very simple and evenly balanced color, physically satisfying and associated with home. In the same way, the tonic is associated with home, for example when referring to the "home key," as well as complete simplicity. The return of the tonic evokes feelings of physical and psychological relief, or satisfaction, or both.

The other colors on the spectrum are generated through a process of intensification or *Steigerung*: concentration, saturation, or darkening of yellow on the plus side and blue on the minus side. They begin to manifest a reddish tint that becomes stronger as the intensification process continues, until the original yellow or blue is almost unrecognizable. The culmination of the whole process is the unity of these two intensified sides, which generates the most exalted

---

<sup>158</sup> Dahlhaus, *Studies on the Origins of Harmonic Tonality*, 41-44.

<sup>159</sup> Rameau, *Génération harmonique*, 109, 112.

<sup>160</sup> Goethe, *Scientific Studies*, 283.

color: pure red or *Purpur*. This unity is considered higher and more graceful than the merely beautiful and pleasant effect of the lower unity of yellow and blue to generate green:

The extremes of simple opposites produced a beautiful and pleasant effect when mixed. The intensified extremes will create an even more graceful color when mixed; indeed, we might expect to find the culmination of the entire process here. And, so it is: there arises the pure red we have often called pure red [*Purpur*] because of its exalted quality.<sup>161</sup>

The contrast between the pleasant beauty of green resulting from the mixture of simple opposites and the exalted, highly intense quality of pure red resulting from the union of the intensified extremes suggests the polarity between "beauty" and "the sublime," prevalent in the philosophy of Goethe's era.<sup>162</sup> Elsewhere in *Farbenlehre*, Goethe calls the mixture of simple opposites a lower mixture, associating it with commonness and earthly creation. By contrast, the union of intensified sides is a higher union, associated with highest nobility and heavenly creation.<sup>163</sup>

In terms of tonality, intensification corresponds to modulation and unidirectional modulatory movement, particularly modulatory sequences, where the "law of uniformity" disrupts the natural asymmetry of diatonicism. This process generates the remote regions (moderate to very remote), which are those regions whose generative triads contain tones foreign to the global tonic. Intensification on the plus (yellow) side generates various shades of orange, moving toward red, while intensification on the minus side generates shades of violet, from blue-violet to red-violet. Correspondingly, regions resulting from modal interchange to major are moderate to very remote relations on the sharp side, mapping onto orange; regions resulting from modal interchange to minor are flat-sided relations, mapping onto violet. In C major, E and A

---

<sup>161</sup> Goethe, *Scientific Studies*, 268-69.

<sup>162</sup> See Edmund Burke, *A Philosophical Enquiry into the Origins of Our Idea of the Sublime and the Beautiful* (Notre Dame, IN: University of Notre Dame Press, 1968).

<sup>163</sup> Goethe, *Scientific Studies*, 269, 296

major would be moderately remote relations to the sharp side and A $\flat$  and E $\flat$  flat major moderately remote to the flat side. This happens to correlate directly with Tovey's intuition about flat mediant regions being "purple patches in Mozart's second subjects."<sup>164</sup>

The application of a second modal interchange, or composite relations including a single modal interchange (e.g. the flat supertonic in a major key), and regions generated by equal interval series (e.g. the tritone-related regions) correspond to a stronger level of intensification, where orange and violet begin to converge upon red. Thus, the remote regions of the tonality are equivalent to red-orange and red-violet. The uniting of the two sides generating pure red can be compared with the uniting of the sharp and flat sides in the circle of fifths, creating the paradoxes and double natures of enharmonic opposites. In terms of the tonal narrative, the higher union of intensified extremes is a culmination of spatial-centrifugal force: a point of furthest remove (PoFR) or far-out point (FOP). At the turn of the nineteenth century, points of furthest remove became more remote on the tonal spectrum, as composers such as Mozart and Beethoven expanded the range of modulations centrifugally, involving more modulatory steps or leaps.

From the later compositions of Mozart and Haydn onwards, and also in many earlier ones, the arrival in remote regions engenders the paradoxes and double natures of enharmonic opposites. The point of furthest remove, far-out points, and the exploration of the double nature of enharmonic equivalence all correspond to Goethe's vision of pure red as the union of the intensified extremes. The enharmonic paradox may relate back from the FOP to a region appearing earlier in the tonal narrative; even more strikingly, an enharmonic switch may occur at the FOP itself. This is evident in Mozart's Piano Sonata K. 310 in A minor, in the first movement's development section. The pre-core continues in C major, the subordinate key and

---

<sup>164</sup> Tovey, "Harmony," 61.

globally **M**, but it begins to suggest F minor (**M: sd**) with the addition of the subdominant-functioning tones D $\flat$ , as chromatic neighbor tone, and B $\flat$ , which turns the C chord into a dominant seventh. At this point, there is a transformative turn back to the sharp side via an enharmonic switch: the B $\flat$  switches to A $\sharp$ ; the dominant seventh is reinterpreted as an augmented sixth chord to B major, appearing as a region due to the presence of its leading tone in the augmented sixth chord. Here, the tonal narrative makes a sharp turn away from the moderately remote flat area of the tonality and switches to a remote sharp-side area. With respect to the previously prevailing key, **M** (C major), B major is **mD $\sharp$** , i.e. the mediant's dominant major, three fundamental steps from C major.

A later example is Chopin's Mazurka in A Minor, op. 59/1. The first background intensification is the switch to the tonic major for the middle section; there are further intensifying modulations to G $\sharp$  minor, the background key of furthest remove, for the return of the main theme (m. 79). The centrifugal force intensifies further in the middleground dimension, with D $\sharp$  major being transiently defined as a middleground region of furthest remove, nine sharps from the global tonic. The following retransition to the tonic occurs through this region, reinterpreted enharmonically as E $\flat$  major, still a remote region from the principal tonic but less distant than D $\sharp$ . The enharmonic change here has a centripetal function, and this force increases as E $\flat$  becomes the flat supertonic to D major, the global subdominant major, which is transiently defined over a dominant pedal point. Being the major interchange of the subdominant, this region is only a slightly remote relation, and it returns to the principal key via the dominant in an expanded cadential progression.

The arrival at a remote region corresponds on the color wheel to one of the extremely intensified sides; however, the higher and exalted union of both sides of the tonality is truly

achieved through enharmonic switches, the working-out of enharmonic paradoxes, and/or moving through the enharmonic seam. These paradoxes reveal the simultaneity of extreme centrifugal force and the function of equal temperament as a systemically centripetal force unifying the tonality.<sup>165</sup> Thus, on a grand scale, the enharmonic paradoxes created by the region of furthest remove encapsulate the dynamic balance of centrifugal and centripetal forces that Schoenberg envisioned as the ultimate *musikalische Gedanke*.

The overall tonal narrative can be imagined in terms of a lower mixture or union of the basic polarities, the process of intensification, the contrast between regions or colors including those produced through intensification, and finally a higher union of the intensified sides. The metaphorical resonance between this archetypal tonal narrative and *Farbenlehre* is particularly strong when considering the way in which Goethe elucidated its conceptual foundations already in the essay "Polarity," from 1799, eight years before the publication of the first parts of *Zur Farbenlehre*.

Whatever appears in the world must divide if it is to appear at all. What has been divided seeks itself again, can return to itself and reunite. This happens in the lower sense when it merely intermingles with its opposite, combines with it; here the phenomenon is nullified or at least neutralized. However, the union may occur in a higher sense if what has been divided is first intensified; then in the union of the intensified halves it will produce a third thing, something new, higher, unexpected.<sup>166</sup>

---

<sup>165</sup> Goethe presents the notion that equal temperament is a systemically centripetal force in his essay "Problems," addressing four problems in scientific studies addressed to the botanist Ernst Meyer (1791-1858). He presents an interpretation of centrifugal and centripetal forces in nature in this essay. Centrifugal force is an innate force in Nature, involving development from an "unknown center" towards an "unknowable periphery." This process of metamorphosis is sacred but it also has the potential to destroy and dissolve form and knowledge. Its counterweight is centripetal force, interpreted as the drive toward definition and specificity of form and character, that endures without being changed by external factors. Goethe later implies that in music the "natural sequence of musical notes" is centrifugal force that is brought into coherence through equal temperament: "it is actually equal temperament that makes truly satisfying music of a higher kind possible, nature notwithstanding." Goethe, *Scientific Studies*, 43.

<sup>166</sup> Goethe, *Scientific Studies*, 155-56.



Goethe's summary of the whole process of color generation in part 4 of *Farbenlehre* is notably consistent with his earlier statement. In the later summary, he emphasizes the degrees of height, complexity, and nobility on each side of the *Farbenkreis*:

Two pure, primal opposites are the foundation of the whole. Then an intensification occurs by which both approach a third state. Thus, on each side there are degrees: lowest, highest, simplest and most modified, commonest and noblest. We speak of two combinations (mixtures and unions), one a combination of the simple, original opposites and the other of the intensified opposites.<sup>167</sup>

In the tonal narrative, the expansion of the basic cadence, usually featuring various foreground tonicizations and other chromatic substitutions, achieves the lower mixture of simple opposites to which Goethe refers. This is what Schoenberg described as the "enriched cadence" and usually occurs already in the main theme. The larger tonal motion, with modulations to more remotely related regions at middle and background dimensions, begins to approach the culmination, the exalted union of the intensified sides. Regions on both sides are placed in dynamic contrast, some closer, others more distant from the global tonic. Then the tonal narrative modulates even further from the global tonic, culminating at the most remote region, the climax of centrifugal motion. This process, together with the transformative power of enharmonic changes and paradoxes, produces the higher, exalted union of the intensified sides, generating pure red in the color circle. This is the ultimate synthesis of centrifugal and centripetal forces, the *musikalische Gedanke*.

---

<sup>167</sup> Ibid., 269.

## Chapter 3

### Tonal Narrative Functions and Key Hierarchy

#### 3.1. Introduction to tonal narrative functions

Schoenberg's archetype of the overall tonal narrative (*der musikalische Gedanke*), the chart of regions, and his four centrifugal functions suggest distinctive analytical features. These features are essential parts of the tonal narrative that combine and function in various ways to make up the whole: *tonal narrative functions*. As Goethe wrote, the more distinct the parts, the more perfect the whole; thus, a more worthwhile analysis may be achieved through a clear distinction between these functions, while finding general, even archetypal features for each.<sup>168</sup>

In Schoenberg's *musikalische Gedanke*, the dynamic interplay of centrifugal and centripetal forces result in intensifications of dissonance and centrifugal forces of various kinds leading to significant culminations of either force, often mixed with its opposite.<sup>169</sup> Representation of the progression of regions or harmonies on the chart of the regions shows three things pertinent to tonal narrative functions. First, the contrast and counterbalancing between sharp and flat regions on the spectrum, as well as between the more particular areas of the spectrum (for example, close sharp, close flat, moderately remote sharp, remote flat areas, etc.; see chapter 2). Second, the appearance of turning points, for example the reversal of motion from centrifugal to centripetal at the most remote region (maximum of spatial-CF force). Another example is the enharmonic switch or modulation from the sharp to flat side and vice versa. Third, the arrangement of regions into areas of the spectrum facilitates a judgement of the overall

---

<sup>168</sup> See Goethe, "The Purpose Set Forth," in *Scientific Studies*, trans. Douglas Miller (New York: Suhrkamp, 1988), 64.

<sup>169</sup> Schoenberg, *The Musical Idea*, 20-21, 62-63.

trajectory in terms of spatial completeness. Spatial completeness occurs when all the areas in a given range are touched upon or represented in the tonal narrative, as a whole or part. For example, a tonal narrative may visit close regions in all four of the closer areas, upper fifth, lower fifth, parallel, and third-relations: the attainment of spatial completeness within the closer areas. The addition of excursions to moderately-remote regions on the sharp and flat sides means that a higher level of spatial completeness is attained.

The three centrifugal functions (i.e. functions of chromaticism and modulation) also generate different tonal narrative functions.<sup>172</sup> The chromatic intensification or enrichment of degrees of a prevailing key generates a local type of centrifugal force, while the modulatory intensification function generates a larger-scale centrifugal force; each functions differently in the tonal narrative. Chromatic enrichment of progressions circumscribing a prevailing key often motivates the accumulation of temporal-centripetal force towards the cadential goal. This is a typical example of the interdependence of centrifugal and centripetal forces, with local centrifugal force from chromatic intensification of the prevailing key generating extra momentum leading toward a stronger cadential arrival, which creates strong temporal centripetal force.

The tonal narrative functions are listed below. They will be introduced, explored and examined through an analysis of Mozart's Piano Sonata in A Minor, K. 310, first movement, with reference to other, related works. The tonal narrative functions are:

- 1) Alternation/opposition between regions or consonance/dissonance (discussed in more detail in sections 1.2 and 1.3)

---

<sup>172</sup> Schoenberg presents four functions of chromaticism and modulation in Schoenberg, *Theory of Harmony*, 152-53. See 1.4 for further elucidation.

- 2) Intensification: accumulation of dissonance, local centrifugal force through enrichment of a prevailing key, or larger-scale centrifugal force through modulatory, kinetic-tonic passages
- 3) Culminations: goals of harmonic motion and maximums of centripetal or centrifugal force; often these maximums are combined with slighter and/or more local forms of the opposite force.
- 4) Contrast between and counterbalancing of fixed-/kinetic-tonicality (discussed in more detail in chapter 4)
- 5) Contrast between and counterbalancing of regions on the sharp/flat sides and directions of modulatory movement
- 6) Turning points, surprising/sudden contrasts
- 7) Spatial completeness: comprehensive circumscribing of a key or tonal spectrum

The tonal narrative functions are essentially ways of defining the many types of centrifugal and centripetal forces and their interactions in the spatial and temporal dimensions.

The opening theme of Mozart's K. 310/i illustrates the differing functions of alternation, intensification, and culmination within a diatonic framework. This eight-measure sentence begins with a presentation prolonging the tonic through the simple alternation of consonant tonic and dissonant dominant over a tonic pedal. The range of harmonic motion is expanded in the continuation through a descending-fifths sequence that moves through all the degrees of the scale in the fundamental bass (root progressions). The chords are all seventh chords: this represents a slight dissonant intensification through a chain of descending simple dominants (in the Ramellian sense) that eventually lead back to the tonic.<sup>173</sup> There is even an increase in diatonic-centrifugal force (a very small centrifugal force) due to the expansion of degrees passed through.

---

<sup>173</sup> See Christensen, *Rameau and Musical Thought*, 129.

The intensification leads to a cadential progression and only a partial closure: a half cadence at the end of m. 8 marked by the re-beginning of the theme in the following measure.<sup>174</sup> The diatonic nature of the sequence (as to be expected in the first phrase of a classical sonata) means that the slight CF-motion through various degrees of the scale automatically becomes centripetal due to the seven-tone limits of the diatonic scale. The amending of the perfect fifth to a diminished one in the fundamental bass between the VI that ends the sequential motivic pattern and the ii of the cadence (second half of m. 7 to m. 8) is the element that ties the ends of the diatonic scale together, manifesting clear centripetal force to the tonic.

The half cadence is the goal of harmonic motion, a small-scale culmination. It is approached via dissonant intensification and very slight centrifugal expansion within diatonic harmony, but it is spatially centripetal, since it establishes the home key. Temporally, it is only partly centripetal, since the temporal type of CF/CP forces refers to degrees of cadential closure. The centripetal force continues with the return to tonic and re-beginning of the theme (m. 9), but the dominant harmony is now intensified by a very strong diminished seventh dissonance over the tonic pedal. This dissonant intensification soon becomes modulatory intensification: centripetal force is definitively counteracted by modulatory centrifugal forces, beginning from m. 12 with the III $\flat$ 7 chord moving to VI. The harmonic goal is **M-m $\flat$** : V (the dominant of the C major and minor regions). The choice of a half-cadential preparation of the new key creates only

---

<sup>174</sup> Poundie Burstein notes the ambiguous cadential situation here; decent arguments may be made in favor of reading the cadence as a HC or IAC. In support of the HC reading Burstein points to the voice leading and textural disjunction between measures 8 and 9 required to avoid parallel fifths; to support the IAC reading he cites the presence of V7 on a weak beat of the measure (among other reasons). See Burstein, "The Half Cadence and Related Analytical Fictions," in *What is a Cadence? Theoretical and Analytical Perspectives on Cadences in the Classical Repertoire*, ed. Markus Neuwirth and Pieter Biergé (Leuven: Leuven University Press, 2015), 110-12.

a partial centripetal force towards **M**, a lesser centripetal force compared with that which would have been generated by an authentic cadence.<sup>175</sup>

Example 3.1. Mozart Sonata in A minor, K. 310, i, Exposition: primary theme and transition, mm, 1-22.

*Allegro maestoso.*

Tonic prolongation \_\_\_\_\_

5

Descending fifths through all degrees to half cadence \_\_\_\_\_

10

T: LTo7 i III<sup>4</sup> b7 V7 I III# sd: V7

14

calando M: #4 from M:D legato

sd: I 6 6 6 6 b6 b7  
5 5 5 4 4 4

M: II# V7 I ii II# V

Indication of m b and suggestions of M:D throughout standing dominant phase

18

Indication of m b and suggestions of M:D \_\_\_\_\_

V

<sup>175</sup> See Schoenberg's chart of regions and section 2.5 of this dissertation for explanation of symbols. I modify Schoenberg's symbols in some cases, in order to show the number of fundamental relations from the principal key. See Schoenberg, *Structural Functions*, 20-21, 30-31, 73-75.

21

M: v

The modulatory intensification generates a strong centrifugal force (both temporal and spatial) because of the multiplicity of regions and distance covered on the tonal spectrum. The modulatory passage intensifies the close flat-side relation of **M** to **t**: rather than simply moving directly to **M**, Mozart intensifies the flat-side centrifugal force by moving through other flat-sided regions toward the harmonic goal, the standing-on-the-dominant passage (mm. 16-22). The modulatory trajectory passes through **SM** (F major, 12-13) and **sd** (D minor, 13-14) with **M** being provisionally established through the half-cadential progression in mm. 14-16.

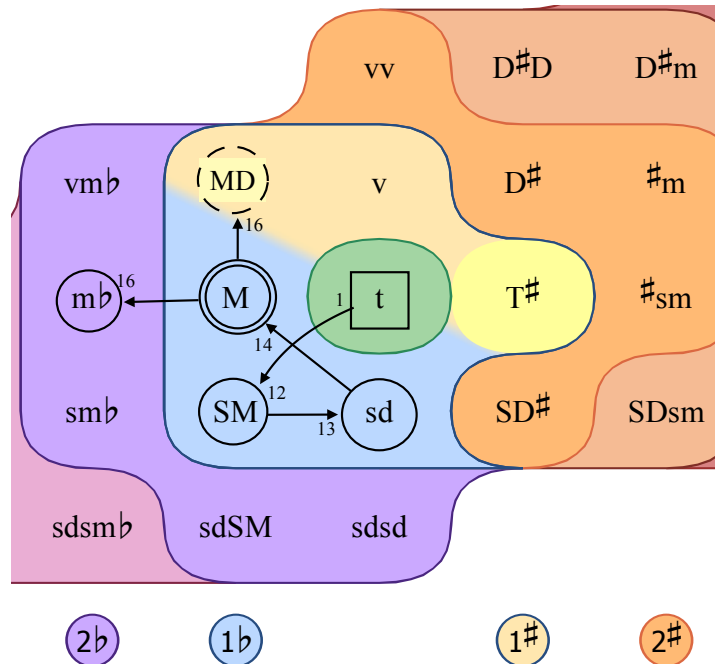
Chromatic leading tones from the **M: D** (the dominant of C major) and **mb** regions further intensify the standing-on-the-dominant passage. The incursion of leading-tone energy from **M: D** begins already in the upbeat chord to m. 16, with the applied dominant 6/5 creating sharp CF-force. It continues through the prolonged dominant, manifesting as repeated leading-tone diminished sevenths of **M: D**. There is also a switch from the mediant to its parallel minor, **mb**, which pervades the whole culminating passage. This increases the flat-side centrifugal force further, continuing the flat-sided modulatory movement through regions, from close to moderately remote.

In this eleven-measure modulatory intensification, Mozart presents five regions; this includes the most remote region on the flat side, the mediant minor (C minor), which is a local maximum of spatial-CF force. Contrastingly, the centrifugal **F#** from **M: D**, appearing repeatedly from m. 15 to m. 19, generates a counterbalancing sharp-side force that directs tonal motion

more strongly towards **M**. This standing-on-the-dominant culmination thus combines spatial-centrifugal and a partial temporal-centripetal force, provisionally establishing the mediant region, which will be definitively confirmed in the group of subordinate themes (beginning at m. 23).

Figure 3.1. presents the tonal narrative of the transition on the tonal spectrum, in terms of the progression of regions to the flat and sharp sides.

Figure 3.1. Mozart, K. 310/i, transition, mm. 9-22: progression of regions on the tonal spectrum. Boxed regions are strongly established, double circled regions are partly or provisionally established, circled regions are briefly indicated, dotted circle around a region denotes suggestion of a region as a tonicized degree of prevailing key (see 3.8 on key-hierarchy).



### 3.2. Intensification

The first half of the exposition (primary theme and transition) presents various pertinent examples of intensification leading to culminations. The terminology and concept of intensification in the tonal narrative approach draws upon Goethe's development of the concept in his scientific studies. For Goethe, there are two driving forces in nature: intensification (*Steigerung*) and polarity. Intensification is the development, expansion, and evolution of forms toward a state of greater complexity and perfection. It always involves a change of quality that



brings about something new of a phenomenon, bringing forth an unexpected, higher form.<sup>176</sup>

This emerging form manifests the inner, metaphysical archetype of the phenomenon, its perfected form, in the physical world. In his botanical studies, the plant grows centrifugally from the seed, moving upwards toward the sky and developing various more complex forms such as cotyledons, leaves, and eventually flowers. These are forces of expansion that are balanced by contraction back toward the stem: centripetal forces giving stability and structure to the plant.<sup>177</sup> In his theory of color, the two basic colors, blue and yellow, are intensified through alteration of the balance between light and darkness. This intensification manifests as an increasing reddish tint emerging on both sides, culminating in the attainment of a pure-red color without any traces of blue or yellow. This culmination, through a uniting of the two sides, creates an exalted, exciting effect: pure-red is considered the highest, most perfect color on the wheel.<sup>178</sup> On the other hand, when the basic colors blue and yellow are united, green results, which Goethe considers a simple, mundane union, a kind of nullification effect.

In harmonic motion, intensification refers to the increasing complexity of the harmony and expansion of territory traversed on the tonal spectrum — the centrifugal range. There are three types, which are often combined: the accumulation of vertical dissonance, chromatic enrichment of harmonic progressions outlining a prevailing key, and passages featuring modulatory movement through multiple regions. Intensification is distinct from alternation/opposition, in that there is usually a gradual accumulation or increase in dissonance or centrifugal force, rather than a direct contrast between consonance/dissonance and/or a tonic

---

<sup>176</sup> Douglas Miller, "Introduction," in Goethe, *Scientific Studies*, ix.

<sup>177</sup> The connection between centrifugal and centripetal forces in Goethe's studies of plant growth and those forces in musical analysis is made by Severine Neff, who has studied the strong connections between Goethe's scientific studies and Schoenberg's musical thought. See Severine Neff, "Schoenberg and Goethe: Organicism and Analysis," 409-434.

<sup>178</sup> See 2.6 for extended discussion of Goethe's theory of color as a metaphor for the tonal spectrum.

and a non-tonic element. Its basic model as a foreground harmonic progression is the descending-fifths progression with seventh chords: Rameau's chain of dominants, the Sechter-chain with seventh chords.<sup>179</sup> This is in contrast to the basic model for opposition or alternation, the *cadence parfaite*, with its simple opposition of a dissonant *dominant-tonique* resolving to the consonant *tonique*.

There are three types of intensification, as follows:

1) *Dissonant intensification* involves consecutive dissonant chords, the accumulation of vertical dissonance, for example in the chain-of-dominants archetype. The additive effect of the dissonances increases tension towards a culmination and anticipated resolution of the tension.

2) *Chromatic intensification* of a harmonic progression outlining a prevailing key refers to the way in which tones foreign to the prevailing key infiltrate the harmonies, generating a local centrifugal force. These foreign or artificial tones are ascending and descending leading tones drawn from one or more of the regions. The pre-dominant phase of a progression is often chromatically intensified, particularly in expanded cadential progressions leading to culminations of temporal-centripetal force. These chromatic harmonies include the applied or artificial dominant sevenths, leading-tone sevenths, Phrygian II, and augmented sixth chords. Some chromatic intensifications create sharp-CF forces, others flat-CF forces; certain harmonies generate sharp and flat centrifugal forces simultaneously, such as the augmented sixth chord, which contains artificial leading tones from the dominant and minor subdominant. Artificial leading tone seventh chords combine ascending leading tones from a major region with

---

<sup>179</sup> According to Christensen, Rameau considered the descending fifth progression of seventh chords, moving through all diatonic degrees of the key as the ideal of tonal motion. See Christensen, *Rameau and Musical Thought*, 129.

descending leading tones from its parallel minor, which also generate simultaneous sharp- and flat-CF forces.

3) *Modulatory intensification* involves departure from a prevailing key and movement through multiple, transient regions. These kinetic-tonic (tonally unstable) sections are usually based on unidirectional, often sequential harmonic motion that transcends the diatonic borders of a previously prevailing key or initiating region: the centrifugal unidirectional principle. The unidirectional modulatory movement intensifies large-scale centrifugal force, both temporal and spatial. The centrifugal unidirectional principle counteracts the circular, balancing principle of large-scale centripetal force and fixed-tonicity. Modulatory leaps also generate modulatory intensification: these are sudden shifts to a remote region, often through enharmonic switches.

### **3.3. Culminations of centrifugal and centripetal force**

We have seen in the first half of the Mozart exposition how modulatory intensification led to a culminating passage on the dominant of the mediant, ending with the medial caesura. Intensifications are directed accumulations of dissonance or centrifugal force directed towards goals that constitute significant landmarks in the tonal narrative: culminations. We have discussed in section 1.5 the differing organizing principles of fixed- and kinetic-tonic sections, and how they lead to contrasting kinds of culminations. Fixed-tonic sections are directed towards circumscribing areas of the key and attaining cadential completeness; they reach their temporal-centripetal culmination at the most expanded cadential progression with the most perfect tonic arrival. Chromatic intensification (Schoenberg's first function) often serves to considerably expand the pre-dominant and/or dominant phases of a cadential cycle, both in duration and centrifugal range, motivating and intensifying the temporal-centripetal culmination.

Contrastingly, kinetic-tonic sections feature modulatory intensification, unidirectional modulatory movement aimed at the goal region: the far-out point or point of furthest remove. This is a spatial-centrifugal culmination, a maximum of spatial-CF force. Often, a composer emphasizes this CF culmination by arriving on the dominant with a half cadence that is subsequently prolonged (a standing-on-the-dominant). This partial substantiation of a region suggests the slight influence of temporal-centripetal (i.e., cadential) force; therefore, this type of culmination is called **spatial-CF/partial-CP**. It is abbreviated as CF(CP), with the parentheses denoting the secondary function of CP forces.

Regarding development sections in sonata form, Ratner calls this culmination of spatial-centrifugal force the *point of furthest remove*.<sup>180</sup> His model for the tonal organization of more extensive development sections divides them into "two phases of action."<sup>181</sup> The first continues the centrifugal motion initiated by the modulation to the subordinate key in the exposition, leading to the point of furthest remove, which acts as a turning point that reverses the large-scale harmonic direction from centrifugal to centripetal. This also initiates the second phase, the centripetal return to the principal tonic. The first, centrifugal phase of motion usually consists of a modulatory sequence, phase, or multiple sequences/phases; the modulatory goal of the centrifugal phase is the point of furthest remove. In the classical sonata development in a major key, this modulatory goal is most typically the dominant of the submediant: a half cadence *on* the mediant major, but *in* the key of the submediant. Charles Rosen identified the frequent establishment of the submediant, or relative minor (assuming a major tonic) as the primary development key to be a stereotype of the 1770s and 1780s, well known to Haydn, Mozart and

---

<sup>180</sup> Ratner, *Classic Music*, 226.

<sup>181</sup> *Ibid.*, 225-227.

Beethoven.<sup>182</sup> The earlier practice was to confirm the key with an authentic cadence; however, Rosen notes that as it became more stereotypical, it was sometimes intensified by a half-cadential progression emphasizing its dominant.<sup>183</sup> This dominant of the submediant is typically intensified by a chromatic chord containing its ascending leading tone, such as the augmented sixth chord.

The tonal narrative approach regards the chromatically intensified stereotypical point of furthest remove as "**M#**, as **sm: V**," in order to show how **M#** is the goal, while acknowledging its local dependence on the region in which it functions as a dominant.<sup>184</sup> As a moderately remote region, **M#** generates a strong CF force with respect to the principal key (see section 2.5). This could be justifiably interpreted as a maximum of centrifugal force for some pieces, but for others there are equally or more distant regions appearing at other parts of the piece. For example, the initiating region of the development section may be the minor dominant or flat mediant, as in Mozart's sonatas K. 533/i and K. 570/i respectively, which also generate a strong centrifugal force as moderately remote regions.

Measuring centrifugal force from the initiating region, as an alternative to the principal tonic, emphasizes the centrifugal force generated by the motion between regions within the modulatory phase. It often generates a larger CF-force than that measured from the principal key, thus presenting more clearly the modulatory goal as a maximum of centrifugal force: a spatial-centrifugal culmination. In many of Mozart's piano-sonata development sections, the point of furthest remove or spatial-CF culmination is the goal of a modulatory sequence initiated from the

---

<sup>182</sup> Rosen, *The Classical Style*, 460, 466-83. The convention of moving to the "minor key of the sixth" was pointed out by a major theorist of the time, Heinrich Koch, in the treatise *Versuch einer Einleitung zur Composition*, 3 vols. (Leipzig: A.F. Böhme, 1782-93), 3:308-9.

<sup>183</sup> Rosen, *Sonata Forms*, 267-75.

<sup>184</sup> The presence of the ascending leading tone to **M#** is required to consider it a region.

global dominant minor. For example, in three of Mozart's sonata movements in F major, K. 310/ii, 332/i, and 533/i, the development and its centrifugal phase begin in C minor, leading by ascending fifths to culminate on the region three fifths above, A major, acting as the local dominant of D minor, **d**: V. Globally, this goal region is **M**#, as **sm**: V. At the same time, the dynamic centrifugal force generated by the modulatory movement itself can be discerned by considering C minor as a temporary reference point from which to measure the centrifugal force of its goal region, A major, based on the fundamental relations between the regions in the modulatory sequence. The goal region is four fundamental steps from the initiating region (C minor): three ascending fifths, preserving the mode (c-g-a-d) plus a parallel major switch making the fourth fundamental step. This generates a very strong centrifugal force and makes A major as **d**: V a very remote goal.

In this study, I measure the point of furthest remove by counting the number of fundamental steps taken from the initiating region of the modulatory phase that travels the furthest in the movement to its goal. To refer to remote goals that are not clearly maximum distances from the reference point, the tonal narrative approach also employs Taruskin's term "far-out point" (FOP).<sup>185</sup> The FOP label can also be used to denote more local maximums of spatial-CF force within a section, and generally allows for multiple interpretations in calculating spatial-CF force.

While spatial-CF culminations occur mostly in kinetic-tonic sections, temporal-centripetal culminations occur mostly in fixed-tonic sections. There are two types of temporal-CP culminations, and the difference between them is significant. The first involves the

---

<sup>185</sup> See, for example, his discussion of Beethoven's *Eroica* symphony, where both the note and key of E is called a FOP; it is also regarded as "unclassifiable" and its mode (minor) is not specified. See Taruskin. "Chapter 12: The First Romantics."

modulation-as-opposition function, where the tonal narrative departs from the principal tonic region and establishes one of its regions as a subordinate key. The first goal is often the arrival on the dominant of the dominant, often a culmination of spatial-CF force within the exposition, mixed with a slight temporal-CP force due to half-cadential articulation. The second main goal is the tonic arrival of the most expanded cadential progression consolidating the subordinate key: the temporal-centripetal culmination. This culmination is primarily temporal-centripetal; since it is a non-tonic key it is also global spatially centrifugal, though this is secondary to its overall effect. Therefore, I call this a **temporal-CP/partial-spatial-CF** culmination, abbreviated as CP(CF) as shown in table 4.1. By contrast, the most expanded cadential progression with the most perfect tonic arrival of the recapitulation second group combines maximums of both temporal- and spatial-centripetal forces; thus, I call it a fully-centripetal or global centripetal culmination. It generates a maximum temporal-CP force because it is most emphatically substantiates and secures the principal key; it is spatially centripetal because it is the principal key. The initial return of the principal key at the beginning of the recapitulation generates global spatial centripetal force; however, it usually does not coincide with a maximum of temporal-centripetal force. This maximum of temporal-CP force, defined here as the most expanded cadential progression with a perfect tonic arrival, usually occurs later in the exposition.

The concepts of Essential Structural Closure and Essential Expositional Closure from Hepokoski and Darcy's Sonata Theory constitute a basis for both types of centripetal culminations in the tonal narrative approach. In Hepokoski and Darcy's Sonata Theory, the broad trajectory (or tonal narrative) of the sonata is interpreted as a process of securing and realizing the tonic in the recapitulation, which had been established only provisionally in the first part of

the exposition (the P-zone).<sup>186</sup> The most significant landmark of their model of the form is the essential sonata closure or ESC, the first satisfactory perfect authentic cadence in the second part (S-zone and closing-zone) of the recapitulation; this is the event that achieves the full realization or actualization of the global tonic. For Hepokoski and Darcy, the ESC is the ultimate "goal toward which the entire sonata-trajectory has been aimed," fulfilling the ultimate purpose or "delivering the *telos*" of the sonata.<sup>187</sup>

The ESC is clearly a culmination of the highest significance in the tonal narrative, but of an opposite kind to the *point of furthest remove* or global culmination of spatial-centrifugal force. The ESC is the moment when the tonic is fully realized and substantiated as the primary key of the work; in the tonal narrative approach, an approximate equivalent to this is the fully-centripetal culmination. This global culmination of centripetal force is a maximum of both spatial- and temporal-centripetal forces: there is a complete return to the tonic key on the spectrum of tonal space and crucially this key is also confirmed with the maximum degree of comprehensiveness and substantiality in the piece. While the tonic is normally established and provisionally confirmed in the first group of the exposition, this constitutes only a local apex of centripetal force; there is a strong spatial-CP force since it is in the principal key but the usually moderate rather than very strong cadential articulation generates a correspondingly moderate temporal-CP force. On the other hand, the ESC in the recapitulation generates a maximum of spatial- and temporal-CP forces, which is the fully-centripetal culmination of the whole tonal

---

<sup>186</sup> Hepokoski and Darcy, *Elements of Sonata Theory*, 250-54.

<sup>187</sup> *Ibid.*, 232, 250-51.



narrative; the ESC fully realizes and substantiates the tonic as principal key for the whole piece.<sup>188</sup>

In Sonata Theory, the parallel moment to the ESC in the recapitulation is the essential expositional closure or EEC in the second part of the exposition. This represents a middleground equivalent to the ESC: while the ESC realizes the tonic as the true key of the piece, the EEC fulfils the generic purpose of the exposition, by means of the first satisfactory PAC confirming the subordinate key.<sup>189</sup> The essential difference between the two landmarks is that the EEC is simultaneously a maximum of temporal-centripetal force and at the same time generates significant global spatial-centrifugal force. The group of subordinate themes, establishing and confirming the subordinate key, creates what Charles Rosen calls a "structural dissonance" with the section in the subordinate key being a "dissonant section."<sup>190</sup> This global centrifugal motion intensifies to greater degrees in the development section.

While conceptually the global culmination of centripetal force and the ESC are equivalent, the tonal-narrative approach uses a more harmonic approach for determining the former. In Sonata Theory, the EEC is the first satisfactory PAC in the subordinate key that is not immediately repeated or overridden (for example by a second medial caesura) and the ESC the equivalent PAC in the recapitulation confirming the tonic key. For the tonal-narrative approach, temporal-centripetal force is determined by the substantiality and comprehensiveness of harmonic progressions; thus, it follows that the global culmination of centripetal force confirms the tonic key with the most expanded or substantial cadential progression that arrives with a

---

<sup>188</sup> Hepokoski and Darcy develop an overall narrative trajectory for the sonata where the tonic is first only established provisionally as a structure of promise, and is only fully actualized by the ESC in the recapitulation. See Hepokoski and Darcy, *Elements of Sonata Theory*, 250-51.

<sup>189</sup> *Ibid.*, 121-24.

<sup>190</sup> For Charles Rosen's explanation of structural dissonance, see Charles Rosen, *The Classical Style*, 26. For Rosen's use of the term dissonant section see Rosen, *The Classical Style*, 81 and Rosen, *Sonata Forms*, 229.

PAC. In practice, many ESCs are arrived at through expanded cadential progressions that are also culminations of centripetal force, due to their being the most substantial of such progressions confirming the tonic key. In some cases, however, the most substantial of cadential progressions arriving on a PAC may be a later cadence, such as that which Caplin defines as the final cadence of the subordinate-theme group.<sup>191</sup>

Finally, there are certain remote goals of modulatory phases that are spatial-centrifugal culminations that are not cadentially articulated or otherwise work against the cadential principle through deceptive resolution. These are thus called **spatial/temporal-CF culminations**. The four types of culminations identified (thus far) in the tonal narrative approach are summarized in table 3.1 and matched with their precedents.

Table 3.1. Four types of culmination: centrifugal, centripetal and their combinations

<b>Culmination type</b>	<b>Abbreviation</b>	<b>Brief explanation</b>	<b>Precedents</b>
<b>Spatial-CF (partial-temporal-CP)</b>	CF(CP)	Region generating maximum CF-force from initiating region or principal tonic, also partly substantiated cadentially. Usually goal regions of modulatory phases.	Ratner: point of furthest remove. Taruskin: FOP.
<b>Temporal-CP (partial-spatial-CF)</b>	CP(CF)	Associated with modulation as opposition, full substantiation of the subordinate key. Often involves chromatic intensification within the subordinate key.	Hepokoski/Darcy: EEC
<b>Fully-CP or global CP (temporal- and spatial-CF)</b>	CP	Strongest cadential progression and tonic arrival in primary key, associated with large-scale resolution. Often involves chromatic intensification within the key.	Hepokoski/Darcy: ESC
<b>Temporal/spatial-CF</b>	CF	Region generating maximum CF-force from initiating region or principal tonic. No cadential substantiation involved.	Taruskin: FOP

<sup>191</sup> Caplin, *Classical Form*, 121-22.

Let us now turn to the large-scale tonal narrative of Mozart's K. 310, first movement, which includes the first three culmination types introduced above. I have identified seven culminations that articulate the tonal narrative: two in the exposition, three in the development, and two more in the recapitulation. The culminations and their intensifications in K. 310/i are summarized in table 3.2.

Table 3.2. Form chart indicating intensifications and culminations in Mozart's K. 310/i

Large Section	Subsection	Measure numbers	Intensifications and culminations (measures in parentheses)
Exposition	Primary theme	1-8	
	Transition MC: m. 22	9-22	Modulatory intensification in the flat direction from <b>t</b> to <b>bm</b> (12-16) leads to <b>(1) CF(CP) culminating passage</b> (16-22). Chromatic intensification from flat side ( <b>bm</b> , C minor) and sharp side ( <b>M: D</b> , <b>C: V</b> ) continues through culminating passage.
	First subordinate theme	23-34	Accumulation of temporal-CP force towards <b>(2) CP(CF) culmination</b> (EEC, m. 45). Evasion of PAC at m. 35 motivates further temporal-CP force to accumulate in the second subordinate theme.
	Second subordinate theme	35-45	
	Closing passage	45-49	<b>(2) CP(CF) culmination</b> extended into a culminating passage.
Development	Preliminary CF-phase	50-58	Flat-side intensification through implication of <b>C: sdb.</b> (F minor). Sudden turning point and enharmonic change generates <b>(3) CF(CP) culmination</b> on <b>C: m:D</b> (B major) (58).
	Main CF-phase	58-70	Modulatory intensification in flat direction leads to <b>(4) CF(CP) culmination</b> on <b>e: sd<sup>2</sup> = sd</b> globally (D minor).
	Centripetal phase Standing dominant (74-79)	70-79	Chromatic intensification in m. 73 leading to <b>(5) part-CP(CF) culminating passage</b> prolonging <b>t: V</b> (74-79). Local sharp-CF forces (chromatic intensification) from <b>D#</b> continue throughout passage.
Recapitulation	Primary theme	80-88	

Recapitulatory (expanded) transition	88-103	Chromatic intensification of prevailing key from all four harmonic areas (fifth and third relations on the sharp and flat sides). Leads to <b>(6) part-CP(CF) culminating passage</b> (97-103) on <b>t: V</b> ; local sharp-CF intensification (from <b>D#</b> ) continues through the passage.
First subordinate theme	104-116	Gradual accumulation of local flat-CF force from <b>t: bII</b> and <b>sd</b> . This, combined with evaded PAC, motivates the strongest CP forces leading to the CP culmination.
Second subordinate theme (expanded)	116-129	More local flat-CF forces from <b>t: bII</b> (119) and local sharp-CF force from <b>t: D</b> (mm. 127-128) intensifies motion to <b>(7) CP culmination</b> of whole movement: ESC (129).
Closing passage	129-133	<b>CP culmination</b> extended into culminating passage.

The first culmination of the exposition is the standing-on-the-dominant passage extending from the cadential arrival on **M-mb: V (C-c: V)** to the medial caesura. This is an example of a spatial-centrifugal and partial-temporal-centripetal harmonic goal. It is a spatial-CF culmination because it is the goal of modulatory intensification, reaching the most remote region of the section, the mediant minor (C minor); the half-cadential arrival also gives it a secondary, partial-temporal-CP aspect. The mediant major-minor region has acted on its desires to assert influence on the tonal narrative: it has become slightly substantiated by a half-cadential arrival but not completely by a subsequent PAC.

The second culmination of the exposition fully substantiates the mediant region, without any shading from its parallel minor. The group of subordinate themes features mostly diatonic harmony, contrasting strongly with the modulatory and dissonant intensification of the transition and primary theme. This creates the effect of an idyllic illusion in the midst of the tumultuous reality conveyed before and after. Mozart sets up the culmination in stages, by playfully delaying the perfect tonic chord that completes the cadential progression. The end of the first subordinate

theme (S<sup>1</sup>) begins the process, with an expanded cadential progression mm. 31-34 presenting initial tonic, pre-dominant, and dominant phases of the harmony.<sup>192</sup> A tonic chord follows in m. 35, but the top voice cuts out, with another theme beginning in a higher register, blurring the tonic and delaying the completion of the PAC.

This delay increases the motivation for temporal-centripetal force, the desire for a completed cadence. In the recapitulation, this delaying process is strongly intensified by the local centrifugal forces of chromatic harmonies enriching the prevailing key (discussed below). In the exposition, however, the movement to the EEC is only slightly elaborated by the polyphonic texture, the expansion of the register in both directions, and the incorporation of the submediant chord for the first time in the second group, in mm. 42-43. The group of subordinate themes reaches its culmination through the appearance of the tonic note in the top voice over tonic harmony (m. 45). This perfect tonic arrival completes the expanded cadential progression that began at m. 31. The codetta that follows, with its repeated cadential progressions, can be considered a culminating passage that begins at m. 45 and extends to the majestic concluding tonic chords in m. 49. By completing the strong cadential progression from mm. 31-34, the perfect tonic arrival at m. 45 presents a temporal-centripetal culmination, which is also spatially centrifugal since it confirms the mediant region (C major); I denote this culmination CP(CF).

The development section features three culminations, the first two being primarily centrifugal and the third being partly centripetal with local-CF intensification. This divides the section into three phases: a preliminary centrifugal phase featuring a modulatory leap in the form of an enharmonic switch (mm. 50-58); a main centrifugal phase based on a modulatory sequence by descending fifths (mm. 58-70); and a centripetal phase where the descending fifths change

---

<sup>192</sup> This draws on Caplin's concept of a cadential progression with four syntactic functions or phases: initial tonic–predominant–dominant–final tonic. See Caplin, *Classic Form*, 23-31.

from modulatory to diatonic, returning to the principal key (mm. 70-79).<sup>193</sup> The preliminary phase builds toward the enharmonic switch: an "inciting incident" and remote turning point early in the section that dramatically propels its strong centrifugal and later centripetal forces (see example 3.2).

Example 3.2. Development section: preliminary phase with modulatory leap (mm. 50-58), main centrifugal phase (mm. 58-70), and centripetal phase (mm. 70-79).

50

**T:** Tonic prolongation

T = C major = global M

(sd  $\flat$ :) V  $\frac{9}{7}$

54

sd  $\flat$ : V7 Enharmonic switch Leading to FOP

m: #4 from m:D

Aug  $\frac{\#6}{5}$

58 **FOP** (far-out point)

m = iR: V full cycle of harmonies over dominant pedal

m = iR = E minor

iR = initiating region of modulatory sequence

<sup>193</sup> The preliminary phase corresponds to the pre-core and the latter two phases together comprise the core. Caplin reads mm. 50-58 as the pre-core and 58-79 as the core of the development section. See Caplin, *Classic Form*, 142-43.

61 *legato*

iR: V <sup>7</sup> I  
 iR: sd: V \_\_\_\_\_

64

iR: sd: V \_\_\_\_\_ I  
 iR: sdsd: V

67

iR: sdsd: V \_\_\_\_\_  
 iR: sdsd = global sd

**Modulatory goal**

70

sd: i <sup>6</sup>/<sub>5</sub> <sup>6</sup>/<sub>5</sub> <sup>6</sup>/<sub>5</sub> Dissonant and chromatic intensification  
 t: iv VII7 III7 V17 ii7 V7 i →  
 Descending fifths through all degrees of principal key \_\_\_\_\_

74

t: V Augmented sixth (m. 73) and leading-tone sevenths suggest D-region  
 partly-CP-culmination

Mozart begins the section by prolonging the C-major tonic that concluded the exposition, holding on to the illusory serenity suggested in the group of subordinate themes (including the closing section) of the exposition. Mozart presents the basic idea of the main theme, briefly transformed from its initial *Sturm und Drang* character. The tonic prolongation lasts for only three measures (mm. 50-52), at which point the stillness is disrupted by the appearance of Db and Bb, giving a glimpse of **C: sdb** (F minor) through its fourth and sixth degrees (the latter is a descending leading tone). Note that since the global mediant overcame the principal key as governing key, we shall register regions for the centripetal phase with respect to the global mediant, C major (**C**).

Mozart transforms the C harmony into a dominant seventh of **C: sdb**, alternating with **C: sdb**'s leading-tone diminished seventh with the lower voice moving C-Db-C (mm. 53-56, see example 3.2). The repetition of the Db in the diminished-seventh chords seems to prepare for further flatward centrifugal motion; this would continue the flatward trajectory of the exposition's modulatory transition. That expectation is monumentally reversed, however, as the dominant seventh of F minor becomes the augmented sixth of E minor or **C: m** (m. 57), with Bb (the seventh) transforming enharmonically to A# (the augmented sixth). This leads to a spatial-CF/part-temporal-CP culmination on **C: mD#** as **C: m: V** (B major as **e: V**, m. 58). By approaching it with an augmented sixth chord, Mozart strongly and chromatically emphasizes this harmonic pillar. The augmented sixth chord also presents the leading-tone of **C: mD#** prominently in the low-register chord in the left hand (A#2) and the right-hand figuration (A#3). Since **m: i** does not appear until m. 60 (and then only over a dominant pedal), we can speak of the culmination at m. 58 presenting a hybrid region: **C: mD#** as **C: m: V**. Its remoteness from its reference point, C major, makes it a FOP. As well as being a centrifugal culmination, this point

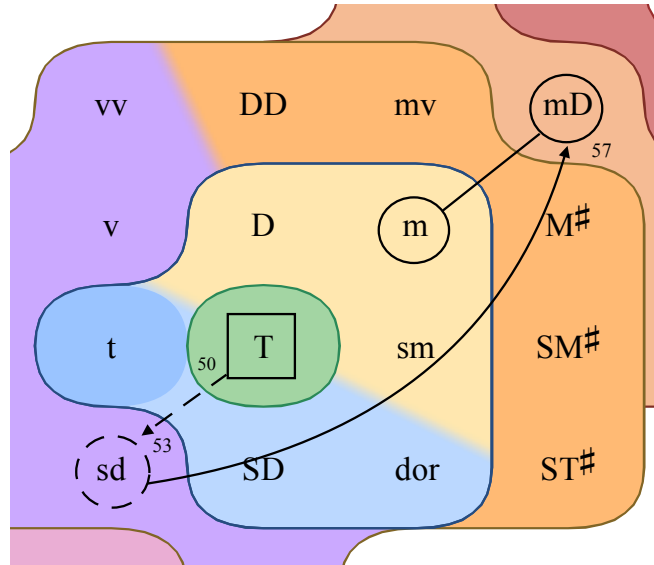


in the tonal narrative is also a sudden turning point. The enharmonic switch creates a modulatory leap from the implied moderately-remote flat-side region, **C: sdb**, to the remote sharp-side region **C: mD#** (see figure 3.2). The fact that this is the first sharp-directed centrifugal motion of the piece highlights the suddenness of this turning point and culmination.

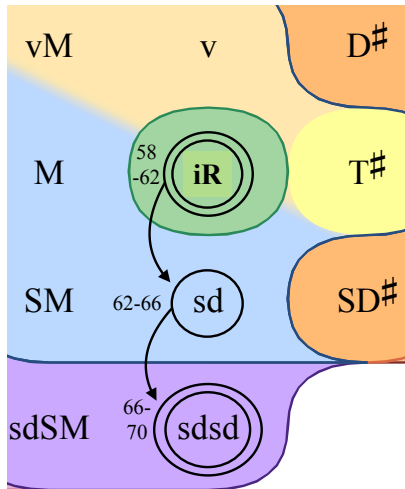
The arrival on **C: mD#** initiates the developmental core, which extends to the end of the development (mm. 58-79). It has two harmonic goals, the first centrifugal and the second partly centripetal with significant chromatic intensification. This divides the core into the main centrifugal and centripetal phases. The first culmination is the goal of a modulatory sequence, the tonic of the D minor region arriving at m. 70, while the second is the prolonged dominant of the principal key, a culminating passage from m. 74-79. The first part of the core (mm. 58-70) further intensifies centrifugal force through a modulatory sequence by descending fifths from the initiating region (E minor) to the goal region D minor. Each region spans five measures, with four measures over a dominant pedal resolving to its major tonic, which becomes the next dominant (creating an overlap of one measure). The modulatory intensification is enhanced by continual dissonant intensification in the polyphonic texture over the local dominant pedal. These two kinds of intensification accumulate toward the goal region (D minor), creating another culmination of spatial-centrifugal force. Measured from its origin, the initiating region (**iR**, E minor), it is two fifths to the flat side and thus a remote region, which can be represented as **e: sdsd** (see example 3.2 and figure 3.2).

Figure 3.2. Development section, mm. 50-79. Progression of regions represented on the tonal spectrum.

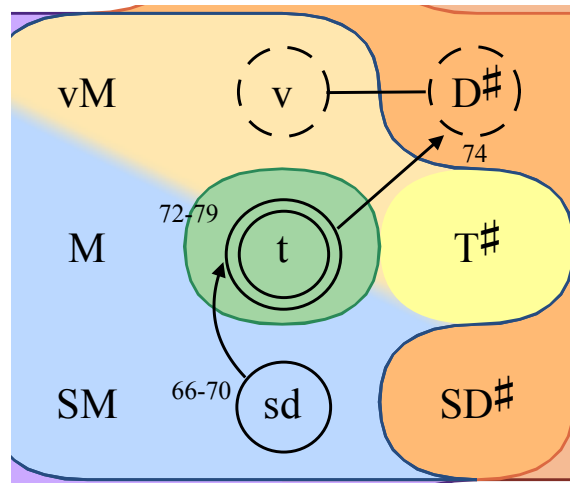
a) Preliminary phase with enharmonic switch, mm. 50-58. **T** = C major.



b) Development section, main centripetal phase, mm. 58-70. **iR** = E minor



c) Development section, centripetal phase, mm. 70-79. **t** = A minor



At the arrival on **e**: **sdsd** the descending-fifths motion continues, but now it becomes diatonic and centripetal towards the principal key, and it moves between harmonic roots instead of regions (see example 3.2). As the diatonic sequence traverses the principal key (mm. 70-73), the D minor goal from m. 70 is reconceived as **sd** globally, a close region and a large-scale predominant in the principal key. The tonal narrative then leads from the global subdominant region

to the dominant of the principal key, which stands for six measures (mm. 74-79), preparing the recapitulation. Foreign leading tones from the dominant region (E major) intensify the arrival of the dominant and its subsequent prolongation, generating local sharp-CF forces. For example, the augmented sixth on the upbeat to m. 74 features a D♯, the foreign leading tone from the dominant region that intensifies its arrival; leading tone diminished sevenths of the dominant region present two sharp chromatic tones, D♯ and F♯ that continue to saturate the dominant prolongation. The arrival on the dominant makes this a part-CP culmination; the local sharp-CF forces give the culmination a local-CF edge.

The recapitulation features two culminations. The first culminating passage is the standing on the dominant leading to the medial caesura of the recapitulatory transition (mm. 97-103). This parallels the first culmination for the movement, the prolonged dominant of the exposition's transition (mm. 16-22). Like the standing on the dominant ending the development section, this is a part-centripetal culmination that features significant local-CF intensification leading up to and including the culminating passage itself. As will be discussed below, these local-CF forces come from regions on both the sharp and flat sides of the spectrum.

The final culmination for the movement — the fully-CP culmination — is the goal of the significantly expanded cadential progression that closes the second subordinate theme (m. 129). The cadential progression (mm. 125-29) is dramatically intensified by the leading-tone diminished seventh from **D** (m. 127). Local flat-CF intensification from preceding measures and the sharp-CF forces from **D** accumulate energy towards this fully-centripetal culmination; this is a typical example of how CF forces, in this case local ones, motivate the opposing CP forces, in this case global ones (both spatial and temporal). The passages leading up to the final culmination will also be investigated further below.

### 3.4. Counterbalancing the sharp and flat sides of the tonal spectrum and directions of modulation

Intensifications leading to culminations of various kinds generate the dynamic curve or overall shape of the tonal narrative. Contrasting and counterbalancing of the sharp and flat sides and directions shades, tilts, or orients the tonal narrative to one of the other sides or directions. Contrasting and counterbalancing can occur between regions on either side of the principal or prevailing key, or between a region(s) on one side of the principal key and a modulatory trajectory in the other direction, or between trajectories in opposite directions. Modulatory trajectories in the sharp direction contrast with trajectories in the flat direction, or regions on the flat side, and vice versa. This perspective reveals the tonal narrative as a dialectic alternating between the sides and directions, ultimately leading toward a comprehensive circumscribing of the global tonal spectrum.

This dialectic between sharp and flat sides of the principal key was recognized by Rameau in *Code de musique pratique* (1760). In chapter 11, "On relations between keys," paragraph 47, he recommends that, in a piece that modulates, composers balance keys on the sharp side with those on the flat side of the "reigning key" in order to reaffirm its centrality.<sup>194</sup> Charles Rosen discusses the role of the subdominant in the recapitulation of sonata forms as an anti-dominant that balances the substantial role of the dominant in the exposition.<sup>195</sup> While the subdominant usually does not appear as a confirmed key, its region is often strongly indicated as

---

<sup>194</sup> Jean-Phillipe Rameau, *Decoding Rameau: Music as a Sovereign Science: A Translation with Commentary of Code de musique pratique and Nouvelles réflexions sur le principe sonore (1760)*, trans. Mark Howard (Liberia Musicale Italiana: Lucca, 2016), 432.

<sup>195</sup> Rosen writes: "The subdominant plays a special role in sonata style; it acts itself as a force for resolution, an antidominant in fact, and there is a tendency for the second half of a sonata to move toward the subdominant and flat-related keys." See Rosen, *Sonata Forms*, 288-89.

an expanded tonicization, and/or repeatedly suggested through chromatic enrichment.<sup>196</sup>

Schoenberg also recognized the opposition of harmonies featuring foreign tones from the flat regions and sharp regions in progressions expressing a prevailing key. In the chapter "Relationship to the Minor Subdominant," he emphasizes the antithetical relationship between harmonies derived from the minor subdominant or flat-sided regions and the secondary dominants, which are mostly to the sharp side (with the exception of V of IV).<sup>197</sup> Schoenberg also makes a brief reference to sharp/flat counterbalancing in *Structural Functions*, where he recommends balancing the "sub-regions [flat regions] by elements of the super-regions [sharp regions]."<sup>198</sup>

Scott Burnham has insightfully revealed the importance of dialectical contrast or counterbalancing in A.B. Marx's analyses of Beethoven sonatas. According to Burnham, Marx's analytical method was distinctive in the way that it focused on the temporal unfolding of the piece as a dialectical interplay between opposites. Each passage or phrase is considered incomplete in some way, motivating a successive or later phrase to provide contrast as well as similarity, so that their combination creates a more complete whole.<sup>199</sup> Specifically, Marx focused on the opposing characters of successive phrases, particularly the primary and subordinate themes (*Hauptsatz* and *Nebensatz*) of the sonata exposition. These opposing characters each comprise contrasting harmonic, melodic-motivic, and rhythmic elements. The

---

<sup>196</sup> Heinrich Koch discusses the tonicization of the subdominant in the recapitulation, referring to the shift to the "key of the subdominant" which "without making a cadence, soon returns to the main key." See Heinrich Koch, *Introductory Essay on Composition*, trans. Baker (New Haven: Yale University Press, 1983), 201.

<sup>197</sup> "Above all, the source of these chords should be kept in mind: the region of the minor subdominant. They are therefore strongly antithetical to the secondary dominants, which belong essentially to the region of the dominant (only the secondary dominant on I leads on to the subdominant region, whereas that on VI leads to the dominant of the dominant as well)." See Schoenberg, *Theory of Harmony*, 222-23.

<sup>198</sup> Schoenberg, *Structural Functions*, 54.

<sup>199</sup> Scott Burnham, "A.B. Marx and the Gendering of Sonata Form," in *Music Theory in the Age of Romanticism*, ed. Ian Bent (New York: Cambridge University Press, 1996), 167-69.

*Hauptsatz* or first theme is primary in the sense that it motivates what follows. It is necessarily incomplete, requiring contrasting qualities in the subordinate themes and closing section in order to create a more complete whole. This process works on different levels: even within the theme there may be a dialectical process of contrast.

The tonal narrative approach applies A. B. Marx's concept of the dialectical interplay of opposites in order to analyze centrifugal forces at various levels in terms of the contrast and counterbalancing of sharp and flat sides. This also builds on Rameau, Rosen, and Schoenberg's suggestions of such balancing processes. A modulation to one side of the spectrum, such as movement to the dominant key on the sharp side in a major key sonata, or the movement to the mediant key on the flat side in a minor key sonata, leaves the tonal narrative incomplete, demanding a balancing force from the other side or opposing direction. The combination of dialectics between these opposites can then combine in the global dimension of harmonic motion as a tour through the four main areas or directions of the tonal spectrum, which result from sharp and flat sides being divided into fifth and third relations.<sup>200</sup>

The analysis of Mozart's K. 310/i thus far has focused on intensifications and culminations, creating a map of the overall shape of the tonal narrative and the interaction of spatial and temporal CP/CF forces. The analysis has also touched upon contrasts and counterbalancing of sharp- and flat-CF forces. I will now continue by analyzing the recapitulation in more detail, with a focus on the interplay between sharp- and flat-CF forces,

---

<sup>200</sup> With respect to a principal minor key, the four areas are (1) fifth relations to the sharp side, principally **v**; (2) fifth relations to the flat side, principally **sd**; (3) parallel major and third relations to the sharp side (including **T** and **D#** because their regions have raised third degrees, an inner-third relation); and (4) third relations to the flat side (principally **M** and **SM**). For a major principal key, the close sharp-third relations are **sm** and **m**, while the close flat-third relation is **t**, because its third degree is flattened compared with the major tonic.

whose alternation generates momentum leading to culminations. This will be followed by a summary of the movement in terms of the large-scale balancing of sharp- and flat-CF forces.

*Counterbalancing of sharp- and flat-CF forces in the recapitulation of Mozart's K. 310/i*

In the recapitulation, Mozart intensifies the progressions leading to the two culminations (the standing on the dominant leading to the MC, mm. 97-103 and the cadential arrival at m. 129) with frequent local sharp- and flat-CF forces. The recapitulatory transition is a developmental form beginning with a model/sequence (mm. 88-91) followed by liquidation in the continuation (mm. 92-96) leading to the chromatically intensified dominant arrival and prolongation (mm. 97-103): the part-temporal culmination. The model is two measures long, moving up a fifth for the second measure. Responding to the local sharp-CF forces from the end of the development, the model/sequence moves flatward by descending thirds from the tonic (m. 88), through the submediant (m. 90), to the subdominant (m. 92) (see example 3.3 and figure 3.3). Each region's leading tones intensify the beat before their tonics appear, generating local flat-CF forces. In figure 3.3, the regular arrows show the more structural descent by thirds every two measures, while the dotted arrows show the foreground ascending fifths for the second measure of the unit.

The continuation leads to **sd**, which is briefly established in mm. 94-96. Its local flat-CF forces motivate the sharp-CF forces that intensify the dominant arrival and prolongation, beginning on the upbeat to m. 97 and continuing until m. 101; these take the form of the foreign leading tone, D#, appearing prominently in the bass and top voice. The switch from local flat- to sharp-CF forces just prior to the dominant arrival creates additional energy that makes this a particularly dramatic culmination.

Example 3.3. Recapitulatory Transition, mm. 88-103

87 from v-region from SM

t: i Aug  $\frac{6}{5}$  v LTo7/VI VI LTo7/III

Mdgd, t: i   VI VI

91 from sd sd indicated

III LTo7/iv iv LTo7 i P chr.P iv P

**iv: descending arpeggiation**

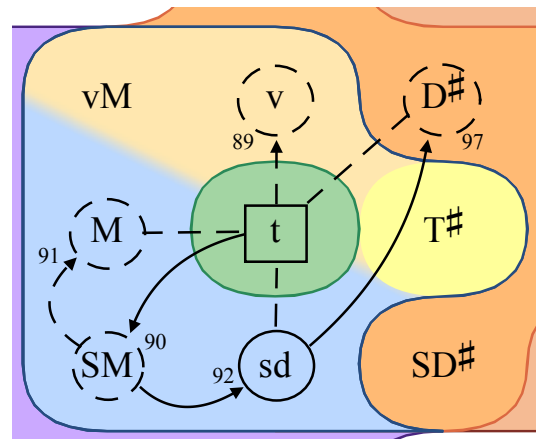
95 sd indicated D suggested

t: iv II# V

sd: i V i V i

t: iv   V

Figure 3.3 (right) Recapitulatory transition represented on tonal spectrum



Another factor building momentum to the culmination is the withholding of the dominant

major region. The dominant minor region was only fleetingly suggested in mm. 88-89; the dominant major harmony does not appear before m. 97. The establishment of **sd** over five



measures (mm. 91-92 and 94-96) builds anticipation for the dominant goal. The arrival of the dominant region, with its leading tones, also completes the presentation of four areas or directions of the principal tonality within this section. In the model/sequence and continuation, three areas had been suggested: the fifth relation to the sharp side (**v**), the third relation to the flat side (**SM**), and the fifth relation to the flat side (**sd**). The major dominant, with its sharp third degree, provides the missing element of sharp relations based on parallel major or third-relations (see figure 3.3). Therefore, the harmonic progressions of the recapitulatory transition present a spatially complete chromatic enrichment or intensification of the prevailing key. This completion strategy will be discussed further in section 3.5.

The strong influence of the dominant region that pervades the culminating passage leading to the medial caesura creates an urgency that is counterbalanced in the first subordinate theme (mm. 104-15). The theme features two shadings toward the flat side, the first coloring the 7-6 suspension chain that begins the continuation (mm. 109-10) and the second within the expanded cadential progression (upbeat to m. 114). The 7-6 suspension chain is harmonically tinted to the flat side by the Phrygian II harmony, suggesting both **sd** and **SM** and creating a mysterious sombreness (the flattened second degree [B $\flat$ ] of the prevailing key is a descending leading tone of both regions,  $\hat{6}$  of **sd** and  $\hat{4}$  of **SM**). The cadential progression (mm. 113-15) then tilts to **sd** (D minor): the tonic harmony of m. 113 is unsettled by **sd**'s ascending leading tone (C $\sharp$ ) and fourth degree (G $\sharp$ ) on the final beat, leading to the subdominant harmony in m. 114.

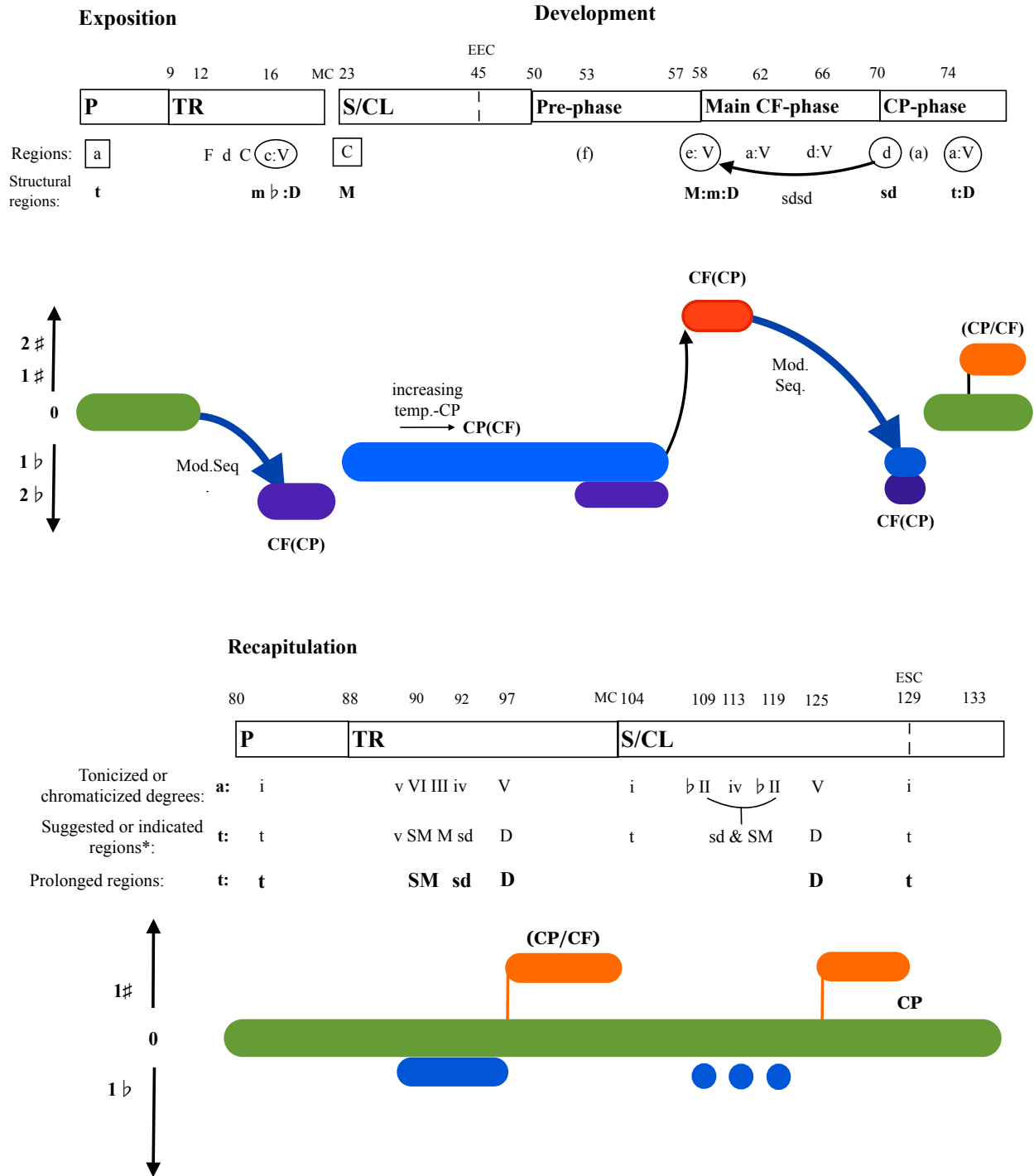
The second subordinate theme (mm. 116-29) at first continues and strengthens the local flat-centrifugal shading of the tonal narrative by returning to the Phrygian II harmony in m. 119. This mysterious sombreness generated by this flat-CF shading is powerfully counteracted by the

*Sturm und Drang* urgency of local sharp-CF forces expanding the cadential progression leading to the global-centripetal culmination. Mozart dramatically expands the final cadential progression (beginning at m. 125) by moving through two consecutive diminished-seventh harmonies. The dominant at the end of m. 125 moves deceptively to the first of these harmonies: the leading-tone seventh of the principal key with the subdominant in the bass. This progresses to the leading-tone seventh from the dominant region (m. 127), generating powerful local sharp-CF forces. This chromatic dissonance resolves to the expanded cadential 6/4 in m. 128, with the final tonic resolution in m. 129.

The powerful assertion of sharp-CF forces that respond to the previous flat-CF shadings in the group of subordinate themes creates momentum that makes the global centripetal culmination even stronger. This is a typical way in which the alternation of local flat- and sharp-CF forces motivate a stronger centripetal culmination. CF-forces disappear in the following closing section, whose diatonic cadential progressions prolong centripetal force from the culmination, balancing the local-CF forces that permeated the recapitulation on the whole.

Figure 3.4 illustrates the counterbalancing of sharp and flat sides and directions for the whole movement. The contrast between sharp and flat sides, and degrees of each, are illuminated by colors, corresponding to Goethe's color wheel (see section 2.6). It is notable that the exposition and developments each feature an imbalance between the sharp and flat sides, with the exposition tilting strongly to the flat side and the development slightly to the sharp side. The recapitulation, by contrast, features a more even balancing of the sharp and flat sides. The imbalances in the exposition and development, combined with its tonal instability, are resolved by the more evenly balanced recapitulations.

Figure 3.4. Overview of K. 310/i. Counterbalancing of the sharp and flat sides and directions, using color scheme based on Goethe's color wheel. Intensifications marked by arrows unless otherwise indicated; CF/CP refer to types of culminations. The indications 1#, 2# etc. refer to the number of fundamental relations and direction from the reference point.



\*The principal key, A minor, prevails throughout the recapitulation

The exposition orients strongly to the flat side, owing to the modulatory trajectory in the flat direction in the transition, and the prevailing mediant region in the group of subordinate themes (mm. 23-49). The development begins by continuing to intensify flat-CF force, but responds to the imbalance by suddenly switching to a remote sharp-side region. It then alternates between substantial flat-CF forces generated by the flatward trajectory of the main-CF phase (mm. 58-70) followed by sharp-chromatic intensification throughout the final dominant prolongation (mm. 74-79). The imbalance and tumultuous alternations between flat and sharp centrifugal forces are brought into greater balance in the recapitulation. The recapitulatory transition features chromatic intensification for more than half of its duration, shading the tonal narrative to the flat side in the early and middle parts (90-96) opposed by the extensive local sharp-CF forces through the dominant prolongation (mm. 97-103). This trend is replicated in the group of subordinate themes, where three brief flat-CF shadings (adding up to three measures) are balanced by a four-measure chromatic intensification of the dominant (mm. 125-128).<sup>201</sup>

Counterbalancing between or within large sections varies in general between forms, and evolved with the development of large-scale harmonic motion from the classical to romantic eras. Sonata form tends to feature more even counterbalancing, including the balance between a region on one side and modulatory movement in the opposing direction. Large ternary forms, particularly those expanded through kinetic-tonic passages in the middle section, tend to concentrate the large-scale centrifugal force on one side of the spectrum. Local centrifugal force may be more evenly balanced. This results from the most common large-scale key relation in large ternary forms: between parallel major and minor. Composers from the later classical period onwards — Beethoven, Schubert and Chopin — usually intensified the middle sections of large

---

<sup>201</sup> The measurement of durations of chromatic intensification includes the chromatic chord and chords resolving an applied dominant or leading-tone seventh.

ternary forms through modulatory intensification. Sometimes the inner section would begin not in the parallel minor, but in a region closely related to it, more distant from the principal (major) key, such as **bSM**.

The concentration of CF-force to one side in large-ternary forms follows the logic of the tonal spectrum and narrative. If a composer sets the outer sections in a major key and the inner section begins in the parallel minor, then any modulatory movement in the sharp direction would be returning back to or going past the principal key. That would defeat the purpose of modulatory movement, which is to move centrifugally away from the principal key. Therefore, modulatory movement for a parallel-minor inner section usually goes in the flat direction; for a parallel major section, it goes in the sharp direction.

Beethoven's slow movements offer an example from the classical period, showing his intensification of traditional key-schemes. Op. 31/1/ii, in C major, begins the interior section (mm. 35-64) by switching to the parallel minor before immediately modulating down a major third to **bSM** (A $\flat$  major, m. 36), whose tonic arrives in m. 41. The section then modulates by another descending third to **sdb** (F minor, mm. 46-49), at which point the subdominant is reinterpreted as **t**: iv. **t** then governs the rest of the inner section, including much of the final standing on the dominant, until the final two measures, where the melody replaces E $\flat$  from **t** with E $\natural$  from **T**. In an earlier large ternary movement, op. 7/1/ii, also in C major, Beethoven moves directly to **bSM** without the initial switch to the parallel minor. The modulatory intensification moves further than in the later movement, reaching **bSMSD** (B $\flat$  major, m. 33). In each of these cases, the global harmonic motion features increasing centrifugal motion to the flat side in the middle section, contrasting with the principal key of the outer sections. This

intensifies the moderate centrifugal force generated by the parallel minor with respect to a major principal key.

Many of Chopin's mazurkas and nocturnes expand large ternary in a similar fashion. In his Mazurka in A Minor, op. 59/1 (briefly discussed in chapter 2) the opening theme features expanded local-centrifugal motion on both flat and sharp sides, though the sharp side is emphasized. The middle section begins with a lengthy theme in the parallel major, whose second part modulates toward the dominant (E major). The rest of the section features modulatory intensification mostly to the sharp side through  $\mathbf{v}^2$  (B minor, mm. 57-68) and  $\mathbf{D}^2$  (B major, mm. 70-76), leading to the remarkable return of the opening theme in  $\mathbf{D}^2\mathbf{sm}$  (G# minor, mm. 79-90), the remotest established region appearing in the piece, a CF(CP) culminating passage on the sharp side. The overall tonal narrative intensifies the moderate-sharp CF-force generated by the parallel major to a principal minor key: it leads to a very strong CF-force on the sharp side.<sup>202</sup>

Counterbalancing between sides of the tonal spectrum and directions of modulatory trajectories in sonata form will be discussed further in chapters 4 and 5. In the sonata forms of Mozart, Beethoven, and Schubert, significant regions and/or modulatory trajectories appear on both the sharp and flat sides. Compared with large ternary forms, they usually come closer to counterbalancing the sides and directions evenly. In many cases, however, there is some emphasis on one side and direction when looking at the overall tonal narrative, though both sides and directions are emphasized in certain parts of the form. In major-key movements, the normative dominant key governing the group of subordinate themes prescribes a sharp-side emphasis for the exposition. Hence, the parallel minor and its related regions to the flat-side

---

<sup>202</sup> Note that a very strong CF-force and CF-culmination in general does not necessarily correspond to a very strong dynamic or the strongest emotion. They are often negative climaxes, marked by particularly soft dynamics. Character-wise, they often suggest strangeness and psychological remoteness from the characters associated with passages in the principal and secondary keys.

become important players in Mozart and Beethoven's piano sonata movements in order to contrast with the sharp-side subordinate key.

### 3.5. Spatial completeness: circumscribing the key

My examination of chromatic intensification of the prevailing key in the recapitulatory transition brought up a special case of counterbalancing the sharp and flat sides. When both third/parallel and fifth relations on both the sharp and flat sides of the prevailing key are suggested in a passage or section, completeness has been achieved. I call this a spatially complete chromatic enrichment of the prevailing key. This section will investigate Rameau's implications of such completion strategies, which can also apply to the totality of substantiated regions established in a whole movement (this occurs particularly in rondos, such as in Mozart's K. 533/iii). A second kind of completion strategy will also be investigated; this latter strategy typically occurs in recapitulation sections. It concerns the assimilation of foreign tones, which appeared in structural regions in the development, back into the principal tonality.<sup>203</sup>

Rameau implied the notion of completeness in his examples of good modulations in the *Traité* and *Nouveau système*. In the *Traité* he gives an example of a short piece that modulates through the five regions based on all the diatonic harmonic degrees of the key — **D**, **SD**, **sm**, **m**, and **dor** based on the degrees V, IV, vi, iii, and ii respectively. Some of these regions are defined cadentially and others are tonicized more fleetingly.<sup>204</sup> All of the "keys" that Rameau gives are articulated by his *cadence parfaite* or *irregulaire*, though some are not confirmed by a cadence in the more substantial sense involving root-position dominant-to-tonic resolution. The piece,

---

<sup>203</sup> This kind of completion strategy draws upon Patricia Carpenter's tonal-problem approach, adopted from Schoenberg and also discussed by Murray Dineen. See Carpenter, "Grundgestalt as Tonal Function," 15-38. See also Carpenter, "Schoenberg's Tonal Body," 31-63.

<sup>204</sup> Rameau, *Treatise on Harmony*, trans. Philip Gossett (New York, Dover Publications: 1971), 252.

whose principal key is C major, moves through G major (cadentially confirmed), D minor, F major (cadentially confirmed), A minor, and E minor (cadentially confirmed). It also tonicizes the more remote D major region as V of G major.

Rameau presents an analysis of Lully's monologue from *Armide* in *Nouveau système* that also shows modulation touching on all five regions based on diatonic degrees of the key.<sup>205</sup> This is offered as an illustration of a "perfect" modulation; the choice of words here is notable since perfection can be closely related to completeness.<sup>206</sup> Thus, in calling this a perfect modulation, Rameau could have been referring to the complete presentation of regions. Rameau's commitment to presenting examples of modulation through the five closest regions (apart from the parallel region) continued throughout his treatises. There is a comprehensive example of a modulating piece in the *Code de musique pratique* (1760), where four of the close regions are confirmed cadentially: V, iii, ii, and IV. An inner hierarchy is also discussed, where iii is understood as the relative of V and ii that of IV.<sup>207</sup>

Rameau's examples suggest an approach to key or regional relations that has been called *solar* by Ratner<sup>208</sup> and a *tour-of-keys approach* by Caplin.<sup>209</sup> It was the main perspective in the Baroque era; Ratner suggests that it was overtaken by the polar perspective in the classical era. The polar perspective emphasizes the tonic-dominant polarity and the opposition of principal and subordinate keys (typically tonic and dominant keys in major-key sonatas). Alternatively, the solar perspective envisions a central tonic "sun" surrounded by regions in all directions forming a circular arrangement; Schoenberg's Chart of the Regions presents one kind of solar arrangement.

---

<sup>205</sup> Christensen discusses Rameau's analysis of Lully in *Rameau and Musical Thought*, 120-21, 174.

<sup>206</sup> Cohen discusses the close conceptual connection between perfection and completeness in "The Imperfect Seeks its Perfection," 154-55.

<sup>207</sup> Rameau, *Code de musique pratique* (Paris, Imprimerie royale, 1760), 24-25.

<sup>208</sup> Ratner, *Classic Music*, 48.

<sup>209</sup> Caplin, *Classical Form*, 195-96.



A solar perspective would embrace all four directions of a spectrum based on Schoenberg's Chart — north, south, east, and west — not only the tonic-dominant polarity.

The tonal narrative of sonata form is defined by polar opposition, yet it is also illuminated by the solar principle. The exposition is organized as an opposition between the principal key and the subordinate key: normatively, the dominant or the mediant for major and minor principal keys respectively. The recapitulation creates large-scale resolution of this opposition by presenting the group of subordinate themes in the principal key. Paying attention to regions from areas other than that of the subordinate key, including remote regions, leads to a more solar perspective on the tonal narrative.

Caplin points to the influence of the solar principle in the development section of sonata forms, which moves through multiple regions other than the region confirmed in the exposition, usually with at least one region at least partly confirmed as a "development key."<sup>210</sup> In many movements, regions that had not appeared earlier in the movement (or had not been established) appear or are more firmly established early in the recapitulation; typically these regions are the subdominant and/or the parallel minor (this will be discussed in chapter 4).<sup>211</sup> The solar perspective leads toward a higher aesthetic goal for analyzing tonal narratives: spatial completeness. As discussed above, spatial completeness of local chromaticism occurs in the recapitulatory transition of Mozart's K. 310/i.

A second completion strategy regards the assimilation of salient foreign tones into the principal tonality. These foreign tones are "salient" or distinctive because they appeared in highly centrifugal situations in the development, functioning as remote goal regions. This completion

---

<sup>210</sup> Caplin, *Classical Form* 140-41.

<sup>211</sup> Caplin refers to the references to the subdominant in the recapitulation as "vestiges" of the solar approach. See *ibid.*, 196.

strategy occurs in Mozart's K. 310/i; in the recapitulation, comprehensive reference to closer regions within the principal key has a larger-scale function of assimilating the chromatic elements from the FOPs that appeared in the kinetic and anti-cadential context of the *Durchführung*. The second FOP, D minor, was the apparently remote double subdominant of the initiating region, E minor. Its defining chromatic tone, B $\flat$ , is also the root of the Phrygian II harmony in the principal key, appearing in mm. 109-10 and 119. By participating in a clear progression circumscribing the principal key, the B $\flat$  functions clearly as  $\flat\hat{2}$  in the principal key: it is therefore assimilated into it.

The first FOP, B major as dominant of E minor, is understood primarily with respect to the previous prevailing key, C major. As a structurally emphasized region, however, it can also be related back to the principal key. Strikingly, its most centrifugal tone, the A $\sharp$  of the augmented sixth dominantizing B major (m. 57), is the enharmonic twin of B $\flat$ . As the ascending leading tone of the global dominant of the dominant region (**D $\sharp$ D**), it is more strongly centrifugal to the principal key than B $\flat$ , which is the descending leading tone of **sd**. Therefore, the appearance of B $\flat$  as the enharmonic twin of A $\sharp$  in the Phrygian II chords in the recapitulation also assimilates the A $\sharp$  from the first FOP: a large-scale centripetal process.

The final chromatic-centrifugal event, the sudden incursion of the dominant region's leading-tone seventh into the final cadential progression, completes the centripetal assimilation of the **D $\sharp$ D** region (B major) into the principal tonality. Since vii of V is also a B dominant ninth harmony whose root does not sound ( $\text{II}\cdot\frac{\flat 9}{\sharp 3}$ ), there is a direct connection between the B major of the FOP and this final centrifugal moment. In the FOP, the D $\sharp$  and F $\sharp$  were part of the goal harmony, whereas at the final intensification they are dissonant chromatic tones that resolve

definitively to the dominant of the principal key and onwards to complete the expanded cadential progression and full centripetal culmination for the piece. Hence the spatial completeness attained in the recapitulation — completeness of chromatic enrichment while remaining in the principal key — also functions to reach a large-scale centripetal resolution of the centrifugal events in the development.

### **3.6. Simultaneity of centrifugal and centripetal forces**

As we have seen, the interaction of centrifugal and centripetal forces generates the tonal narrative; tonal narrative functions define particular combinations and forms that these opposing forces take. In particularly significant passages or at critical moments in tonal narratives, strong centrifugal and centripetal forces occur simultaneously. Three of the most common, arising particularly in sonata form, have been mentioned in the above discussion. The first common convergence of centrifugal and centripetal forces is the significant chromatic intensification of harmonic progressions circumscribing a prevailing key, leading to the temporal-CP culmination. Here, local-centrifugal forces function simultaneously with larger-scale centripetal forces building to their maximum. The second instance regards the prolongation of the goal region of modulatory phases through durational and half-cadential emphasis. In this case, a maximum of spatial- and global-centrifugal force coincides with a slight local temporal-centripetal force: a slight fixed-tonic passage in a kinetic-tonic section. In the third case, the tonal narrative function of counterbalancing the sharp and flat sides of the prevailing key or the whole tonal spectrum manifests a simultaneity of centrifugal and centripetal forces. As discussed in the above section on spatial completeness, centrifugal force generated by regions in the recapitulation, such as the subdominant and parallel minor (to a major principal key) often counterbalance previous large-

scale centrifugal motion to more remote regions. Even while both modulations or chromatic intensifications generate significant CF-force, they contribute essentially to a large-scale circumscribing of the principal tonal spectrum: a centripetal force at the most global level.

In *Harmonielehre*, Schoenberg vividly conceives of modulation in terms not only of the interaction of centrifugal and centripetal forces, but of their simultaneity. Schoenberg's conception was discussed in 1.2 above, where it was interpreted as a continuation of the energetics tradition in music theory, emphasizing the dynamic interplay of polarities deriving from dissonance and consonance. Schoenberg's conception of the simultaneity of these polarities also echoes and may have been influenced by the philosophical paradigm of Heraclitus. This pre-Socratic Greek philosopher believed that the entire universe is held together by the constant conflict between centripetal and centrifugal forces, which he called peace and strife.<sup>212</sup> The remainder of this section will present the philosophical basis for the way in which simultaneous centrifugal and centripetal forces generate potent and crucial passages of the tonal narrative.

In Schoenberg's passages on modulation discussed in 1.2, an intensive power struggle between the principal tonic and its regions generates these simultaneous centrifugal and centripetal forces. For a work of art to emerge, the principal key must be "placed in danger of losing its sovereignty;" the regions' desires for influence "must be given opportunity to activate themselves." The regions' "appetites for independence" generate centrifugal forces, while at the same time the principal tonic's "urge to dominate" generates centripetal forces to overcome and subordinate the regions.<sup>213</sup> In other cases, the regions may establish themselves as temporary keys, thereby generating their own (temporal) centripetal force. At the same time, their position

---

<sup>212</sup> Michael Cherlin, "Dialectical Opposition in Schoenberg's Music and Thought," *Music Theory Spectrum* 22/2 (2000): 158-60.

<sup>213</sup> Schoenberg, *Theory of Harmony*, 151-52.

as a region of the principal tonic simultaneously generates a global centrifugal force. In kinetic-tonic sections, motion through many regions generates even stronger centrifugal forces.

Ultimately, however, the regions circumscribe the tonal spectrum organized around the principal tonic, their centrifugal forces being part of a larger-scale counterbalancing of the sides of the spectrum: a centripetal phenomenon at the most global level.

As Michael Cherlin points out, Schoenberg was well aware of Heraclitus' notion of oppositions. Cherlin notes Schoenberg's reference to Heraclitus in a passage from *Fundamentals of Musical Composition*, discussing the significance of contrast in Beethoven's *Appassionata* Sonata:

All good music consists of many contrasting ideas. An idea achieves its distinctiveness and validity in contrast with others. Heraclitus called contrast "the principle of development." Musical thinking is subject to the same dialectic as all other thinking.<sup>214</sup>

Cherlin suggests that Schoenberg's most likely source is Aristotle's citation of Heraclitus in *Nicomachean Ethics*:

And Heraclitus says, "The unlike is joined together, and from differences results the most beautiful harmony, and all things take place by strife."<sup>215</sup>

Heraclitus' concept of polarity was distinctive in its emphasis on the continual conflict between opposites; it differed significantly from the Pythagorean one. Music itself played a crucial role in both definitions, the basic duality being between *harmonia* and discord or dissonance. For the Pythagoreans, *harmonia* is synonymous with consonance and alternates with dissonance; the higher unity achieved through their synthesis is a resolution to a consonance. For Heraclitus, on

---

<sup>214</sup> Quoted in Cherlin, "Dialectical Opposition," 168-69.

<sup>215</sup> Quoted in *ibid.*, 169.

the other hand, harmony between contrasting elements is only achieved through their simultaneity, opposition, and equal strength. The struggle between them is never fully resolved, but it continues eternally. W.G.K. Guthrie wrote that

Heraclitus with his "stricter muse" asserted that any harmony between contrasting elements necessarily involved a tension or strife between the opposites of which they were composed. The tension is never resolved. Peace and war do not succeed each other in turn: always in the world there is both peace and war. Cessation of struggle would mean disintegration of the universe.<sup>216</sup>

For Heraclitus, it is the simultaneity of and conflict between opposing forces that allows the universe to continue to function and avoid disintegration. In the same way, it is the simultaneity of centrifugal and centripetal forces that generates a functioning and meaningful tonal narrative. The passages from *Theory of Harmony* discussed above elaborate upon this view. The tonality does not merely allow but requires the challenge of alternate regions; it must be placed in danger of losing its control of the tonal narrative. Without the tendencies of the regions of toward independence, the tonal narrative would stagnate and disintegrate. The regions must be allowed to influence the tonal narrative, generating centrifugal forces. They should even be granted occasional victories, enabling them to generate their own temporary spectra. The more strongly that a region asserts itself in opposition to the principal key, and the more numerous the regions passed through, the more "dazzling" and significant the victory of the principal key becomes.

### **3.7. Summary of tonal narrative functions: three archetypal shapes**

The tonal narrative functions, and Schoenberg's three centrifugal functions, upon which they are partly based, manifest three archetypal shapes. These shapes are also based on

---

<sup>216</sup> Quoted in *ibid.*, 159.

combinations of the polar/solar and cadential/sequential (fixed-/kinetic-tonic) modes of harmonic motion discussed above. Tonal narratives can be conceived of as a concatenation of these archetypal shapes, representing modes of harmonic motion, operating at different levels. Each shape also corresponds to a particular perspective, the combination of which may aid a performer-interpreter, analyst, or listener to comprehend tonal narratives.

One perspective of analysis discussed in this chapter focuses on centrifugal intensifications leading to culminations, which may be centripetal or centrifugal. The perspective manifests in A.B. Marx's model of *Ruhe-Bewegung-Ruhe* (rest-motion-rest).<sup>217</sup> This model can be applied to various levels of form, from a C major scale, to local centrifugal/centripetal fluctuations within a phrase, to the large-scale undulations of centrifugal and centripetal forces for an entire movement. In passages and sections outlining a prevailing key, often local centrifugal forces create extra motion or momentum that leads toward a temporal-centripetal culmination—the cadential arrival and a return to the state of rest. In the modulation-as-opposition function, a foreign key creates an opposition with the principal key, generating large-scale motion from a state of rest. In modulatory passages and sections, the kinetic-centrifugal forces intensify toward the point of furthest remove, the centrifugal culmination.

In each of these cases, the intensifications lead to a maximum of centrifugal and/or centripetal force, creating a simple wave shape. Intensification creates rising centrifugal forces represented by the rise of the wave, leading to a maximum, corresponding to the crest, followed by a de-escalation. Scholars such as Leonard Ratner, Kofi Agawu, and Blair Johnston have drawn upon this kind of wave model as a basis for analysis, calling it a dynamic curve or

---

<sup>217</sup> Scott Burnham investigates this model in Burnham, "The Role of Sonata Form in A.B. Marx's Theory of Form," *Journal of Music Theory* 33/2 (1989): 247-71.

dynamic wave.<sup>218</sup> In modulatory movement leading to a centrifugal culmination, the rise of the wave is enhanced and extended. This centrifugal motion in a single direction suggests a continuous arrow, potentially extending to infinity until halted by the arrival at the point of furthest remove.

Harmonic motion and counterbalancing between sharp and flat sides of the tonal spectrum or within a key creates a different kind of wave: an oscillation around a central point. While the simple dynamic wave involves oscillation between central and peripheral elements, harmonic motion between sharp and flat sides generates a multi-faceted wave that moves either side of a central point. This generates a sine-wave shape, with a peak and a trough: the second archetypal shape. The dynamic wave emphasizes the process of intensification and the regional dissonance generated by the alternate region or regions; the sine wave adds the perspective of two sides (which divide further into fifth- and third-relations), that correspond to brighter and darker harmonic shades. The model manifests, at various levels, Rameau's archetype of the tonic as center of gravity surrounded by upper and lower dominants. Indeed, Rameau wrote of the two dominants as the extremes or peripheries of the whole system that are joined in various ways, such as through the characteristic dissonances borrowed from the other dominant.<sup>219</sup>

The combination of sharp and flat with fifth- and third-relations (including the parallel relation) generates a tonal spectrum such as Schoenberg's chart of the regions. Motion through regions in all four areas (sharp-side fifth- and third-relations; flat-side fifth- and third- relations) creates a circular shape when regions are laid out so that the parallel and relative relations alternate in the horizontal dimension and fifth relations generate the vertical dimension. Motion

---

<sup>218</sup> See Ratner, *Music: The Listener's Art*, 314; V. Kofi Agawu, "Highpoints in Schumann's *Dichterliebe*," *Music Analysis* 3 (1984): 159-80; Blair Johnston, "Harmony and Climaxes in the Late Works of Sergei Rachmaninoff" (Ph.D. dissertation, University of Michigan, 2009), 24.

<sup>219</sup> Rameau, *Génération harmonique*, 112-13.



through all four areas presents the solar mode of harmonic motion; analysis in terms of the four areas promotes a solar perspective on harmonic motion. Therefore, the corresponding shape to this perspective is the circle, the third archetypal shape. The corresponding tonal narrative function, or aesthetic goal, is attaining spatial completeness: when the tonal narrative progresses towards spatial completeness on various levels of harmonic motion, it also circumscribes the tonal spectrum, moving in a circular motion around the central term.

### 3.8. Regional/key hierarchy

The tonal narrative functions originate in the interplay of centrifugal and centripetal forces. These primary forces themselves arise through the ambitions and motivations of the regions for independence, to assert their own character and orientation on the tonal narrative, as Schoenberg imagines in his chapter on modulation in *Harmonielehre*.<sup>220</sup> Their character and orientation derives from their upper/lower dominant, relative/parallel relation back to the principal tonic: their relationships on the chart of regions. These in turn create sharp/flat shades, fifth- and third-based relations at varying degrees of centrifugal force with respect to the center. A region may assert itself through strong cadential substantiation, eventually setting up a secondary, transient spectrum where it reigns as a temporary sovereign, eventually to be overcome. In other parts of the tonal narrative, a mysterious kinetic force disrupts the principal or subordinate tonality, compelling multiple regions to jostle for ultimate influence.<sup>221</sup> This force often connects regions by a constant relation (ascending perfect fifth, ascending minor third,

---

<sup>220</sup> Schoenberg, *Theory of Harmony*, 150-53.

<sup>221</sup> The tonal narrative approach's conception of temporary spectra, based around an initiating region rather than the principal key of the whole piece differs from the monotonicity articulated in Schoenberg's *Structural Functions*. The centrifugal function listed as number 3 in the modulation chapter and some of the images suggested earlier in the chapter imply the possibility of a more fluid temporary spectrum (see section 2.4). In the following paragraphs, I build upon Schoenberg's metaphor from the perspective of the tonal narrative approach.

etc.), moving swiftly through these connected regions and leading to a more unlikely candidate for power, one that lies at the periphery of the spectrum. Ultimately, it accepts its place in the principal order and eventually yields power back to the principal tonic. In other parts of the tonal narrative, regions exert a subtler, less revolutionary influence upon the spectrum governed by the principal member, and the mysterious kinetic centrifugal force remains under control. Instead of aiming to depose the principal tonality, regions gently influence the sovereign to lean towards their area, to engage in an exchange of knowledge or resources. For the tonality to remain strong, however, the sovereign aims to balance their interaction with contrasting regions, to draw influence from all four areas: those originating in dominant, subdominant, parallel, and relative relations. These shifting dynamics of influence and power between regions and tonal spectra point toward a nuanced hierarchy of regions.

The dynamic interplay of regions and kinetic forces in the tonal spectrum generates the tonal narrative functions: opposition, intensification, culminations of various kinds, the counterbalancing of areas or directions, and ultimately the development toward spatial completeness. These processes create changing centers of power, but also changing conditions of the spectrum: from one with a fixed central term to a more fluid spectrum moving through fleeting tonics.<sup>222</sup> A hierarchy of regions can thus be determined for tonal narratives, where some regions have a governing role, others a more subordinate one. Governing regions attract more numerous relations, while some subordinates only relate to their own ruling member. Some regions govern temporarily in volatile (kinetic-tonic) situations but ultimately assimilate themselves into the principal tonality. The interaction of governing and subordinate regions

---

<sup>222</sup> Here I depart from Schonberg's monotonicity, flavoring it with aspects of Tovey's approach, see previous footnote.

generates the orientation and quality of the tonal narrative, leaning to the sharp and flat sides with varying degrees of centrifugal force.

Regional hierarchy is largely based on the substantiality and completeness with which a region is presented. This substantiality is measured according to the number and completeness of the harmonic progressions expressing the region. When progressions continually circumscribe a single region, it establishes a fixed-tonic passage or section, and the region becomes a key. Therefore, the governing regions of fixed-tonic passages are the most significant in the piece. After the principal tonic, the regions with the second-strongest influence on the tonal narrative are regions that oppose the principal tonic through the function of modulation as opposition. These are regions whose harmonic progressions develop through multiple phrases and attain a temporal-centripetal culmination. This requires more than a partial or lighter cadence, but usually a more substantial cadential progression asserting the region as a rival tonality to the principal one. In sonata form, there is usually only one such subordinate key, but in rondo forms there are often multiple subordinate keys in opposition to the tonic.

The division of tonal narratives into predominantly fixed-tonic and kinetic-tonic passages and sections leads to separate principles and criteria for determining lesser degrees of regional influence or governance for each type of section. In fixed-tonic sections, centrifugal force operates within the framework of Schoenberg's "chromatic intensifications of a prevailing key." Some of these intensifications, however, do expand into fleeting indications or transient establishments of regions, incorporating a hint of the modulation-as-opposition function. Here, the substantiality and completeness with which a region is presented functions as the sole criterion for determining its position in the regional hierarchy and its role in the tonal narrative. In kinetic-tonic passages, however, regional substantiality is one of two factors taken into

consideration for determining which regions act as reference points that represent the modulatory phases and connect them to the principal tonal narrative. The other factor is that of sequential articulation: the first and last terms of a modulatory sequence or unidirectional phase are given structural weight, equivalent to a transiently established region. This is because they mark significant points of change into and out of the sequential passage.

### **3.8.1. Regional substantiality in fixed-tonic sections**

We begin the discussion by elucidating degrees of key-substantiality. In order for a vital, worthwhile tonal narrative to arise, the tonic key should be challenged by its regions, whose leading tones are foreign to the global tonic scale, generating centrifugal force. Each of Schoenberg's three centrifugal functions — chromatic intensification of a prevailing key, modulation as opposition, and modulatory intensification — results from the influence of regions on the tonic key. The regions exert varying degrees of influence on the tonal narrative, generating their own centers of gravity or power that challenge the global tonic. The completeness and number of harmonic progressions presenting a region determines its degree of substantiality and influence on the tonal narrative. This generates a spectrum that ranges from a mere glimpse, hint, or implication of the key, to a fleeting indication, to a transient establishment, to full confirmation and substantiation of a subordinate key that temporarily functions as tonic of its own spectrum. The tonal narrative approach is based on broad four degrees of regional substantiality, listed here from most ephemeral to most substantial.

1) *Implication, suggestion, or glimpse* of a region: the composer enriches or intensifies a progression expressing a prevailing key by replacing diatonic tones (often the thirds of chords) with the ascending or descending leading tones of the regions, which are foreign to the prevailing

key; Schoenberg also calls these "artificial leading tones."<sup>224</sup> The suggested regions *shade* the tonal narrative toward that region (generating sharp- or flat-CF forces based on its location on the spectrum).

2) *Fleeting indication* of a region: a single closed progression, such as tonic-dominant-tonic, fleetingly indicates a region. Indicated regions *tilt* the tonal narrative toward that region.

3) *Transient establishment* of a region: a region is established by at least two harmonic progressions and lasts for at least four measures. One of these progressions must be a harmonic cycle; if there is a cadential progression the region is considered strongly established.

4) *Confirmation and substantiation* of a region: a region becomes the *prevailing key* of a fixed-tonic passage through continual progressions presenting the region, including multiple harmonic and cadential cycles. A perfect authentic cadence fully confirms the key. Confirmed regions *orient* the tonal narrative substantially toward that region.

Each of these four broader degrees can be subdivided further, based on individual cases that will be explained below.

This spectrum of regional substantiality draws on Ratner's elucidation of four degrees of rhetorical emphasis with which harmonic progressions express and define a key (he presents only three in some instances): implication, indication, establishment, and confirmation.<sup>226</sup> The degrees of rhetorical emphasis also correspond to how completely a region is presented. The first degree refers to chromatic intensification of a prevailing key, where foreign tones color or intensify diatonic progressions. This generates applied or artificial dominants and leading-tone

---

<sup>224</sup> In *Structural Functions*, Schoenberg does not use the term alteration. Instead he writes about substitute tones or artificial leading tones from the regions which substitute for the diatonic tones. See *Structural Functions*, 15-18.

<sup>226</sup> Ratner lists the four degrees of rhetorical emphasis in Leonard Ratner, *Harmony: Structure and Style* (New York: McGraw-Hill, 1962), 231. Earlier in the same chapter, he discusses only indication, establishment, and confirmation (p. 225). Only these three are also given in *Classic Music*, 52-54.

seventh chords, which usually (but not always) resolve to the generative triad (tonic) of the region from which they originate. Complex chromatic harmonies, such as augmented sixth chords, provide glimpses of two regions, often on opposite flat and sharp sides of the tonal spectrum. The leading tones from these regions, foreign or artificial to the prevailing key, provide a glimpse or suggestion of those regions. In a prevailing major key, the augmented sixth chord presents the descending leading tone from **t** (tonic minor region) as  $\flat\hat{6}$  of the prevailing key and the ascending leading-tone from **D** (dominant region) as  $\sharp\hat{4}$  of the prevailing key. Leading-tone diminished seventh chords resolving to major triads also suggest two regions: those generated by the parallel major and minor triads of resolution. Schoenberg refers to chromatic intensification resulting from glimpses of regions as "enriched cadences" in the prevailing key.<sup>228</sup>

The minimum criterion for the *indication* of a region in passages circumscribing a prevailing key is the presence of a T-D-T or T-S-T progression: an opening and closing tonic (in any position) enclosing a harmony containing at least one of the leading tones of the region. This criterion distinguishes it from the implication of a region that primarily serves as chromatic enrichment of the prevailing key. It corresponds approximately to Ratner's definition given in *Harmony: Structure and Style*, where it refers to the "internal section of a period momentarily in the second key with no strong cadence." Here it is distinguished from *implication*, which refers to "secondary dominant action;" in *Classic Music*, which does not include implication in its list of three degrees, the definition of *indication* is broader, also incorporating implication.<sup>229</sup>

When a region is merely glimpsed through chromatic enrichment, it is completely assimilated into the prevailing key, shading it slightly toward that region. When a region

---

<sup>228</sup> Schoenberg, *Structural Functions*, 25-28.

<sup>229</sup> Ratner, *Classic Music*, 52-54.

becomes indicated, it generates a slightly more substantial centrifugal force in the tonal narrative, tilting the tonal narrative slightly more substantially toward that region. The indicated region does not overcome the prevailing key, but it creates a slight challenge to the key, or the fleeting possibility that the region may become the ruling key. A typical example of the *fleeting indication of a region* within a passage based on a single prevailing key is the expanded tonicization of the subdominant and/or its relative (ii) in the first half of a recapitulation. As Rosen has pointed out, this flat-side region contrasts with and counterbalances the dominant region from the exposition, though appearing in a less substantial way.<sup>230</sup> For example, in Mozart's Piano Sonata K. 310, second movement (in F major, see example 3.4), the recapitulatory transition features flat-chromatic enrichment suggesting **SD**, as well as its relative, **SDsm** (mm. 61-66).<sup>231</sup> This leads to the second theme (beginning at m. 68), where the fleeting indication of **SD** expands the presentation through the progression **SD: V<sup>7</sup>-I-V<sup>7</sup>-I** in mm. 70-72. This indication of **SD** has slightly more substantiality than the earlier suggestions of **SD** and **SDsm** because of the repetition of **SD: V<sup>7</sup>-I**, creating slightly more influence on the tonal narrative. The suggestion or implication of a region correlates with the standard tonicization of a harmonic degree; the indication of a region correlates with expanded tonicization.

In some fixed-tonic passages, a region appears as though it will be substantiated: it gains a momentary or apparent independence within the phrase. Often, however, these appearances of regions turn out to be durationally extended indications of a region, which ultimately function as a harmonic degree of the prevailing key in a progression circumscribing that key. The tonal narrative approach calls this phenomenon an *extended indication* of a region. It is extended

---

<sup>230</sup> Rosen, *Sonata Forms*, 288-89.

<sup>231</sup> The registration **SDsm** for the region based on ii is an equivalent to Schoenberg's **dor**. The registration shows the connection of this region to both **SD** and **sm**.

rather than fleeting due to the extended duration and multiple progressions expressing the region. The minimum criterion for the extended indication of a region is the presence of at least three progressions with a total duration of at least four measures, the archetypal small phrase.<sup>232</sup> The extended indicated region is considered indicated rather than established because only tonic and dominant, or tonic and subdominant harmonies express the region; the region is not presented by a complete harmonic cycle that includes the pre-dominant function.

Example 3.4. Mozart, Piano Sonata K. 310/ii in F major, mm. 61-72

61 *f* *p* *f* *b 7 of T from SD*

63 *f* *T: I* *V4/2 of IV* *#1 of T from SDsm*

65 *crescendo* *IV6* *f* *V4/2 of ii* *p*

70 *tr* *V* *I* *p* *sf sf*

T: I IV I V7 16  
SD: V6 6/5 I

<sup>232</sup> For example, the archetypal period is eight measures, consisting of two four-measure phrases, antecedent and consequent. See Caplin, *Classical Form*, 49, 35.



Beethoven's Sonata in E-flat Major, op. 7/i presents such a region in the group of subordinate themes. The second subordinate theme ( $S^2$ ) is a loosely structured period with a remarkably expanded consequent: the antecedent is eight measures (mm. 59-67), while the consequent is more than three times as long, lasting 25 measures (mm. 67-92).<sup>233</sup> Example 3.5 shows my harmonic analysis of the theme. The consequent begins with a variation on the basic idea of the antecedent, then moves to a prolonged dominant (mm. 71-78). Beethoven then makes an intensified deceptive progression to a chromatic leading-tone diminished seventh, generated from the (non-sounding) mediant degree ( $III_{\sharp}^7, \bullet$ , mm. 79-80), whose chromatic  $F\sharp$  implies **sm** (G minor). The harmony leads by descending fifths through  $VI\flat$  to  $II\flat$ , appearing at m. 83 but over its own dominant as a pedal point. The  $II\flat$  harmony is then indicated as a region of the prevailing global dominant key ( $B\flat$  major) by alternation of its own tonic and dominant chords over a dominant pedal for another six measures. As a region, it relates to the prevailing key as the double dominant, i.e. **Bb: DD** (C major), since it eventually returns to the prevailing tonic via the dominant harmony. In total, **Bb: DD** appears for eight and a half measures (mm. 81-89), counting the initial **DD:  $V_{4-3}^6-7$** , approximately a quarter of the entire expanded period. The melody presenting the **DD** region also contributes to its distinctiveness, presenting scalar triplet motifs to contrast with the skipping dotted-quarter basic idea of the larger phrase. The extended harmonic presentation, in addition to the melodic emphasis, suggests the possibility of a modulation to this region. It may even seem that this shift in harmonic focal point has resulted in a real change of key. However, in the very measure when the I of **DD** arrives (m. 89), the harmony continues its

---

<sup>233</sup> Schenker reads the phrase as an expanded period; see *Harmony*, 295.

circuit of the prevailing key, B $\flat$  major (the global dominant). It is revealed to be a II $\sharp$  fulfilling a significantly extended pre-dominant phase of the harmonic progression defining B $\flat$  major, moving through V to I followed by another circuit of descending fifths from the mediant: III $\sharp$ -vi-ii-V-I.

Example 3.5. Roman numeral analysis of Beethoven op. 7/i, second subordinate theme (S $^2$ : mm. 59-93). Measure numbers refer to the end of measures. Prevailing key = B $\flat$  major = global dominant.

Antecedent

B $\flat$ : I IV ii V I P vi II

Consequent (much expanded)

V I (mm. 67-71 = 59-63) V

(I) V pedal

from B $\flat$ : sm III $\sharp$   
 B $\flat$ :DD: II $\sharp$

V alternating V-I over V pedal  
 extended indication of B $\flat$ : DD

**B ♭:** VI<sub>♭</sub> II<sup>7</sup><sub>♭</sub> V<sup>7</sup> I III<sup>7</sup><sub>♯</sub> vi  
**B ♭: DD:** alternating V-I over V pedal \_\_\_\_\_ I  
 extended indication of B ♭: DD \_\_\_\_\_

**B ♭:** ii V I

Schenker considered this passage to be a prime example of a *Scheintonart* or "illusory key" in *Harmonielehre* (1906).<sup>234</sup> This is a key that appears to function independently, like a "real" key, but turns out to be an expansion of a harmonic degree of the prevailing key. Schenker compares such *Scheintonarten* to "real" keys resulting from genuine modulations. For example, in the development section of this same piece, he reads six real keys, as opposed to illusory ones. For the keys in the development section, the previously confirmed key (the dominant) is departed from, and thus the fleetingly indicated keys are considered to be real or independent. On the other hand, in this S<sup>2</sup> theme, the passage in **D: D<sup>2</sup>** (C major) grows out of the prevailing dominant key (B flat major) and turns out to be part of a larger extended cadential progression in descending fifths: **D: VI-II-V-I** (mm. 81-92). This makes it "illusory" or more dependent on the prevailing key.

<sup>234</sup> Elisabeth Mann Borgese translates *Scheintonart* as "simulated keys;" see Schenker, *Harmony*, 294-98. Carl Schachter refers to them as "illusory keys" in Schachter, "Analysis by Key: Another Look at Modulation," *Music Analysis* 6/3 (1988): 300-07.

In the tonal narrative approach, the ephemeral rather than illusory quality of these passages is emphasized; they present what I call extended or transient indications of a region. They occur in essentially fixed-tonic passages, as expanded tonicizations or expanded chromatic enrichment within a prevailing key (Schoenberg's first function). By increasing the number of progressions expressing the region, extending its duration, the region creates a slight sense of opposition to the prevailing key, leaning towards the modulation-as-opposition function. It also tilts the prevailing key semi-substantially toward one part of the tonal spectrum, in this case to the sharp-side fifth-relations, at a moderately remote distance.

The modulation-as-opposition function manifests slightly more strongly in cases where the subordinate region is transiently established. The harmonic criteria for the establishment of a region build on that of indication. Just as for extended indications of a region, a transiently established region requires multiple progressions expressing the region and a duration of at least four measures. One of these progressions must be a harmonic cycle. This differentiates a transiently established region from an extended indicated region. A harmonic cycle expands upon the simple alternation of tonic and dominant that indicates a region by presenting tonic, predominant, and dominant functions. For a region to be more strongly established, one of the progressions must be a cadential cycle; a harmonic cycle is substantiated into a cadential cycle when its dominant is in root position. Cadential cycles or progressions have varying degrees of completeness, based on the various cadence types. When a region is transiently established, a more substantial contrast is created with the prevailing key than when a region is indicated, including extended indication. Ultimately, though, the modulation is transient and the region is fully assimilated into the prevailing key.

The opening section of Chopin's Second Ballade (op. 38) features primarily fixed-tonality centered on F major. At the same time, two transient centrifugal passages involving the diatonic mediant region (A minor) challenge the prevailing F major. These appearances of the mediant anticipate and intimate the large-scale tonal narrative, where the mediant eventually becomes substantiated as the ruling key of the final section: a second principal key. The opening section (mm. 1-46) is organized as a small ternary, with a closed opening part in the principal key (mm. 1-18), a modulatory middle section moving through **m** to **D** (mm. 18-26), and a return to the first part (A2), significantly expanded (mm. 27-46). The diatonic mediant first appears when it initiates the transient modulatory middle section, briefly departing from the prevailing key. Here the region is only briefly, though strongly, indicated by a single cadential progression. The mediant region appears for a second time in the return to the theme (A2). A deceptive resolution in mm. 33-34 from V to iii grows into a transient establishment of **m** (the region centered on iii) through multiple alternations of its tonic and subdominant, leading to a cadential progression and PAC (mm. 34-38). This **m**: PAC significantly diverts the trajectory of the A2 part, tilting it semi-substantially toward the sharp-third-related area of the spectrum. It also intimates the later substantiation of A minor as governing key of the final section, where it becomes the second principal key for the piece.

Ultimately, the passage transiently establishing **m** expands progressions circumscribing the prevailing key. It essentially expands a deceptive resolution: V-iii. The conclusion of the **m**: PAC elides into a descending-fifths progression that circumscribes the key and definitively reconfirms the principal key: **T**: iii-VI•<sup>9</sup>/<sub>#</sub>-ii-V-I (mm. 38-40, repeated mm. 40-42).<sup>235</sup> Still, the

---

<sup>235</sup> Note that I interpret the leading-tone diminished seventh applied to ii in mm. 38 and 40 as an incomplete dominant ninth chord; I indicate the non-sounding root with a bullet point. See Damschroder, *Harmony in Schubert*, 4-5.

transiently established **m** generates a moderately substantial CF-force to the sharp side, tilting the whole section to that side. The opening section is then counterbalanced in the following kinetic-tonic section (mm. 47-82), which modulates strongly in the flat direction (particularly mm. 63-71).

Table 3.3 presents a spectrum of regional definition and substantiality based on Ratner's four degrees of key-area presentation: confirmation, establishment, indication, and suggestion/implication. Subdivisions of these broader degrees generate seven degrees of regional substantiality. Confirmed keys are differentiated into principal and subordinate keys; regions that are established but not fully confirmed divide into transiently established and transient (partly established) regions; indicated regions divide into extended and fleeting indications. Suggested or implied regions correspond to non-expanded chromatic intensifications of a prevailing key.

Table 3.3. Spectrum of regional definition and substantiality; Regional hierarchy for fixed-tonic sections

Large division	General criteria (based on Ratner's degrees of emphasis)	Subdivisions	Specific criteria
<b>Substantial keys</b>	A region becomes the <i>prevailing key</i> of a fixed-tonic passage through continual progressions presenting the region, including multiple harmonic and cadential cycles. A perfect authentic cadence fully <b>confirms</b> the key. Should govern a section of at least eight measures in length (the typical length of a theme).	I. Principal key	Prevailing key of multiple fixed-tonic sections: usually defined in the global tonal narrative by a return to the key and a centripetal culmination, such as the ESC in sonata form.
		II. Subordinate key	A region that becomes a prevailing key of a fixed-tonic section. It directly opposes the principal key by developing toward and attaining a temporal-centripetal culmination. This generates a simultaneity of a more local temporal-centripetal force around the key and global

			spatial-centrifugal force with respect to the principal key.
<b>Transient regions</b>	<b>Established</b> by at least two or three consecutive progressions, including a harmonic cycle presenting three harmonic areas (often a half or other incomplete cadential progression).	III. Transiently established	Typically established by a half-cadential or evaded cadential progression. A region appearing for less than eight measures, established with an authentic cadence, is also considered transient.
		IV. Transient (partly established)	More weakly established by a harmonic cycle that is not a cadential progression.
<b>Indicated regions</b>	When there is a prevailing substantial key, minimal criteria for a digression to a fleeting key is <b>indication</b> through a self-contained I-V-I progression (chords can occur in any position). In a modulatory section or passage, a tonic and chord containing its leading tones are sufficient to indicate the region. Any single, stand-alone progression only <b>indicates</b> or <b>suggests</b> a key, even if the progression is itself cadential.	V. Extended indication	Refers to durational expansion resulting from repeated spatially incomplete progressions (usually alternations of I-V or I-IV, prolonging a single harmony). Region appears for at least four measures. Corresponds to Schenker's <i>Scheintonarten</i> as discussed in his <i>Harmonielehre</i> (1906).
		VI. Fleeting	Fleetingly suggested by a single progression (at least I-V-I, if occurring as digression within passage with prevailing key).
<b>Chromatic intensification</b>	VII. <b>Implication, glimpse of a region:</b> Applied dominants and applied leading tone seventh chords, augmented sixth chords, and single chords appearing through modal mixture (including the Phrygian II) imply or give a glimpse of a region through its leading tones, which are artificial or foreign to the prevailing key. After the resolution of the applied or other chromatic chord, the progression continues to outline the prevailing key: there is no closed I-V-I progression that could indicate a digression to a fleeting region distinguishes this situation.		

### 3.8.2. Key hierarchy in kinetic-tonic passages

As we have seen, in fixed-tonic passages, progressions clearly circumscribe the governing key, essentially following T-PD-D-T syntax (allowing for many kinds of expansions

and insertions). There is eventual establishment of the prevailing key, with further, more complete cadential progressions potentially leading to a temporal-centripetal culmination. Subordinate regions may appear as expansions of the T-PD-D-T syntax, sometimes elaborately so. Kinetic-tonic passages, however, follow an organizing principle that opposes the cadential principle. The kinetic-tonic principle is based on unidirectional modulatory movement, including modulatory sequences, phases, and modulatory leaps. Cadential establishment and substantiation of a region in a kinetic-tonic passage suggests the influence of the fixed-tonic principle within a kinetic-tonic section, giving the region more significance in the tonal narrative and the potential to be directly related to the principal and/or subordinate keys. Regarding development sections, Caplin refers to regions that are partly or fully confirmed cadentially as *development keys*.<sup>236</sup> The tonal narrative approach considers them to be transiently established regions. As in fixed-tonic passages, in kinetic-tonic passages the tonal narrative only establishes a region when there are multiple harmonic progressions in that region, of which at least one is a harmonic cycle.

Since the main purpose of kinetic-tonic passages is to lead toward a culmination of centrifugal force through unidirectional modulatory movement, there should also be another criterion, specific to kinetic-tonic sections, for determining intermediate governing regions. In any kind of sequence, the point of departure and the goal or arrival point are the most important, defining terms: in a harmonic sequence, usually the structurally defining chords are the initiating and goal ones. In a modulatory sequence or unidirectional modulatory phase, the initiating region marks a change from fixed-tonicity or from a different modulatory sequence. For example, the initiating region of the whole development section, if different from the subordinate key, marks the departure from that key. The goal region marks the end of the modulatory sequence and a

---

<sup>236</sup> Caplin, *Classical Form*, 139-41.



change back toward fixed-tonicality or a further modulatory sequence. For example, the culmination of centrifugal force is the goal of a modulatory sequence or phase, at which point the tonal narrative turns centripetally toward the principal key. Therefore, in a modulatory sequence or unidirectional modulatory phase, the initiating and goal regions serve to define and govern the passage. These harmonic pillars can then relate to preceding or subsequent cadential events, preceding or subsequent pillars of modulatory phases, and to the principal tonic. In the case of sonata form, an initiating region in the development typically relates to the subordinate key, while the subsequent cadential event after the goal region of a modulatory sequence is often the return to the principal key, to which it therefore directly relates.

The three globally significant elements of a modulatory sequence or phase are: (1) the initiating region; (2) the direction and interval(s) between regions; and (3) the goal region. As a crucial event in the tonal narrative, the modulatory sequence or phase relates to the principal key and tonal spectrum, but only via these three significant elements. This creates an inner hierarchy within the modulatory sequence where the region or regions in the middle of the sequence or phase are governed by the outer ones. Any medial regions only function within the sequence; they have no meaningful relationship to the principal or subordinate keys. For example, in the K. 310/i modulatory sequence in the development, the regions move from E minor through A minor to D minor, the goal region. The goal region relates as **sd** to the principal key, since the next cadential event or harmonic pillar is the half-cadential arrival on the dominant of the principal key. The initiating region relates to the subordinate key as **M:m**, since the previous prevailing key was clearly the mediant, C major. The A minor medial region, however, only relates to the initiating and goal regions, not to the principal tonic or tonal spectrum. Therefore, even though it happens to coincide with the principal tonic, its meaning has nothing to do with the principal

tonic. Rather, it functions as the fifth below the initiating region and above the goal region, connecting them.

The most significant aspects of a modulatory phase or sequence are the direction of modulation (sharp/flat), the number of fundamental steps/relations taken from the initiating region to the goal region, and the interval or intervals between regions. The direction of modulation may counterbalance or reinforce the centrifugal force of the subordinate region against the principal tonic. For example, in Schubert's Sonata in G major, D. 894/i, the subordinate key is the standard dominant, creating a moderate sharp-sided CF force. This is counterbalanced by the extensive flat-directional modulatory phases of the development, creating a very strong CF-force in the opposing, flat direction.

In this study, I determine the harmonic distance travelled in a modulatory phase by adding the number of fundamental steps from the initiating region to the goal region. This number also determines the degree of centrifugal force generated by the modulatory phase or sequence.

In kinetic-tonic passages or sections, both the defining pillars of modulatory sequences or phases and cadential substantiation determine the most globally significant regions in the tonal narrative. Therefore, there are three ways in which regions can take on a global significance as structural pillars:

- 1) as the initiating region of modulatory sequences or phases (**IR/iR**: for major/minor)
- 2) as the goal region of modulatory sequences or phases (**GR/gR**: for major/minor)
- 3) as a cadentially confirmed region (often only partly confirmed; often also a goal region).

The goal region of a modulatory sequence is frequently only partly substantiated by a half-cadential arrival: for example, in the **sm**: V stereotype noted by Rosen. This is the case, for

example, in the development of Mozart's K. 332, first movement in F major. Its sequential progression of regions forms a pattern that is also found in the development sections of K. 310/ii and K. 533/i, both also in F major. After the development commences with a new theme in the secondary key (the dominant, C major, mm. 94-109), there is a modal interchange to C minor, the initiating region of the modulatory sequence (mm. 110-13). The modulatory sequence (mm. 113-23) moves by ascending fifths through G minor (mm. 114-17) to D minor, which is partly substantiated by the chromatically emphasized, half-cadential arrival on its dominant (prolonged in mm. 123-126). The presence of the leading tones of **d: V** and subsequent reversal from centrifugal to centripetal motion (mm. 127-32) justify considering the goal region to be A major, as **d: V**. The hybrid goal region is four fundamental steps from the initiating region (C minor), three fifths plus a parallel major switch, therefore generating a very strong CF-force. With respect to the principal tonic, it generates a moderately strong CF-force as **M#** (as **sm: V**). The half-cadential substantiation then further emphasizes its significance in the global tonal narrative.

The development section of Beethoven's op.7/i in E $\flat$  major presents a case where the most substantiated region does not coincide with the pillars of a modulatory sequence but occurs in the middle of one. This generates more structurally significant regions and requires judgement in applying the criteria for regional hierarchy in kinetic-tonic sections. The development features six real keys, according to Schenker in *Harmonielehre* (1906): C minor, A $\flat$  major, F minor, G minor, A minor and D minor.<sup>237</sup> Schenker compares their reality to the illusory nature of the C major appearing in the B $\flat$  major section of the exposition, as discussed in 3.8.1 above.

---

<sup>237</sup> Schenker, *Harmony*, 299-300.

Identifying the hierarchy of regions in this development section helps to clarify its shape and trajectory.<sup>238</sup> The section divides overall into centrifugal and centripetal phases, following Ratner's archetype presented in *Classic Music*. The centrifugal phase moves from the initiating region, C minor, to the point of furthest remove (PoFR), A minor (mm. 135-169). The goal region generates a maximum CF force with respect to both the initiating region of the development and the principal tonic, which is the goal of the centripetal phase. The centripetal phase moves from A minor, through D minor, back to the principal key, E♭ major (mm. 169-188). The path of modulation back to the principal key justifies regarding the PoFR as **Dm<sub>v</sub>**, since it returns via **Dm** (D minor). The thematic organization reflects this; both phases begin in a parallel way, with the basic idea of the theme, before moving on to other material; the centripetal phase consists of a model and single sequence.

The centrifugal phase subdivides further into two parts. The first presents a modulatory sequence by descending thirds outlining a descending fifth from C minor to F minor; the second presents a more strongly centrifugal modulatory sequence ascending by whole tones from F minor to the PoFR, A minor. The first modulatory sequence moves in the flat direction, only by one fundamental step, while the second moves far more remotely in the sharp direction.

The initiating region of the first sequence, C minor, most directly relates to the secondary key, **D** (B♭ major). It also relates, albeit less directly, to the principal key. The repeat of the exposition reasserts the principal key in the listener's mind and invites comparison between the principal key and the initiating region of the development section. This justifies reading the initiating region with respect to the principal key. In this piece, the initiating region (C minor)

---

<sup>238</sup> Schachter analyzes this development section with the purpose of identifying a hierarchy of keys from a Schenkerian perspective. See "Analysis by Key," 300-03.

relates to the secondary key as **D: smsd**. This means, however, that the dominant and subdominant cancel each other out, justifying interpreting the region as **sm** globally. In this situation, I favor Schoenberg's monotonicity over Tovey's dismissal of non-contiguous key relations because the modulatory path features two equal but opposite relations cancelling each other out.<sup>239</sup>

The first modulatory sequence, therefore, moves from **sm** to **smsd** (F minor), a slight centrifugal motion that does not exceed the boundaries of the principal key. It modulates through **sm:SM** (A $\flat$  major), a medial region presented fleetingly; therefore, this region functions on the most subordinate level, relating only to the initiating and goal regions of the sequence but not to the principal key. When the tonal narrative reaches **smsd: i**, the thematic pattern changes to the syncopated motif from the closing section. The **smsd** region initiates the second sequence, which generates a stronger centrifugal intensification; leading-tone diminished sevenths in the model further intensify this passage. The modulatory sequence leads through **smsd: v<sup>2</sup>** (G minor) to the PoFR, **smsd: v<sup>4</sup>**.

The second, more centrifugal modulatory sequence features three regions that all lay claims to higher hierarchical status. The initiating and goal regions become structural pillars by marking changing conditions; the middle region (G minor) is transiently established by a half-cadential arrival. Chromatic intensification of its dominant suggests the D major region, subordinate to its tonic. The goal region (A minor) is also established, slightly less strongly, by an incomplete cadential progression: **Dmv**:  $LT^{\circ}7/V - V^{\frac{6}{4}} \frac{7}{3} - i$  (mm. 167-73). The progression fulfils the conditions of PD-D-T syntax, with the dominant and tonic in root position, making it

---

<sup>239</sup> See 2.4 for more discussion of Schoenberg and Tovey's approaches to key relations. See also Schoenberg, *Structural Functions*, 19; Tovey, *Companion*, 7.

an incomplete cadential progression, albeit without perfect tonic arrival. The repeated alternating tonic and dominant chords in mm. 173-76 fulfil the other requirement for an established region: three progressions expressing the region.

The point of furthest remove, **Dmv** (A minor), also relates directly to the principal tonic, as the initiating region of the centripetal phase, as mentioned above. G minor may have related to the principal tonic as a transiently established region; however, its position as medial region in the modulatory sequence negates the possibility of that large-scale relationship. These two factors — the establishment of the point of furthest remove and its direct relation to the principal key — combine to promote the PoFR to the highest rank in the development section.

Having established the PoFR as the most significant region in the development, it would be worthwhile to establish a second most significant region. Since A minor is the goal, the initiating region of either the first or second modulatory sequences should be considered the main initiating region for the development, and its second most significant structural pillar. The initiating region of the first modulatory sequence, **sm** (C minor), might be considered particularly significant due to its more direct connection to the principal key. On the other hand, the region initiating the second sequence is also the goal region of the first modulatory sequence. Furthermore, the second modulatory sequence clearly generates the strongest centrifugal force for the entire development, leading to the PoFR. Therefore, we can consider the first part of the centrifugal phase a preliminary phase, and the second modulatory sequence the main centrifugal phase. Correspondingly, the most significant regions of the development are **smsd**, which initiates the main centrifugal phase, and its goal, the PoFR **Dmv**.

Table 3.4 presents the hierarchy of regions in the development section of op. 7/i. The regions are listed in order of appearance and ranked from I to VII based on the combination of

regional substantiation and sequential articulation summarized in the above discussion. The hierarchy includes the principal key as I, the subordinate/secondary key as II, with the most significant structural region of the development counting as III.

Table 3.4. Chart of regional hierarchy in the development section of Beethoven, op. 7/i

<b>Region</b>	<b>Registration</b>	<b>Measure numbers</b>	<b>Position in hierarchy</b>	<b>Justification</b>
C minor	<b>sm</b>	137-145	V	Initiating region of modulatory phase generating less CF-force (which therefore also does not lead to PoFR).
Ab major	<b>sm:SM</b>	145-150	VI	Medial region that is indicated but not established
F minor	<b>sm:sd</b>	151-157	IV	Initiating region of modulatory phase with the strongest CF-force: the main centrifugal phase.
G minor	<b>smsd: v<sup>2</sup></b>	158-166	V	Medial region that is transiently established
(D major)	<b>smsd:v<sup>2</sup>: V</b>	162-166	VII	Chromatic enrichment of <b>smsd: v<sup>2</sup></b>
A minor	<b>smsd: v<sup>4</sup></b> <b>Dmv</b>	167-176	III	The most remote goal of a modulatory sequence (spatial-CF culmination) that is also established: the point of furthest remove.
D minor	<b>Dm</b>	177-186	VI	Medial region
E $\flat$ major	<b>T</b>	189	I	Principal key

The next table (3.5) generalizes regional hierarchy for kinetic-tonic sections, based on the combination of regional substantiality and sequential/unidirectional articulation. This combination generates a hierarchy of seven grades: five for regions in kinetic-tonic passages plus the principal and secondary keys. Table 3.6 presents the combined regional hierarchy for fixed- and kinetic-tonicity, also featuring seven grades in total.

Table 3.5. Regional hierarchy for kinetic-tonic sections (such as development sections)

Name	Position in hierarchy	Explanation
Principal key	I	See table 3.3
Secondary key	II	See table 3.3
Spatial-CF/part-CP culmination	III	The goal of the modulatory phase or sequence that covers the most distance on the tonal spectrum, i.e. the most centrifugal phase. This makes it the point of furthest remove; it is usually also established.
Primary initiating region	IV	Initiating region of the modulatory phase the covers the most harmonic distance.
Secondary initiating or goal region; established medial region	V	A goal region that is not the PoFR; the initiating region of a modulatory phase/sequence that does not lead to PoFR; transiently established regions in the middle of a modulatory sequence or phase.
Medial regions	VI	Regions occurring in the middle of a modulatory sequence or phase, that are only indicated.
Chromatic enrichment	VII	Chromatic intensification of an established region.

Table 3.6. Regional hierarchy combining fixed- and kinetic-tonic sections

Hierarchical position	Fixed-tonic sections	Kinetic-tonic sections
I	Principal key	
II	Secondary key	
III	Transiently established region: contrasting with prevailing key	Point of furthest remove
IV	Transient, partly-established region	Primary initiating region
V	Extended indicated region	Secondary initiating or goal region; transiently established medial region.
VI	Fleetingly indicated region	Medial region
VII	Chromatic enrichment of a prevailing key	Chromatic enrichment of an established region

### 3.9. Hybrid Regions

Special situations arise in tonal narratives when a passage presents two or three regions that merge and simultaneously influence the tonal narrative. Two cases will be discussed. The



first occurs in kinetic-tonic passages, when a region arises through chromatic enrichment of another region but is more strongly emphasized than the tonic to which it refers. The second case involves passages where the harmonic progressions present parallel major and minor regions in equal measure; the fusion of parallel major and minor occurs typically in fixed-tonic sections. The tonal narrative approach refers to both cases as *hybrid regions*.

In the first case, a local tonic and its dominant form a hybrid region, typically the goal of a modulatory phase such as the point of furthest remove. Here, a modulatory sequence or phase moves to a region, often the global submediant, that is only indicated briefly, before moving on to its own dominant, which arrives through a half cadence. Leading tones from this upper-fifth (local dominant) region chromatically intensify the half cadence (e.g., through an augmented sixth or applied leading-tone seventh), and the same region's generative triad is typically prolonged. The following phrase does not continue to establish and confirm the lower-fifth (local tonic) region, instead typically moving back to the principal key, whether by modulatory steps or a leap back.

If the following phrase were instead to return to the tonic of the original region and continue to establish that region, the dominant would only count as chromatic enrichment and the original region would become the newly prevailing key. This might happen, for example, in a period where the antecedent leads to an assumed dominant, chromatically intensified by leading tones from its region. At this point, there are two regions indicated, a fifth apart. The consequent then completes the expression of the lower region, which becomes a prevailing key, whose dominant was chromatically intensified. On the other hand, if the lower-fifth region generating a dominant does not become a prevailing key, having been only transiently established by the half cadence, the local dominant region, indicated by its leading tones, gains more independence. The

combination of chromatic, cadential, and durational emphasis combine to present the local dominant at least as strongly as the tonic to which it refers.

Furthermore, typically the two regions function as the final two terms of a modulatory sequence through regions ascending by fifths. The local dominant then functions as the overall goal of the sequence, often three fifths above the initiating region. The goal region is defined as such by the change in direction (and usually also thematic material) creating a new modulatory phase or the centripetal phase of the development section. Harmonic momentum continues through the second-last region, to the final region. For example, in the progressions discussed above from K. 533/i and K. 332/i, the modulatory sequence begins at the initiating region, C minor, continuing through D minor on to its local dominant, A major. Therefore, A major has as much significance in the tonal narrative as the tonic that generates it locally. Two regions combine as the goal of a modulatory sequence, the emphasized literal goal of the ascending-fifths sequence and the region a fifth below that generates it. Both are recognized as playing an equally significant role in the tonal narrative. The upper fifth is recognized due to the presence of its leading tones combined with the strong emphasis, but since it is introduced through a harmonic progression indicating the lower-fifth region (its local tonic), this lower region is recognized as an equal partner.

In summary, three conditions determine a hybrid region between a tonic and its dominant. The first two are mandatory, while the third may be applied optionally if the first two are clearly fulfilled:

- 1) The local dominant region's leading tones must be presented, leading to a half-cadential arrival followed by dominant prolongation.

- 2) The local tonic region is only transiently established and does not return (in the same section) to be confirmed or more strongly established.
- 3) The local dominant functions as the literal goal of a modulatory sequence or phase, typically moving in a single direction.

The second case pertains mostly to fixed-tonic passages. Here, parallel major and minor regions equally shape the harmonic progression. Typically, the prevailing key is major, but the continual presence of the flatted sixth degree asserts its parallel minor region. This parallel major-minor hybrid region was theorized by nineteenth-century scholars such as Moritz Hauptmann, who called it the minor-major key. He understood this hybrid key as a major key combined with minor through the minor subdominant triad.<sup>240</sup> The hybrid key relates symmetrically to the minor key, with its altered but normative major dominant. While the minor key features a minor tonic and major upper dominant, the minor-major key has a major tonic and minor lower (sub) dominant. Here, each term is opposite: major/minor, upper/lower; thus, the minor-major key is a reflection of the artificial but normative minor key. Hauptmann demonstrates this in his generation of the minor-major key: he shifts his minor-key diagram of interlocking primary triads by one fifth in the sharp direction, so that the minor tonic becomes the minor subdominant of the minor-major key and the major dominant becomes the major tonic of the minor-major key.

Hauptmann points to the leading-tone diminished seventh chord resolving to a major tonic as presenting a minor-major key.<sup>241</sup> The tonal narrative approach considers single or occasional instances of the leading-tone diminished seventh or minor subdominant chord of a

---

<sup>240</sup> Moritz Hauptmann, *The Nature of Harmony and Meter*, trans. W. E. Heathcote (London: Swan Sonnenschein & Co. 1888), 21-23.

<sup>241</sup> Hauptmann, *The Nature of Harmony*, 22.

prevailing major key to be only chromatic enrichment, not a hybrid region. When, however, harmonic progressions present harmonies from the major and minor regions fairly equally, the passage is considered a parallel major-minor hybrid region. Typically, the tonic chord remains mostly major and the subdominant chord mostly minor, while the third degree from minor often appears in the applied leading-tone diminished seventh to the dominant region. Commonly, the minor subdominant region is also suggested through further chromatic enrichment, which adds Phrygian color through the descending leading tone (flattened sixth degree) of the minor subdominant.

The closing section of Beethoven's op. 7/i, in both the exposition and recapitulation, offers an example of hybrid parallel major-minor regions. In the second half of the exposition, the prevailing key is B $\flat$  major. In the closing section (mm. 111-37), Beethoven adds its parallel minor to form a hybrid region (ending at m. 127). The tonal narrative begins on the tonic major but immediately adds a  $\flat 9$  and  $\flat 7$  to the harmony, forming a dominant flat-ninth chord to the minor subdominant. This extends for four measures (mm. 111-14), resolving first to the major subdominant before switching to the minor (mm. 115-16). Beethoven also suspends the flattened sixth degree into the following dominant harmony, emphasizing it. The progression resolves to tonic in m. 119 and then repeats an octave lower.

## Chapter 4

### **Alternating CP/CF Stages and Expanding Trajectories in Piano Sonatas by Mozart and Beethoven**

This chapter explores the interaction of centrifugal and centripetal forces, the counterbalancing of sharp- and flat-centrifugal forces, and the expansion of centrifugal trajectories in piano sonatas by Mozart and Beethoven. The first section (4.1) draws on A. F. C Kollmann and Ratner's explanations of the various parts of sonata form in order to develop a model of sonata form consisting of alternating centripetal and centrifugal stages. The stages aim to highlight the tonal function of the typical parts of sonata form, such as primary theme and transition. In some cases, there is a mixture of centripetal and centrifugal forces, such as in the group of subordinate themes. Certain formal parts correlate in most cases with a particular CP/CF stage; however, sometimes the alternating stages model diverges from the thematic organization, revealing a counterpoint between tonal forces and thematic design.

Section 4.2. adds the solar perspective and harmonic shading to the overall trajectory of CF/CP forces outlined in the first section. The section focuses particularly on the parallel minor and its counterbalancing with regions on the sharp side, such as the relative minor with its sharp-third orientation. I identify typical examples of the parallel minor in all seven stages of the tonal narrative, using the CP/CF stages model introduced in 4.1. These examples draw upon Charles Rosen's identification of stereotypes involving the parallel minor in sonata form.

The following two sections, 4.3 and 4.4, explore the expansion of the point-of-furthest-

remove stereotype (**M#** as **sm: V**) in both the spatial and temporal dimensions. Section 4.3 investigates expansions of centrifugal trajectories in later Mozart and earlier Beethoven piano sonatas, particularly their development sections. These expansions result from an initial modulatory phase in the flat direction, followed by a more extensive sharpward trajectory to the opposite side of the tonal spectrum. I measure the centrifugal force of these modulatory phases in terms of the number of fundamental steps or relations travelled between the initiating and goal regions.<sup>244</sup> I use this value to show how the development sections of Mozart's final two sonatas generate a greater centrifugal force than earlier ones discussed in section 4.2, such as K. 332/i and K. 533/i.

While section 4.3. focuses on Mozart's and Beethoven's increasingly remote regions of furthest remove and expanding modulatory trajectories in tonal space, section 4.4. examines expansions of the region of furthest remove in the temporal sense — substantiation or prolongation of the region of furthest remove. In his op. 10/2/i, Beethoven substantiates the point of furthest remove, **SM#**, into a confirmed key. Then, in op. 28, Beethoven prolongs **M#** as **sm: V** for a remarkable duration, inducing an almost trance-like state. In the words of Charles Rosen, Beethoven "magnifies" the convention, to the extent that it "gives up its secret power" and "reveals" its hidden meaning.<sup>245</sup>

The final section of the chapter, 4.5, returns to the spatial expansion of centrifugal forces. In movements such as op. 2/2/i and op. 7/i, Beethoven reaches regions highly remote from the

---

<sup>244</sup> Fundamental steps are fundamental relations which are combined to determine the distance between regions, whether consecutively or between regions across a larger modulatory trajectory in a single sharp or flat direction. The fundamental relations are the fifth- and third-relations between regions whose scales differ by only one or two tones (including the raised seventh degree in minor), plus the parallel relation.

<sup>245</sup> Charles Rosen, *The Classical Style*, 483.

principal key. In each case, the composer moves back in the opposite direction, making a "there and back again" shape. For example, in op. 7/i in E $\flat$  major, Beethoven moves centrifugally in the sharp direction to the region of furthest remove (A minor) before returning centripetally in the flat direction to the principal key. In the *Waldstein* sonata (op. 53/i), Beethoven comes up with an extraordinary alternative that circumvents the previously necessary reversal of direction. Having modulated in the flat direction to very remote regions, Beethoven continues modulating in the same direction, eventually returning emphatically to the principal key. This alternative relies upon the limitation of the tempered tonal system to twelve equidistant semitones in the octave. Following a modulatory path in a constant flat or sharp direction continually leads one further away from the origin, as shown for example on Weber's Table (see figure 2.3). It is the cohering and limiting force of the equally tempered system, with its enharmonic equivalence, that limits the proliferation of fifth- and third relations; this allows Beethoven and other composers to modulate in a single prevailing direction and yet return to the origin and/or principal key. In this work Beethoven completely traverses the enharmonic circle (or circle of fifths), generating a paradox and simultaneity of centrifugal and centripetal forces. This extraordinary modulatory technique can be found in other works by Beethoven (such as the *Appassionata*, op. 57) and those of later composers such as Schubert and Chopin.

#### **4.1. A model of sonata form in alternating CP/CF stages**

Schoenberg's three centrifugal functions — chromatic intensification of a prevailing key, modulation as opposition, and modulatory intensification — each play an essential role in the tonal narratives of sonata forms. The role played by one or more of these functions in each of the

larger or smaller sections gives us vital information about the underlying purpose of each section. Augustus Frederic Christopher Kollmann, writing at the end of the eighteenth century, also made a distinction between three kinds of elaboration occurring in different sections of sonata forms. These three types of elaboration are intimations of Schoenberg's three centrifugal functions, as adapted in the tonal narrative approach.

Writing in 1799, Kollmann briefly explains "the form of a long movement,"<sup>246</sup> which was later named sonata form by A.B. Marx,<sup>247</sup> in a way that suggests the interaction of Schoenberg's three centrifugal functions. Kollmann presents sonata form mostly in terms of large-scale harmonic organization, dividing it into two large sections and four subsections, as shown in table 4.1.<sup>248</sup> The first subsection corresponds to the exposition's primary theme and transition, the second subsection to the whole second part of the exposition in the secondary key; these comprise the first large section. The second large section consists of two subsections: development and recapitulation. In addition to the polar opposition between principal and secondary keys, Kollmann identifies two other distinct types of "elaboration," or centrifugal motion, in the different sections. Thus, he points to three kinds of centrifugal motion in total, corresponding approximately to the three centrifugal functions.<sup>249</sup> Table 4.1. shows how Kollmann's presentation of sonata form suggests large-scale centripetal and centrifugal forces, with the latter being differentiated according to the three centrifugal functions: I. chromatic intensification of a prevailing key, II. modulation as opposition, and III. modulatory intensification.

---

<sup>246</sup> Kollmann simply refers to it as the form of a "long movement" that appears in sonatas, symphonies and concertos; see Augustus Frederic Christopher Kollmann, *Essay on Practical Musical Composition* (New York: Da Capo, 1973/1799), 5.

<sup>247</sup> Ratner notes this in *Classic Music*, 221. For the original term see A.B. Marx, *Die Lehre von der musikalische Komposition, vol. III* (Leipzig: Breitkopf & Härtel, 1841-51), 282.

<sup>248</sup> Ratner presents Kollmann's idea of form in *Classic Music*, 217-18.

<sup>249</sup> Kollmann, *Essay*, 5.



Table 4.1. Kollmann's presentation of sonata form in four subsections, with his references to modulation interpreted in terms of the three centrifugal functions

<b>Kollmann's subsections</b>	<b>Common names for sections</b>	<b>Centrifugal functions</b>
<b>1</b>	Exposition: primary group (Rosen: "tonic section" <sup>250</sup> ) and transition	Centripetal stability, then "setting out from the key to its fifth in major." The "setting out" may involve <b>(III) modulatory intensification.</b>
<b>2</b>	Exposition: from the beginning of the secondary group to the end of the exposition (Rosen: "dominant section" <sup>251</sup> )	Establishment of the secondary key generates <b>(II) modulation as opposition</b> with principal key from subsection 1. Subsection 2 often features <b>(I) chromatic intensification of the prevailing key</b> (the secondary key), extended indications of its regions, and/or middleground establishment of one of its regions. These latter two centrifugal forces expand <b>(I) chromatic intensification</b> , tending toward <b>(II) modulation.</b>
<b>3</b>	Development section <i>Durchführung</i>	<b>(III) Modulatory intensification</b> , i.e. movement through multiple regions. May feature abrupt modulations (i.e. modulatory leaps) and enharmonic changes.
<b>4</b>	Recapitulation (complete)	Returns to the principal key (centripetal). Often features <b>(I) chromatic intensification of the prevailing key</b> (the principal key), extended indications of its regions, and/or middleground establishment of a region.

In the first subsection, the opposition between a principal key and its dominant (or mediant in minor) is set up by the motion away from the principal key. Kollmann refers to this motion as "a setting out from the key to its fifth in major, or third in minor."<sup>252</sup> The movement away from the principal key often generates a passage of modulatory intensification, the third CF-function. The establishment of the secondary key sets up a polar opposition between principal and secondary keys, exhibiting modulation as opposition. Kollmann then notes that the

<sup>250</sup> Rosen, *The Classical Style*, 81.

<sup>251</sup> *Ibid.*, 81.

<sup>252</sup> Kollmann, *Essay*, 5.

second subsection "comprehends a first sort of elaboration." This kind of elaboration contrasts with the modulation of the third subsection (the development section): it is a more "natural modulation."<sup>253</sup>

Kollmann uses the term "modulation" here in the eighteenth-century sense, referring to any kind of harmonic progression, whether circumscribing a single key, departing from the key, or moving through multiple regions.<sup>254</sup> By "natural modulation," he refers to progressions circumscribing the secondary key rather than definitively departing from it. He notes, however, that the harmonic progressions may be limited only to the secondary key, or they may suggest other regions, whether closer or more remote. Kollmann writes that the second subsection "consist[s] of a more natural modulation than that of the third subsection; it may be confined to the third or fifth of the key, or also touch upon some related or even non-related keys if only no formal digression is made to any key other than the said fifth in major or third in minor."<sup>255</sup> Note that Kollmann, like most late eighteenth-century theorists, means the principal key when he refers to "the key," so that the dominant or mediant key is conceived as a region within the principal key, even when a "formal digression," i.e. a definitive modulation, has been made to that region, as in the second half of the exposition. When Kollmann mentions suggestions of various other "keys" or regions other than the now governing secondary key, he refers to chromatic elaboration of the prevailing secondary key without full cadential confirmation. In this study, I differentiate the various chromatic elaborations into fleeting suggestions, extended indications, and establishments of these regions.

---

<sup>253</sup> Kollmann, *Essay*, 5.

<sup>254</sup> See Mitchell, "Modulation in C.P.E. Bach's *Versuch*," 333-42.

<sup>255</sup> *Ibid.*, 5.

This function of chromatic enrichment of the prevailing key, as discussed, contrasts markedly with the modulatory intensification function. Chromatic intensification of the prevailing key refers to suggestions or indications of regions that shade the harmonic motion toward one or more of the four directions (fifth-relations in the sharp direction, third-relations in the sharp direction, fifth-relations in the flat direction, and third-relations in the flat direction) while still participating in a large-scale circumnavigation of a single key. These suggestions of regions expand the centrifugal range of the key, embracing various regions without departing from it, illuminating it from various sides but without its center losing stability. This local centrifugal function may include significant digressions that appear to be modulations but are revealed to participate in the overall progression circumscribing a key.<sup>256</sup> In these situations, the expansion of local-CF forces points toward the slight influence of modulation as opposition.

Kollmann's third subsection "comprehends a second sort of modulation:" modulatory movement through multiple regions. This involves two aspects, according to Kollmann. First, there are "digressions" to regions ("keys and modes") other than the secondary key. Second, there may also be abrupt modulations and enharmonic changes, if the piece "admits or requires" them. Kollmann's "second sort of modulation" corresponds to Schoenberg's modulatory intensification function, where no single key prevails throughout the section and multiple regions other than the principal and secondary keys are led through, including the most remote regions.<sup>257</sup> These most remote regions, enharmonic changes, and abrupt modulations (modulatory leaps) generate the strongest centrifugal forces for the movement.

---

<sup>256</sup> See 3.8.1 on the extended indication and transient establishment of regions. That discussion draws on Schenker's concept of *Scheintonarten* in *Harmony* (1906).

<sup>257</sup> See Schoenberg, *Theory of Harmony*, 153 and Schoenberg, *Structural Functions of Harmony*, 145.

Kollmann explains that the fourth subsection returns to the (principal) key, and involves a third sort of elaboration, which is similar to the first. The fourth subsection's harmonic progressions circumscribe the principal key, but they may also contain various transient "digressions" to the regions, as in the second subsection. In the recapitulation, these chromatic intensifications of the prevailing key and their expansions often occur in the recapitulatory transition and in the group of subordinate themes. These local centrifugal forces build on the stronger centrifugal momentum generated in the development, motivating the opposing centripetal forces that lead to the global centripetal culmination and the continuing centripetal forces of the closing section.

Ratner represents the large-scale harmonic plan of Kollmann's model in the form: **I-V(III), X-I**.<sup>258</sup> Ratner first introduces the plan, which he calls *key-area form*, as the archetypal harmonic plan for smaller two-reprise forms.<sup>259</sup> As Ratner points out, each term of his large-scale harmonic plan corresponds to one of Kollmann's subsections.<sup>260</sup> Furthermore, just as Kollmann's description of three types of centrifugal elaboration correspond to the three centrifugal functions considered in the tonal narrative approach, the three centrifugal functions may be incorporated into Ratner's background plan. Modulation as opposition occurs between **I** and **V(III)**, while chromatic intensifications of the prevailing key (including expansions) are contained within the second term, **V**, and the final **I**. The "**X**" section includes modulatory movement through a variety of regions, intensifying toward the point of furthest remove. It often involves the modulatory leaps ("abrupt modulations") and enharmonic turning points to which Kollmann refers. Just as the symbol "**X**" implies the unknown, the **X** section moves continually outward

---

<sup>258</sup> The (III) refers to the normative secondary key in minor keys.

<sup>259</sup> Ratner introduces this archetypal tonal plan in *Classic Music*, 209-16.

<sup>260</sup> *Ibid.*, 218.

from its initiating region to a remote goal that is far less predictable than the secondary key in the exposition. At the point of furthest remove, large-scale harmonic motion reverses, returning to the principal key (I). Each of the four terms in Ratner's background harmonic plan can be associated with both centripetal and centrifugal phases or stages in the overall tonal narrative, whether as a transition from one term to another, or as stages within the term itself (see figure 4.1).

Figure 4.1. Diagram representing sonata form in seven alternating CP/CF stages, building upon Ratner's archetypal key-area form. Guide to form symbols: PT means primary theme, STG means subordinate-theme group, including one or more subordinate themes and closing section.

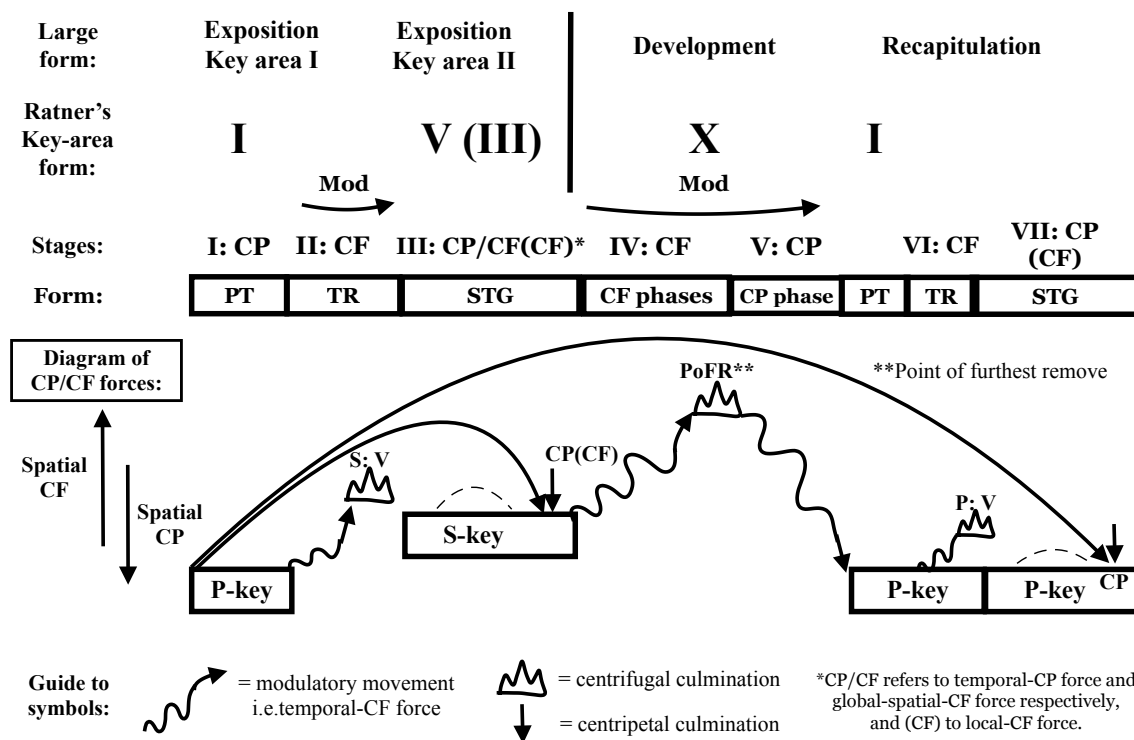


Figure 4.1 shows how Ratner's concise four-term background plan can be expanded into seven stages alternating centripetal and centrifugal forces, drawing on both Ratner and Kollmann's explanations of sonata form. The trajectories shown by the curved arrows build on Hepokoski and Darcy's diagrams, which show the whole sonata leading toward the EEC and

ESC.<sup>261</sup> My model highlights the equally important centrifugal journey taken on the way to the global or fully centripetal culmination, which is conceptually similar to the ESC. Modulatory centrifugal forces are shown by the wavy lines leading to centrifugal culminations such as medial caesuras and the point of furthest remove. Local-CF forces are shown by the dotted arches above the rectangles showing sections in a prevailing key. These centrifugal trajectories are necessary to stimulate a correspondingly powerful centripetal trajectory both to return to the principal key at the end of the development and to generate the strongest cadential progression consolidating the principal key. In figure 4.1, I have chosen to divide the exposition into three distinct parts, the primary theme, transition, and group of subordinate themes, which includes a closing section. I have chosen to count the whole latter part of the exposition in the subordinate or secondary key to be one section, to emphasize the unity of the parts in the same key. This follows Schoenberg and Caplin's divisions of the development section, but differs from Hepokoski and Darcy's distinction between S- and Closing-zones.<sup>262</sup>

The first stage of a typical sonata form (without introduction), **stage I: CP**, is spatially and temporally centripetal, establishing the principal key with the primary theme. The departure from the principal key toward the subordinate (secondary) key marks the opening centrifugal stage for the tonal narrative, **stage II: CF** overall. This model assumes a modulatory transition, moving through multiple regions on the way to the subordinate key and generating spatial- and temporal-centrifugal forces. The modulatory intensification often culminates on the dominant of the subordinate key, creating a spatial-CF culmination for the exposition. Ratner calls this part the "shift to the second key," emphasizing its centrifugal function. He presents three typical paths

---

<sup>261</sup> Hepokoski and Darcy, *Elements of Sonata Theory*, 17.

<sup>262</sup> Schoenberg's "subordinate group" contains various subordinate themes and codettas or a closing theme. See Schoenberg, *Fundamentals of Musical Composition*, 204. Caplin considers any themes in the subordinate key to be subordinate themes, followed by a closing section of codettas. See *Classical Form*, 97-99, 122-23.

to the second key, the second and third of which are different kinds of modulating transitions.<sup>264</sup>

The second shows tonicized degrees moving through the circle of fifths; the third combines modal interchange (parallel minor of the secondary and/or principal keys) and tonicized degrees. The presence of a modulating transition suggests that Kollmann's first subsection of sonata form divides into an initial centripetal phase, the primary theme, and a following centrifugal phase, the modulatory transition. This begins a process of alternating centripetal and centrifugal phases that continues throughout the form.

As discussed in section 1.3, the remainder of the exposition — the group of subordinate themes (including the closing section) — combines centripetal and centrifugal forces of different kinds. By remaining in a non-tonic key, there is always a large-scale centrifugal force, which remains moderate compared to the stronger CF forces of the development section. At the same time, since the purpose or *telos* of the secondary group and the exposition overall is to confirm this secondary key, this third stage of the tonal narrative is clearly centripetal in the temporal or cadential sense. Kollmann's "first sort of elaboration" or chromatic enrichment of the prevailing key is also often prevalent in this stage; some of these enrichments are expanded as extended indications or establishments of regions. William Caplin also observes "modal shifts" and "tonicization of remote regions" as common loosening devices occurring in subordinate themes,<sup>265</sup> but far less commonly in other parts of the exposition; these correspond to local (fleeting) or middleground (semi-substantial) centrifugal forces in the tonal narrative approach. Due to the importance of centripetal and two types of centrifugal forces in this section, the third stage is represented as **stage III: CP/CF(CF)**. The CF in parentheses refers to local and/or middleground centrifugal forces generated by suggestions, extended indications, and transient

---

<sup>264</sup> Ratner, *Classic Music*, 223-24.

<sup>265</sup> Caplin, *Classical Form*, 119.

establishment of regions such as the parallel minor to the prevailing key. Stage III often subdivides into an opening centripetal phase (establishing the secondary key), a middle centrifugal phase containing transient digressions, and a closing centripetal phase (the closing section). In sum, the exposition, or the first large section in the two-part conception of sonata form, consists of three stages: I: CP; II: CF; and III: CP/CF(CF).

The development or **X** section consists of two stages, respectively centrifugal and centripetal. The modulatory intensification from the exposition's transition returns and grows in each of these phases, particularly the former. This two-stage or two-phase model for the development section comes from Ratner, who parses the **X** section into centrifugal and centripetal phases.<sup>266</sup> Ratner uses the terms centrifugal and centripetal in his discussion of the development dividing into two phases, but he does not explicitly label them as such. I have adapted the terms "centrifugal phase" and "centripetal phase" from his description of the two phases. The centrifugal phase continues the outward motion away from the tonic, which was initiated in the exposition. The development intensifies the centrifugal force that emerged in the exposition, bringing it to its culmination, the maximum of centrifugal force for the whole tonal narrative. The maximum of centrifugal force, the goal of the centrifugal motion, is the point of furthest remove.<sup>267</sup> This point marks the definitive "reversal of direction" or "change in harmonic intention" from large-scale spatial-centrifugal to large-scale centripetal motion returning to the principal key.<sup>269</sup>

---

<sup>266</sup> See Ratner, *Classic Music*, 225-26.

<sup>267</sup> Ratner writes that "in broadly scaled movements, the change of direction represents a *point of furthest remove*, dividing the development into two phases of action: 1) *Continuation* of the outward movement from I initiated at the end of key area I; 2) *Reversal* of direction to create expectation for returning to the tonic." See *ibid.*, 225-26. Ratner also points out that while the point of furthest remove was optional in the development, most sonata forms did employ this centrifugal goal in order to "give an additional thrust to the harmony." See Ratner, *Classic Music*, 227.

<sup>269</sup> *Ibid.*, 225.



As discussed in chapter 3, classical and early romantic composers often marked the point of furthest remove with a chromatically intensified half cadence, and sometimes prolonged this region (often **M**♯ functioning locally as **sm**: V) significantly. The centripetal phase follows, leading to the next structural goal, the principal key (tonic region). While the centripetal phase of the development makes the definitive spatial-centripetal motion back to the principal key, it continues to generate temporal-centrifugal force; this is because the CP phase continues to feature modulatory movement, whether gradual or more abrupt, involving remodulatory steps or a remodulatory leap(s) back to the principal key. Composers often delayed the full return of the primary theme and principal key by standing on its dominant, creating a partly centripetal culmination with local centrifugal force from the chromatic intensification of the dominant.

The centrifugal phase of the development section, according to Ratner's model, corresponds to **stage IV: CF** in the tonal narrative approach. It is typically the most centrifugal stage of the whole sonata form. Stage IV: CF begins with the first centrifugal move of the development (for example, a shift from the secondary key to its parallel minor). This usually corresponds with the beginning of the development; however, if the development begins by continuing in the secondary key, then stage IV: CF begins with the first actual modulatory move after this continuation (for example in Mozart's K. 332/i). Stage IV: CF may involve multiple phases, such as a preliminary trajectory in one sharp or flat direction followed by a more extensive main CF phase in the opposite direction.

While the CF-phase of the development corresponds to stage IV: CF, the centripetal phase of the development, which is typically shorter than the development's centrifugal phase, does not comprise a whole stage by itself in the tonal narrative approach; it only forms the first part of **stage V: CP**. Centripetal force from the last part of the development continues to

accumulate into the opening of the recapitulation, reaching its conclusion at the first cadence of the recapitulation, reconfirming the principal key.<sup>270</sup> Thus, the tonal narrative approach regards stage V: CP as a fusion of the development section's centripetal phase and the opening theme of the recapitulation (usually the primary theme), until its first cadence. Here, the CP/CF stages model works in counterpoint with thematic design, crossing the division between the end of the development and beginning of the recapitulation. The frequent abbreviation of the primary theme in the recapitulation avoids excessive prolongation of centripetal forces in stage V: CP, with centrifugal forces returning to enliven the tonal narrative once more in the next stage.

The recapitulation features three stages: the completion of stage V: CP; stage VI: CF; and the final stage VII: CP. The sixth stage counterbalances the centripetal force of the fifth stage with local and middleground (or expanded local) centrifugal force: chromatic intensification and digressions to contrasting regions that often border on modulatory intensification. The tonal narrative approach considers the most centrifugal part of the recapitulation to be **stage VI: CF**. This is typically the recapitulatory transition, which often features repeated suggestions, extended indications, or transient establishments of flat-side regions such as **SD** and **t**. In some sonata forms in major keys, the composer remains in the parallel minor for more than a typical theme length (eight measures) and suggests or indicates more remote flat-side regions, for example in Mozart's sonatas K. 309/i, 332/i and 533/i (see the following section). Charles Rosen calls this passage the "secondary development," which may be only a few bars long or "very extensive."<sup>271</sup> This term highlights the continuity of centrifugal forces from the development

---

<sup>270</sup> The tonal narrative approach defines the beginning of the recapitulation as the moment where the tonic harmony of the principal key returns. Therefore, a deceptive return of the primary theme in a non-tonic key, as in Beethoven's op. 10/2/i, still counts as the development. The opening theme or phrase of the recapitulation, as defined here, is self-evidently centripetal.

<sup>271</sup> Rosen, *Sonata Forms*, 289-90. See also Rosen, *Classical Style*, 75-76.

section, which return in stage VI. For Rosen, the use of flat-side regions reduces the harmonic tension while maintaining the "harmonic interest." The tonal narrative approach counts both sharp and flat-side chromaticism, digressions, and modulations as conveying centrifugal force whose quality varies between brightening and darkening.

When the recapitulatory transition is clearly not the most centrifugal part of the recapitulation, stage VI: CF can usually be interpreted as the middle or latter part of the group of subordinate themes. Here, a local and/or middleground centrifugal passage in the exposition may be reinterpreted as a larger-scale centrifugal stage in the recapitulation; hence its significance increases accordingly. This occurs, for example in Schubert's Piano Sonata in G Major, D. 894, first movement (see chapter 5). The importance of the dynamic interdependence of centrifugal and centripetal forces to the tonal narrative approach justifies the possible reinterpretation of more local events in the exposition as a large-scale CF-stage in the recapitulation. Still, the most common situation in Mozart and Beethoven's piano sonatas is for stage VI: CF to be the recapitulatory transition, for example in Mozart's K. 533/i, analyzed in the following section.

The centrifugal forces from stage VI: CF combine with the strongest centrifugal forces of the movement from stage IV: CF to motivate and compel the final centripetal stage VII. Stage VII usually corresponds to the group of subordinate themes in the recapitulation, which may feature extensions and expansions of the subordinate themes and closing section from the exposition. Often, local centrifugal forces continue in stage VII (transposed from stage III and sometimes expanded), creating further momentum leading to the strongest centripetal forces in the entire movement: the most expanded cadential progressions in the principal key, leading to the global centripetal culmination. An expansion of the closing section can be understood as a large-scale counterbalancing of accumulated centrifugal forces from stages IV, VI, and VII with

centripetal ones. An extensive coda may also generate an extra stage, which normally leads from centrifugal to centripetal force, making eight stages of an extended tonal narrative for sonata form (see the analysis of Beethoven's op. 7/i in section 4.3).

Note that while the centripetal forces returning to the principal key at the end of the development (discussed below) are significant, the global centripetal culmination in the recapitulation (conceptually similar to the ESC) generates a more comprehensive centripetal force, combining both spatial and temporal kinds. The centripetal forces at the end of the development, on the other hand, generate global-spatial centripetal forces but are combined with continuing temporal-*centrifugal* forces, due to the remodulatory motion through multiple regions or a remodulatory leap back to the principal key.

The seven stages are summarized in table 4.2:<sup>272</sup>

---

<sup>272</sup> Interesting correspondences exist between Goethe's model of the growth of plants and the alternating CP/CF stages model presented here. In the essay *Metamorphosis of Plants*, Goethe conceived of the growth of plants in seven stages alternating between contraction and expansion, similar to centripetal and centrifugal forces. He refers in a summary to six stages, but he excludes a first stage that he refers to earlier in the work. The first stage, left out of a later account, is the seed itself. In the second stage, which Goethe calls the first stage, the stem expands, growing upward and sprouting leaves. The third stage corresponds to the contracting of the stem and leaves, and the sudden appearance of the calyx, which forms the base for the flower and stays closer to the stem than the leaves. In the fourth stage, the plant's inherent "force" expands centrifugally to form the petals; in the fifth stage the plant contracts to form the reproductive organs. The sixth stage is again centrifugal, with the leaves transforming into the fruit. The seventh stage is the final centripetal one: the seed forming within the fruit. The outward expansion of the plant and the appearance of more complex parts corresponds to the centrifugal expansion of harmony outward from the principal tonic, whether enriching a single prevailing key, modulating to another cadentially defined key, or through continual modulatory movement. The consolidating contraction back towards the central stem corresponds to large-scale centripetal forces returning to and outlining the principal or other prevailing key. The correspondence between Goethe's expanding/contracting stages of plant metamorphosis and the alternating centrifugal/centripetal stages in sonata form may provide an argument for the organicism of sonata form, or for the unity of art and nature. See Gray, *Goethe the Alchemist*, 78-79.

Table 4.2. Summary of sonata form in seven stages alternating centripetal and centrifugal forces

Large section	Stage (CF/CP)	Typical formal part	Explanation
Exposition	I. CP	Primary theme	Spatially centripetal but provisional, without the highest degree of temporal-CP substantiation
	II. CF	Modulatory transition	Spatial- and temporal-CF. Often leads through intermediate region(s) before reaching dominant of secondary key. Frequently leads to half-cadential arrival and standing on the dominant, a spatial-CF culmination.
	III. CP/CF (CF)	Group of subordinate themes	Generates global-spatial CF-force but leads to temporal-CP culmination. May also feature significant local- and middleground-CF force (denoted by (CF)). Codettas or "cadence themes" generate local/temporal-CP force at the end. <sup>273</sup>
Development and recapitulation: P-theme	IV. CF	Development: centrifugal phase	Modulatory movement combining spatial- and temporal-CF forces, leading to a spatial-CF culmination (point of furthest remove). This often features slight temporal-CP force at the spatial-CF culmination, through half-cadential arrival and a local prolonged V. (See section 3.3). Occasionally, an authentic cadence confirms the region.
	V. CP	Development: centripetal phase and recapitulation: primary theme	The centripetal phase of the development features spatial-CP but temporal-CF forces. The spatial-CP forces refer to the large-scale return to the principal key; the temporal-CF forces to the continuing motion through multiple regions – remodulatory rather than modulatory motion. A modulatory leap back to the principal key also generates temporal-CF force. Composers often abbreviate the return of the primary theme in order to bring back CF-forces that enliven the tonal narrative, beginning stage VI: CF.
Recapitulation (and coda)	VI. CF	Recapitulatory transition	Significant indications of flat-side regions create local-CF forces, responding to the CP-forces of stage V. When the whole passage remains in the tonic minor and related flat-side remote regions, this becomes a middleground

<sup>273</sup> Tovey uses the term "cadence theme" or "cadence-group" to refer to closing material involving repeated cadential progressions. See Tovey, *A Companion to Beethoven's Piano Sonatas*.

			spatial- and temporal-CF force. These CF-forces enliven the tonal narrative and motivate even stronger CP forces in stage VII.
	VII. CP(CF)	Group of subordinate themes	Global-spatial and temporal-CP function. Leads to final fully-CP culmination. There may be significant chromatic intensification within the prevailing key, including various expansions, represented by CF in parentheses.

#### 4.2. The parallel minor and its role in counterbalancing the sharp and flat sides

The seven stages delineated above present an archetypal framework for sonata form, focusing on large-scale centrifugal and centripetal forces, drawing on Schoenberg's archetypal tonal narrative. This model represents the overall shape of the tonal narrative, emphasizing its broad trajectories and intensifications leading toward centrifugal and centripetal culminations such as medial caesuras, the point of furthest remove, and the ESC. In this section I will analyze sonata-form movements from Mozart's piano sonatas, examining how centrifugal forces shade, tilt, and orient the tonal narrative toward the sharp or flat sides or directions of the tonal spectrum.<sup>274</sup> I will investigate the way in which harmonic contrasts, modulations, and modulatory trajectories participate in the counterbalancing of sharp- and flat-centrifugal forces at local, middleground, and global levels.

The analyses take a solar perspective on relationships between regions, examining parallel, relative, and other third-relations to the flat and sharp sides, as well as more normative fifth-relations. I consider the parallel region to be a third relation owing to the inner third generating flat- or sharp-CF force for the parallel minor and major respectively; they also function as gateways to the regions built on the four chromatic-median triads (**bM**, **bSM**, **M#**,

---

<sup>274</sup> In 3.8.1, I explain how my use of the term "shading" corresponds to local-CF forces, "tilting" to middleground-CF forces, and "orienting" to large-scale CF forces.

**SM#**, with respect to **T**). I will investigate uses of the parallel minor in each of the seven stages of the tonal narrative and in each of the three large sections (exposition, development, and recapitulation), some of which are generically typical, others less so. These appearances of the parallel minor generate flat-CF forces that participate in counterbalancing processes with sharp-side regions and trajectories, often involving third relations such as the typical point of furthest remove, **M#** as **sm: V**. Mozart and Beethoven often use the parallel minor of the principal or secondary key to generate centrifugal force in stage II: CF (the transition of the exposition); in locally centrifugal parts of stage III: CP/CF(CF) such as the middle of the group of subordinate themes or the closing section; at the beginning of the development section, i.e., stage IV: CF; at end of the development section (during stage V: CP); and in stage VI: CF (the recapitulatory transition). The parallel minor appears less commonly in stage I: CP. Stage VII: CP(CF) features the parallel minor if it appeared in stage III, having been transposed from the earlier stage.

Across three books, Rosen refers to five stereotypes in sonata forms involving regions other than the upper fifth. In *Sonata Forms*, he refers to two stereotypical uses of the parallel minor from the 1750s and 1760s, at the beginning of the group of subordinate themes and the beginning of the recapitulation.<sup>275</sup> In *The Classical Style*, Rosen points to two more stereotypes: the cadence confirming **sm** in the development section, often **sm: V**, and **SD** appearing in the earlier parts of the recapitulation.<sup>276</sup> Finally, he also notes Mozart's common use parallel minor at the end of the development section.<sup>277</sup> I will now focus on the typical appearances of the parallel minor identified by Rosen. Additionally, I will identify other typical instances of the parallel minor that have not been highlighted in the literature.

---

<sup>275</sup> See Rosen, *Sonata Forms*, 153-55.

<sup>276</sup> See Rosen, *The Classical Style*, 460-83.

<sup>277</sup> See Rosen, *Beethoven's Piano Sonatas: A Short Companion* (New Haven: Yale University Press, 2002), 10.

In the first parallel-minor stereotype, the exposition's group of subordinate themes begins in the parallel minor to the dominant. Haydn, for example, used the parallel minor at the beginning of his group of subordinate themes in many of his early symphonies; Rosen lists Haydn's symphonies 1, 2, 4, 5, and 15, which were all probably written around 1761, as examples.<sup>279</sup> In the mid-eighteenth century, the second place where composers typically used the parallel minor was at the beginning of the recapitulation, which would start with the primary theme in the tonic minor. Rosen suggests that this, like the first stereotype, probably originated with the Neapolitan school of composers, such as Alessandro Scarlatti. He also notes that Johann Schobert employed this device in his Piano Trio in F Major. Mozart also used this stereotype as a child in his Sonata for Piano and Violin in G Major, K. 9 (composed in 1764), inflecting the beginning of the recapitulation to the flat side by presenting the main theme in the tonic minor.<sup>280</sup>

By the later decades of the eighteenth century, the parallel minor was still employed by composers such as Mozart but they usually made these flat-centrifugal contrasts in slightly different parts of the form.<sup>281</sup> Rare cases preserving the same position in the form as the mid-eighteenth century stereotype include Mozart's K. 332/iii in F major, where the exposition's first subordinate theme is in the dominant minor (C minor, mm. 50-64) and Beethoven's op. 2/3/i in C major, where the first subordinate theme is in the dominant minor but modulates to the region a fifth above (G minor modulating to D minor, mm. 27-32). The parallel minor of the principal or secondary key was more commonly employed after the first subordinate theme or immediately preceding it in a transition or retransition. This is the case, for example, in Mozart's piano sonatas, all of which were published between 1775 and 1789. In these and other works of the last

---

<sup>279</sup> Rosen, *Sonata Forms*, 154.

<sup>280</sup> *Ibid.*, 155.

<sup>281</sup> *Ibid.*, 154-55.



quarter of the eighteenth century, the relocation of parallel minor passages creates a more effective and sophisticated dialectic of centrifugal and centripetal forces. Regarding the exposition (and recapitulation), this ensures temporal-centripetal stability at the beginning and culmination of the secondary group, responding to the preceding centrifugal forces and motivating possible fleeting or semi-substantial centrifugal forces in the middle or end of stage III (group of subordinate themes). The parallel minor in the transition, for example, generates flat-centrifugal force, strongly motivating the corresponding temporal-centripetal force establishing the secondary key at the beginning of the group of subordinate themes. When the parallel minor to the prevailing key appears in the middle of the group of subordinate themes, it effectively motivates the subsequent return to the prevailing key and strong cadential confirmation – the temporal-centripetal culmination.<sup>282</sup> Occasionally the parallel minor in an extensive closing section may motivate final codettas consisting of tonic prolongation or repeated cadential progressions, for example in Beethoven's op. 7/i (mm. 111-27).

In the mid- to late-classical style, the parallel minor in the recapitulation moved from the very beginning (the return of the primary theme) to a phrase or two later, often forming the recapitulatory transition or stage VI: CF according to the model of alternating CP/CF stages.<sup>283</sup> This follows the logic of alternating centripetal and centrifugal forces. Global centripetal forces are required at the beginning of the recapitulation and should dominate the recapitulation overall in order to counterbalance the maximum centrifugal force generated by stage IV: CF (the CF-phase of the development) and achieve structural closure. In order to stimulate the tonal

---

<sup>282</sup> Examples from Mozart's piano sonatas follow. In Beethoven's piano sonatas, the parallel minor appears, for example, in the middle of the secondary group in op. 10/2/i (mm. 41-46).

<sup>283</sup> Rosen writes that the parallel-minor change became a more permanent feature of sonata style when it was "postponed a phrase or two" forming what Rosen calls the "secondary development." See Rosen, *Sonata Forms*, 155.

narrative, however, composers often introduced a section with prevalent fleeting and/or semi-substantial centrifugal forces after the return of the primary theme but before the secondary group's return in the principal key. This often took the form of the parallel minor in the transition following the arrival of the recapitulation, for example in Mozart's K. 309/i, 332/i, and 533/i, the latter two of which are analyzed below.<sup>284</sup> In these works, more remote flat-side regions such as the subdominant minor and flat submediant are also touched upon in stage VI: CF, through the established tonic minor region.

*Counterbalancing processes involving the parallel minor in Mozart's K. 332/i*

Having presented the origins of the use of the parallel minor in the exposition and recapitulation of sonata form, I will now examine salient examples of Mozart's use of the parallel minor in his piano sonata movements K. 332/i and 533/i; I will also refer to a few other works. I will investigate centrifugal moves to the parallel minor in various parts of the exposition, development, and recapitulation, including examples from all stages of the alternating CP/CF model. The analyses show how the parallel minor participates in counterbalancing processes between flat- and sharp-CF forces between and within various stages of the tonal narrative. They also explore the way in which culminations (both centripetal and centrifugal) are approached by intensifications alternating between flat- and sharp-CF forces, often with one force clearly stronger than the other. This creates an imbalance that generates extra centrifugal momentum leading to the culmination. All the intensifications leading to important culminations in the movements discussed below display this phenomenon.

---

<sup>284</sup> Rosen observes (*Classical Style*, 73) that "a use of the tonic minor after the recapitulation has been reached invariably means a reduction in stability."

Mozart does not frequently employ the parallel minor in **stage I: CP**, since its main function is centripetal and it is usually significantly shorter than stage III: CP/CF, featuring significantly less chromatic intensification of the prevailing key (sometimes there is no local-CF force in stage I). In some movements, there are fleeting suggestions of the parallel minor (from modal mixture), for example in K. 533/i in m. 26. More commonly, the parallel minor of the secondary key intensifies the centrifugal force of stage II: CF, the modulatory transition, tilting the tonal narrative centrifugally to the flat side.<sup>285</sup> In chapter 3, I showed how this happens in a minor-key sonata movement, K. 310/i, contributing to an overall flat-side tilt for the whole exposition. In major-key sonatas, the move to the flat side illuminates the effect of establishing the normative dominant key to the sharp side: the appearance of the dominant minor generates a flat-CF force that creates a greater anticipation or desire for the complementary sharp-CF force of the dominant major.

In Mozart's K. 332/i, the primary theme generates a strong centripetal force through repeated cadences, motivating a correspondingly strong centrifugal force in **stage II: CF** (see example 4.1).<sup>286</sup> Mozart also enhances the modulatory CF-forces in stage II with strongly dissonant leading-tone diminished-seventh chords, evoking the *Sturm und Drang* topic.<sup>287</sup> *Sturm und Drang* will continue to be associated with centrifugal forces in stages III, IV, VI, and VII of the tonal narrative, opposing dance and pastoral topics associated with centripetal passages.<sup>288</sup> The transition modulates through the submediant (D minor, mm. 23-28) to the parallel minor of

---

<sup>285</sup> Rosen examines centrifugal moves to the dominant minor and its expansion into its flat submediant in Beethoven's piano concertos nos. 4 and no. 5. See Rosen, *Sonata Forms*, 248-56.

<sup>286</sup> Rosen suggests that the cadences in stage I are "too emphatic" and there "are too many of them," thus making the move away from the tonic imperative. See *ibid.*, 245-46.

<sup>287</sup> V. Kofi Agawu discusses the variety and interaction of various topics, including *Sturm und Drang*, in Mozart's K. 332 in his book *Playing with Signs: A Semiotic Interpretation of Classic Music* (Princeton: Princeton University Press, 1991), 44-48.

<sup>288</sup> The correlation of expressive opposites and CF/CP forces will be explored further in chapter 5.

the dominant (C minor, mm. 29-40), which leads to the common dominant shared by dominant major and minor regions (C/c: V, mm. 37-40). An augmented sixth chord in m. 36 also chromatically intensifies the dominant of the dominant, suggesting its region through its ascending leading tone (F♯). The abrupt move to **sm** sets up a slight sharp-CF force, which is counteracted by the more substantial flat-CF force generated by twelve measures expressing **vb** (C minor). The accumulation of a large degree of centrifugal force in this transition makes the establishment of the normative dominant (major) key, which governs stage III: CP/CF, more effective. The flat-CF force generated by **vb** also creates more anticipation for the substantial sharp-side CF-force generated by the dominant key (C major).

This transition also shows a notable phenomenon regarding intensification leading to culminations (including both primarily centripetal and primarily centrifugal ones). Typically, intensifications alternate between sharp and flat sides. Usually forces from one side are stronger than the other. In this transition, intensification begins with fleeting sharp-CF forces; these motivate stronger, semi-substantial flat-CF forces, with fleeting sharp-CF forces also returning in the augmented sixth chord. The alternation between sharp- and flat-CF forces seem to generate extra momentum driving toward the dominant arrival and prolongation (mm. 37-40), which is the first spatial-CF culmination for the exposition.

Mozart employs the parallel minor for an even longer duration in the middle of **stage III: CP/CF(CF)**. Here, as in many other movements, significant middleground centrifugal forces, generated during the middle of the stage, temporarily challenge the centripetal forces around the prevailing secondary key by transiently establishing one or more of its regions. This stage divides into four parts: (1) a centripetal first subordinate theme (S<sup>1</sup>, mm. 41-56); (2) a centrifugal episode in the parallel minor (mm. 58-70), featuring sequential motion leading to a chromatically

intensified dominant, which is prolonged and concludes with a second medial caesura; (3) the centripetal second subordinate theme leading to the EEC at m. 86 (S<sup>2</sup>, mm. 71-86); and (4) the closing section (mm. 86-93).

Example 4.1. Mozart, Piano Sonata in F Major, K. 332/i. Stage II: CF (Transition) mm. 22-40.

T: V7 I V7 I vi i

sm: V<sup>9</sup> i

vb: V<sup>9</sup> i

vb: VI Aug 6th (suggests DD)

vb: V

**Inset:** Regions shown on a tonal spectrum. Hierarchy: Squares denote fully confirmed keys, circles denote indicated and established regions, thicker line around v represents its stronger establishment. Dotted circle denotes suggested region. Flat directions are left and down, sharp directions are right and up.

The first subordinate theme presents a simple, innocent character, featuring only diatonic harmonies; it is a balanced period with clear cadential articulation. The strongly centripetal forces generated by the diatonic harmonies and cadential articulation of the prevailing key motivate a centrifugal switch to the parallel minor for the following episode. Yet glimpses of

centrifugal forces emerge as melodic chromaticism, such as D# and F# as chromatic neighboring and passing tones in mm. 49-50, 52, and 54. These non-chordal chromatic elements expand into more substantial centrifugal forces in the following parallel-minor (C minor) episode.

Furthermore, the tone D# foreshadows its enharmonic equivalent, Eb, becoming an important tone in the following centrifugal episode as the mediant degree of the parallel minor.

The centrifugal episode revisits the *Sturm und Drang* character of the transition, just as it returns to the region established there (C minor). It moves by descending fifths through all the degrees of the dominant minor (C minor) before arriving on its dominant, which is prolonged and chromatically intensified by its leading-tone diminished seventh (mm. 65-70); this prolongation forms a local CF(CP) culminating passage. Features such as the successive dissonances through seventh chords including diminished sevenths and the syncopated off-beat figure leading to a hemiola (rhythmic dissonance) intensify harmonic motion toward the culmination. The circumnavigation and partial confirmation of the dominant minor generate a semi-substantial flat-CF force that prevails throughout the passage. The stronger flat-CF forces are opposed by fleeting sharp-CF forces in the dominant prolongation, generated by the F# leading tone to the dominant (of the dominant minor). This once again creates an imbalance between more powerful flat-CF forces and fleeting sharp-CF forces that generates momentum toward the culminating passage.

These centrifugal intensifications and their culmination create a yearning for a corresponding powerful temporal-centripetal force. The following theme (S<sup>2</sup>) satiates this thirst by consolidating the dominant major key through cadential progressions leading to the CP(CF) culmination (the EEC) at m. 86. These cadential progressions (mm. 81-86) also generate a fleeting sharp-CF force that responds to the semi-substantial flat-CF force from the parallel-

minor episode. The approach to the EEC is prolonged (and its arrival delayed) by deceptive cadential progressions that are enhanced by leading-tone sevenths to **sm** (m. 82 and m. 84); the G $\sharp$  leading tones to **C: sm** generate a fleeting sharp-CF force. The contrast between flat-CF forces from the dominant minor episode (in C minor) and the fleeting sharp-CF forces from **C: sm** (A minor) is accentuated by the enharmonic pairing of A $\flat$  and G $\sharp$ . A $\flat$  is prominent in the centrifugal episode as the descending leading tone of C minor (for example as the top voice in mm. 61-62 and the bass in mm. 64 and 66), while G $\sharp$  functions as the ascending leading tone of **C: sm**, which is pronounced in the bass in m. 82 and m. 84.

As the goal for the exposition overall, the CP(CF) culmination represents the result of the larger-scale dialectic between flat- and sharp-CF forces. The semi-substantial flat-CF forces from stage II and the centrifugal episode in stage III counterbalance the substantial sharp-CF forces generated by the move to the dominant key and its consolidation throughout stage III. Once again, centrifugal forces from one side alternate with more powerful or substantial forces from the other side, creating an imbalance that generates more momentum toward a culmination, in this case a temporal-centripetal culmination.

Since the dominant minor frequently appears in the transition (stage II: CF) in the piano sonatas of Mozart and Beethoven, it can be considered a generically typical option for a modulatory transition in this repertoire.<sup>289</sup> The appearance of the parallel minor somewhere during stage III: CP/CF is also generically typical if we include fleeting suggestions such as the augmented sixth chord and brief modal mixture. More substantial establishments of the parallel minor in stage III are less common but not rare. Extended indications or establishments of

---

<sup>289</sup> Hepokoski and Darcy describe the use of the parallel minor of the major-mode secondary key as a "darkened or stressful pathway" through which the music leads toward the attainment of major key; more colloquially they call it a "momentary lights-out feature." See Hepokoski and Darcy, *Sonata Theory*, 25-26.

regions to either the sharp and flat sides or both<sup>290</sup> in stage III (and thus VII) are generically typical in Beethoven's piano sonatas.<sup>291</sup>

The next switch to the parallel minor commonly made by Mozart occurs at the beginning of the development section or soon after, the beginning of **stage IV: CF** of the overall tonal narrative. The centrifugal switch to the parallel minor (of the prevailing key) at this point in the form is sufficiently common in Mozart's piano sonatas to be considered a generic norm for this set of works. While the appearance of the submediant later in the development has been noted by many scholars (cited above), I am not aware of any scholarship that has discussed the parallel minor switch early on. This switch occurs, for example, at the very beginning of the development section in K. 284/i, 309/i, and 533/i. Mozart also makes the switch from the dominant key to its parallel minor as the first centrifugal move of the development section in K. 310/ii, 332/i, and 333/i. In each of these movements, the development section begins with a theme continuing in the dominant key that governed stage III: CP/CF, followed by a switch to its parallel minor to begin the centrifugal modulatory movement.

In K. 332/i, since the development section begins with a new theme in the major dominant key (mm. 94-109), stage IV: CF actually begins with the first centrifugal move for the section, the switch from the dominant to its parallel minor (C major to C minor). This is an example where the seven-stage model diverges slightly from the large-scale thematic design. Stage IV: CF begins at m. 109 with the return of the syncopated figure from the centrifugal episode of the group of subordinate themes. Even though the actual C minor tonic appears at m.

---

<sup>290</sup> This includes establishment of a region that is on both the flat and sharp sides at the same time, as in the subdominant of the submediant (**smsd**). The region **smsd** is equivalent to Schoenberg's **dor**.

<sup>291</sup> Examples from this repertoire that remain for at least eight measures in a sharp-side region (of the prevailing key) in stage III (and VII) include op. 7/i (analyzed below) and op. 28/i. Examples from Beethoven's piano sonata movements that remain for at least eight measures in a flat-side region (or regions) during stage III include op. 2/2/i, op. 10/3/i, and op. 13/i. Examples of brief establishments of the parallel minor for between four and eight measures include op. 2/3/i and op. 10/2/i.



111, the return of the thematic material to be developed better marks the beginning of the stage. Stage IV: CF extends until m. 126, where the prolongation of **d**: V ends and the large-scale harmonic direction reverses from centrifugal to centripetal for the very short centripetal phase (mm. 127-130).

The modulatory trajectory of stage IV: CF sets free the contained centrifugal forces of the parallel-minor episode from stage III and brings the corresponding expressive force of *Sturm und Drang* to its culmination. The agitated energy of the syncopated figure becomes fully kinetic in the modulatory sequence. Instead of remaining in the dominant minor, Mozart responds to the initial flat-CF move with the typical sharpward modulatory trajectory from **v** (C minor) by three ascending fifths to the typical point of furthest remove, **M**♯ as **sm**: V (**d**: V), which arrives at m. 123 and is prolonged until m. 126. This makes four fundamental steps sharpward, counting two fifths (C-G-D minor) plus a third fifth and parallel major switch from D minor to its dominant (A major). In stage IV: CF, intensification to the point of furthest remove features a slight flat-CF force followed by a much stronger sharp-CF force. This follows the phenomenon of alternating sharp- and flat-CF forces intensifying harmonic motion to the culmination, with one force greater than the other. For the spatial-CF culmination, the difference in power between the forces is pronounced, with the four fundamental steps sharpward strongly outweighing the single flatward step that initiated stage IV.

Notably, in each of the major-key movements cited above, which all switch from **D** to **vb** at or near the beginning of the development section, Mozart follows this flatward tilt with a sharpward modulatory trajectory (the main centrifugal trajectory for the piece) toward a point of furthest remove. Each of these sharpward trajectories moves by ascending fifths between regions, culminating in a region which is in a sharp-side third-relation to the principal key; these

regions of furthest remove are either **M** as **sm**: V (K. 310/i, 333/i, 533/i), **sm** tilted to its dominant (K. 309/i), or **m** (K. 284/i). In each case, the initial flatward turn creates extra harmonic space for centrifugal motion in the sharp direction toward the point of furthest remove. At the same time, the PoFR retains a direct connection to the principal key: each of these points of furthest remove are regions whose root triads share one or two common tones with the principal tonic triad. In this typical harmonic plan for development sections, there is a notable contrast between flat-CF forces at the beginning and much stronger sharp-CF forces in the middle of the section, leading to the point of furthest remove; this gives these development sections a strong orientation to the sharp side.

In some cases, Mozart brings back significant flat-CF forces at the end of the development section, during stage V: CP, in the form of the tonic minor leading to and/or coloring a standing on the dominant preparing the return of the principal key. This creates a more even counterbalancing of sharp and flat sides within the development section (see for example, K. 284/i.) More commonly, Mozart leaves the development section with a sharp-side orientation counterbalancing it with flat-CF forces in the recapitulation, particularly in the recapitulatory transition. As Rosen has noted, classical composers may repeatedly tonicize or indicate the subdominant region soon after the beginning of the recapitulation in order to generate flat-side shading to contrast with the sharp-side orientation of earlier sections.<sup>292</sup> See, for example, K. 310/ii (mm. 61-65 and mm. 70-72), which was discussed in section 3.8.1.

While ephemeral suggestions and indications of flat-side regions may contrast with the larger sharp-CF forces from earlier sections, they only counterbalance a small part of the sharp-CF force generated by the sharpward modulatory trajectory. On the other hand, in movements

---

<sup>292</sup> See Rosen, *Sonata Forms*, 288-93 and Rosen, *The Classical Style*, 79-80.

such as K. 309/i, 332/i, and 533/i, Mozart counterbalances all of the sharp-oriented stage IV: CF of the development with a more substantial flat-CF force in **stage VI: CF** (the recapitulatory transition). In these movements, Mozart generates this semi-substantial flat-CF force by fully establishing the tonic minor region, with harmonies outlining it for at least the length of an archetypal theme, eight measures, including suggestions and indications of more remote flat-side regions such as **sdb**). This illustrates Rosen's observation on the historical evolution of composers' temporal placement of the parallel minor from the mid-eighteenth century to its last three decades.<sup>293</sup> In the later practice, composers such as Mozart use the parallel minor to form the centrifugal stage VI of the tonal narrative in order to respond to the centripetal strength of the returning principal key from stage V: CP.

In K. 332/i, the recapitulatory transition (stage VI: CF, mm. 155-76) expands upon the use of the parallel minor in the exposition transition (stage II: CF). Instead of simply transposing the earlier passage from the dominant minor (mm. 29-40) into the tonic minor, Mozart moves through three flat-side, parallel-minor-related regions in order to intensify the overall flat-CF force and the corresponding *Sturm und Drang* character of stage VI: CF. He begins the recapitulatory transition by repeating the first six measures of the exposition transition in the submediant (D minor, mm. 155-60). He then sequences the two-measure basic and contrasting ideas of the transition (mm. 155-58) into the dominant minor (C minor, mm. 161-64) but reverses their order. Mozart then sequences his contrasting idea, a diminished-seventh figure, by a descending whole step into the subdominant minor (Bb minor, mm. 165-68). The **sdb** region is reinterpreted as iv of the tonic minor as the progression moves to **t**: V through its applied leading-tone diminished seventh (m. 172). The dominant is prolonged, alternating with the tonic

---

<sup>293</sup> Rosen, *Sonata Forms*, 155.

minor triad on weak beats (mm. 173-76); the whole progression from mm. 165 to 176 establishes the tonic minor.

The progression of regions in the recapitulatory transition descends by whole step from **sm** (D minor) through **vb** (C minor) to **sdb** (B $\flat$  minor) before arriving on **t**: V. This represents a motion of four fundamental steps in the flat direction, since each descending whole step combines two descending fifths. This flatward trajectory generates the maximum flat-CF forces for the movement and counterbalances the sharpward trajectory of the development section (stage IV: CF), which also takes four fundamental steps. The duration of the flatward trajectory of the transition, fourteen measures plus a further eight measures establishing **t**, also matches the sixteen-measure sharpward trajectory of the development section (mm. 111-26).

Stage VII: CP(CF), consisting of the group of subordinate themes, transposes stage III: CP/CF(CF) from the exposition into the recapitulation with only a few ornamental changes. It leads toward the global centripetal culmination, which arrives at m. 222 and transposes the CP(CF) culmination from stage III into the principal key. From a local perspective, the intensification toward this crucial moment also transposes that leading to the CP(CF) culmination of stage III. On the other hand, the global-CP culmination functions differently in the global dialectic of culminations than the corresponding culmination of the exposition. The global-CP culmination responds to and fulfils the dialectic between the two previous large-scale culminations: the point of furthest remove and the dominant arrival and prolongation leading to the medial casura, a CP/CF culmination reached via powerful flat-CF forces. The two preceding intensifications set up an opposition, the first generating the strongest sharp-CF force for the whole movement, the second generating the strongest flat-CF force for the movement but arriving on the dominant of the principal key. The strongest sharp- and flat-CF forces generated

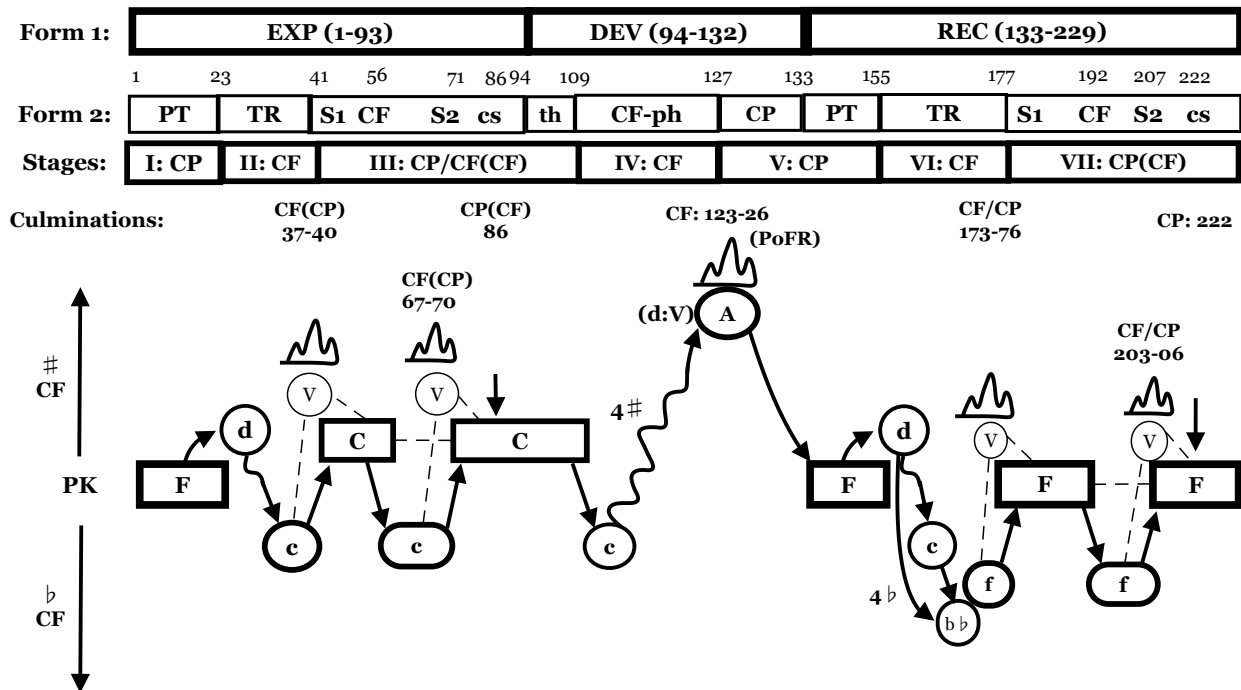
by these two intensification → culminations reach their final balance and resolution in the global-CP culmination confirming the central key for the movement.

Figure 4.2 shows the large-scale interplay of sharp- and flat-CF forces leading toward centripetal and centrifugal culminations. Intensifications featuring flat- and sharp-CF forces lead toward each of these culminations; in each case one force is more powerful than the other, creating an imbalance that creates further momentum to the culmination. Centrifugal forces lie mostly dormant in stage I: CP, apart from very fleeting flat-CF forces from the suggestion of **SD** (mm. 2-3). They awaken in stage II: CF, taking on a decidedly *Sturm und Drang* character. The CF forces intensify towards the first spatial-CF culmination for the exposition, the dominant arrival and prolongation leading to the first medial caesura (mm. 37-40). The modulatory intensification alternates between fleeting sharp-CF forces and semi-substantial flat-CF forces that generate extra momentum to the culmination. In stage III: CP/CF(CF), temporal-centripetal and sharp-centrifugal forces substantiate the dominant region, which becomes the subordinate key; they are challenged by the semi-substantial flat-CF forces from the episode in the dominant minor. These semi-substantial flat-CF forces compel more substantial sharp-CF forces that consolidate the dominant region in the temporal-CP/spatial-CF culmination at m. 86.

Stage IV: CF moves initially flatward but responds with a sharpward trajectory generating the maximum sharp-CF forces for the movement, travelling four fundamental steps sharpward to culminate at the point of furthest remove **M#** as **sm: V (d: V)**. Stage V makes the centripetal return to the principal key, but the CP forces do not yet reach their maximum for the

overall tonal narrative. Stage VI: CF responds to these centripetal forces and the maximum sharp-CF forces of stage IV by generating the maximum flat-CF forces for the movement, travelling four fundamental steps flatward on the way to a culmination on the dominant of the principal key. Stage VII leads toward the global centripetal culmination in m. 222. This final culmination completes and resolves the dialectic between the centrifugal forces generated in stages IV: CF and VI: CF; the maximum sharp-CF forces of the former and maximum flat-CF forces of the latter are brought into balance by the strongest cadential progressions consolidating the principal and central key.

Figure 4.2. The tonal narrative of K. 332/i in seven CP/CF stages. The diagram shows the principal key (PK) in the center, with increasing sharp-CF forces represented by distances above and flat-CF forces by distances below the center. Hierarchy of regions: Rectangles signify principal and secondary keys (differentiated by thickness) and circles transient and fleeting regions (differentiated by thickness). See fig. 4.1 for explanation of other symbols.



*Counterbalancing processes involving the parallel minor in Mozart's K. 533/i*

The parallel-minor and sharp-side regions also play a vital role in the interplay of sharp- and flat-CF forces in Mozart's later sonata K. 533/i, also in F major. Mozart employs the parallel minor in the expositional and recapitulatory transitions in both works, while in both movements the first centrifugal move of the development is from the dominant major to its parallel minor. There is also a significant difference between the expressive or topical associations with centrifugal forces in each movement. In K. 332/i, most centrifugal activity can be associated with the *Sturm und Drang* topic. In K. 533/i, on the other hand, the most salient centrifugal passages correlate with suggestions or marked indications of the "learned style:" they are enriched by polyphonic techniques such as imitation and suspensions. Polyphonic dissonances enhance CF forces significantly in three places: (1) during a brief digression to **smsd** towards the end of the group of subordinate themes (mm. 75-78; the digression lasts until m. 79); (2) in the development section, stage IV: CF, in the measures leading to the point of furthest remove (mm. 113-15); and especially during (3) the recapitulatory transition, stage VI: CF (mm. 154-69). In this last manifestation of powerful CF forces and the learned style, there are also strong connotations of sacred music. As in K. 332/i, centripetal forces in K. 533/i correlate with pastoral and dance topics, particularly the former.<sup>294</sup>

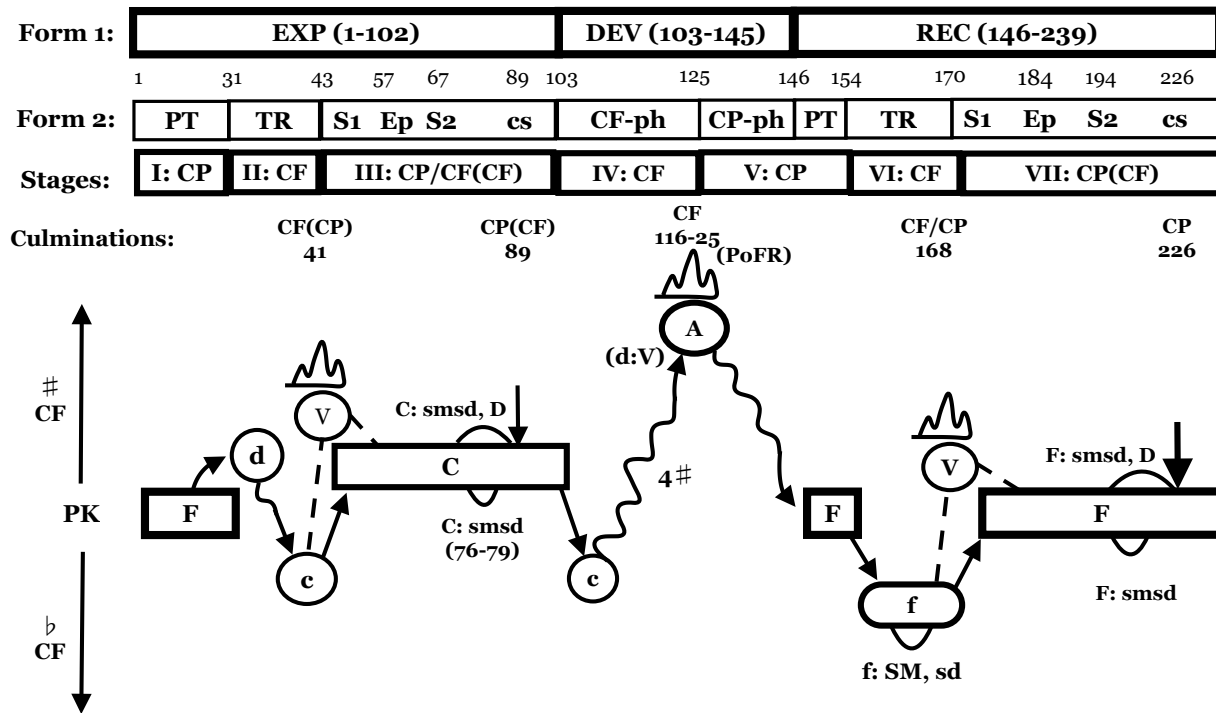
Figure 4.3 shows the tonal narrative of K. 533/i in alternating CP/CF stages and the sharp- and flat-CF forces generated by regions and trajectories to either side of the principal key. As in K.332/i, intensifications leading to culminations typically alternate between sharp- and flat-CF forces, with one type overpowering the other, creating an imbalance that generates vital

---

<sup>294</sup> Pastoral elements in K. 533/i include pedal points, such as the opening tonic (mm. 5-8) and on the dominant in the second subordinate theme (mm. 70-75), an implied compound meter in the first subordinate theme and following episode (mm. 43-66) and closing section (mm. 89-102), and the key of F major. Robert Hatten discusses these markers of the pastoral in *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington, IN, Indiana University Press, 2004), 51. Chapter 5 will explore correlations between large-scale CP/CF forces and expressive "modes" such as pastoral/epic in more detail.

momentum to the culmination. The positioning of flat- and sharp-CF intensifications leading to culminations bears some similarities with those of K. 332/i. For example, in stage II of K. 533/i, the modulatory movement leans first to the sharp side, indicating **sm** before tilting semi-substantially to the flat side by establishing **vb**, with fleeting sharp-CF forces returning to intensify the two measures leading to the dominant arrival and spatial-CF culmination at m. 41. In both movements, semi-substantial flat-CF forces combine with more fleeting sharp-CF forces to create an imbalance that generates powerful momentum to the culmination.

Figure 4.3. The tonal narrative of K. 533/i in seven CP/CF stages. See fig 4.2 for explanation.



In stage III, clear differences emerge in the tonal narrative of the two movements. In K. 332/i, semi-substantial flat-CF forces from the dominant-minor episode complement the more substantial sharp-CF forces generated by the prevailing dominant-major key. In stage III of K.



533/i, flat-CF forces (including appearances of the parallel minor of the dominant) are more fleeting, functioning as the smaller of the opposing forces leading toward culminations. More pervasive are sharp-CF forces from intensified prolongations of the dominant of the prevailing key (mm. 62-66 and 82-88) and combined sharp- and flat-CF forces from the transient establishment of **C: smsd** (mm. 76-79).

The progression of regions in stage IV: CF of K. 533/i is identical with that of K. 332/i and gives the tonal narrative the same powerful sharp orientation, motivating correspondingly strong centripetal and flat-CF forces later in the tonal narrative. As in K. 332/i, the corresponding flat-CF forces arrive in stage VI: CF (the recapitulatory transition). In K. 533/i, the parallel minor prevails throughout the fifteen-measure stage but travels through **bSM** and **sdb**, (mm. 155-59 and 161-62) intensifying the flat-CF force of the stage. The overwhelming flat-CF forces of this stage incorporate fleeting sharp-CF forces (mm. 166-67) leading to the dominant arrival and spatial-CF/partial-CP culmination (at m. 168); the large imbalance between the forces intensifies the culmination.

The slightly greater flat-CF forces in stage VI of K. 533/i compared with the corresponding stage of K. 332/i may result from the contrasting sharp- and flat- orientations of the following stage VII (which transposes stage III to the principal key with slight modifications) in each movement. In K. 332/i, stage VII: CP(CF) tilts flatward, owing to the parallel-minor episode. On the other hand, the corresponding stage in K. 533/i shades to the sharp side, resulting from the more prevalent influence of the dominant region on intensifications leading to culminations (for example in mm. 189-93 and mm. 219-25). In K. 332/i, stage VI counterbalances the powerful sharpward trajectory of stage IV; in K. 533/i stage VI counterbalances not only stage IV but creates extra flat-CF forces that motivate the extended

local sharp-CF forces of stage VII. Once again, the creation of a sharp/flat imbalance compels the opposing CF-force, which then compels a balancing and restorative centripetal force leading to the global centripetal culmination.

I will now examine two passages from K. 533/i that contribute significantly to the counterbalancing (imperfect though it is) of sharp and flat forces in the tonal narrative. I will first examine the passage leading to the EEC at m. 89 in stage III: CP/CF(CF). This stage includes a group of subordinate themes consisting of four parts: (1) the first subordinate theme (S<sup>1</sup>, mm. 43-57); (2) a connecting episode leading to a second prolonged dominant and second medial caesura (mm. 57-66); (3) a second subordinate theme leading to the CP(CF) culmination (S<sup>2</sup>, mm. 66-89);<sup>295</sup> and (4) a closing section of codettas (mm. 89-102). I will focus on the third part (see example 4.2).

As in the culminations discussed in K. 332/i, intensification towards the CP(CF) culmination at m. 89 features local and expanded-local CF forces from both sides. One force is greater than the other, which creates an imbalance that builds powerful momentum to the culmination. The first intensification building toward the culmination occurs in the middle of the second subordinate theme. Mozart transiently establishes **smsd**, generating semi-substantial CF forces from both the sharp and flat sides of the spectrum. The suspension in the tenor and the pointed diminished seventh created between its resolution to C♯ and the soprano B♭ (mm. 76-77, see example 4.2) poignantly enhance the CF-forces of this digression.

A brief return to tonic harmony (m. 80) initiates a significantly expanded cadential progression (mm. 80-89). Sharp-CF forces continue throughout the progression beginning with

---

<sup>295</sup> Hepokoski and Darcy would call these first three parts a "tri-modular block," forming the S-zone; see Hepokoski and Darcy, *Sonata Theory*, 170-77.

leading-tone sevenths to **D** in mm. 82 and 84. The augmented sixth chord in the measure before the final dominant (m. 86) continues the sharp-CF force but also adds a fleeting flat-CF element: the  $\flat\hat{6}$  in the bass of the augmented sixth chord combines with sharp-CF forces from  $\sharp\hat{4}$ . This creates the necessary unbalanced alternation of extended sharp- and fleeting flat-CF forces that empowers the imminent culmination.

Example 4.2. Mozart, K. 533/i: Second subordinate theme ( $S^2$ )

C: V \_\_\_\_\_ I

C: V pedal \_\_\_\_\_

C:  $\sharp 9$  8  $\flat 9$   
7 \_\_\_\_\_ 5 # ii  
C: smsd. II V i V7

C: ii 6 6 6 7 9  
5 V7 I ii P II# (LT7)

C: 6 9 6  $\flat 9$   
4 7 4  $\flat 5$  II# (Aug 6th)

C:  $\flat 9$   
5 3 I

Example 4.3. Recapitulatory transition (mm. 154-69)

154

t: i V7 i  
 bSM: V7 I V7 I  
 sd: III V7 i V7

t: i VI iv

159

sd: i  
 t: iv ii \_\_\_\_\_ V7 i iv desc. 5ths \_\_\_\_\_ V9  
 bSM: iii IV V9 I  
 sd: III IV V9 i  
 t: ii \_\_\_\_\_ V7 i VI iv V9

164

t: i desc. bass line \_\_\_\_\_ II<sup>b9</sup> b5 \_\_\_\_\_ V

The second passage I will examine is the recapitulatory transition, or stage VI: CF (mm. 154-68; see example 4.3). Mozart structures the recapitulatory transition like a developmental core, beginning with a model-sequence (mm. 154-59), continuing through fragmentation (mm. 159-67) and leading to a half-cadential arrival (m. 168) (see example 4.3).<sup>296</sup> It features three harmonic cycles expressing the tonic minor and indicating regions further to the flat side: these cycles generate a semi-substantial flat-CF force that counterbalances the sharpward trajectory of

<sup>296</sup> This recapitulatory transition can justifiably be called "secondary development." See Rosen, *Sonata Forms*, 289-93.

stage IV: CF. Mozart significantly expands this syntax in the first two harmonic cycles through chromatic and diatonic sequences (cycle 1: mm. 154-60; cycle 2: mm. 160-63), while the third cycle forms a half cadential progression (mm. 164-68).

The transition opens with the basic idea or model in the tonic (F) minor, based on a i-V-i progression (tonic phase: mm. 154-55). This model is imitated and sequenced into regions descending by thirds (a real sequence), **bSM** (D $\flat$  major, mm. 156-57), and **sdb** (B $\flat$  minor, mm. 157-59); this chromatic sequence increases the flat-CF force generated by stage VI. At measure 159, the one-and-a-half-measure basic idea fragments into a half-measure motive and the texture becomes even more polyphonic through 2-3 suspension chains; the poignant dissonances they create enhance the CF force. The pre-dominant phase (mm. 156-59) is extended but returns to the diatonic harmonies of the key, prolonging ii then leading to i via the leading-tone diminished seventh to complete the first harmonic cycle (mm. 159-60).

The polyphonic texture and half-measure motivic rhythm continue through the second harmonic cycle, which features a chromatic sequence indicating the same regions as the first cycle, **bSM** and **sdb** (mm. 161-62), flowing into a descending-fifths sequence through all harmonic degrees returning to the tonic (mm. 162-64). The texture becomes more homophonic for the cadential phase; some centripetal forces return in the form of a half-cadential cycle with the bass first descending by step from tonic to dominant, then circling it chromatically: F-E $\flat$ -D $\flat$ -C-B $\sharp$ -C-D $\flat$ -C (mm. 164-68). This part parallels the end of the expositional transition, with significant chromatic intensification of the dominant through its leading-tone diminished seventh and the augmented sixth chord (mm. 166-67). The leading tones from **D** generate the fleeting sharp-CF forces that oppose the prevailing semi-substantial flat-CF forces of stage VI; the resulting imbalance enhances intensification toward the dominant culmination in m. 168.

The intricate and dissonant polyphony in the recapitulatory transition (particularly mm. 159-63) contrasts markedly with the highly homophonic texture and simple vertical consonance of the culminating passage prolonging the point of furthest remove, **sm**: V (mm. 116-25). The culminating passage in the development consists simply of arpeggiations of V and i in root position; it is fully homophonic and consonant. Here, textural contrast reinforces the counterbalancing between sharp- and flat-CF forces in stages IV: CF and VI: CF.

In his sonatas K. 332/i and K. 533/i, Mozart utilizes the parallel minor in most of the seven stages of the tonal narrative, which I have interpreted as contrasting and counterbalancing centrifugal forces to the sharp side, as well as centripetal forces. Mozart's employment of the parallel minor in the exposition (stages II: CF and III: CP/CF) and recapitulation (stages VI: CF and VII: CP(CF)) originates in the mid-eighteenth-century stereotypes that Rosen elucidates. Mozart's practice of shifting to the parallel minor of the dominant key at the beginning of the development can be considered a generic norm for the piano sonatas. This flatward move opens up a significant amount of tonal space for the composer to modulate sharpward to the standard point of furthest remove, **M#** as **sm**: V. Mozart's practice of establishing the tonic minor throughout the recapitulatory transition substantiates the standard flat-shading that commonly occurs at the beginning of the recapitulation through more fleeting indications of the subdominant. Often more remote flat-side regions such as **sdb** are indicated, further shading stage VI: CF to the flat side. The flat-CF forces of this stage counterbalance the typically sharp-CF forces generated by stage IV: CF (the development's centrifugal phase).

The parallel minor also plays a vital role in enhancing intensifications toward centripetal and centrifugal culminations throughout the tonal narrative. The passages leading to the culmination feature stronger or expanded local-CF forces from one side; opposing these are more

fleeting CF-forces from the other. The resulting imbalance enhances the centrifugal momentum leading to the culmination, motivating a correspondingly strong centripetal force for CP culminations or reaching a maximum of centrifugal forces for CF culminations.

#### **4.3. Expansion of centrifugal trajectories in the development**

The typical development section in Mozart's major-key piano sonatas from K. 284 to K. 533 involves a switch to the parallel minor of the dominant key, followed by a sharpward trajectory by ascending fifths, to a point of furthest remove that is normally a sharp-side third-relation of the principal key, often **M#** as **sm: V**. In his last two piano sonatas (K. 570 and K. 576), Mozart intensifies flat-centrifugal force at the beginning of the development section by extending the parallel-minor relationship, combining it with third-relations in the flat direction. This gives Mozart more tonal distance in which to modulate sharpward to the typical point of furthest remove, **M#** as **sm: V**. In K. 576, Mozart also increases the centrifugal trajectory in the sharp direction by substituting an ascending whole-tone sequence of regions for the usual ascending-fifths sequence to move more swiftly in the sharp direction, since an ascending whole tone combines two ascending fifths.

Beethoven expands upon both of these flat- and sharp-centrifugal techniques in his early sonatas in order to generate stronger CF forces in his development sections. In op. 2/2/i, he applies the parallel-minor relationship twice to generate very strongly centrifugal trajectories in the flat direction. In op. 7/i, Beethoven uses ascending whole tones between regions as a tool for modulating further in the sharp direction than in earlier works and to move past the typical point of furthest remove to a more remote region on the sharp side of the spectrum.

At the beginning of the development section of K. 570/i, Mozart again makes use of the parallel-minor relation, as he did in earlier piano sonata movements. This time, however, rather than simply switching to the parallel minor of the prevailing dominant key (F minor from F major), he draws upon its close relations in order to increase the flat-CF force. Mozart moves to the dominant's flat submediant (D $\flat$  major, mm. 80-85), which shares most of its scale with the dominant minor (F minor). The parallel-minor relationship between F major and minor acts as a catalyst or gateway to more remote flat-side relationships; D $\flat$  major is more distant from F major on the circle of fifths than F minor is. Later composers would use this gateway to the flat side extensively in works such as Beethoven's op. 2/2/i, discussed below, and Schubert's D. 894/i, investigated in chapter 5. By reaching D $\flat$  major, Mozart opens up more tonal space for his subsequent sharpward trajectory, leading to the typical point of furthest remove, **M $\sharp$**  as **sm: V** (**g: V**, mm. 95-100; see example 4.4). While the PoFR is only two fundamental steps from the principal key, it is six fundamental steps from the initiating region of the trajectory, D $\flat$  major, following the path of regions leading towards it. This generates an extremely strong sharp-centrifugal force, making the point of furthest remove more remote than in previous works, due to its greater remoteness from the initiating region.

The first progression between regions is a third-relation in the sharp direction, from D $\flat$  major to its submediant, B $\flat$  minor, which is indicated fleetingly (mm. 86-87; see example 4.5). From here, Mozart uses the typical ascending-fifths sequence of regions, from B $\flat$  minor through F minor (mm. 88-89), C minor (mm. 89-91), and G minor (mm. 92-100), making the final ascending fifth to V of G minor by introducing its ascending leading tone (C $\sharp$ ) in the augmented sixth chord. This chromatic tone is the enharmonic twin of the root of the initiating region (D $\flat$ ),



a sign of the remoteness of this trajectory. Note that the C minor region is indicated by a V-VI progression; thus, an A $\flat$  major harmony appears at m. 91, which also functions as **g**: bII.

Example 4.4. Mozart, K. 570/i, development section, centrifugal phase (mm. 81-100). Progression of regions notated as triads. Rhythmic values correspond to hierarchy of regions: longer durations denote more substantial regions. "Steps" refers to number of fundamental steps from the specified region. Slurs connect a region that also functions as a local dominant to its tonic.

	DEV					PoFR	
	41-79	81	87	89	91	93	95-100

Steps from <b>F</b> :	0	2 $\flat$					
Steps from <b>D<math>\flat</math></b> :	0	1 $\sharp$	2 $\sharp$	3 $\sharp$	4 $\sharp$	6 $\sharp$	

At the beginning of the development section of K. 576/i, Mozart moves from the dominant (A major) to its  $\flat$ SMSD (B $\flat$  major) by taking three fundamental steps (see example 4.5). He first switches from dominant major to minor, the standard flatward move (mm. 58-59). He then intensifies the flatward trajectory by moving to the submediant chord of A minor, but with an added flat seventh, making it an F dominant seventh chord (mm. 61-62). The chord resolves naturally to B $\flat$  major (mm. 63-66), which is also the region built on the Phrygian II chord (Neapolitan) of A minor. This opens up a very large tonal space between B $\flat$  major and the eventual PoFR, F $\sharp$  major as **b**: V, slightly larger than the equivalent sharp trajectory in K. 570/i.

Since there is an initial flatward trajectory involving more than one modulatory move, followed by a more centrifugal trajectory in the sharp direction, it may be useful to divide stage IV: CF into a preliminary flatward trajectory (mm. 59-63) and a main or primary sharpward trajectory (mm. 63-81). These two centrifugal phases can be called the preliminary and primary CF-phases respectively, which together form stage IV: CF. The primary sharp-centrifugal phase is followed by the centripetal phase of the development (mm. 81-98), which is also the first part of stage V: CP for the overall tonal narrative. The division of stage IV: CF into preliminary and primary CF-phases will also apply to my analysis of Beethoven's op. 7/i.

Example 4.5. Mozart, K. 576/i, development section, centrifugal phase. Progression of regions notated as triads.

	DEV				PoFR		
	28-58	59	63	70	76	78	79-82
Steps from <b>A:</b>	0	1 $\flat$	3 $\flat$				
Steps from <b>B<math>\flat</math>:</b>		0	1 $\sharp$	3 $\sharp$	5 $\sharp$	7 $\sharp$	

The sharpward trajectory begins its progression of regions (see example 4.5) by moving from B $\flat$  major to its submediant, G minor (mm. 68-74); this is the same relation between regions that began the sharpward trajectory of K. 570. Instead of following this with ascending fifths, Mozart ascends by whole steps from G minor through A minor (mm. 75-76) to B minor (mm. 77-79); this intensifies the sharpward trajectory. The latter two regions are approached via

augmented sixth chords to their dominants; Mozart repeats the **b**: aug 6th–V progression in mm. 78-79, arriving on **b**: V at m. 79 and prolonging it as a region it until m. 82. The overall trajectory from B $\flat$  major to **b**: V makes a total of *seven* fundamental steps, generating an even stronger CF-force than that generated by the sharpward trajectory of K. 570.

*Expansion of centrifugal trajectories in two early Beethoven piano sonatas*

Like Mozart, Beethoven begins the development section of Op. 2/2/i (in A major) by making use of the parallel-minor relation to move in the flat direction. While Mozart follows his preliminary CF phase in the flat direction with a more extensive sharpward trajectory to the point of furthest remove on the sharp side, Beethoven makes use of the parallel-minor relation a second time to continue the flatward trajectory to the point of furthest remove early in the development section (m. 130). He then remains to the flat side of the principal key throughout the section while making large-scale centripetal motion returning to the principal key.

Beethoven's flatward trajectory to the point of furthest remove involves two descending major thirds or flat-submediant relations between regions, from the dominant ending the exposition (E major) through C major (mm. 122-29) to the point of furthest remove, A $\flat$  major (mm. 130-41). Each of these flat-submediant moves is based on the interchangeability of major and minor regions sharing a common root. Beethoven's first move echoes Mozart's stereotype, switching from dominant major to minor as the first centrifugal move of the development (E major to E minor, mm. 118-20). Beethoven then replays the primary theme in E minor's (close) submediant region, C major. This eight-measure theme leads into the next flat-submediant turn. Beethoven draws on the interchangeability of major and minor regions sharing the same root to make the deceptive progression V– $\flat$ VI in measures 129-30. He then continues in A $\flat$  major, the

flat submediant of C major.

Even though this is early in the development section, the remainder of the development moves in the sharp direction back towards the principal key, making this an unusually early point of furthest remove. Based on the modulatory path, the PoFR (A $\flat$  major) registers as a very remote region on the flat side, **D:  $\flat$ SM $\flat$ SM**. Beethoven then moves sharpward from A $\flat$  major through F minor (mm. 142-60), F major (mm. 161-75), and D minor (mm. 176-96) to A minor (mm. 197-209) — the tonic minor region — which presents the dominant it shares with the tonic major (mm. 202-23), preparing for the return of the principal key (A major). While the first sharpward and centripetal move occurs with the move from A $\flat$  major to F minor at m. 140, the thematic material changes significantly at m. 161; therefore, the long centripetal phase of the development section could be read as beginning at m. 161, extending until the end of the section, m. 223.

Beethoven's complete focus on the flat side of the principal key in the development section gives the section a strong flat-CF orientation. The exposition and recapitulation also feature significant flat-CF forces generated by the centrifugal episode that forms the first subordinate theme in the exposition and recapitulation (mm. 58-83 and 277-302). In these centrifugal episodes, modulatory movement by ascending minor thirds between regions, from E minor (the dominant minor, mm. 58-61) through G major (mm. 62-65) to B $\flat$  major (mm. 66-68), generates very strong flat-CF forces in the exposition and recapitulation.<sup>297</sup> In the exposition,

---

<sup>297</sup> Brian Alegant points out that a high proportion of sonata-form movements in A-major focus on the flat side, rarely moving beyond E major. He insightfully observes that the commonly flatward trajectories in the development section are often foreshadowed in the exposition, for example in op. 2/2/i. See Brian Alegant, "A-Major Events" in *Keys to the Drama: Nine Perspectives on Sonata Form*, ed. Gordan Sly (Farnham, UK: Ashgate, 2009), 199-224.

these flat-CF forces counterbalance the normative large-scale sharp-CF force of the dominant key; in the recapitulation, they tilt the whole of stage VII: CP(CF) to the flat side. The modulatory sequence by ascending minor thirds forms the first part of a large-scale, stepwise bass ascent spanning a twelfth, from E3 to B (m. 87), albeit with switches to lower registers after reaching F#4 (mm. 74-83).<sup>298</sup> The combination of flat-CF forces from stage IV:CF (the centrifugal phase of the development) and this centrifugal episode in stages III: CP/CF(CF) and VII: CP (CF) give the movement a significant flat-CF orientation overall.

Beethoven uses the parallel minor as a gateway to the most remote flat-side regions in Op. 2/2/i; by contrast, in op. 7/i (in Eb major) he reaches very remote sharp-side regions by applying the parallel-major relation (in a digression within the secondary group) or by making an ascending whole-tone sequence of regions (in the development). In the same movement, Beethoven also generates extensive flat-CF forces, drawing upon typical uses of the parallel minor discussed in the previous section. These flat-CF forces counterbalance sharp-CF forces in preceding and following sections.

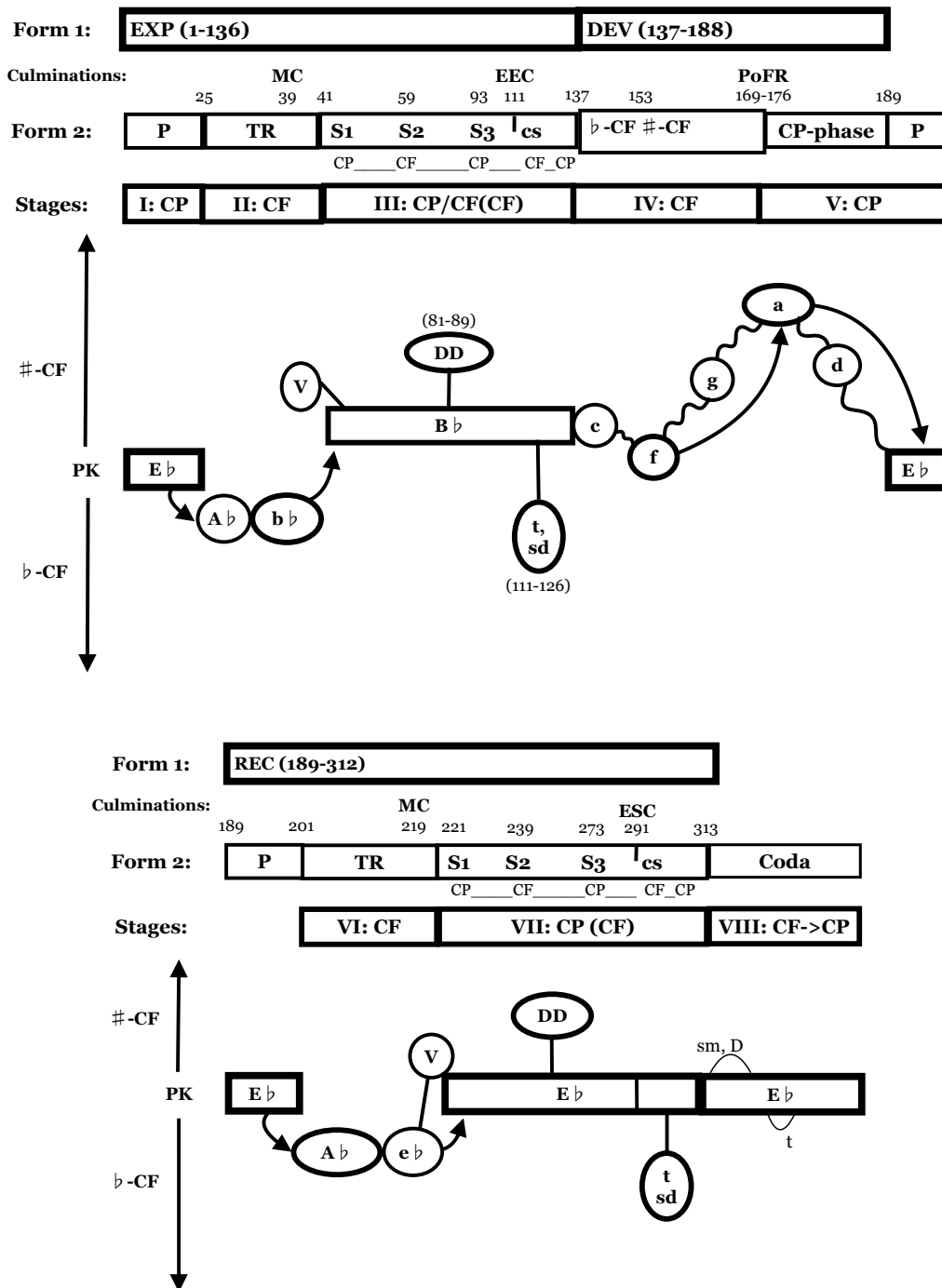
Figure 4.4 shows Beethoven's op. 7/i in terms of the CP/CF model. When I discussed parts of this work in chapter 3, I focused on the degrees of definition or substantiality with which regions appear. In this section, I concentrate on the interplay of large-scale centrifugal and centripetal forces on the sharp and flat sides. As in Mozart's K. 332/i and K. 533/i, Beethoven inflects his stages II: CF (the exposition's transition, mm. 25-40) and VI: CF (the recapitulatory transition, mm. 201-20) toward the flat side by establishing the parallel minor (to the secondary and principal keys respectively). Beethoven also moves through the subdominant in both stages,

---

<sup>298</sup> Tovey considers this stepwise ascent to be a new and significant tonal technique, calling it "epoch-making in the history of sonata expositions." See Tovey, *Companion*, 20.

expanding it significantly in the recapitulatory transition. This tilts stage II: CF in op. 7/i more strongly to the flat side than K. 533/i, which moves first through the sharp-side region **sm**.

Figure 4.4. Overview of Beethoven, op. 7/i in eight CP/CF stages (see fig 4.3 caption for explanation of symbols)



The strong flat-CF forces from stage II: CF generate anticipation for the global sharp-CF force generated by stage III: CP/CF(CF). In this movement, stage III features a particularly extensive interplay of centripetal with local- and middleground-centrifugal forces. I interpret this by dividing stage III into five alternating local CP/CF phases, corresponding with the division of the group of subordinate themes into three themes and a two-part closing section. The first subordinate theme and its repetition (mm. 41-59) form a centripetal phase, since it features only fleeting CF forces and ends with a PAC. Furthermore, the sharp-CF forces from suggestions of **sm** and **smsd** evenly counterbalance the flat-CF forces from **sd** and **smsd** (mm. 45-47 and 55-57). Equal counterbalancing of sharp- and flat-CF forces creates a large-scale centripetal effect, unlike the extra centrifugal momentum created by the unequal weighting of sharp- and flat-CF forces.

The second subordinate theme (mm. 59-93) features a significant chromatically intensified deceptive progression that makes a transient modulation to **DD** (C major, mm. 81-89) of the dominant key (B-flat major). This is a remote region on the sharp side, which Tovey calls "intrusive" and "violently opposed" to the prevailing B $\flat$  major.<sup>299</sup> The digression could have ventured to the close relation **dor** or **smsd** (C minor), whose parallel major is **DD**. Since the digression is made to **DD** instead, we can see how **DD** intensifies the closer **dor** to the sharp side, generating a very strong sharp-CF force. This makes the second subordinate theme a CF-phase within stage III: CP/CF(CF), tilting it strongly to the sharp side.<sup>300</sup>

---

<sup>299</sup> Tovey's phrase by phrase analysis is as follows: "[mm.] 81-92—Resolution of the diminished 7th into C major. This is not an enhanced dominant but an intrusive key violently opposed to the present B $\flat$ ." See Tovey, *Companion*, 39.

<sup>300</sup> Alternatively, just the passage mm. 79-89 could be considered as a shorter CF-phase within stage III. Significant local CF-forces in the opening phrase of the theme (mm. 59-67) and the prolongation of the dominant leading to the digression (mm. 71-78), delaying any tonic resolution, justify considering the whole theme (mm. 59-93) as a local & middleground centrifugal phase within stage III: CP/CF(CF).

The centrifugal forces from this phase motivate the strong temporal-centripetal forces of the third subordinate theme ( $S^3$ , mm. 93-111), driving to the temporal-CP culmination at m. 111. The semi-substantial sharp-CF forces created by the digression to **DD** in the previous theme creates an imbalance that compels the addition of flat-CF forces in the expanded cadential progression leading to the temporal-CP culmination. In the expanded cadential progression that leads to the culmination (mm. 105-11), Beethoven adds fleeting flat-CF forces to the continuing sharp-CF ones. The  $\flat\hat{6}$  in the bass of the augmented sixth chord and  $\flat\hat{3}$  as the top voice of the leading-tone diminished seventh of the dominant generate flat-CF forces, while sharp-CF forces are generated by  $\sharp\hat{4}$  in both of these harmonies. Since the sharp-CF forces strongly outweigh the flat-CF forces (in  $S^2$  and  $S^3$  combined), the unbalanced combination of sharp- and flat-CF forces creates extra momentum to the culmination. This displays the phenomenon discussed in the previous section: more powerful CF forces on one side alternate and/or combine with fleeting ones on the other, creating an imbalance that increases momentum to the culmination.

The first part of the closing section (mm. 111-27) answers the sharp-CF tilting of the second subordinate theme with semi-substantial flat-CF forces from the subdominant and parallel minor; this results in another local centrifugal phase, this time tilted to the flat side. The extensive semi-substantial centrifugal excursions in the latter part of the second subordinate theme and the closing section's first part epitomize Kollmann's reference to touching on regions other than the designated secondary key in the second of his four subsections. Finally, the powerful semi-substantial sharp- and flat-CF forces are temporarily brought into balance or



resolution by a final centripetal phase (mm. 127-136). This second closing part<sup>301</sup> prolongs the tonic (without chromatic enrichment) and introduces an apparently comical syncopated figure that will be developed in the main CF-phase of the development section, where it takes on a very contrasting *Sturm und Drang* character.<sup>302</sup>

The development section divides into two centrifugal phases and the centripetal phase. The centrifugal phases combine to form stage IV: CF (mm. 137-69), while the centripetal phase (mm. 169-88) forms the first part of stage V: CP (mm. 169-201). As in Mozart's K. 570/i and 576/i, Beethoven begins stage IV: CF with a preliminary flatward phase (mm. 137-52) before launching the longer centrifugal trajectory in the sharp direction (mm. 153-69). Instead of using the parallel-minor relation for the flatward trajectory, in this movement Beethoven begins on **smsd** of the dominant key, which can be reduced to simply the global **sm** (C minor), and uses a descending-thirds sequence outlining a descending fifth from C minor (mm. 137-45) through Ab major (mm. 145-50) to F minor (mm. 151-57).

Upon reaching F minor, Beethoven switches to the syncopated theme from the end of the exposition and moves by ascending whole tones between regions, from F minor through G minor (mm. 158-65) to A minor, the point of furthest remove (167-75). Beethoven's use of the ascending whole-tone sequence of regions increases the speed of the sharpward trajectory by combining two sharpward fifths in each move, just as Mozart did in K. 576/i. The latter two regions are both strongly tilted toward their dominants, further intensifying the sharpward trajectory. Beethoven moves from G minor to **g**: V through the augmented sixth, the typical

---

<sup>301</sup> Tovey calls this a "cadence theme." See *ibid.*, 39.

<sup>302</sup> Schoenberg identifies six sections in what he reads as a large subordinate group, corresponding to my stage III. He counts the theme appearing in mm. 81-89 in **DD** as a distinct third section, whereas I count it as part of the second phase of stage III. See Schoenberg, *Fundamentals of Musical Composition*, 204-5.

point-of-furthest-remove gesture (mm. 161-65). Instead of making the reversal to the centripetal phase here, Beethoven continues in the sharp direction with the bass rising from D to D $\sharp$ , which supports a leading-tone diminished seventh to **a: V** (mm.167-68). The opening basic idea returns over a cadential 6/4 that establishes A minor; Beethoven answers this four-measure idea with a contrasting new cantabile idea (mm. 169-76). Since the next modulatory move is centripetal, moving flatward back toward the principal key (E $\flat$  major) via D minor, A minor is the region of furthest remove.

The centrifugal stage IV: CF again displays the phenomenon of alternation between unbalanced flat- and sharp-CF forces leading to and enhancing the culmination. In this stage, a slight flat-CF modulatory trajectory prepares for a very extensive sharp-CF trajectory leading to the point of furthest remove. This sharp-centrifugal goal is both very remote from the initiating region and remote from the principal key, as **f: v<sup>4</sup>** and **E $\flat$ : Dmv** (A minor). As in Mozart's K. 570/i and K. 576/i, the initial flatward move enables the far-reaching sharpward trajectory and allows for the imbalance between flat- and sharp-CF forces that further stimulates centrifugal momentum toward the culmination.

A distinctive feature of the centripetal phase (mm. 169-88) is the surreptitious way in which it passes through the dominant, the lack of emphasis given to it. This contrasts with development sections that prolong and intensify the final dominant extensively, such as in the op. 2 sonatas and op. 53/i (discussed below). The absence of a marked dominant also accentuates the remote relation of the PoFR to the principal key. The centripetal phase consists of a sequencing of the passage in A minor (mm. 169-76) down a fifth into D minor (mm. 177-86), followed by a short harmonic progression making the modulatory leap to the principal key, since D minor is also remote from E $\flat$  major. The dominant of the principal key (B $\flat$  major) forms the subtle bridge

from the remote region back home. The harmony moves from the tonic of D minor to its submediant (mm. 185-187), which becomes **E♭: V<sup>7</sup>** only in the next bar when the minor seventh (A♭) is added, contradicting the D-minor region. By giving this dominant seventh only one measure at *pp*, the tonic return becomes an emphatic surprise.

The return of the primary theme (mm. 189-200) continues stage V: CP. Beethoven aptly abbreviates the theme by omitting the stronger cadential progression of two (mm. 13-17 in the exposition), keeping the tonal narrative buoyant by bringing back centrifugal motion in stage VI: CF, the recapitulatory transition (mm. 201-20). Beethoven builds momentum toward the culminating passage on the dominant with intensifications of differing weights from flat- and sharp-CF forces. First, he modulates transiently to **SD** (A♭ major), which generates a semi-substantial force owing to its extended indication for thirteen measures (mm. 201-13). Then, he makes a fleeting turn to sharp-CF force in m. 214 by turning the bass A♭ into the ascending leading tone to **D** (A♯). This leads to the culminating passage prolonging the dominant (mm. 215-18); the prolongation is infused with the tonic minor, which continues to build flat-CF forces until the medial caesura (m. 219). The flat-CF forces generated by stage VI: CF counterbalance part of the sharp-CF force of the sharpward trajectory of stage IV: CF. The following stage VII repeats stage III in the principal key, with only registral changes due to the constraints of the five-octave keyboard of Beethoven's time and the upper counterpoint from mm. 41-46.<sup>303</sup>

The movement concludes with an extensive coda that presents significant local-CF and CP forces and completes the tonal narrative by assimilating crucial centrifugal elements. This justifies calling it a distinct eighth stage. The coda responds to the semi-substantial CF-forces of

---

<sup>303</sup> Tovey, *Companion*, 40.

stage VII with more fleeting CF forces from suggestions of regions that are fully assimilated into the prevailing key. Stage VIII: CF→CP (mm. 313-62) brings together sharp- and flat-CF forces by suggesting regions from all four directions of the tonal spectrum — sharp-third, sharp-fifth, flat-fifth, and flat-third/parallel. These fleeting CF forces contribute to a spatially complete *Stufenreichtum* of the principal key. Stage VIII: CF→CP also assimilates the chromatic elements that appeared earlier in the movement as more independent regions, since they now appear as foreign tones embellishing and subordinate to the prevailing principal key rather than as independently established regions. For example, the tone A $\sharp$  had appeared in the development as the root of the region of furthest remove (A minor). In the coda, it reappears as the ascending leading tone to the dominant (m. 318) in a progression strongly defining the principal key.

The designation stage VIII: CF→CP describes the opposing natures of its first two phases on the one hand (mm. 313-23 and 323-51), featuring harmonies that suggest regions from all four directions of the spectrum, and the centripetal final phase (mm. 351-62), which prolongs the tonic with only tonic and dominant chords. Fleeting CF forces from the sharp-side regions **sm** and **D** enrich the harmony in phase 1 (mm. 313-23), which develops the opening basic idea. Fleeting CF-forces from the flat-side regions **SD** and **t** (mm. 342-45) enhance phase 2 (mm. 323-51), which develops the basic idea of the second subordinate theme and the syncopated motif from the closing section. While stage VIII completes the tonal narrative with spatially complete *Stufenreichtum* of the principal key, the tonal narrative overall shades slightly to the sharp side, owing to the sharpward trajectory of stage IV and the substantial sharp-CF forces from the dominant key of stage III being mostly but not completely balanced by flat-CF forces from stages II, III, IV, VI, and VII.

The discussion in this section has aimed to show how Mozart and Beethoven expand the

centrifugal range of their sonata forms in both the sharp and flat directions. In his final two piano sonatas, K. 570/i and 576/i, Mozart expands the centrifugal trajectory of the development by first moving remotely in the flat direction from the secondary key. This increases the tonal distance available for moving in the sharp direction toward the typical point of furthest remove, **M#** as **sm**: V. Mozart then moves six and seven steps, respectively, in the sharp direction to reach the PoFR, generating a stronger CF force than in the development sections of earlier movements such as K. 332/i and 533/i.

The gateway or catalyst for Mozart's remote moves in the flat direction is the parallel-minor relation. For the sharp direction, Mozart reaches more remote regions (measured from the initiating region) either by adding extra terms to the ascending-fifths sequence of regions (K. 570/i) or by substituting ascending whole steps for ascending fifths, accelerating and intensifying the sharpward trajectory (K. 576/i). Beethoven draws upon all of these techniques for generating very strong centrifugal forces in the flat and sharp directions in his piano sonata movements. Beethoven's points of furthest remove are often more remote from the principal key than Mozart's. While Mozart's PoFRs in K. 570/i and 576/i are the standard **M#**, only moderately remote from the principal key, in Beethoven's op. 2/2/i the PoFR is **bSMbSM** and in op. 7/i it is **Dmv**, both very remote relations from the principal key; these PoFRs are four and three fundamental steps respectively from the principal key.

The expansion of centrifugal trajectories has at least three main effects. First, it increases the centrifugal force built up in the development section, leading to a stronger centrifugal culmination than in movements with shorter centrifugal trajectories. This creates a greater yearning for a correspondingly strong centripetal force accumulating toward the final significant culmination of sonata form: the essential structural closure (ESC) or global-centripetal

culmination. Second, the more remote centrifugal culmination facilitates more variety and scope in the tonal narrative, particularly in development sections. Many earlier sonata developments feature only two types of relations between regions — ascending and descending fifths and the parallel major-minor change — such as in Mozart's K. 332/i and 533/i discussed above. Mozart's final two sonatas feature a greater variety of relationships between regions in the development. The development section of Beethoven's op. 7/i features even more variety of relationships between regions, including close-third, close-fifth, parallel major-minor, and modulatory leaps including whole tones or semitones between regions. The preliminary CF-phase features the third-relations; the move from G minor to its dominant major manifests fifth- and parallel relations; the main CF-phase features whole-step modulatory leaps (combining two or more fundamental steps); and the final remodulatory move is another modulatory leap, from **Dm** (D minor) to the principal key (E $\flat$  major).

The third effect of making the region of furthest remove more remote is to expand the dramatic possibilities of the instrumental sonata. By increasing the distance from the principal key or reference point, the psychological expression of remoteness, conflict, or struggle may develop over a longer duration, becoming more intense and marked at the arrival at the region of furthest remove. It also creates the possibility of arriving at a potential PoFR but then moving even further to the actual PoFR. This occurs in Beethoven's op. 7/i and more elaborately in Schubert's D. 894/i, analyzed in chapter 5. The expansion of centrifugal range, correlating with an expansion of emotional expression also points toward the influence of large-scale dramatic works such as oratorio and opera on the piano sonata. While J.S. Bach's, Handel's, and most of Mozart's earlier instrumental works feature a more restricted harmonic range on the tonal spectrum, their oratorios and operas feature key-plans that travel to keys very remote from the

principal key of the whole work.<sup>304</sup> These large-scale dramatic works may have influenced Mozart and Beethoven to apply this larger-scale key planning to their expanding sonata forms in instrumental works as well.

Having explored some ways in which Mozart and Beethoven increased the regional distances of the most remote regions in the tonal narrative, let us turn to ways in which Beethoven substantiated or prolonged the region of furthest remove in time.

#### 4.4 Substantiation of the point of furthest remove

In the chapter "Beethoven's later years and the conventions of his childhood" in the expanded edition of *The Classical Style*, Rosen investigates various ways in which Beethoven temporally expands and illuminates the conventional chromatic intensification of the **sm**: V point-of-furthest-remove stereotype. Two of Rosen's examples, from Beethoven's sonatas op. 10/2/i and op. 28/i, feature extensive substantiation or prolongation of this sharp-side centrifugal culmination. In the earlier movement, Beethoven substantiates the point of furthest remove into a confirmed key, **SM#**. In the later movement, **M#** as **sm**: V is prolonged for a remarkable 38 measures until "it appears to give up its secret power to us," creating a momentary trance-like state or feeling of stasis.<sup>305</sup> In both cases, full confirmation of the key or prolongation of the region increases the temporal-centripetal force at the point of furthest remove. This creates a simultaneity of (strong) spatial-centrifugal and (slight) temporal-centripetal forces, a paradox in the tonal narrative.

---

<sup>304</sup> J. S. Bach's St. Matthew Passion begins in E minor and features a key of furthest remove of Eb minor, which sets the text "My God, my God, why have you forsaken me?" The utter remoteness of this key reflects Jesus' extreme sense of separation from God the Father at this point in the narrative. See Eric Chafe, *Tonal Allegory in the Vocal Music of J. S. Bach* (Berkeley, CA: University of California Press, 1991).

<sup>305</sup> *Ibid.*, 483.

Beethoven's op. 7/i, discussed in the previous section, also features temporal expansion of the region of furthest remove (A minor, mm. 169-76). In this passage, Beethoven accentuates the sense of strangeness and foreignness generated by such a remote region by remaining in it for eight measures, the archetypal length of a theme. Beethoven also establishes the PoFR with an incomplete cadential progression:  $LT^{\circ}7/V-V6/4-7-i$  (mm. 167-73). The temporary stabilization of the harmony also contributes to a slight temporal-CP force substantiating the point of furthest remove or spatial-CF culmination. The modulatory phase leading to the point of furthest remove features a high degree of dissonant and chromatic intensification, in addition to modulatory intensification, matched by the *fortissimo* dynamic indication. When Beethoven arrives at the PoFR, the harmony presenting it becomes more consonant as well, with a cadential 6/4 and dominant sevenths (including inversions) replacing the dissonant intensification created by diminished-seventh and augmented-sixth chords. Drawing on Kurth's terminology, the energetic harmony of the centrifugal phase is replaced by more *klangsinnlich* (sensuous) harmony for the passage presenting the most remote region of the piece.<sup>306</sup>

The lowering of vertical dissonance or energetic harmony for the presentation of the most remote region, as well as the extended duration of its presentation, enhance the phenomenological effect and meaning of the most foreign region of the movement. Beethoven's treatment of the PoFR suggests his awareness that a foreign and remarkable experience takes more time to process and understand than a comparatively familiar and normal one. The combination of lower dissonance and extended duration, backed up by the *pianissimo* dynamic, makes time appear to slow down and expand after the urgency of the modulatory phase leading up to it.

---

<sup>306</sup> Rothfarb, *Ernst Kurth as Theorist and Analyst*, 113-15.



In the first movement of op. 10/2 (in F major), Beethoven ends the development by substantiating the PoFR into a key confirmed by a PAC. This region, D major, is a fully remote three fundamental steps from the origin of the modulatory phase leading to it, B $\flat$  minor (mm. 99-104), with the PoFR registering as **bb: #M#**. Paradoxically, the main theme returns deceptively at the point of furthest remove (mm. 117-28). Here, Beethoven juxtaposes the strong sense of familiarity created by the return, which should be a centripetal event, with the foreignness of the remote key. The informed listener realizes the strangeness of the situation after the cadence concluding the theme: a short retransitional modulation follows with the harmony slipping back to the principal key through descending fifths with alterations from the scale of **SM#** to that of **T** (mm. 130-35).

In op. 28/i (in D major), the point of furthest remove is the standard chromatically intensified **M#** as **sm: V** (F# major as **b: V**); however, the prolongation of this region for a large part of the development section is highly original. The PoFR functions as the goal of a lengthy sharpward centrifugal trajectory (mm. 182-217), beginning with **sd $\flat$**  (G minor) as the initiating region. The trajectory from G minor to F# major (as **b: V**) takes six fundamental steps: five ascending fifths plus a parallel-major switch, generating an extremely strong sharp-CF force.

Beethoven expands the PoFR temporally by prolonging **M#** (F# major) for 38 measures (mm. 218-55), over one-third the length of the development section. The phenomenon of dissonant intensification (strong vertical dissonances) resolving into consonance applies even more strongly here than in op. 7/i. The previous passage, beginning from the fragmentation of thematic units (mm. 206-18), presents strong dissonant intensification through leading-tone diminished sevenths and an augmented-sixth chord lasting two measures, leading to **M#** as **sm: V** (m. 218). The arrival harmony is, by contrast, a consonant major triad. The linear motion in

the inner voices above the dominant pedal continues to present vertical dissonance, resolving back to the major triad every four measures, but the strongest vertical dissonances have disappeared. From m. 226 to m. 255, however, the harmony becomes exclusively consonant (apart from one melodic leading tone, E#). At m. 226, the prevailing scale also changes from B minor to F# major. The increasing concentration on the F# major harmony evokes a trance-like or contemplative state, contrasting with the centrifugal turmoil of the preceding modulatory motion. While the preceding sharpward trajectory combined both spatial and temporal-CF force, the extensive prolongation of the PoFR itself adds significant temporal-CP force to the spatial-CF culmination.

The trance is softly interrupted in m. 256, when the basic idea of the closing theme returns in **SM#** (B major), with **M#** (F# major) returning to its harmonic function as a dominant. This begins a very short centripetal phase (mm. 256-67) that returns to the tonic through repetition of the basic idea in **sm** (mm. 261-64), leading to the dominant seventh of the principal key (mm. 265-67).

Rosen insightfully observes that "Beethoven's originality reveals itself most often not by frustrating a convention that he learned as a child, but by magnifying them beyond the experience or expectations of any of his contemporaries."<sup>307</sup> Rosen later points out that Beethoven usually magnified consonant harmonies in this way, with the occasional exception of dominant flat ninth chords, for example in the *Eroica* symphony. By enormously expanding the duration of the most remote region, Beethoven also creates a paradox of structural dissonance and vertical consonance: the most spatially centrifugal element, the point of furthest remove, is magnified as the most perfect and consonant sonority. Beethoven leads the listener to the most

---

<sup>307</sup> Ibid., 483.

remote region of the psyche (the tonal spectrum being a metaphor for the psyche), inviting the listener to remain there for so long that it seems timeless. The most foreign element becomes not only magnified but purified, illuminated, and exalted by the perfect triad.<sup>308</sup>

#### 4.5. The complete traversal of the enharmonic circle: the apotheosis of *Durchführung*

Section 4.3 investigated how Mozart and Beethoven intensified the centrifugal trajectory of the development section by modulating a greater distance from the initiating region to the goal region, the point of furthest remove. In terms of Ratner's scheme (**I–V**, **X–I**), these composers expanded the dimensions of the **X** section, creating more drama and greater anticipation for the opposing centripetal forces to drive the tonal narrative to the final centripetal culmination (conceptually similar to the ESC). In op. 7/i in E $\flat$  major, Beethoven reaches **Dmv** (A minor), a point of furthest remove that is very remote from the principal key on the sharp side, more remote than the standard **M $\sharp$**  reached by Mozart in his piano sonatas. In op. 2/2/i in A major, Beethoven builds upon Mozart's practice of moving in the flat direction early in the development section and modulates to a point of furthest remove on the flat side, the very remote **E:  $\flat$ SM $\flat$ SM** (A $\flat$  major).

In each of these movements, Beethoven makes the longest centrifugal trajectory in the sharp or flat direction to the point of furthest remove, then reverses direction to begin the centripetal phase returning to the principal key; this creates a "there-and-back-again" shape. In the development section of op. 53/i in C major (the *Waldstein* sonata), Beethoven discovered an

---

<sup>308</sup> This reflects Goethe's interpretation of red as the culmination of the process of generating colors on the color wheel. The union of the two intensified sides – light and dark represented by yellow and blue as basic colors – yields pure red, which is the most noble and exalted color. Pure red in Goethe's theory of color corresponds to the point of furthest remove in the tonal narrative approach (see 2.6).

extraordinary way of further extending the modulatory trajectory and generating more extreme degrees of centrifugal force. In this epic development section, Beethoven completely traverses the circle of fifths, which Tovey calls "an enharmonic circle."<sup>309</sup> The composer begins the modulatory trajectory in the flat direction from the secondary key, **M#** (E major) in the closing section of the exposition. The flatward trajectory continues throughout the development, leading through the most remote regions from the secondary and principal keys, such as **bmb** (Eb minor). In previous sonatas, Beethoven may have chosen this region as the point of furthest remove, making the large-scale reversal of direction to centripetal motion. Instead, Beethoven continues moving in a continuously flatward direction, continuing to increase the centrifugal forces of the modulatory trajectory to immense degrees by travelling a total of twelve fundamental steps to reach the point of furthest remove, **Dbb/C** minor (mm. 130-36). At the same time, owing to the principle of enharmonic equivalence and the circular nature of the tonal system, a large-scale centripetal process occurs whereby the tonal narrative returns to the principal key.<sup>310</sup>

On the one hand, following the modulatory path of consecutive regions, centrifugal forces continue to increase in the flat direction. As Tovey points out, there is no precise point when a real enharmonic change occurs.<sup>311</sup> The progression of regions from Eb minor (mm. 122-

---

<sup>309</sup> Tovey, *Companion*, 10, 160.

<sup>310</sup> Beethoven traverses the enharmonic circle in the development section of one of his earliest piano sonatas, op. 2/3/i, also in C major. In this sonata, Beethoven also modulates in the flat direction around the enharmonic circle; however, the modulatory path is less emphatic and continuous than in the *Waldstein*. This is due to a long passage of roving harmony early in the section that connects F minor (mm. 93-96) and Gb minor, notated as F# minor (mm. 103-6). While F minor and Gb minor are indicated by dominant-to-tonic progressions, the roving harmony does not suggest any region, featuring various sonorities over an ascending chromatic bass line from Bb to Db. The modulatory path continues by replaying the opening basic idea in Ebb/D major (mm. 109-12). The flatward trajectory continues by descending fifths in minor regions, G minor-C minor-F minor (mm. 113-25), leading to the (principal) dominant preparing the return (mm. 129-38). See Tovey, *Companion*, 29 and Schoenberg, *Structural Functions*, 165. Beethoven also explores enharmonic circles in his Two Preludes Through All Twelve Major Keys for Piano, op. 39.

<sup>311</sup> Tovey, *Companion*, 10, 160.

25) to the notated B minor (126-29), for example, moves in the flat direction — there is no radical switch to the sharp side. C $\flat$  minor is the submediant minor of E $\flat$  minor, B minor its enharmonic twin; the difference is primarily one of notation. The harmony moves from E $\flat$  minor to its mediant, G $\flat$  major, notated as F $\sharp$  major, with an added minor seventh. The G $\flat$  major harmony becomes the dominant seventh to the minor region a fifth below, C $\flat$ /B minor; this makes C $\flat$ /B minor the submediant minor region of E $\flat$  minor, since the submediant equals the lower dominant (subdominant) of the mediant.

On the other hand, the tonal system based on equal temperament limits the potentially infinite proliferation of relations by fifth, third, and parallel relations in the flat and sharp directions, by making tones with very similar frequencies, such as G $\flat$  and F $\sharp$ , in one sense equivalent.<sup>312</sup> Equal temperament controls the emanations of tones in the sharp and flat directions, limiting them to twelve pitch classes within the octave, which when arranged in a scale are a uniform semitone apart. This enables the two lines of perfect fifths moving in the sharp and flat directions to be joined into a circle, an enharmonic circle or circle of fifths. For example, the sixth perfect fifth ascending from C is F $\sharp$ , which is the enharmonic equivalent of the sixth perfect fifth descending from C, which is G $\flat$ . Thus, the C $\flat$  minor region indicated in mm. 126-29 is simultaneously B minor, the former being its centrifugal identity based on the modulatory path, the latter its centripetal identity that connects it back to the principal key.

Equal temperament functions in this passage as a systemic centripetal force emerging simultaneously with extreme centrifugal forces; however, the large-scale centrifugal motion

---

<sup>312</sup> Richard Cohn discusses this phenomenon in his book *Audacious Euphony: Chromatic Harmony and the Triad's Second Nature*, 209-10.

continues further, making one more crucial modulatory move to D $\flat\flat$ /C minor, which I read as the point of furthest remove. D $\flat\flat$ /C minor functions as the point of furthest remove because following this region the modulatory movement reverses definitively from flatward and centrifugal to sharpward and centripetal; the next region to appear is its dominant (mm. 136-55), which it shares with its parallel major, the principal key (C major, arriving at m. 156). The enharmonic equivalence of D $\flat\flat$  and C minor functions as a centripetal wormhole back to the principal key while also being the point of furthest remove. The common dominant shared by the tonic minor and tonic major regions acts as the final gateway for entering the principal key. This dominant is chromatically intensified and prolonged extensively, for twenty measures, forming the whole centripetal phase of the development (mm. 136-55).

According to Tovey, when the enharmonic circle reaches the extremely remote enharmonic twin of the principal key, it is only the return of the primary theme in this key that restores the principal key itself, distinguishing it from its enharmonic twin. He calls the thematic return the "collateral evidence of design," which, in enharmonic circles is the "only thing that can re-establish the tonic."<sup>313</sup> In my interpretation, I allow for the imminent return of the primary theme in C major (m. 156) to justify a dual centrifugal/centripetal identity for D $\flat\flat$ /C minor, arriving in m. 132 and established by the half-cadential arrival at m. 136. Yet the C major that eventually shines forth is not the same as the C major that began the movement: the returning C major has been transformed through the traversal of the enharmonic circle.

Example 4.6 shows the progression of regions and the form of the development section, including the closing section of the exposition, which functions as a centrifugal transition into

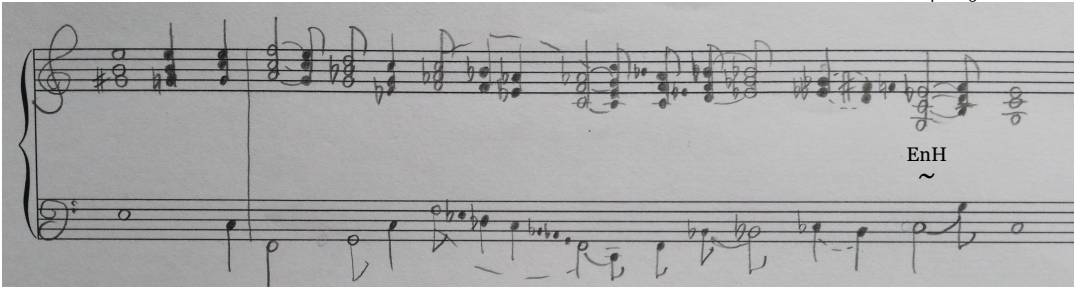
---

<sup>313</sup> Tovey, *Companion*, 10.

the development and begins the large-scale flatward trajectory. In the development of Beethoven's *Waldstein* sonata there are three main culminations, which shape its form. The first is the chromatically intensified arrival on V of **sdb** (**f**: V) in m. 112. The progression from an augmented sixth to **f**: V reflects a typical point-of-furthest-remove gesture, but the harmony arrived at is C major as a local dominant. Because C major is also the principal tonic harmony, this would not work as the point of furthest remove (it would, at least, be extremely paradoxical). This arrival on **f**: V divides the development section into two centrifugal phases, mm. 90-112 and mm. 112-36 (see figure 4.5).

Example 4.6. Beethoven, op. 53/i, development: Progression of regions: each region notated as a triad. Rhythmic durations correspond to hierarchy of regions. Figures in bold refer to regions, italics refer to relations between regions.

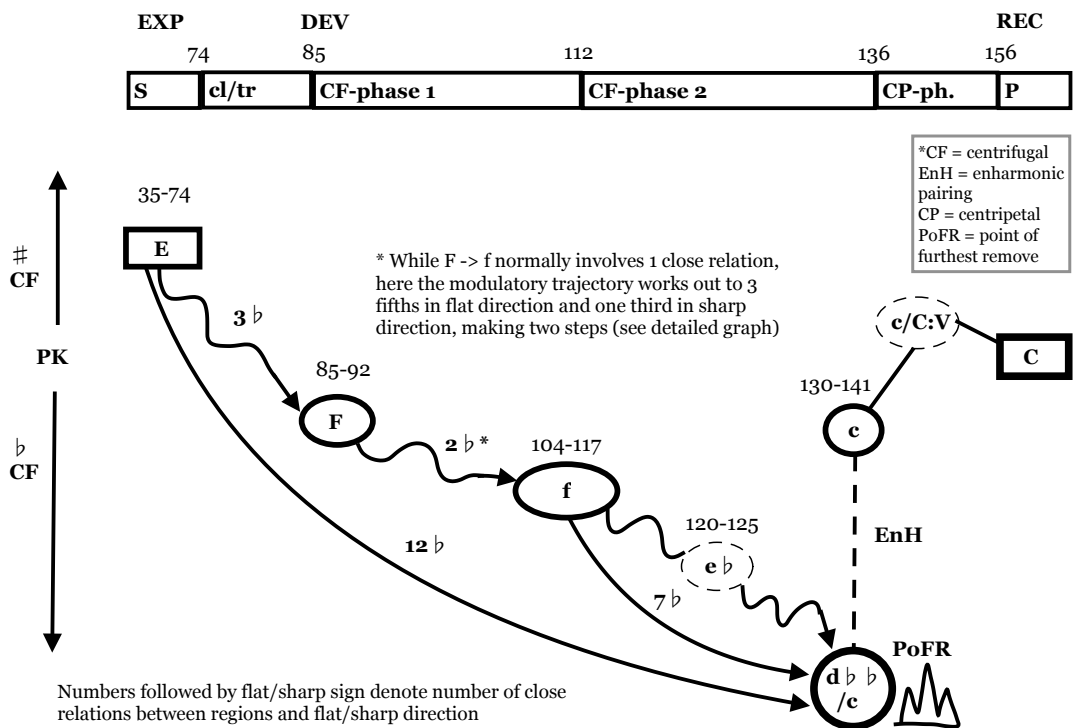
*CF = centrifugal EnH = enharmonic CP = centripetal PoFR = point of furthest remove	<b>EXP</b> S cl/tr → cl/tr 35-74 74 84	<b>DEV (85-155)</b> (CF-phase 1 (85-111)) intro ModSeq↓5 <sup>th</sup> 85 93-99 100 104 ↓ bs ln 106 107 112 116 120 124 ModSeq↓5 <sup>th</sup>	CF-phase 2 (112-135) ↑ chr bs 126 130 136 156 PoFR -141 -151	<b>REC</b> CP-ph (136-155)
--	---	--	--	-------------------------------

Structural	Regions: <b>C</b> : <b>M#</b>	<b>SD</b>	<b>sdb</b>	<b>t</b>	<b>T</b>												
Progression of regions:	E	e	C	F (F:V)	g	c	f	bb Ab	f	f:V	bb:V	eb:V	eb	cb/b	dbb/c	c:V	C
Relation*:	P	T	F	FP	F	F	F	FP	t	FP	F	F	FP	FP	FP	FP	F
Direction:	b	b	b	#	b	b	b	b	b#	#	#	b	b	b	b	b	#
No. of close relations from	o	1	2	<b>3</b>	3	4	5	6	<b>5</b>	3	4	5	7	9	<b>PoFR</b>		11
M# in flat	E			<b>F</b>					<b>f</b>						<b>12</b>	<b>10</b>	11
direction:															<b>dbb/c</b>	<b>C</b>	<b>C</b>

\*Relation symbols: P = parallel major-minor; F = perfect fifth between roots; T / t = major/minor third between roots.

Figure 4.5. Beethoven, op. 53/i, development: progression of structural regions, showing flat- and sharp-CF distances and trajectories



The second culmination occurs at the arrival on the dominant of the point of furthest remove, D $\flat\flat$ /C minor (m. 136). I consider the arrival on this dominant to begin the centripetal phase, since this is the first modulatory move in the sharp direction back to the principal key. The eventual return of the primary theme in the principal key makes this dominant retrospectively the shared dominant of tonic minor and major. As the dominant of the point of furthest remove, an extremely remote goal of the flatward CF trajectory, this is an extremely strong spatial-CF culmination. Yet as the dominant preparing the principal key's imminent return, it is also a crucial centripetal moment, though clearly less centripetal than the beginning of the recapitulation or the later global-CP culmination. The third culmination is the return to the principal key itself.

Stage IV: CF consists of the preliminary CF-phase (mm. 74-90), CF-phase 1 (mm. 90-112), and CF-phase 2 (mm. 112-36). The centripetal phase of the development (mm. 135-56)



forms the first part of stage V: CP (mm. 135-167), which also includes the return of the theme (mm. 156-67). The large-scale flat-CF trajectory from the secondary key (E major) begins before the development section, with the closing section of the exposition (mm. 74-85/90). Remarkably, this section switches function from centripetal, when leading back to the repeat of the exposition, to centrifugal when leading to the beginning of the development (m. 90). When the closing section leads back to the beginning of the exposition, it leads from E major centripetally in the flat direction through E minor (mm. 74-84) to the principal key, C major, prepared by a cadential progression beginning in m. 84 and leading to the repeat at m. 86.

The closing section functions in an opposing, centrifugal way for the second playing of the exposition leading to the development. The flatward trajectory does not stop at the principal tonic key but instead moves through C major to F major, whose tonic arrives at m. 90 to begin the development section with the return of the opening basic idea. F major now generates a significant flat-CF force being three fundamental steps from **M**♯ (E major); following the path of regions (**E–e–C–F**), these three fundamental steps are parallel minor–submediant–descending fifth (see example 4.6 and figure 4.5). For the second time through the exposition, its closing section forms a preliminary centrifugal phase for the development section.

The colossal flatward trajectory of stage IV: CF features two modulatory sequences that descend gradually by fifths into the tonal underworld. The last part of CF-phase 2 then speeds up the modulatory trajectory by leaping between remotely related regions, with the tonal narrative moving inexorably toward the point of furthest remove. The first CF-phase of the development features a move in both the sharp and flat directions (cancelling each other out) from F major to G minor, whose local tonic arrives at m. 96. This initiates a modulatory sequence by descending fifths developing the motifs appearing in measures 3 and 4. The sequence moves from G minor

(mm. 96-99) through C minor (mm. 100-03) arriving on the local tonic of F minor in m. 104. The following eight measures (mm. 104-11) form the second part of CF-phase 1 that tilts toward the flat side of F minor, indicating B $\flat$  minor (mm. 105-06, **f: sd**) and A $\flat$  major (mm. 106-07, **f: M**) with each region shaded by Phrygian II chords. This further flat-side tilting foreshadows the continuing descent into the tonal underworld in CF-phase 2. The harmonic progressions from m. 108 to m. 112 assert the F-minor region, which is established firmly by the half-cadential arrival at m.112. A descending F-minor scale in the bass outlining a twelfth from F3 to C2 (mm. 104-12) also contributes to the establishment of F minor as a structural region in the development (see example 4.6).

The second centrifugal phase of stage IV: CF continues the descending fifths modulatory sequence from CF-phase 1, with each region represented by its local dominant. The rhythmic and thematic patterns switch to triplets (the distinctive rhythm of the exposition's subordinate-theme group). The sequence (mm. 112-23) unfolds with each local dominant prolonged for four measures, from **f: V** (mm. 112-15) to **bb: V** (mm. 116-19) to **eb: V** (mm. 120-23). The last V ends the sequence by resolving to a consonant Eb minor triad. This begins the final and most centrifugal part of stage IV: CF, and the whole movement. In this second part of CF-phase 2 (mm. 124-35), Beethoven combines third relations with resolutions of dominant sevenths to minor regions which are remote from the previous region to make modulatory leaps (remote relations between consecutive regions). If we imagine the entire flatward trajectory to be a series of trials and battles undertaken by the hero of a story, the speeding up of the trajectory evokes

the most crucial and difficult challenges, leading toward the point of maximum psychological or physical separation from home—the point of furthest remove.<sup>316</sup>

The first modulatory leap moves from E $\flat$  minor to its submediant minor (C $\flat$  minor, notated as B minor); it makes two fundamental steps in the flat direction, submediant plus parallel minor (see example 4.6). Then Beethoven makes a modulatory leap of three fundamental steps, from C $\flat$ /B minor to D $\flat\flat$ /C minor. The counting of fundamental steps follows the harmonic progression, from B minor as local tonic to its submediant G major, which becomes the dominant seventh to C minor (m. 130-42). This makes three fundamental steps — submediant, descending fifth (subdominant), and parallel minor. The resolution of the dominant seventh to the minor rather than major region makes the relation of B/C $\flat$  minor to C/D $\flat\flat$  minor more remote, and also bypasses the enharmonic twin of the principal key (D $\flat\flat$  major).

The centrifugal force generated by the point of furthest remove (D $\flat\flat$ /C minor) can be determined by counting the fundamental steps taken from the initiating region of the entire trajectory, the subordinate key (E major). The flatward trajectory makes a total of twelve fundamental steps, generating a colossal centrifugal force (see figure 4.5). This value combines the CF force from (1) the preliminary CF phase from E major to F major (three flat-CF steps); (2) the first descending fifths modulatory sequence in CF-phase 1 (two flat-CF steps); (3) the second descending fifths modulatory sequence in CF-phase 2 (two flat-CF steps); and (4) the final modulatory leaps of CF-phase 2 (five flat-CF steps).

The twelve-step centrifugal trajectory of op. 53/i doubles the six-step CF trajectories of Mozart's K. 570/i, Beethoven's op. 7/i, and op. 28/i; it also greatly exceeds the seven-step CF-

---

<sup>316</sup> This interpretation of far-reaching enharmonic circles will be explored at greater length in chapter 5.

trajectory of Mozart's K. 576/i. Examining the progression of regions in these development sections offers a justification for the common perception that the *Waldstein* and *Appassionata* sonatas bring the trajectory and drama of the classical sonata to its crowning glory, its apotheosis. It shows that Beethoven expanded the centrifugal range of his sonatas significantly from his earliest opus numbers until the heroic period. Tovey writes that "the Waldstein Sonata marks the point at which Beethoven's style grew finally incompatible with that of his 'first period.'"<sup>317</sup> The immense trajectory of the development section with its traversal of the enharmonic circle provides one way in which Beethoven's style moved on from that of his first period. Tovey also writes that in the *Waldstein* sonata Beethoven "crossed the Rubicon," a reference to the river that Julius Caesar famously crossed as a declaration of war against the Roman senate that he would overthrow.<sup>318</sup> Tovey's image of Beethoven crossing a "point of no return" functions as a powerful metaphor for Beethoven's modulatory act: his penetration of the enharmonic seam on the way to traversing the enharmonic circle.

As mentioned above, enharmonic pairing acts as a centripetal wormhole back to the principal key, transforming the point of furthest remove, D $\flat\flat$  minor into the tonic minor, C minor, which moves to the common dominant of tonic minor and major (arriving at m. 136). The changing scale over the dominant pedal completes the centripetal motion of the centripetal phase. The tonic minor (C minor) scale prevails from m. 136 to m. 141, combined with the ascending leading tone from **D** (F $\sharp$ ). At this point, the scale of the dominant (G major) takes over until m. 151, making a clear sharpward turn. The return of the tonic major scale occurs in m. 152, where F $\sharp$  changes to F $\natural$  and the harmony becomes the dominant seventh of the tonic major key.

---

<sup>317</sup> See Tovey, *Companion*, 156.

<sup>318</sup> See *ibid.*, 156.

The extended prolongation of the dominant combined with the liquidation of thematic material and the tonic minor scale creates a significant phenomenological effect. The stasis of the controlling harmony and bass gives the ear time to change its interpretation of the harmony: from being the dominant of the extremely centrifugal goal, D $\flat\flat$  minor, to being the common dominant of the principal tonic minor and major keys (C minor and major). The liquidation of the parallel minor element, E $\flat$ , in the diminished seventh, at m. 142, symbolizes the corresponding dissipation of centrifugal force, the disappearance of the region of furthest remove.

The arrival of the tonic and primary theme in the principal key completes the enharmonic circle. While I have focused on the flatward CF-trajectory from M $\sharp$  (E major), we can also examine the tonal narrative from the beginning of the movement until the moment of recapitulation as a traversal of the enharmonic circle from the principal key to itself. In a material sense the principal key returning in the recapitulation is the same as the principal key that began the movement but it is also different, having been transformed through the modulations around the enharmonic circle.

This process transfers and transforms Hauptmann's conception of the cadence to a higher level. Hauptmann's model of the cadence draws on the Ramellian and dualistic conception of the tonic as a center surrounded by upper and lower dominants. Hauptmann's cadence begins with the tonic, descends to subdominant, returns to an intermediate tonic, ascends to the dominant before descending to the final tonic, which has been transformed through the cadential progression.<sup>319</sup> In Hauptmann's cadential model, the tonic begins in a provisional state where it is

---

<sup>319</sup> Hauptmann, *The Nature of Harmony*, 8-13. Dahlhaus observes that Hauptmann describes the I-IV-I-V-I cadence, with the intermediate tonic, rather than I-IV-V-I, as in August Halm's cadence. See Dahlhaus, *Studies on the Origin of Harmonic Tonality*, 43.

not only the tonic but also dominant to the subdominant and subdominant to the dominant: it is not clear which identity prevails. When it returns to the tonic after moving through the dominant and subdominant, however, the tonic changes its status from "being-a-dominant" to "having-a-dominant," at which point the tonic is realized as the center of the whole progression. The process transforms the original tonic metaphysically from being a provisional to being a fully realized tonic. The first and last tonics are materially the same but metaphysically different.

In the same way, the principal key from the first group of the exposition is only materially the same as the principal key that returns in the recapitulation. The principal key began as the governing key of stage I: CP of the tonal narrative. When it appears briefly on the border of the exposition and development it no longer functions as the principal key but as a passing region in the centrifugal flatward progression of regions from E major to F major. It appears as the first culmination of the development in m. 112 as the dominant of **sdb** (F minor). By this point, C major has changed from having a dominant to being a dominant. When the principal key returns triumphantly with the primary theme in m. 156, it is at the same time the extremely remote region D $\flat\flat$  major. It is only due to the collateral evidence of the thematic return, the systemic centripetal role of equal temperament, and the large-scale reversal from flat-centrifugal to sharp-centripetal motion that this region truly functions as the principal key, with its extremely remote enharmonic twin subsiding into the distance. In the same way that the tonic in Hauptmann's cadence changes its meaning from being a dominant to having a dominant, the tonic key changes from being a simple provisional key to becoming transformed into its flatward enharmonic opposite, which dissolves due to the collateral evidence of design. Just as Rosen conceived of modulation transferring dissonance to a higher level of harmonic motion, becoming

"structural dissonance," modulations completely traversing the enharmonic circle transfers Hauptmann's concept of the cadence to the large-scale progression of regions.

The complete traversal of the enharmonic circle also exemplifies Schoenberg's concept of the development section as *Durchführung*. As discussed in chapter 1 above, Schoenberg favored the German term *Durchführung* over development for the central part of sonata form because development, in the sense of motivic variation, extension, and evolution, occurs throughout the movement, for example in the secondary group.<sup>320</sup> Schoenberg's use of the German term accentuates the kinetic modulatory purpose of the development section: themes are "found in constant modulatory movement through many and even remote regions."

If the telos of the development section, as asserted in this dissertation, is to move through many regions, culminating at the most remote region — the point of furthest remove — then Beethoven's *Waldstein* sonata represents the pinnacle or the apotheosis of *Durchführung*. This sonata presents an ultimate leading through of the entire tonality, completely traversing the enharmonic circle to the enormously remote point of furthest remove, which is also the parallel minor of the principal key. The greatly prolonged dominant then enacts a centripetal transformation, so that the principal tonic arrives genuinely transformed from its original state, illumined by its extremely remote enharmonic opposite.

Beethoven also modulated completely around the enharmonic circle in his next great sonata, the *Appassionata* (op. 57). Schubert and Chopin adopt the practice in many of their larger scale works, such as Schubert's late sonatas and Chopin's ballades. In some of these works, the secondary key lies to one side of the tonal spectrum, while the modulatory section (the development or *Durchführung*-like section) moves in the opposite direction. Modulatory

---

<sup>320</sup> Schoenberg, *Structural Functions*, 145.

movement continues and intensifies in the same direction until it completely traverses the enharmonic circle. Schubert's Piano Sonata in G Major, D. 894/i presents this shape, with a flatward modulatory trajectory that, like Beethoven's *Waldstein* Sonata, traverses the enharmonic circle. Chapter 5 presents my analysis of this work, featuring a hermeneutic element that connects the large-scale centripetal and centrifugal forces to the generic polarity between the pastoral and the epic.

#### **4.6 Conclusion**

This chapter presents a model of sonata form in alternating centripetal and centrifugal stages. Centrifugal forces do not only appear in the transition and development section, but throughout the form in order to stimulate the opposing centripetal forces; the interplay of the opposing forces keeps the tonal narrative buoyant and vital. The model shows how the opposing forces interact and transform into different kinds as the tonal narrative unfolds — temporal and spatial; fleeting, semi-substantial, and substantial. Kollmann points to this when he writes about three types of elaboration in his explanation for sonata form. Centrifugal forces grow throughout the exposition and become kinetic in the centrifugal stage of the development section, intensifying toward their culmination. The first significant centrifugal forces emerge in the form of modulatory movement to the subordinate key, intensifying to a spatial-CF culmination for the exposition (stage II: CF). They are then counteracted by temporal-centripetal forces establishing and consolidating the subordinate key in the stage. Centrifugal forces reemerge within stage III as fleeting intensifications of the prevailing key, though they are often expanded into semi-substantial contrasts. These intensifications of the subordinate key motivate the most powerful



temporal-centripetal forces consolidating the subordinate key and foreshadow the reemergence of modulatory intensification in the development section.

Centrifugal forces transform from local to global and become temporal as well as spatial in the centrifugal phase of the development section (stage IV: CF). Centrifugal motion becomes arrow-like, leading in a single sharp or flat direction toward goal regions; the goal of the most powerful trajectory becomes the point of furthest remove. As Kollmann points out, it may include "abrupt modulations" and "enharmonic changes" according to the requirements of the piece; for example, in order to extensively challenge centripetal forces and motivate a more powerful global centripetal culmination. Centrifugal forces typically deescalate for the remainder of the movement, but many movements feature returning semi-substantial centrifugal forces soon after the return of the primary theme in the recapitulation. In some movements, such as Mozart's K. 533/i, the flat-centrifugal forces match or even outweigh the maximum sharp-centrifugal forces generated by the sharpward trajectory of stage IV: CF.

Centripetal forces in stage V perform the crucial role of returning the tonal narrative to the principal key, yet these are not the strongest for the whole piece; this is because temporal-centrifugal forces continue in the centripetal phase returning to the principal key and the primary theme that returns is usually not closed with the strongest cadential progression of the movement. The centrifugal forces of stage VI: CF are crucial in maintaining a sufficient level of centrifugal force to motivate the final centripetal surge: the most expanded cadential progression leading to the most emphatic arrival, the global centripetal culmination. The maximum spatial- and temporal-centrifugal forces for the movement from stage IV, forces from stage VI, and fleeting and sometimes also semi-substantial CF-forces appearing within stage VII combine to motivate the final centripetal culmination.

In section 4.2, I present salient examples of the parallel minor (and sometimes more remote regions on the flat side) in each stage of the tonal narrative. They generate flat-CF forces, which participate in intensifications that lead to culminations, usually by alternating with sharp-CF forces, whether fleeting, semi-substantial or modulatory. Typically, there is an imbalance between sharp- and flat-CF forces that creates another level of instability that generates extra momentum to the culmination. The most centrifugal stages, II, IV, and VI display this phenomenon; passages in stages III and VII featuring expanded cadential progressions leading to centripetal culminations are also often intensified by unbalanced fleeting and semi-substantial sharp- and flat-CF forces. In movements such as Mozart's K. 332/i and K. 533/i, the intensifications in stage IV: CF and stage VI: CF display opposing sharp and flat forces, leading to maximums of each. The centrifugal forces on both sides are reconciled and balanced by the global centripetal culmination that fully asserts the central tonic key.

Section 4.3 explores the expansion of centrifugal trajectories in the centrifugal stage of the development (stage IV) in particular from Mozart's last two piano sonatas to Beethoven's op. 7/i. Typically, stage IV: CF features a shorter trajectory in the flat direction followed by a longer trajectory in the sharp direction; the expansion of the sharpward trajectory amplifies the imbalance of flat and sharp forces that stimulates further impetus toward the culmination. In section 4.5, I explore how Beethoven "crosses the rubicon" of the enharmonic seam to traverse the enharmonic circle completely in the development section of the *Waldstein* sonata. This creates powerful imbalance in the overall tonal narrative between an exposition strongly oriented to the sharp side, owing to  $M\sharp$  as subordinate key, and an immense flatward trajectory that travels twelve fundamental steps around the enharmonic circle to the point of furthest remove.

Chapter 5 will explore the hermeneutic implications of a similarly colossal modulatory trajectory in Schubert's Piano Sonata in G Major, D. 894 (first movement). The interplay of centripetal and centrifugal forces will be matched to prevailing expressive genres or "modes." While my analysis of Beethoven's op. 53/i focused on the harmonic details of the modulatory trajectory, my exploration of the Schubert movement will interpret the flatward trajectory as an epic journey into the tonal underworld, with the protagonist encountering a series of trials leading to an ultimate confrontation and symbolic death. This responds to the prevailing pastoral expressive mode of the exposition and recapitulation, corresponding with centripetal forces.

## Chapter 5

### Centripetal/Centrifugal Trajectories, Counterbalancing, Completeness, and Hermeneutic Polarities in Schubert's D. 894/i

This chapter analyzes Schubert's Piano Sonata in G Major, D. 894/i, in terms of the evolution, interplay, and counterbalancing of large-scale centripetal and centrifugal forces. The analysis also builds upon the three main focuses of chapter 4: the model for sonata form in seven stages that alternate between centripetal and centrifugal forces, the employment by Mozart and Beethoven of parallel- and relative-minor relations to generate centrifugal forces to the flat and sharp sides, and Beethoven's centrifugal expansion of the point of furthest remove until the modulatory trajectory completely traverses the enharmonic circle. Certain salient features of the form will be highlighted by the seven-stage model, for example the fantasia-like centrifugal episode following the opening thematic statement. Another example concerns the effect of the immensely centrifugal stage of the development section, covering all but seven measures, motivating Schubert to emphasize centripetal stability in the first part of the recapitulation, which continues stage V: CP.

The analysis will also show large-scale counterbalancing of the sharp- and flat-side modulatory trajectories, deriving particularly from third-relations on both sides. The exposition orients strongly to the sharp side. Schubert counterbalances this orientation with a flatward modulatory trajectory that, as in Beethoven's *Waldstein*, completely traverses the enharmonic circle (see section 4.5 on the *Waldstein*). The trajectory of D. 894/i, however, moves even

further, as we shall see. Two related considerations will be the process of attaining *spatial completeness* of regions, suggested by earlier chromatic enrichment of the prevailing key, and the process of metamorphosis and assimilation of chromatic tones from the highly centrifugal context of the development.

This chapter also interprets hermeneutically the general interplay and trajectory of centripetal and centrifugal forces. I read these large-scale harmonic forces as manifestations of two polarities of expressive genre or large-scale character: dance/fantasia and pastoral/epic. I draw upon Ratner's metaphor of sonata form as the interplay of the regulating force of dance and the digressive freedom of fantasia, making the correlation with centripetal and centrifugal forces respectively. The other generic polarity is specific to Schubert's D. 894. Robert Hatten identifies the pastoral genre as the prevailing "mode" of the sonata; he also identifies the contrasting epic genre as the prevailing "mode" in the development section. My analysis will make the connection between centripetal forces in the exposition, expressing the pastoral, and the monumental modulatory trajectory of the development, evoking an epic mode.

### **5.1. Correlation between dance/fantasia and pastoral/epic expressive modes and centripetal/centrifugal forces of harmonic motion in D. 894/i**

Schubert completed his Piano Sonata in G Major, D. 894, in October 1826, the year before he published his final song cycle *Winterreise* and two years before the final three piano sonatas. While Schubert himself called the work a sonata in the autograph score, his publisher, Tobias Haslinger, did not accept this designation: instead, Haslinger published it as a collection of pieces titled *Fantasia, Andante, Menuetto, and Allegretto*.<sup>321</sup> The discrepancy between the

---

<sup>321</sup> Eva Badura-Skoda, "Schubert's Piano Music," in *Nineteenth Century Piano Music*, ed. Larry Todd (New York and London: Routledge, 2004), 101-2.

titles is notable, suggesting that while his publisher may have believed the first movement to be a fantasy rather than the opening movement of a sonata, Schubert clearly considered it to be the latter (unless he changed his mind and asked the publisher to change the title for the first edition). This ambiguity between a sonata-form opening movement and a fantasia points toward a vital generic polarity that, according to Leonard Ratner, operates in sonata form generally: dance and fantasia.<sup>322</sup>

According to Ratner, the artistic vitality of sonata style is generated by the "play between two poles: (1) rigorously regular dance patterns, and (2) totally free fantasia."<sup>323</sup> Ratner conceives of dance as an essentially regulating force, where a single key is outlined in phrases of equal length, with frequent cadential definition of the key. The fantasia opposes this force through harmonic and melodic digressions, manifesting discursive, freely unfolding outward harmonic motion. Within fixed-tonic sections, the fantasia passages are fleeting or transient, soon returning to the harmonic motion outlining a key, relating to the dance ethos. In kinetic-tonic sections, such as the development, the fantasia element begins to dominate: the *telos* of the development is, as Schoenberg and Ratner explain, to move through multiple regions, including remote ones, leading toward a point of furthest remove before returning to the principal key and reestablishing the regulating dance.<sup>324</sup>

As discussed in chapter 4, Ratner's presentation of sonata form in *Classic Music* suggests my interpretation of sonata form in terms of the interplay of CP/CF forces. For example, I borrow his parsing of the development section into centrifugal and centripetal phases. Ratner's

---

<sup>322</sup> Ratner, *Classic Music*, 233.

<sup>323</sup> *Ibid.*, 233.

<sup>324</sup> Schoenberg points to motion through multiple regions, including remote ones, as a defining feature of a development section (which he calls *Durchführung*). See *Fundamentals of Musical Composition*, 206. See also 1.3 above. See Ratner, *Classic Music*, 225-26, for his definition and description of the point of furthest remove. See also 3.3 and 4.1 above.

interpretation of sonata style as the interplay of regulating dance and digressive fantasia correlates strongly with the concept of sonata form as the interplay of large-scale centripetal and centrifugal forces. Ratner writes: "the dance shapes the rhythmic scansion and cadences to create the contour of the form, while the fantasia thrusts against the rhythmic and harmonic controls with harmonic digressions and melodic elaborations to impart warmth and expressive color to the style."<sup>326</sup> The dance element regulates the themes, which circumscribe a single key and articulate it cadentially; the fantasia manifests as foreign tones enriching degrees of the prevailing key (*Stufenreichtum*),<sup>327</sup> transient digressions, or genuine departures from the prevailing key into modulatory intensification and kinetic-tonicality, exhibited in modulatory transitions and especially in the development section.

In Schubert's D. 894/i, centrifugal-fantasia elements emerge early in the exposition. They already appear in the primary theme, manifesting as chromatic dissonances disrupting the serenity of the opening idea, particularly the diminished seventh filling almost all of measure 7. Schubert follows the theme with a fantasia-like digression to the mediant minor and major over a dominant pedal (mm. 10-16). The unexpected shift of key evokes a dream-like strangeness, while the dominant pedal creates a hovering, illusory effect. In the second part of the group of subordinate themes (mm. 47-60), foreign tones from the regions continually permeate the progressions that nevertheless circumnavigate the prevailing key (D major). These chromatic harmonies might also be understood as the fantasia element coloring and enriching a progression that ultimately fulfils the centripetal-dance function by cadentially articulating the key.

Robert Hatten interprets Schubert's D. 894/i as projecting a prevailing pastoral "mode." Hatten's term "mode" refers to an overall expressive setting for a movement or section that

---

<sup>326</sup> Ratner, *Classic Music*, 233.

<sup>327</sup> See *Theory of Harmony*, 370. See also section 1.3 above.

embraces both a genre and general character as well as more specific topical and literary allusions.<sup>328</sup> Aspects of the pastoral are abundant in the exposition and recapitulation: the contemplative character and slow harmonic rhythm of the opening theme, extended pedal points, and the *siciliano* rhythm in the first subordinate theme.<sup>329</sup> The latter is also an example of the dance combining with pastoral elements. These features also create centripetal forces, suggesting a correlation between the pastoral and centripetal force in the first movement. As expected, the pastoral mode and its corresponding centripetal force prevail in the exposition and even more strongly in the recapitulation.

Hatten interprets the great shift of mood that occurs at the onset of the development as a shift from pastoral to epic/balladic "modes" of genre or large-scale character, just as the harmonic mode changes from primarily major to primarily minor.<sup>330</sup> The large-scale change of generic mode from pastoral to epic creates a powerful contrast; multiple features express this contrast, not only the switch from major to minor regions. Epic poetry typically features a vast and extraordinary setting, featuring a central heroic character (and other characters of high position) undertaking adventures of pivotal importance to the history of a nation or race.<sup>331</sup> Correspondingly, the modulatory trajectory of the development section covers an enormous amount of terrain on the tonal spectrum, portraying an immense and momentous journey. This journey features many abrupt plunges in the flat direction, symbolizing the hero's most difficult trials.<sup>332</sup> Dramatic presentations of the opening idea in remote minor regions, marked

---

<sup>328</sup> See Robert Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington IN: Indiana University Press, 2004), 50-63.

<sup>329</sup> *Ibid.*, 54-55.

<sup>330</sup> Hatten writes that "The development section shifts mode in both senses, from major to minor, and from the timeless pastoral to the epic/balladic, with a sense of engaged struggle with reality." *Ibid.*, 56.

<sup>331</sup> See William Harmon, *A Handbook to Literature*, 11th ed. (New Jersey: Prentice Hall, 2009), 201.

<sup>332</sup> Meaningful and resonant parallels may be found between this sonata development conceived in terms of CF/CP forces and the Hero's Journey mythic-narrative structure developed by Joseph Campbell. The Hero's Journey takes place across two worlds: the ordinary and extraordinary. The hero undertakes his/her journey by moving from the



*fortississimo* and featuring strong dissonances, evoke strong confrontations with real or imaginary nemeses. The epic correlates strongly with centrifugal forces in D. 894/i, particularly those associated with the third centrifugal function, modulatory movement or intensification. Therefore, the pastoral/epic polarity maps onto the centripetal/centrifugal polarity upon which the tonal narrative approach is founded.

Furthermore, the mostly continuous flatward direction of modulatory movement, often based on the flat- or lower-submediant relation between regions (a descending major third between roots), conjures up the image of the protagonist descending into an underworld of some kind, whether mythological or psychological. The protagonist moves further and further away from his homeland into the underworld, or some other supernatural and dangerous land.<sup>333</sup> The protagonist eventually confronts a situation of maximum strangeness or danger, a point of furthest remove for the epic-centrifugal mode. In psychological terms, the subject leaves behind the equanimity of the central key and moves to the periphery of the psyche, confronting its unknown and volatile aspects, reaching a point of maximum separation from the peace of the center.

---

ordinary world to the extraordinary world, travelling through the extraordinary world before returning to the ordinary one. Not only the development of D. 894/i but that of other sonatas with extensive CF-trajectories may resonate with Campbell's mythic structure. The overall structure of these development sections involves an extensive CF-trajectory in a prevailing sharp or flat direction, enhanced at times by harsh dissonances, leading to the point of furthest remove, a maximum of CF-force. This resonates with the overall pattern of the hero's journey. The development section symbolizes the extraordinary world, in which realm the hero undertakes a series of trials and encounters several supernatural figures, leading toward a culminating ordeal or trial. This is the Atonement with the Father, where the hero confronts that which holds the ultimate power in his/her life. This confrontation leads to an Apotheosis — a symbolic death and rebirth into a transformed state. The interpretation offered later in this chapter interprets the point of furthest remove in light of this symbolism. See Joseph Campbell, *The Hero with a Thousand Faces* (Princeton: Princeton University Press, 1949), 97-167.

<sup>333</sup> Another typical characteristic of the epic is the involvement of supernatural forces such as gods, demons, and angels, in the action; see Harmon, *Handbook*, 201. Homer's *Odyssey* and Virgil's *Aeneid* both feature journeys into the underworld; the basis for Dante's *Inferno* is the author's descent through the circles of Hell.

The pastoral returns twice briefly in the development section, creating what Hatten calls "pastoral oases" in the midst of the prevailing epic mode.<sup>334</sup> In terms of harmonic motion, these pastoral patches are switches to the parallel major that move momentarily in the centripetal and sharp direction, temporarily counteracting the prevailing flatward trajectory. Hatten's interpretation of such centripetal switches to the parallel major as "oases of the pastoral" suggests a close correlation between centripetal/centrifugal forces and the pastoral/epic genres. These parallel-major oases also generate a transient temporal-centripetal force due to the momentary hiatus from the otherwise continual movement between regions.

The following analysis takes Hatten's pastoral/epic expressive-generic modes and matches them with centripetal and centrifugal forces of various kinds in Schubert's D. 894/i. Ratner's generic dance/fantasia polarity is also matched with CP/CF forces. This includes manifestations of CP/CF forces in the spatial and temporal dimensions, branching into sharp/flat, fifth-/third-related sides and directions. The connection between the expressive modes and tonal forces adds a hermeneutic perspective to the tonal narrative approach developed in this study. Like CP/CF forces, expressive modes can also be understood as wave-like forces that accumulate and dissipate in a dynamic interplay, shaping the trajectory and form of the movement.

## **5.2 The overall form of D. 894/i in seven alternating CP/CF stages**

I will now discuss the overall form of D. 894/i in terms of the model of alternating CP/CF stages presented in section 4.1; the analysis is shown in figure 5.1. In the sonata movements discussed in chapters 3 and 4, there was a clear distinction between the fully centripetal opening theme (the primary theme) and the modulatory transition, where both temporal and spatial

---

<sup>334</sup> Hatten, *Interpreting Musical Gestures*, 56.

centrifugal forces emerge in the form of modulatory movement. Following Ratner's division of Kollmann's first subsection into "first key-area" and "shift to second key," I proposed stage I: CP followed by stage II: CF in the stages model.

In Schubert's D. 894/i, the first subsection has three distinct parts but four alternations of centripetal and centrifugal forces. The three parts form a quasi-small-ternary form: an initial thematic statement in the principal key (mm. 1-9); a foreign-key episode (mm. 10-16); a return to the primary theme for the fore-phrase of the thematic statement (mm. 17-21) that becomes briefly centrifugal by modulating to the dominant (21-26). The form resembles small ternary, owing to the contrasting middle and the clear return of the opening theme; however, the modulation to the dominant makes it only "quasi" small ternary. The final transitional part makes four alternations of centripetal/centrifugal forces: (1) the centripetal opening thematic statement expressing the pastoral mode, momentarily disturbed by extended fleeting CF forces; (2) centrifugal forces from the contrasting regions in the episode expressing fantasia inclinations; (3) centripetal forces returning to the principal key and continuing for the four-measure restatement; and (4) brief temporal- and spatial-centrifugal forces moving to the dominant key. Owing to the quasi-small-ternary form and the inner logic of the alternations of CP/CF forces, I consider stage I and II to be fused in D. 894/i, as stage I-II: CP/CF (see figure 5.1).

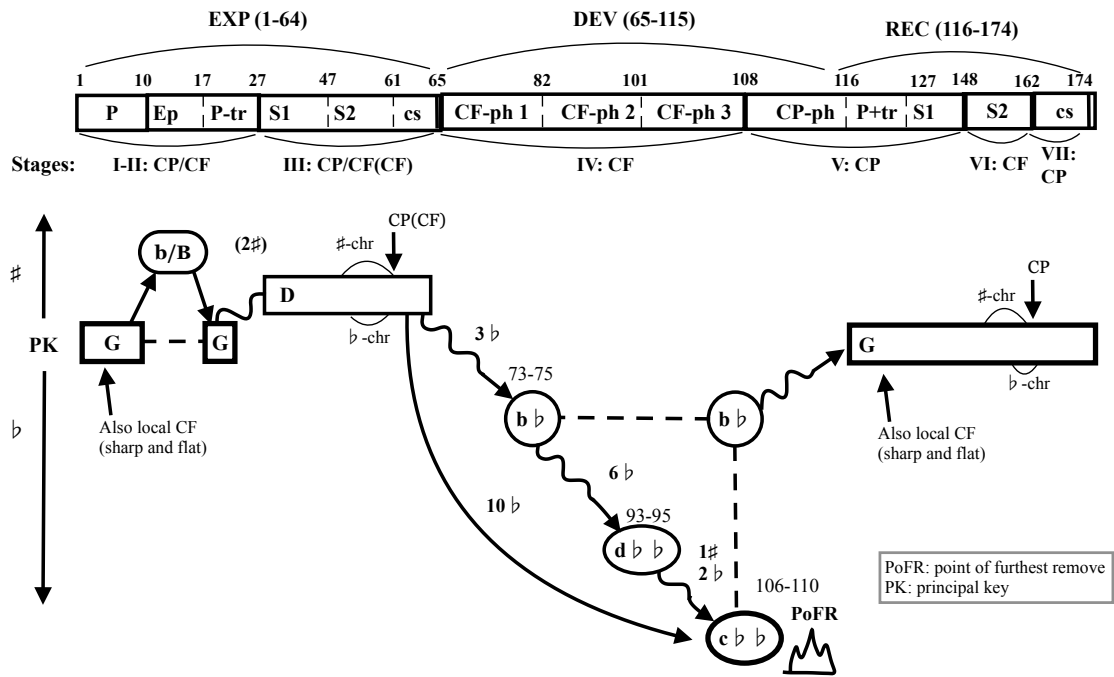
Stage III in the model correlates with Ratner's "second key-area" or the group of subordinate themes (including the closing section). It consists of three parts: the first subordinate theme and its varied repetition (mm. 27-46); a second part including the second subordinate theme and its expanded variation (mm. 47-60); and the closing section (61-64). I read the temporal-centripetal culmination or EEC at m. 60, closing the second subordinate theme, since the most expanded cadential progression occurs here. Since the surface dynamics are *pianissimo*

followed by *diminuendo* (mm. 59-60), this is an example of a culmination manifesting as a negative climax in terms of surface features.

I consider stage III of D. 894/i to be both temporally centripetal and spatially centrifugal (see section 4.1). Temporal-CP forces arise from the initial establishment of the dominant key (D major), its strong cadential confirmation at the temporal-centripetal culmination, and reinforcement in the closing section. The prevailing dominant key generates a moderate but global spatial-CF force through opposition with the principal key. Fleeting (local) but continual centrifugal forces emerge in the middle part of this stage, while the first subordinate theme and closing section are more centripetal (apart from at the global level). Thus, I read an internal alternation of centripetal and centrifugal phases within stage III: CP/CF(CF).

The *siciliano* rhythm, mostly diatonic harmony, and dominant pedal of the first subordinate theme (mm. 27-36) and its varied repetition suggest the dance and pastoral topics. These centripetal modes are counteracted in the second part (mm. 47-60) by fantasia elements. The second part commences with a cascading, descending scalar figure leading to a local centrifugal culmination on the dominant of the dominant (**D**: II $_{\sharp}^7$  in  $\frac{6}{5}$  position), whose foreign leading tone in the bass (G $\sharp$ ) generates sharp-CF force (mm. 47-48). This leads to a second subordinate theme (S $^2$ , mm. 48-52) featuring continual fleeting CF forces from foreign tones enriching the progressions. Following this, Schubert returns to the descending scalar figure, expanding its locally centrifugal arrival (mm. 53-56); he then repeats S $^2$ . The third part of stage III is the closing section (mm. 61-64), featuring two cadential progressions that maintain a strong centripetal force. Each of the three parts of stage III have a locally CP or CF function: first subordinate theme, CP; second subordinate theme, CF; closing section, CP.

Figure 5.1. Overview of Schubert, Piano Sonata in G Major, D. 894/i, showing seven alternating CF/CP stages, structural regions, and modulatory trajectories. Increasing distances from the principal key or other referential region show increasing centrifugal forces to the sharp or flat sides as marked. Numbers with sharp or flat signs show the number of fundamental relations between the regions connected by the arrow, and the direction. Other numbers are measure numbers. Wavy lines refer to modulatory movement. Vertical dashed lines denote enharmonic pairs, horizontal dashed lines connect occurrences of the same region.



The prevailing centripetal forces of the exposition, manifesting as both pastoral and dance characters, motivates the epic modulatory trajectory of the development section. The strong sharp-side orientation of the exposition induces the prevailing flatward direction of modulatory movement. Centrifugal forces transform from fleeting and substantial forms in the exposition into kinetic modulatory forces in stage IV: CF.

The modulatory trajectory begins at D major, the dominant key ending the exposition, and modulates in the flat direction toward three structural regions, marked by half notes in example 5.3: (1) B $\flat$  minor (mm. 73-76), (2) C minor (mm. 93-96), and (3) B $\flat$  minor again (mm. 106-10). The returning B $\flat$  minor is not exactly the same region as the first; it has been

approached in the flat direction by a complete traversal of the enharmonic circle.<sup>335</sup> This draws on the extraordinary modulatory technique that Beethoven employed in his *Waldstein* and *Appassionata* first movements (see section 4.5).<sup>336</sup> Having moved seven fundamental steps<sup>337</sup> in the flat direction, the returning B $\flat$  minor takes on a second, more remote identity as C $\flat\flat$  minor, reflecting the flatward modulatory path that has led to it. Therefore, the returning B $\flat$  minor takes on a dual identity: it is both B $\flat$  and C $\flat\flat$  minor. Similarly, C minor, approached by six fundamental steps in the flat direction from B $\flat$  minor, also represents D $\flat\flat$  minor. Ignoring the double-flat enharmonic versions of these two regions obscures or contradicts the actual direction of modulatory movement; for example, C minor lies to the sharp side of B $\flat$  minor, even though it is approached via several steps in the flat direction.

Each region serves as the goal of a modulatory phase, a culminating passage semi-confirmed by a half cadence.<sup>338</sup> Each modulatory phase leads through multiple regions, including modulatory leaps (remote relations between consecutive regions, each combining multiple fundamental steps). The first culminating passage forcefully develops the basic idea of the primary theme in the remote B $\flat$  minor. Schubert follows this passage by switching to the graceful first subordinate theme in the parallel B $\flat$  major, forming a nine-measure fixed-tonic phase (mm. 73-81). The second culminating passage sequences the first up a whole tone (or down an augmented sixth) and continues with the same parallel switch, forming a second fixed-

---

<sup>335</sup> As discussed in 4.5, Tovey calls these modulations around the complete circle of fifths "enharmonic circles." See Tovey, *Companion*, 10.

<sup>336</sup> *Ibid.*, 160, 180.

<sup>337</sup> For a definition and discussion of fundamental steps, see 2.2–2.4.

<sup>338</sup> Based on William Caplin's hierarchy of key definition in development sections, these would be considered "development keys," the third-highest level for the whole piece, after the principal and secondary keys. See Caplin, *Classical Form*, 140-41. In the tonal narrative approach, most development keys are also structural regions; however, the category of structural regions also embraces some modulatory goal and initiating regions that are only indicated but not cadentially confirmed. See 3.8.

tonic phase (mm. 93-101). The third modulatory phase leads to the final structural region for the development, B $\flat$ /C $\flat\flat$  minor, which also functions as the point of furthest remove, some ten fundamental steps in the flat direction from D major, the origin of the whole trajectory. It is defined as such by the definitive reversal of large-scale harmonic motion from centrifugal to centripetal. Schubert sounds the first subordinate theme here for the first time in a minor instead of a major region. It also acts as the model for the modulatory sequence back to the principal key, initiating the centripetal phase (mm. 108-15).

This establishes a pattern of alternating kinetic-tonic (modulatory) and fixed-tonic passages for the centrifugal stage of the development, followed by the comparatively short centripetal phase/stage: first kinetic-tonic (mm. 65-73)→first fixed-tonic (mm. 73-81); second kinetic-tonic (mm. 82-93)→second fixed-tonic (mm. 93-101); third kinetic-tonic (mm. 101-7)→centripetal phase (mm. 108-15). The five phases of the centrifugal stage can be further reduced to three, since the second kinetic-tonic phase partly sequences the first, and the second fixed-tonic phase is a sequential repetition of the first. The first kinetic→fixed pair of phases thus forms a unit, as does the second such pair. This divides the development into three centrifugal phases and a centripetal phase: CF-phase 1 (mm. 65-81), CF-phase 2 (mm. 82-101), CF-phase 3 (mm. 102-7), CP-phase (mm. 108-15). The three centrifugal phases together comprise stage IV: CF, while the centripetal phase ending the development begins stage V: CP, which continues into the recapitulation.

In the archetypal seven-stage plan introduced in section 4.1, I presented the recapitulation as typically involving three stages: completing the centripetal stage from the end of the development with the arrival of the primary theme in the principal key (stage V: CP); responding to this with the fleeting or semi-substantial centrifugal forces of the recapitulatory transition

(stage VI: CF); and concluding with the final stage, the group of subordinate themes, including the closing section (VII: CP). I noted that the secondary development (if any) or the recapitulatory transition (which sometimes acts as a secondary development) forms the final centrifugal stage (VI) when it is the most centrifugal part of the recapitulation, featuring significant local centrifugal forces such as transient modulatory digressions.<sup>339</sup> When the most centrifugal passage in the recapitulation occurs later, for example in the latter parts of the group of subordinate themes, this would comprise stage VI: CF of the overall tonal narrative.

In Schubert's D. 894/i, the extremely strong centrifugal forces of stage IV: CF, which cover most of the development, motivate a lengthy centripetal stage to follow. Stage V: CP combines the centripetal phase completing the development (mm. 108-15) with the primary theme and the first subordinate theme. Compared with the exposition, Schubert fuses the transition with the primary theme and crucially omits the transient modulation to the mediant minor and major regions. This sustains the CP forces that counterbalance the massive CF forces from the development section. The extended centripetal force with only minimal local chromaticism from m. 116 to m. 147 justifies reading mm. 108-47 as a single stage.

The descending scalar figuration leading to a culmination on the sharp-side dominant of the dominant (m. 149) opposes the centripetal stability of stage V with potent local-centrifugal forces commencing stage VI. The continual infiltration of foreign tones into the progressions of S<sup>2</sup> (mm. 148-61) justifies defining it as the centrifugal stage of the recapitulation, stage VI: CF. While S<sup>2</sup> is an exact transposition of the corresponding S<sup>2</sup> in the exposition, its effect is different since it now follows the development, and because the rest of the recapitulation has become

---

<sup>339</sup> Transient modulatory digressions refer to a level of centrifugal force between regular chromatic enrichment of the prevailing key and genuine departure from the prevailing key. It usually involves at least a closed I-V-I progression indicating the region, giving the region slightly more independence than if it were only suggested by a single applied chord. See 3.8.



more centripetal. The local but intense chromaticism of stage VI: CF keeps alive reverberations from the overwhelming centrifugal forces of the development section, stage IV: CF.

The final stage VII: CP consists of an expanded closing section. It consists of nine long measures prolonging the tonic with repetitions of the basic idea from the opening of the movement, alternating between the most basic harmonies of the key — the tonic and dominant seventh. This brings about a complete centripetal stability that responds not only to the local chromaticism of the most recent centrifugal stage, but also to reverberations from the development section's centrifugal stage, the most centrifugal stage of the whole sonata and perhaps one of the most centrifugal stages in any classical sonata written in or before 1826.

### **5.3. The emergence and expansion of sharp-centrifugal force in the exposition**

As Hatten notes, the pastoral ethos and dance topics prevail throughout the exposition.<sup>340</sup> The opening basic idea (mm. 1-2) suggests the simplicity and serenity of the pastoral through its slow harmonic rhythm, emphasis on thirds in the texture, and compound meter. Hatten also hears “hymn-like dignity” in the long, sustained sonorities, and suggestions of a dance lilt that intimates the *siciliano* and waltz rhythms of the second theme.<sup>341</sup> Yet centrifugal fantasia elements emerge at various levels, disrupting the peacefulness of the pastoral and the regularity of the dance, whether in the form of local chromatic intensification of the prevailing key or as more substantial digressions. The first centrifugal element emerges as a foreign melodic tone, the D $\sharp$  lower neighbor in m. 3. This sharp chromaticism is answered by a chromatic tone from the flat side, F $\natural$  as the seventh of **SD**: V7, appearing over the region's root in the bass (m. 4, see

---

<sup>340</sup> Hatten, *Interpreting Musical Gestures*, 53-54.

<sup>341</sup> *Ibid.*, 54.

example 5.1). With the latter chromaticism, centrifugal force has metamorphosed from being a very surface melodic event to being part of the harmony. Motion from IV to V in measure 4, also intensified by a chromatic passing #4 in the bass, brings the first phrase to a half-close.

Example 5.1. Schubert, D. 894/i, opening thematic statement and episode in contrasting region (mm. 1-17). Score annotations plus inset showing regions on the tonal spectrum.

*Molto moderato e cantabile*

T: I IV V

5

T: I III# vi ii V7  
(smsd: L.T<sup>7</sup> i)

9

T: V7 I  
m: harmonic cycles over V ped

13

M#: harmonic cycles over V ped

16

M#: i  
T: iii V7 I

The tonal spectrum inset shows regions: vv, DD, mv, (mD) 12,15, v, (D) 8, m 10, M# 13, t, (SD) 7, (sm) 6, SM#, sd, (SD) 4, (smsd) 7, ST#.

Schubert presents the primary theme as a period-like structure, with an antecedent beginning with the basic idea, leading to a half cadence in m. 4, and the consequent beginning by repeating m. 1 followed by intensification and expansion of the local centrifugal forces, leading eventually to an (imperfect) authentic cadence in m. 9. The overall harmonic progression of the consequent circumnavigates the principal key by descending fifths from III $\sharp$  (m. 6); at the same time, restless fantasia elements infiltrate the progression in the form of three foreign tones enriching three harmonic degrees of the key (see example 5.1). The second of these harmonies is particularly emotive: a leading-tone diminished seventh of **smsd** (ii as a harmonic degree), built on VI of the principal key (reading it as a dominant ninth chord with omitted root). The harmony is prolonged throughout m. 7, leading to ii, which extends until the final beat of m. 8. My interpretation of the leading-tone seventh of ii rather than ii $\flat$  being the main harmony of this measure is based on the duration of the dissonant chord, which takes up more than three-quarters of the measure, and its placement on the strong beats. This might be considered a centrifugal perspective; from a centripetal perspective, the fact that the diminished seventh acts as an appoggiatura chord that resolves to ii $\flat$  within the measure makes ii $\flat$  the "real" or main harmony of this measure.

The diminished seventh chord in m. 7 is like a painful memory, or a forewarning of the more substantial and kinetic centrifugal forces occurring later in the piece, particularly those unleashed in the development section. The harmony introduces foreign tones to the flat and sharp sides, both of which point to significant centrifugal events later in the movement. The descending (flat-side) leading tone, F $\sharp$ , faintly intimates the flat side regions that appear in the development, such as D minor (as its third) and B $\flat$  minor (as its fifth). Its ascending (sharp-side)

leading-tone, G $\sharp$ , points toward the local centrifugal culmination on the dominant of the dominant of D major.

The chromaticism of the primary theme suggests four of the five regions based on diatonic harmonies of the prevailing key: **SD**, **D**, **sm**, and **smsd**, based on IV, V, vi, and ii respectively. The missing region based on a diatonic harmony is **m** (B minor), based on iii of the key. This may have motivated Schubert to venture centrifugally into this region for the episode of mm. 10-16, in order to complete the set of diatonically related regions (see example 5.1). Schubert develops a variant of the basic idea's rhythm over a local dominant pedal point, first in the mediant (mm. 10-12), then its parallel major (mm. 13-15). Schubert's harmonic presentation of the two mediant regions partly substantiates the centrifugal-fantasia inclinations into a larger dimension. In the opening theme, the leading tones of regions appeared, but no harmonic cycles presented any of the regions more substantially. In this episode, however, Schubert establishes the mediant minor and major regions with harmonic progressions over the dominant pedal that present all notes of each mediant region without confirming them cadentially.

By modulating transiently to the mediant, Schubert tilts the tonal narrative toward the sharp-side, third-related area of the tonal spectrum. The switch to the parallel major intensifies this sharpward tilt, since **M $\sharp$**  is a more remote region from the principal key than **m**. Chromatic intensification from the dominant region in mm. 12 and 15 also brightens the harmony at the local level: the mediant minor and major, are themselves brightened to their common dominant, adding more sharp-CF force (see example 5.1).

The return to the principal key in m. 16 reveals the modulation to the mediant regions to be transitory. The following part (mm. 17-26) returns to the antecedent of the primary theme (mm. 17-21) but its second phrase modulates to the dominant, a more substantial modulation

than that of the centrifugal episode. The second phrase also begins like the consequent of the opening thematic statement by moving to III with a raised third leading to vi, suggesting **sm**. At this point, instead of sounding the painful diminished seventh, as in the equivalent place in the primary theme, centrifugal force moves into the global dimension, establishing the dominant key with three identical authentic cadences (mm. 24-26). The modulation to the dominant generates a global sharp orientation for the exposition as a whole, which is intensified by the previous modulating episode and later local chromaticism from the sharp side.

The first subordinate theme features mostly consonant and diatonic harmony, with the pastoral topic and regulating force of dance re-establishing a strong centripetal force around the subordinate key. This contrasts with the fantasia-centrifugal elements emerging in the fused stage I-II of the overall tonal narrative. The fantasia element does, however, return strongly within stage III: CP/CF(CF) (mm. 27-64) in the form of continual chromatic harmony enriching the prevailing key in the second part (mm. 47-60; see example 5.2). The local centrifugal culmination on the dominant of the dominant represents an incursion of local-centrifugal force that interrupts the pastoral simplicity and dance regularity of the first subordinate theme and its varied repetition (mm. 27-46) and awakens it from its centripetal slumber. The surface and durational emphasis on **D: D** (the dominant of D major) intensifies the larger-scale sharp-orientation generated by the dominant key, brightening the tonal narrative further.

This local centrifugal force continues through the four-measure second subordinate theme (mm. 48-52). The theme begins by continuing harmonic motion from  $II_{\sharp}^7$  to V, before moving deceptively to  $III_{\sharp}^7$  at the beginning of m. 50. The fundamental bass for the remainder of the theme descends by fifths from III to I, moving through every degree except VII; almost every harmony in the progression is intensified by foreign tones. The CP force circumnavigating the

key and the fleeting CF forces are represented in the following representation of the progression:

$\text{III}_{\sharp}^7 - \text{VI}_{\sharp}^9 - \text{II}_{\sharp}^7 - \text{Vb}^9 - \text{Ib}^7 - \text{IV} - \text{V}_4^6 - \text{III}_{\sharp}^7 - \text{I}$  (see example 5.2). Regions from all four directions are

suggested: **sm** and **smsd** from the sharp-side third-relations ( $\text{III}_{\sharp}^7 = \text{sm}: \text{V}^7$  etc.), **D** from the sharp-side fifth-relations, **t** from flat-side third relations, and **SD** from the flat-side fifth-relations.

The tonic minor region (**t**) is suggested by the flat ninth of the dominant harmony in m. 50. The appearance of the enharmonic pairs  $\text{A}_{\sharp}$  from **D: sm** and  $\text{Bb}$  from **D: t** in the same measure (m. 50) highlights the counterbalancing of sharp and flat sides. Sharp-CF and flat-CF forces are united in a common tone whose functions transforms from ascending to descending leading tone.

Overall, the progression of mm. 48-52 presents an even counterbalancing of the sharp and flat sides and a spatially complete chromatic enrichment (*Stufenreichtum*) of the prevailing D major (see example 5.2). This is the first time in the movement where completeness of *Stufenreichtum* occurs. In such passages, the prevailing key is illuminated in a kaleidoscopic way, with chromatic harmonies from the four areas of the tonal spectrum shading the key with distinct tints. This comprehensive but contained local-centrifugal force prepares the way for the dynamic and modulatory trajectories of the development section.

Example 5.2. Schubert, D. 894/i, second part of stage III: CP/CF(CF), mm. 47-60 (only mm. 47-52 shown). Chromatic progression suggests regions from all four harmonic areas of tonal spectrum. Inset shows tonal spectrum showing regions from all four harmonic areas (upper/lower fifth, thirds to flat and sharp sides) suggested through chromatic intensification.

45 *decesc.*

D: V \_\_\_\_\_ I

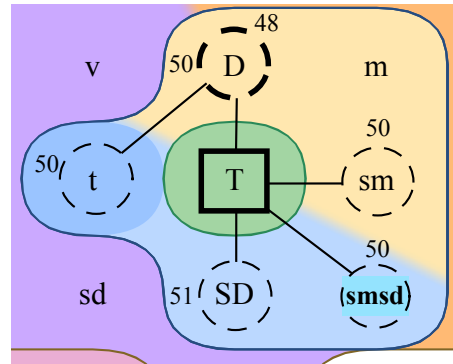
47 *cresc.*

D: \_\_\_\_\_ II<sup>7</sup>/<sub>#</sub> \_\_\_\_\_ V<sup>7</sup>

50 *pp* *dim.*

D: III<sup>7</sup>/<sub>#</sub> VI<sup>9</sup>/<sub>#</sub> II<sup>7</sup>/<sub>#</sub> V<sup>b9</sup> I<sup>b7</sup> IV V<sup>6</sup>/<sub>4</sub> <sup>9</sup>/<sub>3</sub> <sup>6</sup>/<sub>4</sub> <sup>7</sup>/<sub>3</sub> I

Inset right: tonal spectrum showing regions appearing in mm. 48-52 (repeated mm. 56-60). T = D major. Note that regions based on both fifth and third/parallel relations on the sharp and flat sides are suggested: all four basic directions are represented. Regions suggested by chromatic enrichment of prevailing key are dashed; the thick line refers to the durational expansion of V/V.



By introducing the tone B $\flat$  and suggesting the parallel-minor region (of the prevailing key) for the first time in the piece thus far, the dominant flat ninth on the final beat of m. 50 foreshadows centrifugal forces in the development. The B $\flat$  acts like a centrifugal seed, appearing fleetingly (for only one beat) as a foreign tone in a progression circumnavigating the prevailing dominant key. As a chromatic passing tone in an inner voice, the B $\flat$  appears incidentally and

unobtrusively, providing the slightest glimpse of the parallel-minor region of the prevailing key (D minor). The parallel minor (of the dominant) acts as a source of flat-CF force that substantiates into a structural region that shapes the development.

The region's defining submediant degree, B $\flat$ , becomes the root of the most structural region of the development, B $\flat$  minor; the tone B $\flat$  as an inner chromatic passing tone in the key of D major transforms into B $\flat$  as the root of a structural B $\flat$  minor region. This region, first appearing as the goal of CF-phase 1 in the development and later as the enharmonic pairing C $\flat\flat$ /B $\flat$  minor at the point of furthest remove, is a remote flat-side third-relation of both the secondary and principal keys, relating to them as **D: bsm $\flat$**  and **bmb** respectively. What appeared as a fleeting, close flat-side third-relation (the B $\flat$  is a major third below the prevailing tonic, D) becomes intensified to a fully remote element and substantiated into a semi-confirmed region. Furthermore, many other modulatory moves in the development are based on third-relations in the flat direction; these might also be understood as originating in the initial flat-centrifugal seed, **D: b $\hat{6}$** . By withholding any suggestion of the flat-third/parallel-minor area of the tonal spectrum until the end of the exposition and then only presenting it fleetingly, Schubert produces great anticipation for the flatward modulatory trajectory of the development; this makes the large-scale contrast between sharp- and flat-CF forces even more potent.

Three main events generate a sharp-side orientation for the exposition as a whole: the large-scale substantial modulation to the dominant key; the transient modulation to the mediant regions; and the emphasis on II $\sharp^7$  as a surface culmination, also extended in duration for one and a half measures. While the modulation to the dominant key, or a sharp-side alternative, gives almost every sonata-form exposition a sharp orientation, the exposition of D. 894/i leans more



strongly and distinctively to the sharp side than the typical exposition. As seen in chapter 4, Mozart and Beethoven frequently employed the parallel minor in the exposition, often in multiple places and usually for at least a couple of measures. This results in a partial flat-side counterbalancing of the large-scale sharp orientation from the dominant key. On the other hand, the first movement of Beethoven's Sonata op. 28, named "pastoral" by his publisher, also orients the exposition strongly to the sharp side.<sup>343</sup> The secondary group (mm. 63-135) begins with the dominant key (A major) strongly tilted toward the mediant (F# minor) and the mediant's dominant. The first phrase establishing the dominant key (mm. 63-70) indicates the mediant (F# minor) for four measures (mm. 63-66). The following long phrase (mm. 71-109) begins by prolonging the mediant's dominant from mm. 71-82 before moving back to and reestablishing **D** (A major). In his detailed analysis of the movement, Tovey highlights the establishment of the mediant by labelling the second group "(V.) coloured by (iii.);"<sup>344</sup> in Schoenberg's nomenclature, this would be **D** colored by **m**. The extended suggestion of **m: D**, a moderately remote relation to the dominant key, further shades the tonal narrative to the sharp side, giving the exposition a significantly stronger sharp-orientation than usual. It is well known that Schubert used Beethoven's piano sonatas as models for his own efforts in the genre.<sup>345</sup> Both Schubert's D. 894/i and Beethoven's op. 28/i use transient sharp-side mediant relations, tilted toward their dominants; they also share an overall pastoral character. The combination of these two factors suggests the possibility that Schubert drew upon his knowledge of Beethoven's op. 28/i, if only cursorily, in conceiving the harmonic plan of D. 894/i.

---

<sup>343</sup> Tovey, *Companion*, 115.

<sup>344</sup> *Ibid.*, 116.

<sup>345</sup> Badura-Skoda, "Schubert's Piano Music," 90, 98.

In addition to its strong sharp-side orientation, the exposition also features the gradual emergence of centrifugal force: from the most surface chromaticism, to chromatic enrichment of the prevailing key (*Stufenreichtum*), to transient modulations, to the substantial modulation to the dominant key. While the primary theme features chromatic intensification suggesting regions based on four out of five diatonic triads in the key, its chromaticism avoids a flat-side third-related region such as **t** or **sd**. The flat-third element is withheld until the latter part of the group of subordinate themes, where it appears as a B $\flat$ , the flattened ninth of the dominant chord, also the flattened sixth degree of the prevailing D major. The B $\flat$  chord tone foreshadows its composing-out into a structural region in the development, where B $\flat$  minor appears twice as a remote modulatory goal. The withholding of the flat-side third-relations intensifies the opposing effect of the flatward modulatory forces unleashed in the development section.

#### **5.4. Degrees of remoteness, "pastoral oases," and systemic agents of coherence in the development section**

In this section, I investigate how Schubert explores degrees of harmonic and psychological remoteness by modulating toward three remote goals, travelling more remotely in the flat direction with each one. The increasing remoteness of each goal and the distance covered in each modulatory phase amplify the idea of the point of furthest remove — an extreme harmonic and psychological separation from the equilibrium of the center and the safety of home. I will focus on modulatory leaps involving the flat or lower submediant-minor relation, which plunge rapidly flatward between consecutive regions. These occur particularly in the second CF-phase leading to the culminating passage in C/D $\flat\flat$  minor. I will also discuss how Schubert lightens the prevailing flatward trajectory with pastoral patches that move centripetally but transiently back

in the sharp direction by switching to the parallel major and the gentle first subordinate theme with its *siciliano* rhythm. Finally, I will examine the reversal of large-scale motion from centrifugal to centripetal at the point of furthest remove. I demonstrate how Schubert draws upon two agents of coherence inherent to the tonal system in order to produce the return to the principal key: the division and limitation of tones within the octave to twelve, and the common dominant that links major and minor regions sharing the same root.

Example 5.3 shows the modulatory trajectory for the entire development section, with each region notated as a triad. Rhythmic durations differentiate the structural hierarchy of regions, so that longer durations denote more structural regions.<sup>346</sup> Figure 5.2 illustrates the progression of regions on the tonal spectrum. The diagram shows the number and quality of fundamental steps travelled, which are also marked below the notation of regions in figure 5.2. The number of fundamental steps quantifies the extremely remote modulatory trajectory of this section.

In D. 894/i, centrifugal forces from the exposition remained within the range of close and moderately remote regions. The majority of regions suggested were close relations, meaning that the regions' central triad was a diatonic chord in the prevailing key, or the parallel minor. The early shift to the mediant major (B major), oriented to its own dominant, was the most distant move; it lies two fundamental steps from the principal key, as the parallel major (one step) of the mediant region (one step from the principal key). These more moderate or local-CF forces, expressing the fantasia mode, are ultimately secondary to the prevailing pastoral-CP mode of the exposition, as per the tonal norms of sonata form.

---

<sup>346</sup> This draws on Kirnberger's analyses in *Die Kunst des reinen Satzes*, where he represents the cadential articulation and duration of keys in a piece using rhythmic durational symbols. See Johann Philipp Kirnberger, *Die Kunst des reinen Satzes, vol. 1* (Berlin, 1771; reprint, Hildesheim: Olms, 1968), 120; English translation as *The Art of Strict Musical Composition*, trans. David Beach and Jürgen Thym (New Haven: Yale University Press, 1982), 136-37.

Example 5.3. Schubert, D. 894/i, development section, mm. 65-115. Progression of regions, with each region notated as a triad. Relations in italics show fundamental steps between consecutive regions using scale-degree symbols adapted from Schoenberg's Chart of the Regions. Numbers of fundamental steps are shown below the graph. Scale-degree symbols in boldface relate to the principal key or as marked. Guide to other symbols: **PoFR** = point of furthest remove

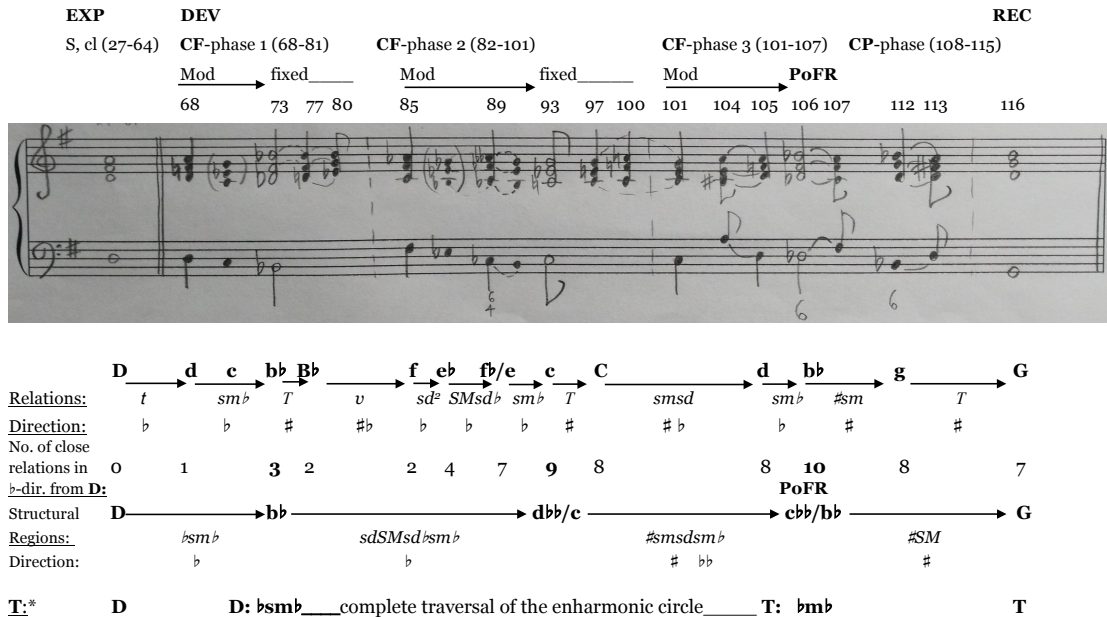
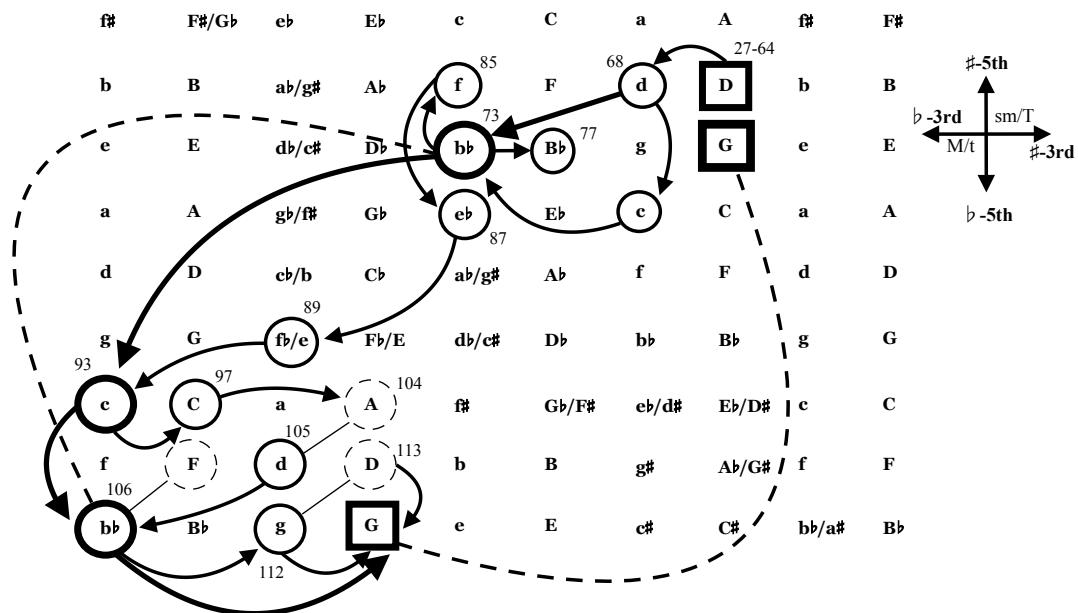


Figure 5.2. Schubert, D. 894/i, development section, progression of regions shown on the tonal spectrum using standard key names, as in Weber's Table of Key Relations. Each vertical or horizontal step represents one fundamental step; the diagonal between third-related regions is also a fundamental step. Dotted lines show enharmonically equivalent regions.



The transformation from pastoral stability to an epic modulatory trajectory strongly intensifies and enhances the generic contrast between the exposition and development. The generic purpose of the development is to disrupt the temporal-centripetal stability of the exposition by moving through multiple regions and to increase spatial-CP force by moving through more remote regions than the subordinate key governing stage III of the tonal narrative. The development section of D. 894/i takes this purpose or *telos* to an extreme level, moving ten fundamental steps in the flat direction from the dominant key that closes the exposition (D major), to the point of furthest remove, B $\flat$ / C $\flat\flat$  minor, which arrives in m. 106 and extends until m. 110. A total of fifteen distinct regions are suggested, indicated, or established during the development (taking enharmonic pairs as distinct regions).

The development moves more remotely than the exposition already in its first modulatory phase (mm. 65-73), plunging flatward from the dominant key (D major) that ended the exposition to the first remote culminating passage in B $\flat$  minor, arriving in m. 73 and semi-confirmed with a half cadence at m. 75 (see figure 5.2 and example 5.3). The first flat-centrifugal move is a switch from D major to its parallel minor (whose triad arrives at m. 68), which transfers the tonal narrative inexorably into the underworld of flat-side and minor regions. It functions like the sign encountered by Dante at the entrance to Hell in his *Inferno*: "All hope abandon, ye who enter in!"<sup>347</sup> The tonal narrative then descends deeper into the flat side (underworld) of the tonal spectrum, much as Dante descends the circles of Hell in his epic poem (there are nine circles in total). The first CF-phase makes three of these fundamental steps from D major to B $\flat$  minor: (1) the initial parallel-minor change from D major to D minor, followed by

---

<sup>347</sup> The sign appears in Canto III, line 9; see Dante Alighieri, *Inferno*, trans. Henry Wadsworth Longfellow (San Diego: Canterbury Classics, 2013/1867), 13.

a combination of (2) submediant and (3) parallel-minor relations going from D minor to B $\flat$  minor.<sup>348</sup> Therefore, I register this goal region as **D: bsmb**, showing the three steps in the flat direction. This initial modulatory phase fully establishes the transformation from the pastoral mode to the epic.

Following CF-phase 1, which leads to the first culmination in B $\flat$  minor (mm. 73-75), Schubert continues in the prevailing flat direction for CF-phase 2, leading to D $\flat\flat$ /C minor (mm. 97-101). He covers twice the tonal distance in this second phase as the first, hence generating double the CF-force; this phase covers the largest distance on the tonal spectrum of any part of the movement. It makes a total of six fundamental steps flatward (followed by one step back in the sharp direction; see below). The third CF-phase makes the final two steps flatward leading to the point of furthest remove, C $\flat\flat$ /B $\flat$  minor (mm. 108-10). Note that each of these culminating regions is marked as a half note in example 5.3, with C minor taking an eighth-note flag to show its medial position in the overall modulatory trajectory. By semi-confirming each of these three remote regions with half cadences, Schubert suggests the possibility that this may be the point of furthest remove. However, each remote arrival continues flatward toward an even more distant culmination, amplifying the sense of separation from the equilibrium of the center of tonal consciousness — the principal or subordinate key (the origin of this modulatory trajectory).

While the prevailing trajectory is centrifugal and flatward, there are two temporary centripetal turns back in the sharp direction. These take the form of two switches to the parallel major, following the culminating passages in the remote minor regions B $\flat$  and C/D $\flat\flat$  minor (mm. 77-81 and 97-101; see example 5.4). These "pastoral oases," as Hatten calls them, provide

---

<sup>348</sup> In Cohn's neo-Riemannian theory, these three fundamental steps would be PLP, where P = parallel and L = leittonwechsel. See *Audacious Euphony*, 17-42.

a respite from the prevailing harmonic descent into more remote regions of the tonal underworld. Their centripetal force is temporal as well as spatial, creating nine-measure fixed-tonic phases where the governing tonic does not change (mm. 73-81 and 93-101). Thematic material also switches from the dotted-rhythm basic idea of the primary theme to the gentle first subordinate theme.

Example 5.4. Roman numeral analysis of development section. Compare regions marked here with progression of regions notated as triads, example 5.3., and on the tonal spectrum, fig 5.2.

**CF-phase 1 (mm. 65-81)**

65 *ff* *fz* *fz*

d: iv      bII      V7      i  
c:      ii<sup>b</sup>5

69 *fz* *fz* *cresc.* *fz*

c: V7      i      iii<sup>b</sup>  
bb: iv

72 *fff* *p*

**First culminating passage in B-flat minor**

bb: V7      i      VI      V<sup>6</sup><sub>4 3</sub>

76 *fz* *fz*

**Pastoral oasis (to m. 81)**

Bb: V7      I

79 *fz* *fz* *fz*

Bb: V7      I      b7 IV  
Eb: V      7 I      IV      V<sup>6</sup><sub>4 3</sub>

**CF-phase 2 (mm. 82-101)**

f: iv                      bII                      V7                      i  
 eb: ii<sup>b</sup>5

eb: V7                      i                      VI  
 fb/e: V

fb/e: i                      vib                      Aug 6  
 c: i

**Second culminating passage in C minor**

**c:** i<sub>4</sub><sup>6</sup>                      7/3                      i                      V<sub>4</sub><sup>6</sup><sub>3</sub>

**Pastoral oasis (to m. 101)**

C: V7                      I                      V7



CF-phase 3 (mm. 101-107)

100 *8*

C: I    b7 IV                    I                    V    7\_\_\_\_\_

F: V    7 I    IV                    V<sup>6</sup><sub>4</sub> <sup>5</sup><sub>3</sub>

103

C: I

d: VII iv \_\_\_\_\_ Aug 6 V<sup>6</sup><sub>4</sub> <sup>5</sup><sub>3</sub>                    V    7\_\_\_\_\_

CP-phase (108-115)

106

d: i III<sup>b</sup>7

bb: V7 i    Aug 6 V<sup>6</sup><sub>4</sub> <sup>5</sup><sub>3</sub>                    Vb9 \_\_\_\_\_

Point of Furthest Remove (to m. 110)

109

bb: i \_\_\_\_\_ iv    Aug 6 V<sup>6</sup><sub>4</sub> <sup>5</sup><sub>3</sub>    ♯III9

g: V9 \_\_\_\_\_

112

g: i \_\_\_\_\_ iv    Aug 6 V<sup>6</sup><sub>4</sub> <sup>5</sup><sub>3</sub>    Aug 6    V

115

g/G: Aug 6    V    7\_\_\_\_\_ (ant) I

Schubert follows the first fixed-tonic phase by sequentially repeating the first six measures of the first modulatory phase a minor third higher. These measures strongly indicate the F-minor region (mm. 65-68) and follow the progression of regions of the first modulatory phase by descending a whole step between regions to E $\flat$  minor (mm. 86-87). Schubert then diverges from the first CF-phase, making many modulatory leaps flatward, accelerating the flatward trajectory in this most centrifugal phase of stage IV: CF. The journey through the underworld intensifies: its rate of descent increases and its toughest trials emerge. These take the form of modulatory leaps from the E $\flat$ -minor to F $\flat$ -minor regions (notated as E minor, mm. 88-89) and from F $\flat$ /E minor to D $\flat\flat$ /C minor (a cadential progression establishing the latter region spans mm. 90-93).

A single, motivic relation unites these modulatory leaps from CF-phase 2 with the first CF-phase and with the entire modulatory trajectory of the development section. This flatward submediant-minor relation originates in the centrifugal seed planted in the winding harmonic progression of the second subordinate theme (S<sup>2</sup>, mm. 49-52 and 57-60); this seed is the B $\flat$  appearing as the foreign flat submediant from the parallel-minor region that enriches the prevailing D-major key. The flatward submediant-minor relation underlies most of the flatward centrifugal trajectory of the development section, whether between consecutive regions, consecutive structural regions, or consecutive harmonies.<sup>350</sup>

The flatward submediant-minor relation metamorphoses into the structural progression of regions traversed by the first modulatory phase: from the dominant key (D major) that ended the

---

<sup>350</sup> I use the phrase "flatward submediant minor" relation to refer to a submediant minor relation in the flat direction. It would only be accurate to call it the flat submediant minor if it was in relation to a major reference region; if the reference region is minor then there is no alteration to the submediant degree.

exposition to its **bsmb** (B $\flat$  minor). This intervallic relation between regions continues in the second CF-phase; each modulatory leap in this phase involves the flatward submediant-minor relation in some way. E $\flat$  minor moves to F $\flat$  minor via the submediant chord of E $\flat$  minor (mm. 87-88); this C $\flat$  major chord then becomes the dominant of F $\flat$  minor, whose fleeting tonic arrives at m. 89. Hence, the progression from E $\flat$  minor to F $\flat$  minor follows the path **SMsdb**: this single modulatory leap between regions covers three fundamental steps in the flat direction – *SM*, *SD*, and parallel minor. The next move between consecutive regions more directly presents the flatward-submediant-minor relation; the harmony moves directly from the central triad of E minor to that of C minor, its submediant switched to minor. These modulatory leaps combine to generate an extremely strong CF-trajectory in CP-phase 2, making a total of six fundamental steps flatward from the previous structural region, B $\flat$  minor (**D: bsmb**) to the goal region of this phase, C/D $\flat\flat$  minor. These modulatory moves accumulate to generate a massive centrifugal force in this phase: (1) one fundamental step from B $\flat$  minor to E $\flat$  minor, a descending fifth; (2) three fundamental steps from E $\flat$  minor to F $\flat$  minor; (3) two fundamental steps from F $\flat$ /E minor to its submediant minor (D $\flat\flat$ /C minor), comprising a close submediant plus its parallel minor.

Since the second modulatory phase moves so remotely, covering twice as much terrain on the tonal spectrum as the first phase, its culminating passage in C/D $\flat\flat$  minor (mm. 93-95) might have been a possible point of furthest remove. But the harmony switches to the parallel major, to present another "oasis of the pastoral," so that mm. 93-101 forms a second fixed-tonic phase that sequentially repeats the first fixed-tonic phase. This brings the tonal narrative to C major, which might be considered **SD** in relation to the principal key, if it were to initiate or form a part of the

centripetal phase.<sup>352</sup> At this point, Schubert could have reversed large-scale motion from centrifugal to centripetal, moving to the global dominant and adding a minor seventh to indicate the principal key. Instead, the vicissitudes of the centrifugal trajectories continue, making a final push toward the point of furthest remove to form the third centrifugal phase.

The third and final centrifugal phase disrupts the large-scale model/sequence pattern set up by the first two centrifugal phases (mm. 65-81 and 82-101). At measure 101, the second theme (S<sup>1</sup>) transforms in character from its gentle *siciliano* dotted rhythm to a robust straight-eighths figure. The modulatory trajectory begins to lean in the sharp and centripetal direction, with motion from C major to the dominant of D minor. Just as the previous C major could have led to the dominant of the principal key, this half-cadential **d: V** could simply have been followed by D major, becoming the dominant seventh of the principal key. But instead, Schubert makes a final flatward move by the flatward submediant-minor relation, tragically descending two fundamental steps from D minor to B $\flat$  minor (**d: smb**). This final persistence of the flatward trajectory, evading the centripetal return with the principal key apparently in sight, creates the deepest sorrow of the whole movement, representing the culmination of the separation from the center, the point of furthest remove from the origin of tonal consciousness, the principal tonal center. Having already moved eight fundamental steps from D major, this final modulatory move takes the final two steps, the close-submediant relation plus the parallel-minor switch, making the whole trajectory of the development section ten steps, from D major, through B $\flat$  minor and D $\flat\flat$ /C minor, to B $\flat$  minor's enharmonic twin, C $\flat\flat$  minor (see figure 4.2).<sup>353</sup>

---

<sup>352</sup> In Schoenberg's strict monotonicity, if C major appears as a region in the development section of a movement in G major, it will always be **SD**. See Schoenberg's analyses of development sections (*Durchführungen*) in Schoenberg, *Structural Functions*, 145-64.

<sup>353</sup> Note that steps in the sharp direction cancel out steps in the flat direction.

Schubert first establishes C $\flat\flat$ /B $\flat$  minor with a chromatically enriched half cadence (mm. 106-7), just as he established the preceding D-minor region. Schubert expresses the tragedy of the point of furthest remove in the local harmonic presentation of the theme as well as through the large-scale progression of regions. Until this point, the first subordinate theme has been associated only with the major mode and more consonant harmonies, both in the exposition and in the two parallel-major passages in the development (mm. 77-81 and 97-101). At the point of furthest remove, however, Schubert plays a variation of the middle part of the theme (originally appearing in mm. 31-32) in the minor mode and with the downbeat of the melody creating a searing flat ninth with the bass, the latter being the dominant of B $\flat$  minor. The contentment and innocence of this gentle pastoral theme (S<sup>1</sup>) has been transformed into the desolate sorrow of the "dark night of the soul."

At the point of furthest remove, the epic protagonist dies a symbolic death, seemingly separated forever from the bliss and peace of the pastoral center. But the tonal narrative emerges reborn through the magical workings of enharmonic pairings and the common dominant shared by major and minor regions. Centripetal motion is facilitated by the function of equal temperament, so that while C $\flat\flat$  minor is extremely and irreconcilably remote from the principal key (G major), its enharmonic twin, B $\flat$  minor, is comparatively less remote. Note, however, that B $\flat$  minor is still fully remote from G major, with three fundamental/close relations between them. But B $\flat$  minor has a distant thread back to the principal key: its root is the third of the principal tonic-minor triad (G minor). The rhythmic lilt of the *siciliano* dance that returns at m. 108 also provides a motivic thread back to the pastoral.

By chromatically inflecting each region to its dominant and making use of the common tone connecting the flat mediant minor (B $\flat$  minor) to the principal tonic minor (G minor), Schubert makes the large-scale centripetal motion surreptitiously, unobtrusively, as though the process of redemption and psychological rejuvenation occurs secretly, returning to the ultimate center before we realize it. The three-measure phrase in C $\flat\flat$ /B $\flat$  minor (mm. 108-10) features a dominant pedal for most of its duration and concludes with a chromatically intensified half-cadence on the dominant. The decisive change from centrifugal to centripetal force occurs through a sequencing of this phrase down a minor third into G minor,  $\mathbf{t}$  of the principal key, with the same emphasis on its dominant (mm. 111-13). Schubert extends the dominant prolongation briefly, alternating with augmented 6/4/3 chords (mm. 114-15). He also cuts out the thematic material, making the repeated common tone, A (the augmented fourth of the augmented sixth chord), prominent in soprano and tenor voices. Both of these factors create a momentary stasis that prepares for the return of the serene primary theme in the principal key.

Schubert's emphasis on the dominant flat ninth chords of B $\flat$  minor and G minor also draws attention to the common tones shared by the dominant ninth chords of each region, which also connects the PoFR with the tonic minor. Four out of five tones are shared in common; only the roots of each chord are different (these four tones also form the diminished seventh common to minor third related regions).<sup>354</sup> While the common tones between the chords may be the same notes on the piano keyboard, the function of one prominent pair of common tones reverses enharmonically. The G $\flat$  ninth in the top voice of the  $\mathbf{bb}$ : V<sup>9</sup> chord in m. 108 transforms from

---

<sup>354</sup> Schoenberg explains how four minor keys share the same diminished seventh. Similarly, four minor keys share the same dominant ninth, whose four tones above the root form a diminished seventh. See Schoenberg, *Theory of Harmony*, 194-95.

being the descending leading tone of B $\flat$  minor (G $\flat$ ) to become the ascending leading tone of G minor and major (F $\sharp$ ). It takes its place as the third of the **g**: V<sup>9</sup> chord in m. 111. The C $\sharp$  of the augmented sixth chord in m. 113 also creates a centripetal enharmonic reversal: third of B $\flat$  minor, D $\flat$ , appearing as recently as m. 110, transforms from being an extremely foreign tone to G major to being one of its most naturally assimilated chromatic tones, C $\sharp$  as  $\hat{\#4}$ .

Schubert makes the final move from the principal tonic minor to the tonic major through its shared dominant. This highlights Schoenberg's lucid point that the potency of the interchangeability of major and minor lies in their common dominant:<sup>355</sup> it is as though suffering and contentment share the same source. Since the majority of regions in this development are minor ones, it is fitting that the final progression of regions is from the principal tonic minor to tonic major, via their common dominant chord and region. Just as the development section began with the switch from the dominant key to its parallel minor (D major to D minor), the section ends by moving from the principal tonic minor to tonic major. This framing of the development section with the most basic of chromatic changes between regions highlights how the parallel minor acts as a gateway to the most remote regions on the flat side. As the final region (apart from its dominant) to appear in the development section, it is also the key for unlocking the door to the principal tonic.<sup>356</sup>

---

<sup>355</sup> Schoenberg, *Structural Functions*, 51.

<sup>356</sup> This image relates to the Brian Hyer's article "Key" in *Oxford Music Online* (formerly *The New Grove Dictionary*). Here, Hyer writes that the tonic acts as a metaphorical key for unlocking the overall arrangement of pitches in a passage: "while the French *ton* and German *Tonart* stress the importance of the tonic, the English term has a broader meaning: as a metaphorical 'key,' the tonic 'unlocks' or clarifies the arrangement of pitch relations that underlies the music." See Brian Hyer, "Key (i)," *Oxford Music Online* (2001). Retrieved May 10, 2019, from <https://www-oxfordmusiconline-com.ezproxy.gc.cuny.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000014942>.

## 5.5 Resolution of the most remote chromatic tones in the recapitulation

As noted above, Schubert modifies the recapitulation in order to generate the strongest centripetal forces of the movement, to counterbalance the extreme centrifugal trajectory of the development. The two main amendments to the recapitulation from the exposition noted above — the omission of the foreign-key episode following the primary theme and the substantial extension of the final closing section — both serve to increase large-scale centripetal force and the expression of the pastoral. The recapitulation also resolves large-scale centrifugal forces by presenting regions and tones that appeared as very centrifugal goals of the modulatory trajectory in stage IV: CF as functional components of progressions circumscribing the principal key. This particularly pertains to tones foreign to the principal key's diatonic scale. Fundamental tones from the most remote regions appearing in the development section, such as **bmb** (B $\flat$  minor), return in the recapitulation as foreign tones enriching degrees of the prevailing principal key, or *Stufenreichtum*; those centrifugal elements that were substantiated in the epic modulatory trajectory return as local fantasia elements flavoring the prevailing pastoral mode.

In the merged primary theme and transition of the recapitulation (mm. 116-27), the consequent diverges decisively from the transition of the exposition by moving to the subdominant harmony instead of to the dominant of the dominant in order to affirm the principal key. The subdominant harmony, which appears in mm. 122-23, is emphasized durationally and dynamically, with foreign leading tones suggesting its region. It stands out when compared with the exposition, where **SD** appears neither in the corresponding part of the transition nor in the consequent of the primary theme (it appears very fleetingly in the antecedent). The emphasis on the subdominant also enhances the expression of the pastoral.



This commonplace harmonic move gains greater significance if we consider its connection to a passage in the development section. The same harmony was emphasized as a region, C major, in the second fixed-tonic phase of the development (mm. 97-101), where it also had an extremely remote meaning as D $\flat\flat$  major, or **bb**: **sdSMsdbSM**, based on its modulatory path. Given its position as a large-scale intermediate region in the modulatory trajectory flatwards from B $\flat$  minor (mm. 71-76) to its extremely remote enharmonic twin, C $\flat\flat$ /B $\flat$  minor, the D $\flat\flat$ /C major region appearing in the second fixed-tonic phase has no meaningful connection to the principal key. However, in the second phrase of the recapitulation, when C major appears as IV in the descending-thirds progression I-vi-IV-ii-V<sup>7</sup>-I defining the principal key (mm. 120-25), it features as a defining element of this key. What had been substantiated as an extremely remote region in the epic trajectory of stage IV:CF is now assimilated into the pastoral mode of stage V: CP.

As discussed above, the highly chromatic second subordinate theme and its expanded repetition (mm. 148-61) functions as the locally centrifugal stage of the recapitulation, or stage VI: CF of the whole movement. The stage also functions to assimilate elements back into the principal key, or tonal spectrum. This can be considered a large-scale centripetal function, pointing to yet another simultaneity of centrifugal and centripetal forces at different levels. The corresponding part in the exposition introduced the flat-third area of the spectrum for the first time in the movement, in the form of  $\sharp\hat{3}$  and  $\flat\hat{6}$  of the prevailing dominant key (D major). These flat-side third-relations were seeds planted by Schubert, sprouting and growing into the monumental flatward centrifugal trajectory of the development section.

In the development section, B $\flat$  minor emerged as the most substantial goal of the epic trajectory, strongly asserting its independence from the principal key. By moving to the principal

tonic minor in the centripetal phase concluding the development, the principal key made its first strong steps toward assimilating B $\flat$  minor and its generative tone back into the tonality; however, the tone B $\flat$  has not yet been heard as a chromatic enrichment of a progression circumscribing the principal key as the prevailing key. It has only been heard as  $\flat\hat{6}$  of the dominant key (D major), in the S<sup>2</sup> part of the exposition. The same goes for E $\flat$ , as  $\hat{4}$  of the B $\flat$  minor region and  $\hat{3}$  of C minor, the second most structural region in the development. These tones are finally assimilated into the principal key and the pastoral mode when they appear in the continually chromatically enriched progression of the S<sup>2</sup> theme, with B $\flat$  ( $\flat 3$  of the key) as the flat ninth above the dominant of the dominant and E $\flat$  ( $\flat 6$  of the key) as the flat ninth above the dominant. In the penultimate stage VI: CF of the tonal narrative, B $\flat$  and E $\flat$  function as chromatic enrichment from the flat-side third-relations that enhance the progression defining the principal key; the progression reintegrates these foreign tones into the principal tonality.

The first chromatic tone of this stage, C $\sharp$ , appearing as the bass of the surface culmination on II $\sharp^7$  in 6/5 position (m. 149), also reintegrates this equally tempered chromatic tone into the prevailing key. Its flat-side enharmonic twin, D $\flat$ , is significantly more remote from G major than C $\sharp$ , since C $\sharp$  is the ascending leading tone of the closely related dominant region, while D $\flat$  is the third of the fully remote **mb**. As the third of the structural B $\flat$  minor region in the development, D $\flat$ , like B $\flat$ , functioned in a highly centrifugal way. Therefore, when its enharmonic twin appears, with significant emphasis, in the chromatically intensified progression circumnavigating the principal key, it assimilates the D $\flat$ /C $\sharp$  pair into the principal tonal spectrum.

## 5.6. Conclusion

This chapter has aimed at connecting centripetal/centrifugal and sharp/flat forces with more concrete expressive meanings, drawing on the genre polarities of dance/fantasia and the expressive modes pastoral/epic. It has also attempted to develop a nuanced and powerful understanding of character, genre, and expression by conceiving them as waves and forces in a dialectical interplay, with meaningful connections to these tonal polarities. A fascinating example of the interplay of pastoral and epic as CP/CF forces are the pastoral oases that twice delay the epic trajectory of the development.

Applying the tonal narrative approach to Schubert's D. 894/i illuminates non-normative centrifugal features of the movement, such as the centrifugal episode after the opening thematic statement and the immense trajectory of the development section. By moving to the sharp side, the episode tilts the whole exposition further to the sharp side than usual and motivates an epic flatward trajectory in the development.

Building upon Beethoven's enharmonic circles, this development traverses an enharmonic circle from an already remote region to its enharmonic twin. The three culminating passages accentuate the perception of remoteness in this development section; each culmination could be the point of furthest remove, but the tonal narrative continues its flatward trajectory, reaching even more remote regions. This intensifies the effect of the point of furthest remove as an extreme separation from the stability and peace of the tonal center. The extremity of centrifugal forces accumulated in stage IV: CF enhances the peacefulness of the return to the principal key and the pastoral mode in the recapitulation.

## Conclusion

In this dissertation, I have applied a tonal narrative approach to piano sonata movements by Mozart, Beethoven, and Schubert. At the heart of the tonal narrative approach lies the dynamic interplay between centrifugal and centripetal forces. This dialectic between forces generates the global shape of the tonal narrative, its middleground trajectories and leanings, and local nuances of the musical surface. Centrifugal forces embrace all kinds of chromaticism and modulation; they are differentiated into four centrifugal functions presented in chapter 1, which draw upon Schoenberg's list in *Theory of Harmony* (1922). Centrifugal and centripetal forces also divide crucially into sharp and flat sides and directions. The duality and opposition of sharp and flat sides has been noted by musician-scholars such as Rameau, Kurth, Tovey, Schoenberg, and Rosen.<sup>357</sup> These scholars have suggested the importance of contrasts and counterbalancing between modulations and chromaticism to the sharp and flat sides; however, an extensive and systematic account of the interactions of sharp- and flat-CF forces has not previously been published. To fill this gap in research, a major goal of this dissertation has been to provide one such theory of the interplay of sharp- and flat-CF forces and to analyze how their interaction shapes the tonal narrative.

As I hope to have demonstrated, centrifugal and centripetal phenomena and trajectories are equally important in generating the global, middleground, and local landmarks and shape of a movement. In particular, this study highlights the point of furthest remove as a global centrifugal

---

<sup>357</sup> Howard, *Decoding Rameau*, 432; Steblin, *A History of Key Characteristics*, 103-4; Rothfarb, *Ernst Kurth as Theorist and Analyst*, 167-89; Rosen, *The Classical Style*, 27, 79; Rosen, *Sonata Forms*, 288-89; Tovey, "Harmony," 61; Schoenberg, *Theory of Harmony*, 222-23; Schoenberg, *Structural Functions of Harmony*, 54.

culmination of the highest significance in the tonal narrative, equal in significance to the global centripetal culmination (bearing some resemblance to the Essential Structural Closure in Sonata Theory) attained in the latter half of the recapitulation of a sonata form, and the temporal-CP culmination (recalling the Essential Expositional Closure) reached in the latter half of the exposition. Another goal of this dissertation has been to emphasize centrifugal landmarks, trajectories, and episodes as equally important as centripetal phenomena — such as cadences and returns to the principal key — in providing a narrative shape to a movement.

I will now recapitulate the important concepts and points made in each chapter. Chapter 1 presented the archetypal models and basic concepts underlying the tonal narrative approach. It introduced and defined centripetal and centrifugal forces, their origins in the consonance/dissonance and perfect/imperfect dualities, the division of the tonal spectrum into sharp and flat sides, and four different kinds of centrifugal force or four centrifugal functions: chromatic intensification of the prevailing key (*Stufenreichtum*); modulation as opposition; modulatory intensification or movement; and roving harmony.

Chapter 2 presented criteria for determining tonal distances between regions and a tonal spectrum showing them. Tonal distances between regions are determined by the number of fundamental steps between them; fundamental steps, in turn, are the closest relations — perfect-fifth- and third-related regions whose diatonic scales differ by one or two notes (including raised seventh degrees for minor) as well as the parallel major-minor relation. The number of fundamental steps determines CF-forces for three different situations: (1) between regions substantiated as keys (principal and secondary keys); (2) the CF-force of a region in a modulatory trajectory (including modulatory sequences), particularly the goal region, measured from the initiating region of the trajectory; (3) the local CF-force generated by a region

suggested or indicated in a passage or section governed by a prevailing key. These three types, or degrees, of CF-force can be represented on a tonal spectrum based on Schoenberg's Chart of the Regions and Gottfried Weber's Table of Key Relations. I adapted these maps of tonal space by adding colors drawn from Goethe's theory of color; this aimed at highlighting the sharp and flat sides and emphasizing the distinctions between close, moderately remote, fully remote, and very or extremely remote relations.

The determination of the degree of CF-force between regions, the division of the spectrum into sharp and flat sides/directions, and the further division into four areas/directions inform the investigation of tonal narrative functions, which was undertaken in chapter 3. I defined there the spatial-CF culmination or point of furthest remove as the goal of the centrifugal trajectory that travels the furthest, taking the most fundamental steps. Chapter 3 further identified two analytical perspectives tied to the tonal narrative functions. One perspective focuses on intensification leading to culminations, the other on the counterbalancing of CP/CF forces and of sharp- and flat-CF forces. As I demonstrated, the alternation and balancing of sharp- and flat-CF forces often develops toward a higher aesthetic goal: spatial completeness. This refers to the presentation of regions from all four directions/areas of the tonal spectrum either globally or locally with respect to the principal key. Local spatial completeness often occurs in recapitulations and codas, which feature sections that suggest regions from four different directions on the spectrum, illuminating the principal key from each side. Local spatial completeness occurs, for example, in the recapitulatory transition of Mozart's K. 310/i, the coda of Beethoven's op. 7/i, and the second subordinate theme of Schubert's D. 894/i.

The latter part of chapter 3 identified a hierarchy of regions, based on the degree to which they are cadentially defined in a movement and, in the case of modulatory sections, whether they

function as a goal, initiator, or medial region. This hierarchy of regions formed the basis for differentiating between CF-forces at global, middleground, and local levels in the analyses of chapters 4 and 5. Local (or fleeting) CF forces *shade* a passage to the sharp or flat side; middleground (or semi-substantial) CF forces *tilt* it; while global (or substantial) CF forces *orient* it more substantially to one side or the other.

Chapter 4 introduced a model of alternating CP/CF stages for sonata form; sections such as the primary theme, transition, and different parts of the development were matched to typical CP or CF functions. This model aimed at highlighting the contrast between CP/CF forces and the continuity and transformation of each force from one section to another. For example, CF forces in stage III combine typically moderate spatial-CF with temporal-CP forces, establishing and confirming the secondary key. These spatial-CF forces become more powerful and combine with temporal-CF forces in stage IV: CF, the centrifugal phase of the development section.

My analyses in chapter 4 aimed at showing how composers such as Mozart and Beethoven presented sharp- and flat-CF forces in a dynamic interplay. In piano sonata movements in major keys, Mozart used the parallel minor at multiple stages of the form; this occurs sufficiently frequently in the transition and beginning of the development to justify calling it somewhat typical. It is notable that Mozart so often used the parallel minor in major-key sonata forms, since it generates a flat-CF force that counterbalances the sharp orientation of the exposition created by the normative dominant key.

Chapters 4 and 5 presented a method for analyzing development sections with the point of furthest remove as its most significant goal, drawing on Ratner's division of the development into centrifugal and centripetal phases. This method highlights three main features of the centrifugal phase (stage IV: CF): the direction of modulatory movement, any recurring

intervallic relations such as fifths or thirds, and the number of fundamental steps to the point of furthest remove. The latter value determines the degree of centrifugal force generated by the point of furthest remove and the overall centrifugal trajectory.

Chapter 4 utilized the tonal narrative approach in order to highlight the historical expansion of centrifugal trajectories to the point of furthest remove in the development section. As I demonstrated, Mozart's final two sonatas travel further in the sharp direction than his earlier ones, and Beethoven travels as far in many of his early sonatas. While Mozart moves in the sharp direction to the point of furthest remove in all of his major-key piano sonata movements, Beethoven also explores the flat direction for the main CF trajectory leading to the point of furthest remove. The development section of op. 2/2/i in A major modulates centrifugally in the flat direction to a very remote PoFR, **bSMbSM**; at this point the composer reverses direction and returns centripetally and sharpward to the principal key. This shape – centrifugal motion in a sharp or flat direction to the PoFR, followed by reversal of direction to centripetal motion in the opposite direction – forms the basis for the vast majority of sonata movements by Mozart and Beethoven until Beethoven's middle period.

In the *Waldstein* and *Appassionata* sonatas, Beethoven found an extraordinary alternative to this "there-and-back-again" shape. Instead of reversing direction, Beethoven continued in the same direction — the flat direction — until he returned to the principal key; this was possible owing to the circular nature of the harmonic system based on equal temperament and the enharmonic equivalence of tones sharing a key on the piano. This traversal of the enharmonic circle doubles the length of the longest centrifugal trajectories of the late Mozart and early Beethoven piano sonata movements, from six steps to twelve, generating extreme centrifugal forces and creating a more powerful narrative trajectory.



In chapter 5, I investigated a piano sonata movement composed twenty-two years later, Schubert's D. 894/i in G major. It also features a powerful epic narrative trajectory in its development section, which further traverses the enharmonic circle. In this chapter, centripetal and centrifugal forces are matched with two pairs of expressive modes, pastoral/epic and dance/fantasia. The first pair of modes comes from Hatten's analysis of the piece, whereas the second refers to sonata form more generally and comes from Ratner.

In my analysis of Schubert's D. 894/i, I used the model of alternating CP/CF stages to examine how the composer generates extremes of both forces, which powerfully project the expressive modes to which they are correlated. Like the first movement of Beethoven's *Waldstein*, the Schubert movement modulates in the flat direction, in contrast to the sharpward trajectories of most of Mozart's and many of Beethoven's earlier piano sonata movements. One significant distinction between the Beethoven and Schubert movements, related to their contrasting characters, is the degree of continuity of their flatward trajectories. In Beethoven's op. 53/i, the modulatory trajectory moves continuously toward the arrival on the dominant of the principal key, dwelling in a single region for a maximum of four measures; furthermore, these regions function as local dominants that descend by fifths. By contrast, Schubert's D. 894/i features three significant culminating passages in remote regions, each remaining in the minor region and its parallel major for nine measures. These passages momentarily halt the persistent flatward trajectory, functioning as oases of the pastoral in the midst of the inexorable epic journey.

*Some applications to performance and other avenues for future exploration*

The tonal narrative approach may be potentially useful to performers who are interested in the inner workings of the harmonic language and compositional technique of common practice

repertoire. I will now outline some ways in which understanding harmonic motion in terms of centripetal/centrifugal forces divided into sharp and flat sides/directions can complement and coordinate with aspects of pianistic technique and interpretation. My comments on piano technique are influenced particularly by the Russian school, and I will refer to Russian-American pianist Boris Berman's book *Notes from the Pianist's Bench*.

One feature of the Russian school (as taught by two of my piano teachers, Natalia Sheludiakova and Boris Berman) is understanding large-scale phrasing in terms of waves leading to and from culminations. Though the culminations discussed by Russian piano pedagogues focus on rhetorical elements, they often coincide with the culminations that I discuss in this study. This manifests physically as energy flow and weight transfer through the arms into the hands and fingers and into the keyboard. Understanding sections and longer passages in terms of intensifications or accumulations of centrifugal or centripetal forces leading to culminations could correlate directly with mindfulness of these energy flows in the upper body leading into the fingers and the piano. Berman advises his students to imagine a long finger extending from the shoulder to the fingers and to imagine juices flowing or weight pouring through the arm into the keyboard.<sup>358</sup> These juices or energies could correspond directly with CP/CF forces.

Differentiating types of intensification as I do in chapter 3 into dissonant intensification, chromatic enrichment of the prevailing key, and modulatory movement would be useful for teachers and performers to connect the specific compositional function of passages with their perception and control of inner energy flows through their upper body and into the keyboard.

Ratner's division of the development into centrifugal and centripetal phases, with the former leading to the point of furthest remove, which I call the spatial-centrifugal culmination

---

<sup>358</sup> Boris Berman, *Notes from the Pianist's Bench*, 2nd ed. (New Haven: Yale University Press, 2017), 11.

for the whole movement, can facilitate dramatically powerful performances. As a pianist, centrifugal culminations and their trajectories are equally important as centripetal culminations (the strongest cadential arrivals following the most expanded cadential progressions). Knowledge about the precise location of the point of furthest remove and the number of fundamental steps or modulatory moves leading towards it can be combined by the pianist with their acute awareness of the flow and transfer of weight and energies from their arms to their hands and fingers and into the piano in order to effectively pace these trajectories. Rubato may also be employed so that the centrifugal phase generally moves forward in tempo, with some broadening of the tempo for particularly remote harmonic turns and the approach to the point of furthest remove itself. For example, in Beethoven's op. 7/i, I would move the tempo forward for the sharpward trajectory of the main centrifugal phrase (153-165), which is also the most vertically dissonant passage of the piece. Then, I would broaden the tempo leading to the arrival at the point of furthest remove (mm. 165-68) and take a slightly slower tempo for the return of the opening basic idea in the region of furthest remove (A minor, mm. 169-76).

Another important feature of piano technique presented by Berman is the opposition between "in" or *sostenuto* touch and "out" or *leggerio* touch. The in/out description is Berman's, while the Italian terms were used by his teacher Lev Oborin.<sup>359</sup> The "in" touch involves pressing the key slowly and continuously into the depths of the key in order to minimize the attack; this creates a warm, mellow, and round sound. Graceful movements of the wrist help as a shock absorber to lower the attack and cushion the sound.<sup>360</sup> Using flatter fingers also contributes to the *sostenuto* touch.<sup>361</sup> By contrast, the "out" touch requires a very fast, circular stroke so that the

---

<sup>359</sup> Ibid., 5.

<sup>360</sup> Josef Lhevinne compares the flexibility of the wrist to shock absorbers in a car; see Lhevinne, *Basic Principles in Pianoforte Playing* (New York: Dover, 1972), 19.

<sup>361</sup> Berman, *Notes*, 13-14.

hammer hits the string and comes off immediately, allowing it to resonate; this creates a very bright and ringing tone.<sup>362</sup> Sharper, more pointed fingers also contribute to the *leggerio* touch. This polarity of sound color and pianistic motion corresponds to a large extent with the flat/sharp polarity of harmonic shading.<sup>363</sup>

A basic application of the in/out touch to harmonic shading for passages remaining in a prevailing key is for any foreign tones to the sharp side (ascending leading tones) to be played with a faster attack to generate a brighter tone, and any foreign tones to the flat side (descending leading tones) to be played with an especially slow movement to generate a mellow and warm tone. This suggestion should not be taken absolutely but combined with other factors, particularly the overall character of the theme or passage in question. A particular passage may require one or other type of touch in order to express its general character; employing the opposing type of touch to bring out fleeting CF forces may enrich and give nuance to the prevailing tone color.<sup>364</sup> Another consideration is that strongly dissonant harmonies could be played with a faster attack in order to enhance their tension, regardless of whether they include flat-CF forces.

The tonal narrative approach's distinction between different degrees of substantiality for CF/CP forces (or structural levels) may enable a performer to differentiate between various ways of projecting mellow/bright shadings in a way that brings out the harmonic logic and purpose of the composition. Use of rubato may help to differentiate between fleeting CF-forces participating in progressions outlining a prevailing key and more extended and semi-substantial excursions to a foreign region. For example, in Schubert's D. 894/i, the fleeting-CF forces of the opening

---

<sup>362</sup> Ibid., 5-6.

<sup>363</sup> Berman specifically calls the two types of touch polarities; *ibid.*, 5.

<sup>364</sup> Berman gives advice about using one or the other type of touch in various excerpts from Brahms, Chopin, and Liszt; *ibid.*, 7-8.

thematic statement (mm. 1-9) could be projected mostly through touch, with only slight rubato within the beats; for the foreign-key episode (mm. 10-16), a slightly slower tempo and more pedal could be employed along with a slightly faster attack in order to project the brightness of the mediant and especially the mediant major regions. Using deeper or longer pedalling can enhance both mellow and bright tone colors.

Harmonic progressions featuring enharmonic pairs that function as foreign ascending and descending leading tones present cases where analyzing sharp/flat chromaticism and applying pianistic shading becomes particularly useful. This kind of *Stufenreichtum* occurs in the second subordinate theme of Schubert's D. 894/i, mm. 49-52 and 57-60). As discussed in chapter 5, the progression in D major features a deceptive progression from V in m. 49 to III# on the first beat of m. 50, presenting A# in the bass as the ascending leading tone of **D: sm**. The pianist will play the same key on the piano keyboard in the final beat in an inner voice in the right hand but the function of the Bb is reversed, now operating as a descending leading tone of **D: t**. The pianist can play the first A# with a quicker stroke (the out touch) and more pointed fingers to enhance the brightness of the fleeting sharp-CF force on the first beat, while in the last beat of the measure he or she could play the Bb with flatter fingers and a slower immersion in the key to bring out the fleeting flat-CF force generated by the inner voice.

Awareness of the nature of enharmonic pairings — that the same note on the piano can have two opposing meanings — becomes crucial for interpreting such modulatory trajectories that traverse the enharmonic circle. As I have explored in section 4.5 and chapter 5, the epic development sections of Beethoven's op. 53/i and Schubert's D. 894/i move in a prevailing flat direction through the enharmonic seam toward the point of furthest remove, which takes on a dual identity, one of which is extremely remote on the flat side. In the second half of each of the

trajectories, the notation switches from flats to sharps or naturals. Understanding that this is only a notational enharmonic change because the modulatory trajectory continues flatward is crucial for maintaining the continual flow of centrifugal energy, moving through the arms into the hands and piano. This centrifugal energy generated by modulatory intensification builds to its maximum — the culmination of centrifugal force for the movement.

The approach developed in this dissertation and the analyses presented above have indicated four clear areas for further exploration. First, it may be applied to piano technique and interpretation; my comments above may serve as an introduction to those applications. Second, the CP/CF model could be applied to large ternary and rondo forms. This would show how composers such as Beethoven, Schubert, and Chopin developed and expanded large ternary forms to incorporate *Durchführung*-like (kinetic-tonic) passages, particularly in the middle sections. It would also reveal generic differences between the overall sharp/flat orientations of large-ternary and sonata-form movements in general. As stated in chapter 3, large-ternary forms tend to orient strongly to one side or the other, by contrast with sonata-form movements, which usually balance the sharp- and flat-CF forces more equally. This is due to the fact that the typical large-scale key relationship in nineteenth-century ternary forms is that between parallel major and minor, or between major and a key closely related to the parallel minor (e.g., the flat submediant). For a movement whose principal key is major, the middle section typically intensifies or expands the parallel minor, moving through regions more remote on the flat side, increasing the flat-CF orientation of the overall tonal narrative.

Another area for further development of the tonal narrative approach would be analyzing in more detail works by Chopin and other romantic composers. Many of Chopin's genre pieces, such as nocturnes and mazurkas, develop large ternary forms; they typically feature closed A

sections in the principal key and middle sections based on the parallel key with significant excursions to more remote regions (flat side for parallel minor, sharp side for major), followed by an abbreviated and varied A' section. Many of Chopin's works also feature complete traversals of the enharmonic circle in the sharp and flat directions. Chopin's Nocturne in G Major, op. 37/2, features multiple traversals of the enharmonic circle in both B and A' sections. Ballades nos. 1, 2, and 4 also feature such traversals; the first ballade, in G minor, features a traversal of the enharmonic circle in the sharp direction from E $\flat$  major to D $\sharp$  major (notated as E $\flat$  major), while the second and fourth ballades feature traversals in the flat direction.

A fourth area for further exploration builds on the analysis of chapter 5: matching or correlating the centripetal/centrifugal polarity and/or sharp/flat forces to expressive modes or large-scale polarities of character. This approach opens up a new dimension for understanding psychological and narrative meanings for tonal repertoire. Moreover, it creates a new way to investigate the artistic purpose behind the choice of keys, directions of modulatory movement, chromatic shadings, and the durations of particular centripetal or centrifugal stages of a given movement.

Overall, I aimed to investigate how composers such as Mozart, Beethoven, Schubert, and Chopin developed and shaped their harmonic journeys in a way that reveals an underlying dynamic interplay of centrifugal and centripetal forces. Each section, passage, or harmony functions as a logical cause for the following and later sections, passages, or harmonies. This cause-and-effect progression often involves the interplay of centripetal and centrifugal forces on the sharp and flat sides. This interplay gives further diversity and impetus to the overall trajectories; tonal narratives usually present salient examples of both sharp- and flat-CF forces on the way to the centrifugal culmination. Furthermore, centrifugal and centripetal forces divide into

spatial and temporal types; these also participate in cause-and-effect progressions and transform from one form to another throughout the course of a tonal narrative. I have aimed to show that while most sections or passages in a tonal narrative may present either centrifugal or centripetal forces as primary, many critical parts of the form feature a simultaneity of both fundamental forces.



## Glossary of terms and abbreviations

**Centrifugal force:** See spatial- and temporal-centrifugal force

**Centripetal force:** See spatial- and temporal-centripetal force

**Chromatic intensification or enrichment of a prevailing key** refers to harmonic progressions outlining a prevailing key that are enriched or intensified by foreign tones — tones outside of the prevailing key's scale; these tones generate local-centrifugal force. These foreign tones are ascending and descending artificial leading tones drawn from one or more of the regions. The artificial ascending leading tones often substitute for the thirds of minor triads, while descending leading tones may become flatted thirds, flatted sevenths or flatted ninths. This substitution or infiltration of artificial tones create chromatic chords that often resolve to the generative triad (tonic) of the region from which they originate, but this resolution is sometimes delayed significantly. The pre-dominant phase of a progression is often chromatically intensified, particularly in expanded cadential progressions leading to culminations of temporal-centripetal force. These chromatic harmonies include the applied or artificial dominant sevenths, leading-tone sevenths, Phrygian II, and augmented sixth chords. It should be noted that the augmented sixth chord contains leading tones from the dominant and minor subdominant regions, on the sharp and flat sides of the tonality respectively.

**Far-out point (FOP):** Far-out points are regions that are remote from the principal tonic or a reference region but are not clearly a maximum of spatial-CF force (a spatial-CF culmination). I borrow the term from Taruskin, who uses it throughout his *Oxford History of Western Music*.

Taruskin's term refers generally to remote harmonies or regions, rather than to a specifically measured maximally remote element.<sup>365</sup>

**Fixed-tonic passages or sections and fixed-tonicity:** When progressions continually circumscribe the harmonies of a region or the principal key, leading to a cadence, they establish a fixed-tonic passage or section. The two organizing principles of fixed-tonic passages are:

- 1) The articulation of harmonic degrees of the key based on the syntactical model Tonic–Pre-dominant–Dominant–Tonic.
- 2) Motion toward completion of a cadential progression with root position dominant to root position tonic arrival.

When a region establishes a fixed-tonic section, it may be also considered a secondary key, generating a secondary spectrum with its own regions. In fixed-tonic passages, chromaticism arising from the leading tones of the regions often intensify progressions circumscribing the key. These chromatic intensifications give glimpses or suggestions of those regions whose leading-tones appear. Regions may also appear slightly more substantially, challenging the prevailing key of the fixed-tonic passage, but not usurping its governance.

**Fundamental step, fundamental relation:** Fundamental steps are fundamental relations which are combined to determine the distance between regions, whether consecutively or between regions across a larger modulatory trajectory in a single sharp or flat direction. The **fundamental relations** are the fifth- and third-relations between regions whose scales differ by only one or two tones (including raised sevenths in minor) plus the parallel relation. From a major tonic, **T**,

---

<sup>365</sup> See, for example, his discussion of Beethoven's *Eroica* symphony, where both the note and key of E is called a FOP; it is also regarded as "unclassifiable" and its mode (minor) is not specified. Taruskin. "Chapter 12: The First Romantics." In *Music in the Seventeenth And Eighteenth Centuries*, Oxford University Press. (New York, USA, 2010). Retrieved 15 Oct. 2018, from <http://www.oxfordwesternmusic.com/view/Volume2/actrade-9780195384826-div1-12005.xml>

the five fundamental relations are **D**, **SD**, **sm**, **m**, and **t**; from a minor tonic **t**, the five fundamental relations are **v**, **sd**, **M**, **SM**, and **T**.

**Generative triad:** The local tonic triad of a region, its central triad, which generates the other tones of the region's scale (such as its ascending and descending leading tones).

**Generative-triad commonality** is one criterion for evaluating the centrifugal force generated by a region based on two factors: (1) the number of common tones shared by the generative triad of the region and the principal tonic triad (or reference region's generative triad); and (2) the consonance or dissonance between the region's root (local tonic) and the principal tonic (or reference region's root). The tonic minor region possesses the maximum generative-triad commonality with the tonic major; its triad shares two common tones with the tonic major, and its tonic note is identical, a maximum consonance. The submediant and mediant regions of a major tonality possess a very high generative-triad commonality with the major tonic; each of these triads share two common tones with the tonic triad.

**Goal region:** The goal region of a modulatory trajectory is the region after which the prevailing sharp/flat direction of the trajectory reverses. In a modulatory sequence, the goal region is the region after which the common interval between regions (such as fifths or whole steps or thirds) changes (this often also involves a change in the prevailing sharp/flat direction).

**Harmonic cycle:** Progressions presenting the three distinct terms of the T-PD-D-T syntactical archetype will be referred to as a *harmonic cycle*, which is considered more complete than progressions involving only two distinct functions (such as tonic-dominant alternations).

**Initiating region:** The initiating region of a modulatory trajectory is the first region in the series of regions moving in a single prevailing sharp or flat direction. In a modulatory sequence, the initiating region is also the first region in the sequence of regions related by a common interval.

**Key area:** See **Region**.

**Kinetic-tonic passages or sections and kinetic tonality.** Kinetic-tonic passages are those that feature mostly continual **modulatory movement** through multiple regions so that the harmonic focal point continually changes from one local tonic to another. The typical organizing principle for kinetic-tonic sections is modulatory movement in a single (sharp or flat) direction that departs from the previously prevailing key. This principle opposes temporal-centripetal forces created by progressions circumscribing a single key leading toward cadences — essential features of fixed-tonic sections. Modulatory movement in a single direction opposes the more circular outlining of degrees of the key, while the multiplicity of regions opposes the singularity of a prevailing key. The common half-cadential substantiation of certain regions suggest the slight influence of fixed-tonality in a mostly kinetic-tonic section. Another possibility for kinetic-tonic passages involves fluctuating tonality that moves through different regions/tonics, but changes direction from one to the other. Unidirectional modulatory motion appears more commonly than fluctuating tonality in the late-eighteenth century to early nineteenth century repertoire covered in this dissertation.

**Modulation:** Following Schoenberg's definition in *Structural Functions of Harmony*, the tonal narrative approach considers modulation to mean that one tonality or key has been abandoned definitively and another tonality or key has been established harmonically as well as thematically.<sup>366</sup> This sets up an opposition between two keys, each of which has been cadentially confirmed and governed at least an eight-measure phrase or phrase-group. For example, the sonata exposition, based primarily on **modulation as opposition**, presents the opposition of the principal and secondary keys, with the principal key governing the first part and the secondary

---

<sup>366</sup> Schoenberg, *Structural Functions of Harmony*, 19.

key the second, often larger part. Each of these two parts are fixed-tonic, usually connected by a modulatory transition.

**Modulatory:** In contradistinction to "modulation" as a noun, the adjective **modulatory** refers to motion through multiple regions, without settling down in any one of these regions for an extended duration with strong confirmation of that region. It normally functions as the adjective of the phrases **modulatory intensification** or **modulatory movement**. Modulatory movement typically involves a prevailing flat or sharp direction, with regions becoming progressively more remote from the origin of the modulatory passage (see **modulatory trajectory**, **modulatory sequence**).

**Modulatory leaps:** A modulatory leap refers to movement between regions or from the principal key to a region by a combination of two or more **fundamental steps**.

**Modulatory sequence:** A modulatory sequence or **sequence of regions** moves through multiple regions connected by a constant interval or interval pattern, such as descending fifths. Unlike in a diatonic harmonic sequence (or tonal sequence) where the interval between harmonic degrees needs to be altered at some point to conform to the asymmetry of the diatonic scale, the interval between regions in a modulatory (or real) sequence remains constant throughout. By manifesting the "law of uniformity," it transcends the diatonic boundaries of a previously prevailing key, usually moving away from it in a single sharp or flat direction. Modulatory sequences generate kinetic-tonic passages or sections. The structurally significant regions in a modulatory sequence are the first and last — the initiating and goal regions.

**Modulatory phase/trajectory:** A modulatory phase or trajectory moves through multiple regions in a single prevailing sharp or flat direction: unidirectional modulatory intensification. Like the modulatory sequence, it manifests the law of uniformity with unidirectional modulatory

movement exceeding the diatonic boundaries of a previously prevailing key. As in a modulatory sequence, the structurally significant terms are the **initiating** and **goal regions**.

**Point of furthest remove (PoFR):** The tonal narrative approach defines the point of furthest remove as the goal region of the modulatory sequence or phase in the development section that travels the furthest on the tonal spectrum, generating a maximum centrifugal force for the movement. This distance is measured according to the number of fundamental steps from the initiating region of the modulatory phase (often also the first region appearing in the development) to the goal region. Note that many development sections feature only one modulatory sequence or phase that is also centrifugal; therefore, the goal of that single modulatory phase is the point of furthest remove.

Points of furthest remove are often also maximum distances from the principal key. The point of furthest remove is equivalent to the **spatial-CF culmination** for the whole movement.

**Region/key area:** Schoenberg's concept of regions interprets all keys appearing in a given piece as segments or parts of an overall tonality organized around the principal key as "tonic," the single tonic for the movement. All keys, other than the tonic, are considered *regions* that function primarily as a harmonic contrast with respect to the one tonic of the piece, even while temporarily acting as though they were independent tonalities.<sup>367</sup> Schoenberg represents these relationships on his Chart of the Regions (see also **tonal spectrum**). The tonal narrative approach allows for regions to relate to secondary keys or other structural regions in addition to or instead of the principal key, for example in the latter section of a sonata exposition or the development section. In these cases, the secondary key or structural region becomes a temporary reference point for a temporary spectrum.

---

<sup>367</sup> Schoenberg, *Structural Functions of Harmony*, 19.

There are two ways in which regions arise from the principal tonality or reference point, which organically connect the regions to their central reference point. The first way arises from the diatonic scale of a principal major key. Most of the closest regions are based on modes that share their diatonic scale with the tonic major. Like the modes, the regions substitute or replace one or two natural tones with artificial ascending and/or descending leading tones in order to "simulate" major and minor tonalities.<sup>368</sup> For example, the dominant region originates as the Mixolydian mode; its minor seventh is replaced by a major seventh or ascending leading tone, making the dominant a major-like region. The second way in which regions are organically connected to a single tonality is through the interchangeability of major and minor on the same tonic. Schoenberg justifies this relationship as fundamental by pointing to the common dominant that introduces either a major or a minor tonic triad.<sup>369</sup> More remote relationships are generated by applying the interchangeability of major and minor (the parallel relation) and relative major-minor relations. Schoenberg represents these in the horizontal dimension on the Chart of the Regions and the upper and lower dominant relations in the vertical dimension. Note that the relative minor and upper/lower fifth relations from a major tonic are based on the closely-related modes Aeolian, Mixolydian, and Lydian respectively.

The concept of regions also provides a unified basis for harmonic relationships between the principal key and alternate "keys," whether they are strongly established and confirmed, more briefly indicated in a passage of around four to eight measures, or suggested by applied dominants and modal mixture. In each case the degree and nature of the relationship of the region to tonic is based on the Chart of the Regions.

---

<sup>368</sup> Schoenberg, *Structural Functions*, 15-18. See also Schoenberg, *Theory of Harmony*, 175-79.

<sup>369</sup> Schoenberg, *Structural Functions of Harmony*, 51.

A region consists of the same components as a key, but the minimum requirements for its presentation are less than those required for the expression of a key. A region consists of its major or minor scale, including its generative triad, ascending and descending leading tones, and potentially its own harmonic degrees based on its scale. A region is more clearly established by a progression featuring each of the terms of the functional-syntactical model, tonic—pre-dominant—dominant—tonic (T-PD-D-T). However, a region can still be implied by chords featuring its leading tones, without the appearance of the tonic chord itself. The appearance of two distinct chords in the functional model is sufficient to express the region; these include progressions such as V7-I, V-VI, IV-V, and II-V. The triads may appear in any position.

**Scale-content similarity** refers to the number of tones in common between a region's scale and the principal tonic scale or scale of the relevant reference region. This is one criterion for evaluating the centrifugal force generated by a region.

**Sequence of Regions:** See **Modulatory sequence**.

**Spatial-centrifugal force:** Regional dissonance — the conflict and difference between regions — generates spatial-CF forces. Four factors contribute to regional dissonance: (1) the difference between the notes of the scales of the regions; (2) the number of common tones shared by their generative triads; and (3) the degree of dissonance/consonance of the interval between the roots/generative tones of the regions. These latter two factors correlate significantly and have been discussed together as **generative-triad commonality** in Chapter 2. A fourth factor unites these three factors and can be used as the sole determiner of spatial-CF force: counting the number of **fundamental steps** between regions. This criterion can be used for measuring spatial-CF force between two regions and measuring CF-force generated by a modulatory trajectory to a point of furthest remove or other centrifugal goal region.



**Spatial-centripetal force:** Harmonic motion expressing the principal key for the whole movement or remodulatory motion returning to the principal key generate spatial-CP force.

A **spatial-centrifugal culmination** is a goal region that generates the maximum CF force for a whole movement or large section. The number of fundamental steps between the goal and initiating regions of a modulatory trajectory or between the region and the principal tonic determines its CF force. The point of furthest remove is the spatial-CF culmination for the whole movement.

**Temporal-centripetal force:** corresponds to the degree to which a region is articulated, defined, and substantiated. Degrees of temporal-CP force are generated by a combination of the strength of cadential articulation of the region, the number of progressions expressing it, and in some cases the duration of progressions expressing the region. While spatial-centripetal force requires harmonic motion returning to or expressing the principal key, temporal-CP force can be generated around any region or the principal key.

A **temporal-centripetal culmination** occurs when there is a maximum of temporal-CP force. It refers to the strongest cadential progression confirming a region as a key. Often, temporal-CP culminations feature cadential progressions that are enriched by foreign tones from the regions, generating local spatial-CF force.

**Temporal-centrifugal force:** opposes the cadential articulation of a single prevailing key.

**Modulatory movement** through multiple regions generates temporal-CF force. When there is a modulation from one prevailing key to a new key that is eventually confirmed cadentially, there is often temporal-CF force in the transition connecting them; however, once the new key becomes established, temporal-centrifugal force disappears and only spatial-CF force remains.

## Bibliography

- Agawu, V. Kofi. "Highpoints in Schumann's *Dichterliebe*." *Music Analysis* 3 (1984): 159-180.
- Agawu, V. Kofi. *Playing with Signs: A Semiotic Interpretation of Classic Music*. Princeton: Princeton University Press, 1991.
- Agmon, Eyton. *The Languages of Western Tonality*. Berlin: Springer, 2013.
- Aldwell, Edward and Carl Schachter. *Harmony and Voice Leading*. 3rd edition U.S.A.: Thomson & Schirmer, 2003.
- Alegant, Brian. "A-Major Events." In *Keys to the Drama: Nine Perspectives on Sonata Form*. Edited by Gordan Sly, 199-224. Farnham, UK: Ashgate, 2009.
- Bach, Carl Philip Emanuel. *Essay on the True Art of Playing Keyboard Instruments*. Translated by William J. Mitchell. New York: W.W. Norton, 1762/1949.
- Badura-Skoda, Eva. "Schubert's Piano Music." In *Nineteenth Century Piano Music*. Edited by Larry Todd. New York and London: Routledge, 2004.
- Baker, Nancy. "'Der Urstoff der Musik': Implications for Harmony and Melody in the Theory of Heinrich Koch." *Music Analysis* 7/1 (1988): 3-30.
- Beethoven, Ludwig van. *Complete Piano Sonatas, vol. 1*. Edited by Heinrich Schenker. New York: Dover Publications, 1975.
- Berman, Boris. *Notes from the Pianist's Bench*. 2nd edition. New Haven: Yale University Press, 2017.
- Bernstein, David. "Nineteenth-Century Harmonic Theory: the Austro-German Legacy." In *Cambridge History of Western Music Theory*, edited by Thomas Christensen, 778-811. Cambridge: Cambridge University Press, 2002.
- Burnham, Scott. "A. B. Marx and the Gendering of Sonata Form." In *Music Theory in the Age of Romanticism*. Edited by Ian Bent, 163-186. New York: Cambridge University Press, 1996.
- Burnham, Scott. "The Role of Sonata Form in A. B. Marx's Theory of Form." *Journal of Music Theory* 33/2 (1989): 247-271.
- Burstein, Poundie. "The Half Cadence and Related Analytical Fictions." in *What is a Cadence? Theoretical and Analytical Perspectives on Cadences in the Classical Repertoire*. Edited by Markus Neuwirth and Pieter Biergé, 85-116. Leuven: Leuven University Press, 2015.

- Campbell, Joseph. *The Hero with a Thousand Faces*. Princeton: Princeton University Press, 1949.
- Caplin, William. *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart and Beethoven*. New York: Oxford University Press, 1998.
- Caplin, William. "The Classical Cadence: Conceptions and Misconceptions." *Journal of the American Musicological Society* 57/1 (2004): 51-118.
- Carpenter, Patricia. "Grundgestalt as Tonal Function." *Music Theory Spectrum* 5 (1983): 15-38.
- Carpenter, Patricia. "A Problem in Organic Form: Schoenberg's Tonal Body." *Theory and Practice* 13 (1988): 31-63.
- Chafe, Eric. *Tonal Allegory in the Vocal Music of J. S. Bach*. Berkeley, CA: University of California Press, 1991.
- Cherlin, Michael. "Dialectical Opposition in Schoenberg's Music and Thought." *Music Theory Spectrum* 22/2 (2000): 157-176.
- Christensen, Thomas. *Rameau and Musical Thought in the Enlightenment*. Cambridge: Cambridge University Press, 1993.
- Cohen, David E. "'The Imperfect Seeks its Perfection': Harmonic Progression, Directed Motion and Aristotelian Physics." *Music Theory Spectrum* 23/2 (2001): 139-169.
- Cohn, Richard. *Audacious Euphony: Chromatic Harmony and the Triad's Second Nature*. New York: Oxford University Press, 2012.
- Cohn, Richard. "Uncanny Resemblances: Tonal Signification in the Freudian Age." *Journal of the American Musicological Society* 57/2 (2004): 285-324.
- Covach, John. "Schoenberg and the Occult: Some Reflections on the Musical Idea." *Theory and Practice* 17 (1992): 103-118.
- Covach, John. "The Sources of Schoenberg's 'Aesthetic Theology.'" *19<sup>th</sup>-Century Music* 19/3 (1996): 252-262.
- Dahlhaus, Carl. *Studies on the Origin of Harmonic Tonality*. Translated by Robert O. Gjerdingen. Princeton: Princeton University Press, 1990.
- Damschroder, David. *Harmony in Schubert*. New York: Cambridge University Press, 2010.
- Dante, Alighieri. *Inferno*. Translated by Henry Wadsworth Longfellow. San Diego: Canterbury Classics, 2013/1867.

Dineen, Murray. "Tonal Problem as a Method of Analysis." *Theory and Practice* 30 (2005): 69-96.

Eigeldinger, Jean-Jacques, ed. *Chopin: Pianist and Teacher as Seen by his Pupils*. Translated by Naomi Shohet, Krycia Osostowicz and Roy Howat. 3rd edition. New York: Cambridge University Press, 1986.

Ferris, David. "C.P.E. Bach and the Strange Art of Modulation." *Music Theory Spectrum* 22/1 (2000): 60-88.

Fétis, François-Joseph. *Complete Treatise on the Theory and Practice of Harmony*. Translated by Peter M. Landey. Hillsdale, NY: Pendragon, 2008/1844.

Goethe, Johann Wolfgang von. *Faust: Part Two*. Translated by Philip Wayne. Middlesex: Penguin, 1959.

Goethe, Johann Wolfgang von. *Scientific Studies*. Edited and translated by Douglas Miller. New York: Suhrkamp, 1988.

Gray, Ronald D. *Goethe the Alchemist: A Study of Alchemical Symbolism in Goethe's Literary and Scientific Works*. Cambridge: Cambridge University Press, 1952.

Harmon, William. *A Handbook to Literature*. 11th edition. New Jersey: Prentice Hall, 2009.

Harrison, Daniel. *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of its Precedents*. Chicago: Chicago University Press, 1994.

Hatten, Robert. *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert*. Bloomington IN: Indiana University Press, 2004.

Hatten, Robert. *Musical Meaning in Beethoven: Markedness, Correlation and Interpretation*. Bloomington, IN: Indiana University Press, 1994.

Hauptmann, Moritz. *The Nature of Harmony and Meter*. Translated by W. E. Heathcote. London: Swan Sonnenschein & Co., 1888.

Hayes, Deborah. *Rameau's Theory of Harmonic Generation; An Annotated Translation and Commentary of Génération harmonique by Jean-Phillipe Rameau*. Ph.D. Dissertation. Stanford University, 1968.

Hepokoski, James, and Warren Darcy. *Elements of Sonata Theory: Norms, Types and Deformations in the Late Eighteenth Century Sonata*. New York: Oxford University Press, 2006.

Hyer, Brian. "Key (i)." *Oxford Music Online* (2001). Retrieved May 10, 2019, from <https://www-oxfordmusiconline->

com.ezproxy.gc.cuny.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000014942.

Hyer, Brian. "Tonality." In *Cambridge History of Western Music Theory*. Edited by Thomas Christensen, 726-752. Cambridge: Cambridge University Press, 2002.

Johnston, Blair. "Harmony and Climaxes in the Late Works of Sergei Rachmaninoff." Ph.D. Dissertation. University of Michigan, 2009.

Kirnberger, Johann Philipp. *Die Kunst des reinen Satzes, vol. I*. Berlin, 1771. Reprint, Hildesheim: Olms, 1968.

Kirnberger, Johann Philipp. *The Art of Strict Musical Composition*. Translated by David Beach and Jürgen Thym. New Haven: Yale University Press, 1982.

Koch, Heinrich. *Introductory Essay on Composition*. Translated by Nancy Baker. New Haven: Yale University Press, 1983.

Koch, Heinrich. *Versuch einer Anleitung zur Composition*. 3 vols. Leipzig: A. F. Böhme, 1782-93.

Kollmann, Augustus Frederic Christopher. *Essay on Practical Musical Composition*. New York: Da Capo, 1973/1799.

Kopp, David. *Chromatic Transformations in Nineteenth Century Music*. New York: Cambridge University Press, 2002.

Kurth, Ernst. *Ernst Kurth: Selected Writings*. Translated by Lee A. Rothfarb. New York: Cambridge University Press, 1991.

Kurth, Ernst. *Romantische Harmonik und ihre Krise in Wagners "Tristan."* Berlin: M. Hesse, 1923.

Lester, Joel. *Compositional Theory in the Eighteenth Century*. Cambridge, MA: Harvard University Press, 1992.

Lhevinne, Joseph. *Basic Principles in Pianoforte Playing*. New York: Dover, 1972.

Linnala, Eino. *Soinnutuksen perusteet* [Fundamentals of Harmony]. Jyväskylä: Gummerus, 1950.

Marx, A. B. *Die Lehre von der musikalische Komposition, vol. III*. Leipzig: Breitkopf & Härtel, 1841-51.

McCreless, Patrick. "Musical structure and musical rhetoric in Schubert's String Quartet in G major, D. 887." *Music Theory and Analysis* 2/1 (2015): 1-36.

- McCreless, Patrick. "Syntagmatics and Paradigmatics: Some Implications for the Analysis of Chromaticism in Tonal Music." *Music Theory Spectrum* 13/2 (1991): 147-178.
- Miller, Douglas. "Introduction." In Johann Wolfgang von Goethe, *Scientific Studies*. Edited and translated by Douglas Miller. New York: Suhrkamp, 1988.
- Mitchell, William. "Modulation in C.P.E. Bach's *Versuch*." In *Studies in Eighteenth-Century Music: A Tribute to Karl Geiringer on His Seventieth Birthday*. Edited by H. C. Robbins Landon and Roger E. Chapman, 333-342. New York: Da Capo, 1970.
- Neff, Severine. "Schoenberg and Goethe: Organicism and Analysis." In *Music Theory and the Exploration of the Past*. Edited by Christopher Hatch and David Bernstein, 409-434. Chicago: Chicago University Press, 1993.
- Neff, Severine. "Schoenberg as Theorist: Three Forms of Presentation." In *Schoenberg and His World*. Edited by Walter Frisch, 55-84. Princeton: Princeton University Press, 1999.
- Pastille, William. "Music and morphology: Goethe's influence on Schenker's thought." In *Schenker Studies*. Edited by Hedi Siegel, 29-44. New York: Cambridge University Press, 1990.
- Quantz, Johann Joachim. *Essay of a Method for Playing the Travers Flute, Accompanied by Several Remarks of Service for the Improvised Good Taste in Practical Music*. Translated by Edward R. Reilly. 2nd edition. Boston: North Eastern University Press, 2001.
- Rameau, Jean-Phillipe. *Code de musique pratique*. Paris: Imprimerie royale, 1760.
- Rameau, Jean-Phillipe. *Decoding Rameau: Music as a Sovereign Science: A Translation with Commentary of Code de musique pratique and Nouvelles réflexions sur le principe sonore (1760)*. Translated by Mark Howard. Liberia Musicale Italiana: Lucca, 2016.
- Rameau, Jean-Phillippe. *Génération harmonique ou traité de musique theorique et pratique*. Paris: Prault fils, 1737.
- Rameau, Jean-Phillippe. *Observations sur notre instinct pour la musique*. Paris: Prault fils, 1754.
- Rameau, Jean-Phillippe. *Treatise on Harmony*. Translated by Philip Gossett. New York: Dover Publications, 1971.
- Ratner, Leonard. *Classic Music: Expression, Form and Style*. New York: Schirmer, 1980.
- Ratner, Leonard. *Harmony: Structure and Style*. New York: McGraw-Hill, 1962.
- Ratner, Leonard. *Music: The Listener's Art*. 2nd edition. New York: McGraw-Hill, 1966.
- Rings, Steven. *Tonality and Transformation*. New York: Oxford University Press, 2011.

- Rosen, Charles. *Beethoven's Piano Sonatas: A Short Companion*. New Haven: Yale University Press, 2002.
- Rosen, Charles. *The Classical Style*. Expanded edition. New York: W. W. Norton, 1997.
- Rosen, Charles. *Romantic Generation*. Cambridge, MA: Harvard University Press, 1995.
- Rosen, Charles. *Sonata Forms*. Revised edition. New York: W.W. Norton, 1988.
- Rothfarb, Lee. "Energetics." In *Cambridge History of Western Music Theory*. Edited by Thomas Christensen, 927-955. Cambridge: Cambridge University Press, 2002.
- Rothfarb, Lee. *Ernst Kurth as Theorist and Analyst*. Philadelphia: University of Pennsylvania, 1988.
- Salm, Peter. *The Poem as Plant, a Biological View of Goethe's Faust*. Cleveland: Press of Case Western Reserve University, 1971.
- Schachter, Carl. "Analysis by Key: Another Look at Modulation." *Music Analysis* 6/3 (1988): 289-318.
- Schenker, Heinrich. *Harmonielehre*. Vienna: Universal, 1906.
- Schenker, Heinrich. *Harmony*. Edited by Oswald Jonas. Translated by Elizabeth Mann Borgese. Chicago: University of Chicago Press, 1954.
- Schoenberg, Arnold. *Harmonielehre*. Wien: Universal Edition, 1922.
- Schoenberg, Arnold. *The Musical Idea: The Logic, Technique and Art of its Presentation*. Translated with commentary by Patricia Carpenter and Severine Neff. New York: Columbia University Press, 1995.
- Schoenberg, Arnold. *Structural Functions of Harmony*. Edited by Leonard Stein. Revised edition. New York: W.W. Norton, 1969.
- Schoenberg, Arnold. *Theory of Harmony*. Translated by Roy E. Carter. Berkeley: University of California Press, 1986.
- Sessions, Roger. *Harmonic Practice*. New York: Harcourt & Brace, 1951.
- Steblin, Rita. *A History of Key Characteristics in the Eighteenth and Nineteenth Centuries*. Ann Arbor, MI: UMI Research Press, 1983.
- Taruskin, Richard. "Chapter 11: The Composer's Voice." In *Music in the Seventeenth and Eighteenth Centuries*. New York: Oxford University Press, 2010. Retrieved 1 Apr. 2019, from

<http://www.oxfordwesternmusic.com.ezproxy.gc.cuny.edu/view/Volume2/actrade-9780195384826-div1-12005.xml>

Taruskin, Richard. "Chapter 12: The First Romantics." In *Music in the Seventeenth and Eighteenth Centuries*. New York: Oxford University Press, 2010. Retrieved 1 Apr. 2019, from <http://www.oxfordwesternmusic.com.ezproxy.gc.cuny.edu/view/Volume2/actrade-9780195384826-div1-11004.xml>.

Tovey, Donald Francis. *Companion to Beethoven's Pianoforte Sonatas*. London: Associated Board, 1931.

Tovey, Donald Francis. "Harmony." In *the Forms of Music: Articles from the Encyclopedia Britannica*, 44-71. Oxford: Oxford University Press, 1957.

Tovey, Donald Francis. "Tonality in Schubert." In *Mainstream of Music and Other Essays*, 134-159. New York: Oxford University Press, 1949.

Türk, Daniel Gottlob. *School of Clavier Playing*. Translated by Raymond H. Hagg. Lincoln, NE: University of Nebraska Press, 1982.

Wason, Robert. *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg*. Ann Arbor, MI: UMI Research Press, 1985.

Weber, Gottfried. *An Attempt at a Systematically Arranged Theory of Musical Composition*. 2nd edition. Translated by James. F. Warner. Boston: J. H Wilkins & R.B. Carter, 1842.