Harmonic Function: Hugo Riemann and his Czech Reception

by

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Dedication

For my wife and children

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Abstract

Harmonic function is a problematic locution. Despite its ubiquity, and that fact that scholars and pedagogues largely assume a shared intuitive understanding of harmonic function, there is little agreement on its meaning and scope. I seek to offer a critical intervention in the field of music theory by undertaking to answer the music-philosophical question of what harmonic function is. Towards that end, I provide a history and critical overview of the Czech tradition of conceptualizing harmonic function up to Janeček's *Základy moderní harmonie*. I begin with Riemann, as the progenitor of harmonic function in general and thus of the Czech tradition as well. I demonstrate, in contrast to prevailing accounts of Riemann's work, that his *Funktionstheorie* is meant to synthesize his most distinctive ideas about harmony (function symbols as a replacement for *Stufentheorie*, his *Kadenzlehre*, his *Harmonieschritte*, his harmonic dualism, and his conception of *Tonalität*), and that this synthesis is facilitated by his foundational analogy between tone relationships and chord relationships. I then examine the work of Otakar Šín, who imported the concept of harmonic function into the Czech lands, but of course, not without first adapting Riemann's *Funktionstheorie* to his own preferences. Reading across two editions of Šín's *Nauka*, I show the variety of ways that Šín either maintained, jettisoned, or repurposed aspects of Riemann's *Funktionstheorie*. I proceed to the harmonic function theory of Karel Janeček, who built on Šín's combination-function labels to create a novel theory featuring a total of five different harmonic functions. I ultimately provide a framework for conceiving of theories of harmonic function according to their capacity to describe pitch-class content, harmonic syntax, and voice-leading between subsequent harmonies.

Chapter 1 Introduction

Harmonic function is a problem. On the one hand, the word "function" pervades music-theoretical research and pedagogy today. Many anglophone harmony textbooks invoke harmonic function.[1] These include texts by authors like: L. Poundie Burstein and Joseph N Straus; Robert Gauldin; Kevin Holm-Hudson; Job IJzerman; Stefan Kostka, Dorothy Payne, and Byron Almén; Steven G. Laitz; Elizabeth Marvin and Jane Piper Clendinning; Miguel Roig-Francolí; and Ralph Turek and Daniel McCarthy.[2] The term is not isolated to only North American music theory pedagogy however—Ludwig Holtmeier explains that the term can be found in texts across Russia, Belgium, the Netherlands, France, Switzerland, Italy, England, Ireland, Denmark, the Czech lands, and even "all of Latin America."[3] The term function is also ubiquitous in music theory scholarship. To list only a small selection of examples: many scholars address the term historically, like Alexander Rehding; many address it for analytical purposes, like J. P. E. Harper-Scott and Oliver Chandler; while others approach the term using computational approaches, like Christopher WM. White and Ian Quinn.[4] The term also appears in a variety of sub-fields of music theory. Again, to list only a few

[1] Both Eytan Agmon and Thomas Jul Kirkegaard-Larsen mention a notable exception to this–the textbook by Edward Aldwell, Carl Schachter, and Allen Cadwallader. However, Agmon argues that "careful study of this text reveals that beneath the surface there is more than a trace of functionalism in its approach." Agmon, "Functional Harmony Revisited: A Prototype-Theoretic Approach," 197; Kirkegaard-Larsen, "The Influence of Riemann (and Richter) on Music Theory in Scandinavia," 102; Aldwell, Schachter, and Cadwallader, *Harmony & Voice Leading*.

[2] Burstein and Straus, *Concise Introduction to Tonal Harmony*, 2016; Clendinning and Marvin, *The Musician's Guide to Theory and Analysis*; Gauldin, *Harmonic Practice in Tonal Music*, 2004; Holm-Hudson, *Music Theory Remixed: A Blended Approach for the Practicing Musician*; IJzerman, *Harmony, Counterpoint, Partimento: A New Method Inspired by Old Masters*; Kostka, Payne, and Almén, *Tonal Harmony: With an Introduction to Twentieth-Century Music*; Kostka, Payne, and Almén; Laitz, *The Complete Musician: An Integrated Approach to Theory, Analysis, and Listening*; Roig-Francolí, *Harmony in Context*; Turek and McCarthy, *Theory for Today's Musician*.

[3] Holtmeier, "The Reception of Hugo Riemann's Music Theory."

[4] Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*; Harper-Scott and Chandler, *Return to Riemann: Tonal Function and Chromatic Music*; White and Quinn, "Chord Context and Harmonic Function in Tonal Music."

representative examples: harmonic function figures into the research of musical form, like in the work of William Caplin; the term is now common in North American Schenkerian thought, as exemplified by Cadwallader and Gagné's Schenkerian textbook; it also features heavily into scholarship on rock and other popular musics, like in the work of Drew Nobile.[5] The concept is indisputably attractive, as its ubiquity attests.

Yet, music theorists disagree on what function is and how it operates. Many authors emphasize that function denotes the harmonic behavior of chords—that is, which chords can lead to which, in the manner of Kostka and Payne's chord-progression flowchart.[6] For others function governs the construction of phrases. Steven Laitz writes, for instance: "The harmonic motion of tonic (T), through pre-dominant (PD), to dominant and tonic at the cadence (D or D-T) guides a phrase from its beginning to its cadence and is called the phrase model."[7] Eytan Agmon provides a different view, stating that his theory of harmonic functions "is stripped of any chord-progressional connotations" and instead provides a "prototype-theoretic account of harmonic functions."[8] Daniel Harrison suggests that function is both a matter categorizing chords and describing their behavior. He states that functions "are harmonic labels denoting perceptual impressions" of "chords and tonal combinations [that] sound and behave alike."[9] As another example of the different ways music theorists conceive of harmonic function, consider John Gabriel Miller, as well as Ian Quinn and Panayotis Mavromatis, who explore the possibility that harmonic function is determined by voice leading.[10]

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[5] Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven*; Cadwallader and Gagné, *Analysis of Tonal Music: A Schenkerian Approach*; Nobile, "Harmonic Function in Rock Music: A Syntactical Approach."
[6] Kostka, Payne, and Almén, *Tonal Harmony with an Introduction to Twentieth-Century Music*, 105.
[7] Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening*, 200.
[8] Agmon, "Functional Harmony Revisited: A Prototype-Theoretic Approach," 199–202.
[9] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 36–37.
[10] Miller, "The Death and Resurrection of Function"; Quinn and Mavromatis, "Voice-Leading Prototypes and Harmonic Function in Two Chorale Corpora."

That harmonic function has multiple and fluid definitions is not unique to recent American music theory. After Hugo Riemann first introduced the concept, the idea of harmonic function spread not only to the United States, but also across Europe, to Russia, and even as far as China.[11] While some scholars simply translated Riemann's work, others adapted Riemann's *Funktionstheorie* to their own purposes. Theorists like Hermann Erpf and Sigfrid Karg-Elert expanded harmonic function to account for increasingly chromatic music.[12] Others, like Hermann Grabner and many of his contemporaries sought to separate harmonic function from some of Riemann's more controversial ideas—undertones, harmonic dualism, or the *Schritt und Wechsel* system.[13] To provide only one example from outside of Germany, Thomas Kirkegaard-Larsen identifies at least five contrasting approaches to function theory in Scandinavian countries alone.[14] This list of adaptors of Riemann's theory of harmonic function could be readily extended.

The problem of harmonic function is that despite its ubiquity, and the tendency of theorists to assume a mutual and intuitive understanding of the locution's use, it is extremely mutable. David Kopp statement from 1995 still holds true today:

> Function is a suggestive term which is still inspiring creative work in theory after over a century of use. But careful definition and elaboration is crucial. The term carries so many associations for us that it is difficult not to read some of them into the historical subject, thereby occluding perception of subtle yet important differences from our own views. Even if we know exactly what we mean, there is no guarantee that our reader will accurately grasp our meaning when we use the term without scrupulous qualification, since there are so many acceptable interpretations of the concept. Furthermore, the widespread and casual use of the

[11] Riemann, "Die Neugestaltung der Harmonielehre"; Schröder, "Researching the Transfer of Central-European Music Theory and Composition Treatises to China."
[12] Erpf, *Studien zur Harmonie- und Klangtechnik der neueren Musik*; Karg-Elert, *Polaristische Klang- und Tonalitätslehre (Harmonologik)*.
[13] Grabner, *Die Funktionstheorie Hugo Riemanns und ihre Bedeutung für die praktische Analyse*.
[14] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 89–94.

> term nowadays has diminished its descriptive power. It may prove helpful to investigate our assumptions and more clearly articulate and differentiate the myriad concepts which function has come to represent for us.[15]

That the term "function" is so mutable becomes less surprising if you consider that nearly every ambiguity or problem explored in the subsequent literature is latent in Riemann's own writings. Take, for example, the disagreement about whether harmonic function is associated with harmonic syntax. Some authors have argued that Riemann's functions have nothing to do with chord progressions.[16] In contrast, Alexander Rehding holds that "in Riemann's thought cadential order did serve a supremely important purpose."[17] Scholars similarly disagree on whether Riemann's doctrine of harmonic function commits him to harmonic dualism. Many scholars have followed Ary Belinfante in suggesting that Riemann's assignment of primary harmonic functions is not in fact dualist, while Henry Klumpenhouwer suggests that the opposite is true.[18] Another disagreement arises when assessing the chromatic limits of Riemann's approach. Daniel Harrison, for example, states that "a student of Riemann's system can analyze virtually any chord into any one of the three functions should the occasion demand."[19] Kopp, on the other hand, argues that Riemann's function theory has a diatonic basis that is at odds with Riemann's earlier views on the equality of chromatic and diatonic relations.[20]

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[15] Kopp, "On the Function of Function," 15. This is also quoted in Miller, "The Death and Resurrection of Function," 32.
[16] Dahlhaus, "Terminologisches zum Begriff der harmonischen Funktion"; Kopp, "On the Function of Function."
[17] Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*, 67.
[18] Belinfante, "De leer der tonale functien in conflict met die der polaire tegenstelling."; Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative."
[19] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 284.
[20] Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 179.

I observe, here and across my dissertation, that the disagreements in theories of harmonic function since Riemann, and in historical examinations of Riemann's own theory, concern the extent to which harmonic function can describe:

1) Pitch-class content
2) Harmonic syntax
3) Voice leading between successive chords

Generally speaking, works of Riemann reception, both novel theories of harmonic function and historical accounts of Riemann's *Funktionstheorie* alike, tend to treat these three aspects as separate, or at least separable, matters. For example, neo-Riemannian theory separates the ability to describe voice leading between chords from the other two aspects by adopting and adapting Riemann's *Harmonieschritte*.[21] Many North American theories of harmonic function emphasize harmonic function's ability to describe harmonic syntax. Most other theories of function focus instead on pitch-class content. The tendency to separate out these three aspects of harmonic function is also typical in histories of Riemann's *Funktionstheorie*. In contrast to the typical understanding of Riemann's *Funktionstheorie*, I will show in Chapter 2 that these three aspects are in fact inextricable, in Riemann's mind at least.

I am not proposing, however, that the solution to the problem of harmonic function is simply a return to Riemann. I acknowledge that there are a variety of theories of harmonic function, and that they invoke the term's ability to describe pitch-class content, harmonic syntax, and voice leading and different ways. Instead, I am suggesting that theories of harmonic function can describe these three aspects simultaneously and that we can understand theories of function according to

[21] Riemann's *Harmonieschritte* are a body of triad transformations that can transform any one chord into any other chord. They are most famously described in Riemann, *Skizze einer neuen Methode der Harmonielehre*.

how they implement these aspects. I also suggest that by examining many theories of harmonic function, we can begin to generalize about how theories work.

To restate the problem in another way: if the problem of harmonic function began with Riemann, then addressing it should begin with Riemann as well. Yet interpreting Riemann poses its own difficulties. As Harrison notes, "the celebrated inventor of the theory of harmonic function, Riemann so confused its explanation that the idea virtually self-deconstructs, leaving conflicting motivations—some noble, some mean—strewn across his field of discourse."[22] In addition to returning to Riemann then, another way to answer these questions is to examine how they played out in the reception of Riemann's ideas. Many of his followers had to confront the same questions when developing their own approach to harmonic function, and we can read their approaches as glosses both on Riemann's approach and on function in general.

One such tradition played out in Czech music theory in the twentieth century. Almost unknown outside of the Czech Republic, this literature merits examination: it is both intellectually and geographically close to the German function tradition, yet isolated due to politics and language; and it is unique in the way it attempts to maintain the connection between pitch-class content, harmonic syntax, and voice leading, despite many changes to Riemann's original theory. Otakar Šín (1881–1943), a Prague-based composer, theorist, and pedagogue, initiated the Czech tradition of Riemann reception. In the first edition of his *Nauka o harmonii na základě melodie a rytmu* (1922), Šín attempts to maintain the surface-level features of Riemann's *Funktionslehre*, such as Riemann's function labels, while discarding more foundational aspects like harmonic dualism and the necessity of a consonant tonic chord.[23] In the second edition (1933) however, Šín fully departs from Riemann's *Nebenklänge* labels and instead purposes his own combination function approach to

[22] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 253.
[23] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922.

labeling neighbor triads.[24] Karel Janeček (1903–1974), likewise a composer, theorist, and professor at the Conservatory in Prague, took up Šín's combination function approach. In *Základy moderní harmonie* (1965), Janeček expands the chromatic limits of harmonic function.[25] He does so by proposing two new functions (Phrygian and Lydian) and then using the resulting set of five categories to assign a function to any chord relative to any key in the equal-tempered system. Janeček's approach would inspire several later Czech theorists whose work lies outside the scope of this dissertation.

In this dissertation, I provide a history and critical overview of the Czech tradition of conceptualizing harmonic function up to Karel Janeček's *Základy*. I examine the writings of Riemann—as the progenitor of harmonic function in general and thus of the Czech tradition as well—as well as those of Šín and Janeček. I offer a close re-reading of Riemann's *Vereinfachte Harmonielehre* that provides a necessary corrective to Riemann scholarship and encourages us to think of Riemann's *Funktionslehre* as the intersection and mutual dependence of pitch-class content, harmonic syntax, and voice leading (Chapter 2).[26] I then examine the theories of Šín (Chapter 3) and Janeček (Chapter 4) with respect to these three aspects. I conclude by suggesting how these readings encourage us to reconceive theories of harmonic function in general (Chapter 5). While the groundwork of this dissertation is historical, my ultimate goal is a critical intervention in the field of music theory in which I undertake to answer the music-philosophical question of what harmonic function is.

[24] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*.
[25] Janeček, *Základy moderní harmonie*.
[26] Riemann, *Vereinfachte Harmonielehre*.

1.1 Three aspects of harmonic function

In this section I expand on my claim that theories of harmonic function tend to differ on how (and whether) they describe pitch-class content, harmonic syntax, and voice leading between successive chords. In so doing, I will provide some necessary background both on the many theories of harmonic function and on the scholarship concerning harmonic function. Given the ubiquity of the locution, and the tendency of theorists to assume a mutual and intuitive understanding of its use, it is important to acknowledge the lack of music-theoretical consensus concerning the its precise meaning and usage.

First, harmonic functions can serve to label chords by uniquely specifying the pitch-class content of those chords. For example, a dominant chord label (D) in the key of C major expresses that the chord in question contains the pitch classes [G, B, D].[27] Second, harmonic function concerns harmonic syntax. This is the capacity of a function symbol to communicate a chord's role within a harmonic progression. For example, a dominant chord label (D) in the key of C major expresses that, among other things, the chord in question is unlikely to be followed by a subdominant chord.

I will also suggest that pitch-class content and harmonic syntax lie on opposite ends of a continuous spectrum. On the pitch-class content end of this spectrum lie annotation systems that express pitch-class content without contextual information. In the purest form of such a system, there is a 1:1 correspondence between symbol(s) and pitch content. An extreme example of this is western music notation, where there is a 1:1 correspondence between how a chord is notated and its pitch content. This notation does not necessarily imply or require contextual information about a chord, such as the prevailing key or the pitch content of the surrounding chords, to accurately

[27] Alternatively, one could instead say that the label "D" expresses the combination of scale degrees 5, 7, and 2, which once we are given the key of C major, we understand as the pitch classes [G, B, D]. However, the point is that function symbols can give us pitch-class content information.

convey its pitch content. On the harmonic-syntax end of the spectrum would lie annotation systems with symbols that convey only syntactical information about a chord without providing any information about pitch content. It is difficult to imagine an example that truly does not provide any information about pitch content, but a well-known example that moves towards that end of the spectrum is the "passing six-four" label (P^6_4), used to describe any second inversion harmony connecting two inversions of another triad. For example, in C major, P^6_4 could indicate a second inversion G+ triad between a root-position and first-inversion C+ triad, or it could indicate a second inversion C+ triad between a first-inversion and root-position D- triad, among other possibilities.[28] The label P^6_4 has the potential to indicate a variety of pitch-class combinations in the same key.

Most theories of harmony lie towards the middle of my hypothetical spectrum. Roman-numeral analysis, for example, tends towards describing pitch-class content, but not entirely without considering harmonic syntax. For Roman numerals to convey information about specific pitch-class content, a key must be specified—for example, the symbol V7 does not convey the pitch-class content of a chord until a key is specified. The key is, in this example, contextual information. Another example is the cadential V^6_4 label. In C major, the pitch classes [C, E, G] could be labeled with a I^6_4 (as a passing six-four) or a V^6_4 (as a cadential six-four), depending on their harmonic context.

The third aspect that harmonic function can describe is voice leading between successive chords. For example, it is not uncommon for theories of harmonic function to associate the dominant chord with its voice leading to the tonic chord. That is, with the dominant [G, B, D] and

[28] In this triad labeling system, triads are designated according to their roots. "+" indicates major quality and "-" indicates minor quality. For example, G+ represents the triad [G, B, D].

the tonic [C, E, G] in C major, the G is maintained as a common tone, the B and C are in a half-step relationship, and the D and E are in a whole-step relationship.

Riemann reception, here broadly construed to encompass both novel post-Riemannian theories of harmonic function and historical accounts of Riemann's *Funktionstheorie*, can be divided into European and North American traditions. The European tradition is characterized by a relative similarity to Riemann's original *Funktionstheorie*, especially in the way that these theorists continue to use harmonic functions to describe the pitch-class content of chords. However, they do tend to dissociate harmonic function from both Riemann's *Harmonieschritte* and his harmonic dualism. The best documented of these traditions is the German reception.[29] This line includes theories by Johannes Schreyer, Rudolf Louis and Ludwig Thuille, Eugen Schmitz, Hermann Grabner, Wilhelm Maler, and Diether de la Motte.[30] Notable exceptions include Erpf and Klarg-Elert, who embrace *both* Riemann's dualism and his *Harmonieschritte*.[31] Outside of Germany, but still broadly within Europe, Riemann's Russian reception has likely received the most attention, as in the work of Wendeline Bitzan, Ellen Bakulina, Philip Ewell, Christopher Segall.[32] Several authors—including Wei Ling Cheong and Ding Hong; Wang Ying and Nikola Komatović; and Gesine Schröder—address this Russian reception in conjunction with Riemann's Chinese reception, noting that the concept of

[29] Arntz, *Hugo Riemann (1849–1919): Leben, Werk Und Wirkung*; Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*; Holtmeier, "From 'Musiktheorie' to "Tonsatz': National Socialism and German Music Theory after 1945"; Kirkegaard-Larsen, "Analytical Practices in Western Music Theory"; Wason, *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg*.

[30] Schreyer, *Von Bach Bis Wagner: Ein Beitrag Zur Psychologie Des Musikhörens*; Louis and Thuille, *Harmonielehre*; Schmitz, *Harmonielehre Als Theorie, Ästhetik Und Geschichte Der Musikalischen Harmonik*; Grabner, *Die Funktionstheorie Hugo Riemanns und ihre Bedeutung für die praktische Analyse*; Maler, *Beitrag zur Harmonielehre*; Motte, *Musikalische Analyse, mit kritischen Anmerkungen von Carl Dahlhaus*.

[31] Erpf, *Studien zur Harmonie- und Klangtechnik der neueren Musik*; Karg-Elert, *Polaristische Klang- und Tonalitätslehre (Harmonologik)*.

[32] Bitzan, "Sonatentheorien des Ostens. Zum Transfer einer westeuropäischen Formidee nach Russland und die Sowjetunion bis 1945."; Bakulina, "The 'Brigade Textbook:' Disseminating the Riemannian Legacy in the Russian-Soviet Theoretical Tradition"; Ewell, "Harmonic Functionalism in Russian Music Theory: A Primer"; Segall, "Expanding Harmonic Function: Yuri Kholopov's Twelve-Step System."

harmonic function came to China via a Chinese translation of the Soviet harmony textbooks.[33] Other European traditions have received comparatively less attention, especially in Anglophone music theory. In the case of France and Italy, this is likely because function theory was much less popular there then it was in Central, Northern, and Eastern Europe.[34] The most significant English-language accounts of Riemann's Danish, Norwegian, and Swedish receptions can be found in Kirkegaard-Larsen's work.[35]

Riemann's Czech reception, as well as Czech music theory in general, is mostly unexamined in American music theory. The most notable exceptions are works by Michael Beckerman and Derek Katz, which examine the theoretical writings of Leoš Janáček (1854–1928), the famous Moravian composer, as well as Martin Nedbal's translation of the entire published theoretical works of Leoš Janáček.[36] There is also a small Canadian reception of Karel Janeček, established by the Czech-Canadian composer and student of Janeček, Rudolf Komorous, who promoted Janeček's theories at the University of Victoria.[37] This strand of reception has produced a recent translation of Janeček's *Základy moderní harmonie* (1965) by Jana Skarecky and Anne Hall.[38]

There are several Czech-language sources, though, that discuss the Czech tradition of harmonic function. Emil Hradecký, for example, in his general introduction to harmony gives accounts of Šín's and Janeček's work.[39] Vladimír Tichý also provides an overview of harmonic function in Czech music theory.[40] He surveys Janeček's music-theoretical and pedagogical thinking

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[33] Cheong and Hong, "Sposobin Remains: A Soviet Harmony Textbook's Twisted Fate in China."; Ying and Komatović, "Ein prächtiges Wachstum! Vorbilder, Originalität und Auswirkungen von Igor Sposobins Harmonielehrbuch, unter Berücksichtigung der Situation in China und in Serbien."; Schröder, "Researching the Transfer of Central-European Music Theory and Composition Treatises to China."
[34] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 86–87.
[35] Kirkegaard-Larsen, 89–94.
[36] Beckerman, *Janácek as Theorist*; Katz, *Janácek Beyond The Borders*; Janáček, *The Published Theoretical Works of Leoš Janáček*.
[37] Mackay, "An Overview of Karel Janeček's Foundations of Modern Harmony."
[38] Janeček, *Foundations of Modern Harmony*.
[39] Hradecký, *Úvod do studia tonální harmonie*.
[40] Tichý, "Order, System, Structure, Function and Mutual Interplay of Theory and Practice. On the Primary Attributes of Music-Theoretical and Pedagogical Thinking of Karel Janeček."

in general and credits him as "the key figure for Czech music theory."[41] He also provides an intellectual genealogy, tracing a path from Zarlino, through to Rameau, Riemann, and Šín, and ultimately to Janeček. Aneta Andělová provides a brief overview of Czech theorist of harmonic function and adjacent theories.[42] Karel Risinger criticizes Riemann's, Šín's, and Janeček's approaches because for some of the chords they describe, these approaches allegedly do not "illuminate the direct relationship to the tonic."[43] In response, Risinger proposes a theory of harmonic function with fifteen different functions. Jaroslav Volek was also critical of Janeček. While Volek agree with Janeček that there should be five functions total, Volek suggested that the two new functions should appear on different scale degrees in relationship to tonic than Janeček suggested.[44] Volek suggested that the new functions should be built on chromatic third scale degrees, such as ♭III and ♭VI in major keys.

North American Riemann reception can be broadly divided into three branches, each emphasizing either pitch-class content, harmonic syntax, or voice leading. One is a "Schenker-inspired" tradition, which prioritizes harmonic syntax, the second is neo-Riemannian, which focuses on voice leading, and the final is the more traditionally Riemannian branch, which does not sacrifice the capacity of functions to describe pitch-class content. Kirkegaard-Larsen describes the Schenker-inspired tradition as one in which "the function concept disseminated from Salzer (1952) to Forte (1962), Aldwell and Schachter (1978; 1979), and Guck (1978), from whence it seems to both establish a current of North American function theory, and to assimilate into mainstream Schenkerian theory."[45] Kirkegaard-Larsen argues that this Schenkerian current of North American function theory is fundamentally different from other function theories, in that it concerns the

[41] Tichý, 467.
[42] Andělová, "Různá Hudebně Teoretická Pojetí Harmonické Funkce."
[43] Risinger, *Nástin obecného hudebního funkčního systému rozšířené tonality*, 7.
[44] Volek, *Struktura a osobnosti hudby.*
[45] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 431.

horizontal element of chord behavior, while most other function theories concern the vertical aspect of chord identity. It is this approach to harmonic function that seems to predominate North American music theory pedagogy in textbooks like Robert Gauldin (1997), Steven Laitz (2003), Kostka and Payne (2012), etc.[46]

The key difference between this Schenkerian current and other theories of harmonic function is the introduction of function terms used to indicate harmonic syntax without a direct correlation to pitch-class content. A common example is the argument concerning the terms "subdominant" and "predominant."[47] The term "subdominant" suggests a chord built with the subdominant scale degree as the root, implying a particular scale-degree content to that chord. The term "predominant," on the other hand, suggests a much larger range of possible chords, so long as that chord can syntactically precede a dominant chord. Another example of this includes Fred Lerdahl's approach, in which he posits seven different functions to describing chord behavior.[48] To the three traditional functions (T, S, and D), he adds categories that he labels "departure," "return," "neighbor," and "passing."[49]

I include in this broadly Schenker-inspired category the work of any theorist that aims to separate harmonic context from pitch-class content, even if they do not consider themselves Schenkerians. For example, Drew Nobile takes idea that function concerns harmonic syntax to an extreme by allowing for pre-dominant V chords and dominant IV chords.[50] As he explains, "a chord's function is given more by formal [i.e. positional] considerations than by its internal structure of any specific voice leading motion" (Nobile 2012, 35).[51] Christopher WM White and Ian Quinn

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[46] Gauldin, *Harmonic Practice in Tonal Music*, 2004; Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening*; Kostka, Payne, and Almén, *Tonal Harmony with an Introduction to Twentieth-Century Music*; Burstein and Straus, *Concise Introduction to Tonal Harmony*, 2016.
[47] For more on this argument, see White and Quinn, "Chord Context and Harmonic Function in Tonal Music," 314.
[48] 2001
[49] Lerdahl, *Tonal Pitch Space*, 215.
[50] Nobile, "A Structural Approach to the Analysis of Rock Music."
[51] Nobile, 35.

(2018) take the idea of function-as-context to another extreme by developing a data-driven approach intended to model where individual chords are most likely to progress in different corpora.[52] They "propose a model that takes into account *context only*, ignoring the scale-degree content of chords."[53]

Neo-Riemann theory represents another branch of North American Riemann reception, one in which voice leading is emphasized above both pitch-class content and harmonic syntax. Broadly speaking, neo-Riemannian theory primarily adopts and adapts Riemann's *Harmonieschritte*. David Lewin founded neo-Riemannian theory by proposing its three most important transformations—REL, PAR, and LT—borrowing directly from Riemann. Brian Hyer took up these transformations in a dissertation that famously introduced the equal tempered *Tonnetz*.[54] Later neo-Riemannian theorists, like Henry Klumpenhouwer, David Kopp, and Michael Kevin Mooney, returned to Riemann's writings to clarify the relationship between Riemann's *Harmonieschritte* as a whole and the triadic transformations of Lewin and Hyer.[55] Neo-Riemannian theory has subsequently developed in ways that merge it with transformational and mathematical music theory more generally.[56] In so doing, it has moved ever farther from its putative roots in Riemann's own writings.

Importantly, neo-Riemannian theory is not widely regarded as a branch of harmonic function theory, and many scholars even object to the term "neo-Riemannian." Richard Cohn, for example, finds that the term gives too much credit to Hugo Riemann, when it was "David Lewin's reading of Riemann's Harmonic writings that constituted the originary moments for this branch of theorizing."[57] Similarly, Kopp suggests that it might be better to name neo-Riemannian terms

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[52] White and Quinn, "Chord Context and Harmonic Function in Tonal Music."
[53] White and Quinn, 316.
[54] Lewin, *Generalized Musical Intervals and Transformations*; Hyer, "Tonal Intuitions in 'Tristan Und Isolde.'"
[55] Klumpenhouwer, "Some Remarks on the Use of Riemann Transformations"; Kopp, *Chromatic Transformations in Nineteenth-Century Music*; Mooney, "The 'Table of Relations' and Music Psychology in Hugo Riemann's Harmonic Theory."
[56] Hook, "Uniform Triadic Transformations"; Cohn, *Audacious Euphony: Chromaticism and the Consonant Triad's Second Nature*.
[57] Cohn, *Audacious Euphony: Chromaticism and the Consonant Triad's Second Nature*, xii. Also quoted in Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 107.

according to their real inventor, David Lewin.[58] However, I include neo-Riemannian theory here, not only because the influence of this music-theoretical subfield warrants its mention, but because it serves as an example of how later theorists isolate the various aspects of Riemann's thought. In the case of neo-Riemannian research, it is the aspect of voice leading that scholars emphasize.

The third branch of North American Riemann reception is more traditionally Riemannian, in the sense that it does not sacrifice the capacity of functions to describe pitch-class content. Kirkegaard-Larsen describes it as a line "from [Leonard] Ratner—Harrison—[Kevin] Swindon, characterized by the assignment of function to individual scale degrees: $\hat{1}$ represents tonic function, $\hat{4}$ represents subdominant function, and $\hat{7}$ represents dominant function."[59] I understand this to be a subbranch of a larger body of work characterized by the desire to repurpose Riemann's *Funktionstheorie* to analyze late-Romantic music. Such works include books by Kopp and also by J. P. E. Harper-Scott and Oliver Chandler.[60]

A significant body of work also provide histories of Riemann's reception.[61] I address how my reading of Riemann's *Vereinfachte* differs from those histories in Chapter 2. For now, it will suffice to state that scholars addressing Riemann's *Fuinktionstheorie* generally treat its capacity to describe pitch-class content, harmonic syntax, and voice leading as separable. In contrast, I observe that Riemann's *Funktionstheorie* not only addresses all three of these aspects, but that they are, in fact,

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[58] Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 150–51. Also quoted in Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 107.
[59] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 97; Ratner, *Harmony: Structure and Style*; Swinden, "Toward Analytic Reconciliation of Outer Form, Harmonic Prolongation and Function"; Swinden, "When Functions Collide: Aspects of Plural Function in Chromatic Music."
[60] Kopp, *Chromatic Transformations in Nineteenth-Century Music*; Harper-Scott and Chandler, *Return to Riemann: Tonal Function and Chromatic Music*.
[61] Seidel, "Die Harmonielehre Hugo Riemanns"; Dahlhaus, *Untersuchungen über die Entstehung der harmonischen Tonalität*; Wason, *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg*; Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*; Kopp, *Chromatic Transformations in Nineteenth-Century Music*; Bernstein, "Nineteenth-Century Harmonic Theory: The Austro-German Legacy"; Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*; Holtmeier, "From 'Musiktheorie' to "Tonsatz': National Socialism and German Music Theory after 1945"; Hussong, "Untersuchungen zu praktischen Harmonielehren seit 1945"; Motte-Haber, "Musikalische Logik. Über das System von Hugo Riemann"; Hyer, "What Is a Function."

inextricable from one another. However, a small selection of studies requires specific mention. Kopp, Miller, and Kierkegaard-Larsen are notable because they directly address the fluidity of the term "function."[62] Kopp evaluates three theories of harmony associated with function—that of Jean-Philippe Rameau, Gottfried Weber, and Hugo Riemann. He ultimately argues that using the same term to describe each of them "denatures its [the term "function"] effectiveness."[63] Though Kopp is primarily concerned with evaluating historical theories of harmony, he does so to "investigate our assumptions and more clearly articulate and differentiate the myriad concepts which function has come to represent."[64] Miller takes up Kopp's call for definition and elaboration. In dramatic fashion, he announces "the death of function"—the term—and its resurrection through four different words meant to capture the myriad ways that "function" is currently used. Miller's proposed replacement terms are as follows: "kinship" refers to shared scale degree content between chords; "province" to harmonic syntax; "quality" to chord type; "behavior" to voice leading.[65] Kierkegaard-Larsen provides a broad overview of both post-Riemannian theories of harmonic function and the reception of Schenker's theories. He associates the first with the term "function," which he thinks concerns chord identity, while he associates the later with "functionality," which concerns the horizontal element of chord behavior. He challenges the assumption that "there is a conflictual relationship at all" between these two and seeks instead to provide a mediation of the two approaches.[66]

[62] Kopp, "On the Function of Function"; Miller, "The Death and Resurrection of Function"; Kirkegaard-Larsen, "Analytical Practices in Western Music Theory."
[63] Kopp, "On the Function of Function," 2.
[64] Kopp, 15.
[65] Miller, "The Death and Resurrection of Function," 38.
[66] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 17.

1.2 Chapter outline

In Chapter 2, I examine Riemann's conception of harmonic function. I pay particular attention to the *Vereinfachte Harmonielehre* as the *locus classicus* of, and arguably the most complete formulation of, Riemann's *Funktionstheorie*. As needed, I also draw on a wealth of other texts by Riemann for clarification. My primary intervention in Riemann scholarship is to demonstrate that Riemann's *Funktionstheorie* integrates many of the most significant elements of his thought, despite subsequent music theory treating them as separable. These elements include his function symbols themselves; his *Kadenzlehre* (theory of cadence or harmonic progression), first advanced in the "*Musikalische Logik*" in 1872; his harmonic dualism, already elaborated in his dissertation in 1873, and by extension his *Harmonieschritte*, first developed in his *Skizze einer neuen methode der Harmonielehre* from 1880; and his vision of *Tonalität* unifying fifth and third relations into a single theory.[67] I make this intervention by recognizing that Riemann explicitly describes his theory of harmonic function as a theory of chord relationships that are analogous to the relationships between single tones. In effect, I argue not only that Riemann's *Funktionstheorie* describes pitch-class content, harmonic syntax, and voice leading, but that he has, at least in his mind, synthesized these three aspects with one body of function symbols.

I examine Šín's approach to harmonic function in Chapter 3. His approach demonstrates some of the consequences of separating pitch-class content, harmonic syntax, and voice leading in a theory of harmonic function. In the first edition of *Nauka* (1922), Šín attempts to maintain most of Riemann's *Funktionstheorie* symbols without the theoretical baggage of Riemann's *Harmonieschritte* or

[67] Ries, "Musikalische Logik: Ein Beitrag zur Theorie der Musik"; Riemann, "Über das musikalische Hören"; Riemann, *Skizze einer neuen Methode der Harmonielehre*. Riemann, in later editions of The *Skizze* will add in his *Funktionstheorie* and change the title to Riemann, *Handbuch der Harmonielehre (Zweite, vermehrte Auflage der "Skizze einer neuen Methode der Harmonielehre)*. The first English-language account of Riemann's *Harmonieschritte* appears in Klumpenhouwer, "Some Remarks on the Use of Riemann Transformations."

harmonic dualism.[68] In so doing, Šín's jettisons Riemann's conceptual grounding of function theory, and in its stead provides an idiosyncratic foundation for harmonic function that allows for dissonant tonic chords. The second edition of *Nauka* (1933) constitutes what I consider to be Šín's mature approach to harmonic function and is the text that later Czech theorists built on.[69] In it, Šín departs more freely from Riemann by proposing an approach to labeling secondary triads as combinations of primary functions. I find that Šín, like Riemann, uses functions to describe both pitch-class content and harmonic syntax. However, Šín differs in that his theorizing of harmonic syntax is not an outgrowth of his understanding pitch-class content. Šín also attempts associate voice leading with harmonic function terms, but bizarrely, his musings about voice leading in both editions of *Nauka* have no bearing on his actual theory of harmonic function.

Chapter 4 examines Janeček's approach to harmonic function in *Základy moderní harmonie*. Janeček expressly follows in Šín's footsteps by assuming the possibility of combining harmonic functions. However, he expands on Šín's approach by positing two new primary functions—Phrygian and Lydian. By combining his five primary functions Janeček is able to assign a function to any harmony, including non-tertian chords. In some sense, Janeček's approach serves as another foil to Riemann's; it emerges by comparison just how limited Riemann's approach is in its chromatic scope. However, despite what appear to be very extreme differences from Riemann, closely examining Janeček's approach reveals that his approach is much more Riemannian in its underlying assumptions than that of Šín. Janeček recognizes that Riemann's approach is appropriate to some styles of music and rather than replacing it, attempts to build on it to account for more chromatic music.

[68] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922.
[69] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*.

In Chapter 5, I share my conclusions as to how Šín's and Janeček's theories of harmonic function, in conjunction with my reinterpretation of Riemann's *Functionstheorie*, can help us to understand harmonic function more generally. I make three broad suggestions. First, I propose that it is beneficial to conceive of Riemann's, Šín's, and Janeček's theories of harmonic function, as well as other traditions of Riemann reception, in terms of vertical and horizontal consonance. Second, I suggest that when considering the possibility of more than just three functions, we should consider possibilities besides the typical chromatic-third related chords of ♭III and ♭VI. Third, I propose that Riemann's *Harmonieschritte* and his harmonic dualism, despite their broad dismissal by the majority of Riemann reception, captures some musical aspects that are integral to harmonic function.

1.3 Summary

Over a century after its introduction by Riemann, "harmonic function" continues to be a powerful locution for expressing ideas about harmonic relationships, meaning, and action. However, it is problematic that there are perhaps as many possible definitions of harmonic function as there are music theorists, especially when theorists consider the term so intuitively self-explanatory that it requires no definition. I understand the various definitions as different approaches to integrating harmonic function's ability to describe pitch-class content, harmonic syntax, and voice leading between chords.

Any attempt to address the problem of harmonic function must begin with Riemann. Yet Riemann makes the task notoriously difficult, since the answers he offers are apparently ambiguous and often inconsistent. As I will show in my dissertation, historians of music theory and music theorists more generally have disagreed about fundamental tenets in Riemann's *Funktionstheorie*. As a supplement to reading Riemann, I examine the Czech tradition of harmonic function. Essentially unknown in American music theory, the function theories of Šín and Janeček, especially when

examined according to their capacity to describe pitch-class content, harmonic syntax, and voice leading, help to clarify both Riemann's conception of harmonic function and our general understanding of harmonic function.

In this dissertation, I provide a history and critical overview of the Czech tradition of conceptualizing harmonic function. My initial task is close reading and interpretation. I examine the writings of Riemann—as the progenitor of harmonic function in general and thus of the Czech tradition as well—as well as of Šín and Janeček. For each of three authors—Riemann, Šín, and Janeček—I provide an overview of their approach to harmonic function. With my reading of Riemann, I demonstrate how the inventor of harmonic function conceived of concept as a synthesis of pitch-class content, harmonic syntax, and voice leading between chords. I then interrogate Šín's and Janeček's approaches in light of these three aspects. The result is a historical narrative treating the Czech traditional of theorizing harmonic function. Riemann invents the term; Šín replaces the *Schritt und Wechsel* system with combination functions; and Janeček expands the system to a five-function approach, which goes on to inspire the rest of the Czech tradition of harmonic function.

Histories however, are rarely written purely for the sake of history. I am not writing about the Czech tradition of music theory only because I think American theorists ought to know about it. Of course, I do think this: familiarity with Slavic music theoretical work is part of the answer to recent calls for the field to decenter western Europe.[70] However, other traditions of music theory also illuminate things that American music theorists are already interested in. In particular, alternate traditions of theorizing harmonic function can influence how we read Riemann. The Czech tradition, it turns out, clarifies the problems and ambiguities in Riemann that permeate historical discussions of his work. Because these problems persist in recent approaches to harmonic function, the Czech tradition also informs our own theorizing about function in general.

[70] Ewell et al., "Reframing Music Theory"; Rehding, "Can the History of Theory Be Decentered?"

Chapter 2 Riemann's *Funktionslehre*

The aim of this chapter to make explicit my understanding of Hugo Riemann's *Funktionslehre* before examining its Czech reception in subsequent chapters. This explication is especially necessary given, as I will describe, the disagreement between scholars on many of the salient features of Riemann's *Functionstheorie*, and what I find to be necessary correctives to the prevailing understanding of Riemann's theory.

Riemann describes his *Funktionstheorie* (theory of harmonic function) most exhaustively in the *Vereinfachte Harmonielehre*.[71] Published in 1893, twenty years after his doctoral dissertation, it synthesizes many of the most distinctive elements of Riemann's work.[72] These include his *Funktionstheorie* itself; his *Kadenzlehre* (theory of cadence or harmonic progression), first advanced in the "*Musikalische Logik*" in 1872; his harmonic dualism, already elaborated in his dissertation in 1873, and by extension his *Harmonieschritte*, first developed in his *Skizze einer neuen methode der Harmonielehre* from 1880.[73] These three constructs—*Funktionstheorie*, *Kadenzlehre*, *Harmonieschritte*—correspond to the three aspects of function theory I described in the first chapter—pitch-class content, harmonic syntax, and voice leading between chords. Although these three constructs are presented in combination in the *Vereinfachte Harmonielehre*, subsequent music theory has treated them as separable.

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[71] Riemann, *Vereinfachte Harmonielehre*. Riemann's function symbols first appear in Riemann, "Die Neugestaltung der Harmonielehre." Riemann first refers to the concept of function by name in Riemann, *Katechismus der Harmonielehre (theoretisch und praktisch)*, 27. David Kopp traces the seeds of harmonic function to Riemann, *Systematische Modulationslehre*. Kopp, *Chromatic Transformations in Nineteenth-Century Music*.

[72] Riemann, "Über das musikalische Hören."

[73] Ries, "Musikalische Logik: Ein Beitrag zur Theorie der Musik"; Riemann, "Über das musikalische Hören"; Riemann, *Skizze einer neuen Methode der Harmonielehre*. Riemann, in later editions of The *Skizze* will add in his *Funktionstheorie* and change the title to Riemann, *Handbuch der Harmonielehre (Zweite, vermehrte Auflage der "Skizze einer neuen Methode der Harmonielehre)*. The first English-language account of Riemann's *Harmonieschritte* appears in Klumpenhouwer, "Some Remarks on the Use of Riemann Transformations."

Neo-Riemannian scholarship, beginning with David Lewin and Brian Hyer, has focused on Riemann's *Harmonieschritte* and ignored his *Kadenzlehre*.[74] The overwhelming majority of harmonic function theorists have detached function from Riemann's *Harmonieschritte*, as well as his dualism. The Schenkerian current of North American function theory separates pitch-class content labels, like traditional function symbols or Roman numerals, from labels that describe harmonic syntax. Likewise, historians of theory, like Carl Dahlhaus, Daniel Harrison, and David Kopp, have explicitly argued that Riemann's *Funktionstheorie* is separable from his *Harmonieschritte* and his *Kadenzlehre*.[75]

I argue instead that these three elements of Riemann's thought were inextricably linked, in Riemann's mind at least, and perhaps by their internal logic as well. As we shall see, removing any of these elements from his *Funktionstheorie*, renders that theory almost unrecognizable. I draw on several of Riemann's writings but pay special attention to the *Vereinfachte Harmonielehre*. I do so because it stands as the *locus classicus* of Riemann's *Funktionstheorie*. More importantly however, a careful reading of the *Vereinfachte Harmonielehre* makes clear how connected the three elements of Riemann's thought were. Namely, Riemann explicitly describes his theory of harmonic function as a theory of chord relationships that are analogous to the relationships between single tones (2.1.1). That is, there is a correspondence between chord structure and chord relationships. While this foundational analogy seems like a relatively small detail of the *Vereinfachte Harmonielehre*, it has significant consequences for Riemann's thought.

First, the analogy confirms that his *Funktionstheorie* relies on the *Harmonieschritte* for function assignments (Section 2.1). Tone relationships are measured by intervals and the *Harmonieschritte* serves as the analogous measure for chord relationships. Secondly, it shows that his *Funktionstheorie*

[74] Lewin, *Generalized Musical Intervals and Transformations*; Hyer, "Tonal Intuitions in 'Tristan Und Isolde.'" Alexander Rehding makes the same observation about Lewin and Hyer in Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*, 67.
[75] Dahlhaus, "Terminologisches zum Begriff der harmonischen Funktion"; Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*; Kopp, *Chromatic Transformations in Nineteenth-Century Music*.

and his *Kadenzlehre* are interconnected (Section 2.2). Riemann's *Kadenzlehre* requires a way to categorize triads into functions and Riemann's categorization—his *Funktionstheorie*—is a product of the analogy. Likewise, it only becomes clear how to categorize some chords in Riemann's *Funktionstheorie* once they are understood in the context of a harmonic progression. Third, the analogy makes clear Riemann's commitment to harmonic dualism in his *Funktionstheorie*, because both his account of tone relationships and his *Harmonieschritte* are dualist (Section 2.3). Fourth, the analogy highlights how Riemann contextualizes his *Funktionstheorie* in his history of music theory (Section 2.4). In Riemann's music historical account of harmony, fifth-related harmonies gradually gave way to third-related harmonies, and he presents his *Funktionstheorie* as a way of reconciling fifth and third relations.[76] In this sense, I will not only argue that Riemann's *Funktionstheorie* joins together his *Harmonieschritte*, his *Kadenzlehre*, and his commitment to harmonic dualism, but also his vision of *Tonalität*—his attempts to join together fifth and third relations into a single theory. It is appropriate to begin with a brief overview of his *Funktionstheorie* (Section 2.1). I have also included here a short aside explaining Riemann's labeling convention for triads (the *Klangschlüssel*) and his *Harmonieschritte* (Section 2.0).

2.0 Aside on how Riemann labels triads and a brief introduction to his *Harmonieschritte*

In discussing Riemann's *Funktionstheorie* theory, I follow Alexander Rehding's example by employing Riemann's own *Klangschlüssel* for labeling triads.[77] Riemann labels triads according to their "prime." The prime is the tone that generates the triad. For major triads, which Riemann also calls over-chords, this is relatively simple. Major triads are generated upwards from the prime, or what we would call the root, and are labeled with name of the prime and a superscript "+." The equivalent minor case is complicated by Riemann's harmonic dualism. Minor chords, which he also calls under-

[76] Riemann, *Katechismus der Harmonielehre (theoretisch und praktisch)*, 38.
[77] Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*.

chords, are generated downwards from prime, or what we would call the fifth, and labeled with the name of the prime and a superscript "o" to the left of the letter name. For example, the major triad [C, E, G] is intuitively labeled as "c^{+}," while the triad [C, E♭, G] is labeled as "^{o}g," because Riemann considers [G] to be the prime of that minor triad.

Riemann's *Harmonieschritte*, on the other hand, are his primary way of describing relationships between triads.[78] The *Harmonieschritte* describe the relationship between two triads according to the interval between their primes and whether or not the two share the same quality (i.e. major or minor). For example, c^{+} and g^{+} are a *Quintschritt* apart—their primes are a fifth apart (*Quint*), and they share the same mode (hence the motion is a *Schritt* [step] as opposed to a *Wechsel* [exchange]).[79] On the other hand, c^{+} and ^{o}g are a *Quintwechsel* apart. Their primes are a fifth apart, but they change mode (hence: *Wechsel*). We can see that when the first triad is major, the indicated interval ascends. The opposite occurs when the prefix *gegen-* is added. For example, c^{+} and f^{+} are a *Gegenquintschritt* apart. On the other hand, the corresponding minor cases swap directions, on account of Riemann's harmonic dualism. For example, ^{o}g and ^{o}c are a *Quintschritt* apart, because Riemann conceives of the prime [G] as descending by fifth to the prime [C]. On the other hand, ^{o}g and ^{o}d are a *Gegenquintschritt* apart, because the ascending fifth is in the opposite direction. Note that Riemann will use the *Harmonieschritte* not only to label the relationship between two triads, as I have just explained, but also to label the triad that is the product of one of his *Harmonieschritte*. For example, g^{+} is the *Quintschrittklang* of c^{+}. The term *Klang* proceeding *Quintschritt* indicates "the triad that is related by a *Quintschritt*."

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[78] More detailed accounts of Riemann's *Harmonieschritte* can be found in Engebretson, "Neo-Riemannian Perspectives on the Harmonieschritte, with a Translation of Riemann's Systematik Der Harmonieschritte"; Gollin and Rehding, *The Oxford Handbook of Neo-Riemannian Music Theories*, 578–579; Klumpenhouwer, "Some Remarks on the Use of Riemann Transformations."

[79] As Engebretson (2011) explains, Riemann's terminology for his *Harmonieschritte* would change and develop through *Musikalische Syntaxis*, *Die Hülfsmittel der Modulation*, and the *Skizze einer neuen Methode der Harmonielehre*. Like Klumpenhouwer and Engebretson, I maintain the naming convention found in the *Skizze*.

2.1 Riemann's functions and how they are determined

This brief overview of Riemann's theory of *Funktionstheorie* serves to introduce some of the terminology, as well as give a view of the forest before zooming in on the trees. The following sections will provide more detail and evidence for how Riemann gets from his theory of tone relationships to his theory of harmonic function.

For Riemann, there are three harmonic functions: the tonic, subdominant, and dominant. These functions serve as categories whose prototypical members are the tonic, subdominant, and dominant triads (T, S, D); in C major, for instance, c^+, f^+, and g^+.[80] These prototypical triads are what Riemann calls *Hauptklänge* (primary triads). The dominant (g^+) is positioned a fifth *above* the tonic (Figure 2.1)—that is, in terms of Riemann's *Harmonieschritte*, the dominant is reached from the (major) tonic by means of a *Quintschritt*. The subdominant (f^+) lies conceptually a fifth *below* the (major) tonic—it is reached by a *Gegenquintschritt*. Riemann emphasizes the location of the dominants above and below the tonic by introducing them respectively as over- and under-dominants (*Ober- und Unter-dominanten*).

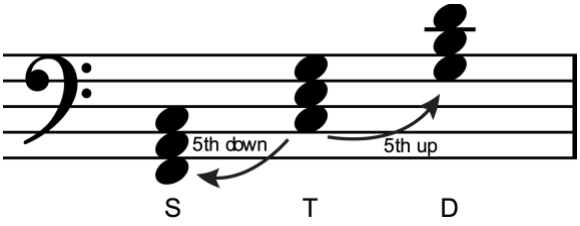

Figure 2.1: The dominant and subdominant triads represented as over- and under-dominants.

[80] With harmonic function, there is often a question of whether functions (T, S, and D), refer to chords or categories. I suggest that the reason this question arises is because function refers to both chords *and* categories. In prototype theory, a category is understood in terms of a member most associated with that category. With harmonic function, tonic, subdominant, and dominant are functional categories that are understood in terms of their most typical members, the tonic, subdominant, and dominant triads, and all other triads are understood as derivations of those members. For more on prototype theory, see Rosch, "Natural Categories."

All *other* consonant triads in a given key—what Riemann calls "*Nebenklänge*"—are derived from the *Hauptklänge* as either *Parallelklänge* or *Leittonwechselklänge*. Riemann's *Parallelklänge* (parallel triads) are equivalent to what English-language music theory calls relative major and minor triads. In *Harmonieschritte* terms, *Parallelklänge* are related by a *Terzwechsel*. Each *Hauptklang* has a corresponding *Parallelklang* (Tp, Sp, Dp). The "p" in the function symbol indicates that the triad in question is a *Parallelklang* of its corresponding *Hauptklang*. In purely *Harmonieschritte* terms, the triad in question is a *Terzwechsel* of its corresponding *Hauptklang*. In C major, like in Figure 2.2, the tonic *Parallelklang* (Tp) is °e (i.e. an A minor triad); the subdominant *Parallelklang* (Sp) is °a (i.e. D minor); and the dominant *Parallelklang* (Dp) is °b (i.e. E minor).[81] *Leittonwechselklänge* (leading-tone exchange triads) are related to the *Hauptklänge* via a *Leittonwechsel*. Each *Hauptklang* has a corresponding *Leittonwechselklang* (T<, S<, D<). The "<" imposed on the function symbol indicates that the triad in question is a *Leittonwechselklang* of that major *Hauptklang*. In C major, the tonic *Leittonwechselklang* (T<) is °b (i.e. E minor), the subdominant *Leittonwechselklang* (S<) is °e (i.e. A minor), and the dominant *Leittonwechselklang* (D<) is °f# (i.e. B minor).

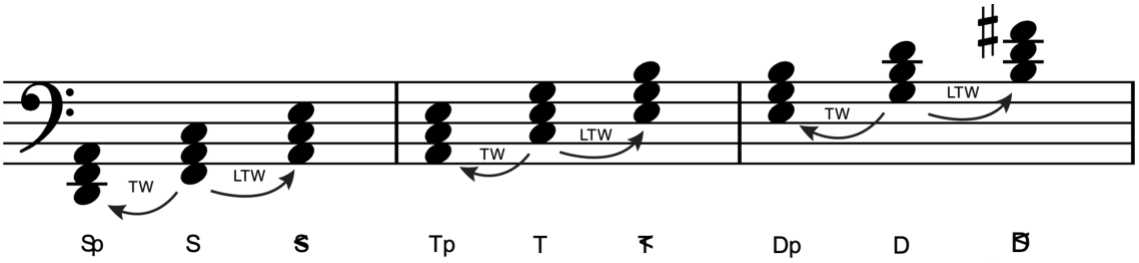

Figure 2.2: *Parallelklänge* and *Leittonwechselklänge* for tonic, subdominant, and dominant in C major. The abbreviation "TW" indicates a *Terzwechsel* and "LTW" indicates a *Leittonwechsel*.

[81] I do not adopt the Central-European musical alphabet of A-H, but instead maintain the North American convention of B flat and B natural.

The corresponding minor cases are complicated by Riemann's, as described by many scholars, inconsistent commitment to harmonic dualism.[82] The three functional categories also have prototypical minor *Hauptklänge* (°T, °S, °D); in C minor, for instance, °g , °c, and °d (i.e., a C minor triad, an F minor triad, and a G minor triad). In what is often described as a departure from his usual commitment to dualism, the dominants are in the same position relative to the tonic as they are in major keys. The dominant (°d) is still positioned a fifth *above* the tonic and the subdominant (°c) is still positioned a fifth *below* the tonic. However, the dominant (°d) is now reached by means of a *Gegenquintschritt* and the subdominant (°c) is reached by means of a *Quintschritt*. While the *Harmonieschritte* change in minor for the *Hauptklänge*, the *Nebenklänge* in a minor key are still derived from the same *Wechseln* as in a major key. In C minor, like in Figure 2.3, the tonic *Parallelklang* (°Tp) is e♭$^+$, the subdominant *Parallelklang* (°Sp) is a♭$^+$, and the dominant *Parallelklang* (°Dp) is b♭$^+$. The tonic *Leittonwechselklang* (T) is a♭$^+$, the subdominant *Leittonwechselklang* (S) is d♭$^+$, and the dominant *Leittonwechselklang* (D) is e♭$^+$. The ">" imposed on the function symbol indicates that the triad in question is a *Leittonwechselklang* of that minor *Hauptklang*, rendering the superscript "o" superfluous.

[82] As Klumpenhouwer explains, this accusation was first articulated by Ary Belinfante, later revived by Carl Dahlhaus, and echoed by Daniel Harrison (p. 273, n. 37). Belinfante, "De leer der tonale functien in conflict met die der polaire tegenstelling."; Dahlhaus, *Untersuchungen über die Entstehung der harmonischen Tonalität*. Klumpenhouwer however questions this accusation. He explains, "the critique, however, is presumptuous: there is no natural procedure for mapping function assignments onto Riemann's dualist transformations. It still needs to be shown that having function labels and transformation relations line up identically amounts to the proper dualist view." Klumpenhouwer, "Dualist Tonal Space and Transformation in Nineteenth-Century Musical Thought." Klumpenhouwer defends his position further in Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative."

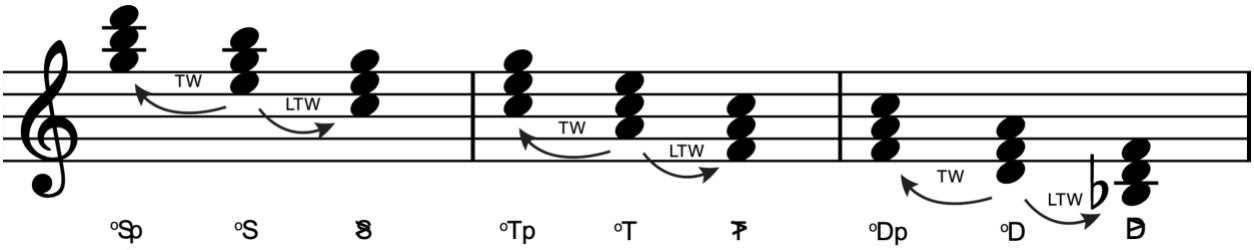

Figure 2.3: *Parallelklänge* and *Leittonwechselklänge* for tonic, subdominant, and dominant in C minor. The abbreviation "TW" indicates a *Terzwechsel* and "LTW" indicates a *Leittonwechsel*.

2.1.1 The foundational analogy and Riemann's Harmonieschritte

This section provides a detailed account of Riemann's *Funktionstheorie* with special attention to his description of it in the *Vereinfacchte Harmonielehre*. I bring attention to the fact that Riemann presents harmonic function as a theory of chord relationships analogous to his harmonic conception of tone relationships.[83] This analogy supports my larger argument about the inextricability of the main three constructs of Riemann's thought in the *Vereinfachte Harmonielehre*—*Funktionstheorie*, the *Harmonieschritte*, and *Kadenzlehre*.[84] In this section, the analogy makes clear how Riemann's *Funktionstheorie* is dependent on the *Harmonieschritte* and that his functions are defined according to his *Harmonieschritte*. In short, the analogy requires a way to measure triadic relationships similar to the way intervals measure tone relationships, and the *Harmonieschritte* are how Riemann accomplishes this. This view contrasts with the those of Harrison and Kopp, who consider Riemann's *Funktionstheorie* as separable from his *Harmonieschritte*.[85]

[83] The most extensive account of this analogy appears in the first chapter in the *Vereinfachte Harmonielehre*. In subsequent texts it is either shortened or omitted.

[84] Accounts of this fundamental analogy are mostly absent from Riemann scholarship. Some exceptions include Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative"; Harper-Scott and Chandler, *Return to Riemann: Tonal Function and Chromatic Music*.

[85] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 282. "[Riemann's function theory] does not come from continued development of the ideas of "Musikalische Logik," nor does it stem from the troublesome transformational approach attempted in *Musikalische Syntaxis* and *Skizze*."; Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 88. "Riemann clearly dost not say, as if often stated, that the *Parallelklänge* assume functions of their archetypes simply *because* they are their relative minors."

Let's begin by examining the role of Riemann's *Harmonieschritte* in determining harmonic function. My arguments stem from a foundational analogy in Riemann's *Vereinfachte Harmonielehre*. Namely, Riemann has a theory of how *tones* are related. He then introduces his theory of harmonic function as an analogous theory for how *chords* are related.[86] Thus, to understand Riemann's concept of harmonic function, we will consider first Riemann's conception of tone relationships, before addressing how harmonies are analogous. Riemann summarizes his conception of tone relationships as follows:

> A tone may be either a principal tone (prime) or a derived tone (and then either directly related, i.e., the plain third or plain fifth of the prime represented, or related in the second degree, i.e., the prime, third, of fifth of another tone, and then dissonant).[87]

Riemann assumes that there is a principal tone, that there are directly related tones, and that there are secondarily related tones. Riemann's principal tone is the single tonic (or prime) tone to which other tones are related.[88] Riemann's directly and secondarily related tones stem from his views on the overtone and undertone series. Namely, Riemann finds that if musical systems are to be derived from these series, then they need to be limited somehow.[89] His solution is to omit tones from the series based on two criteria. His first is to "eliminate those notes from each series which are related to other notes in the series, just as the latter are to the fundamental note."[90] That is, he is removing from the series any note whose ratio to the tonic is a composite of two or more ratios. These are the

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[86] Klumpenhouwer refers to this analogy as a "correspondence between chord construction and chord relationships." Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative."

[87] Riemann, *Vereinfachte Harmonielehre*, 7. "*Ein Ton entweder Hauptton (Prim) sein kann oder bezogener Ton (und dann entweder direkt verwandt, d. h. schlichte Terz oder schlichte Quint des vertretenen Klanges, oder aber im zweiten Grade verwandt, d. h. Prim, Terz oder Quint eines anderen Klanges und dann dissonant).*"

[88] Riemann, 2."*Ein* Ton *verglichen mit anderen Tönen ist entweder selbst der feste Punkt, die prima Ratio, von der aus die anderen beurteilt werden*."

[89] Riemann, 5. "*Betrachtet man die ins endlose verlaufenden beiden harmonischen Naturskalen mit ihren immer kleiner werdenden Intervallen, so ist klar, dass, wenn unser Musiksystem überhaupt von derselben abgeleitet werden soll, doch irgend wo Halt gemacht werden muss; denn das System kennt keine Vierteltöne, die bereits die nächste Oktave bringen muss."*

[90] Riemann, 5. "*Schärfen wir zunächst unsern Blick, indem wir aus beiden Reihen diejenigen Töne ausscheiden, welche sich zu Tönen derselben ebenso verhalten, wie diese zum Ausgangstone*."

tones in brackets in Figure 2.4. One effect of this process is that it eliminates any octave doublings of a tone in the series. What remains are only tones related to the fundamental by ratios with prime numbers (Figure 2.5). His second step is to remove any notes that appear out of tune (those labeled with an asterisk in Figure 2.4 and Figure 2.5). What remains are the major and minor triads.

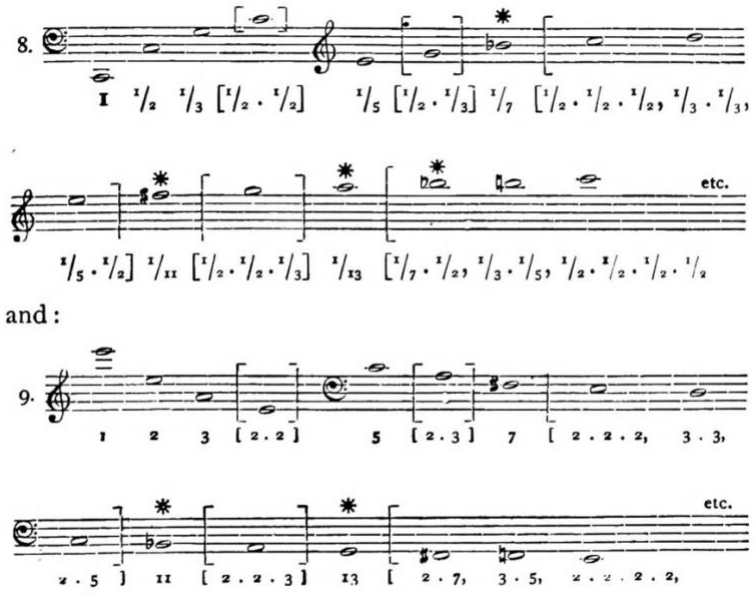

Figure 2.4: A reproduction of Riemann's Examples 8 and 9 from the *Vereinfachte Harmonielehre*. Brackets indicate tones from the overtone series to be eliminated because they can be conceived of as a composite of ratios.

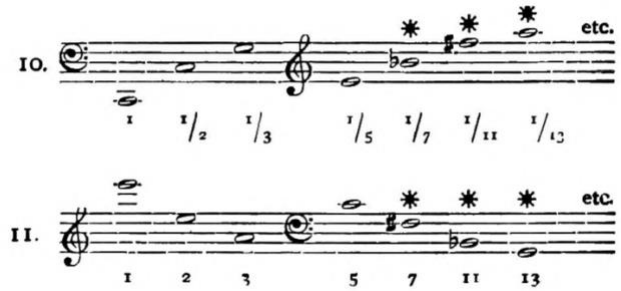

Figure 2.5: A reproduction of Riemann's Examples 10 and 11. After having eliminated tones with composite ratios, starred notes are eliminated on the grounds that they are out of tune.

With Riemann's view of the overtone and undertone series in mind, the fundamental of either series is the principal tone and the directly related tones are those that are a major third or perfect fifth

above or below the principal tone.[91] Riemann's secondarily related tones are those in-tune tones that are not directly related to the principle.[92] Two examples below will help to demonstrate Riemann's directly and secondarily related tones (Figure 2.6 and Figure 2.7).

Remember the first half of Riemann's earlier quote. "A tone may be either a principal tone (prime) or a derived tone (and then either directly related, i.e., the plain third or plain fifth of the prime represented…" For Riemann, the intervals of major third and perfect fifth can be generated either above a tonic so as to create a major chord, which he calls an "over-chord" (*Oberklang*), or *below* a tonic to create a minor chord, or "under-chord" (*Unterklang*).[93] Thus any tone a major third or perfect fifth above the tonic (in a major key) or below the tonic (in a minor key) is directly related (*direkt verwandt)* to the tonic note (Figure 2.6). This is made explicit in the quote above when Riemann uses the qualifier "plain" (*schlicht*) to describe the third and fifth. Riemann's plain third and plain fifth are above the tonic in a major key while the plain third and plain fifth are below the tonic in a minor key.[94]

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[91] Riemann ties his concept of directly related tones to a quote of Hauptmann, declaring that "there are only three directly intelligible intervals: [the] octave, [major] third, and [perfect] fifth." Riemann, 6. "*Es giebt drei direkt verständliche Intervalle: Oktave, [grosse] Terz und [reine] Quinte*." Quoted from Hauptmann, *Die Natur der Harmonik und Metrik: Zur Theorie der Musik*, 19. "*Es gibt drei direkt verständliche Intervalle: I. Die Oktav. II. Die Quint. III. Die (grosse) Terz.*" This quote also appears in Riemann, "Die Natur der Harmonik."

[92] Riemann does not invoke Hauptmann for his secondarily related triads, however, he seems to be borrowing from Hauptmann's harmonic conception of the scale. Hauptmann built a major triad consisting, naturally, of a root, third, and fifth. Hauptmann then built his "triad of triads"—that is, the three triads of the tonic, subdominant, and dominant, which together express a key. He then describes each scale degree in "harmonic-melodic" terms. Scale degree 2 is the fifth of the dominant (effectively the fifth of the fifth), three is the third of the tonic, four is the root of the subdominant, etc. Hauptmann, *Die Natur der Harmonik und Metrik: Zur Theorie der Musik*, 48–49.

[93] Riemann, *Vereinfachte Harmonielehre*, 6.

[94] Riemann, VII. "*Schlicht heisst ein Intervall, wenn es vom Haupttone eines Klanges aus im Sinne von dessen Klanggeschlecht gedacht ist, d. h. vom Durakkord aus sind die Intervalle nach oben schlichte, beim Mollakkord sind die Intervalle nach unten schlichte (von c^{+} aus ist a die schlichte Sexte = 6; von °e aus ist g die schlichte Sexte = VI); dagegen erhalten die umgekehrt gedachten Intervalle den Zusatz Gegen - zu ihren Namen z. B. ist A die kleine Gegensekunde (II$^{<}$) des C-durakkords."*

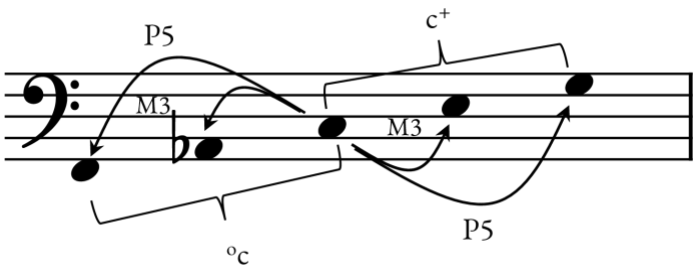

Figure 2.6: C major and F minor as an over-chord (c^+) and under-chord (^oc)

The rest of Riemann's statement from earlier—that derived tones can be related in the second degree as prime, third, or fifth of another tone—corresponds to Figure 2.7. These secondarily-related tones (*im zweiten Grade verwandt*) are those tones that are directly related to the "over-fifth" (*Oberquint*) or "under-fifth" (*Unterquint*) of the tonic.[95] For instance, the B in a C major scale is secondarily-related to the tonic and can be understood as a third above the fifth above C.[96]

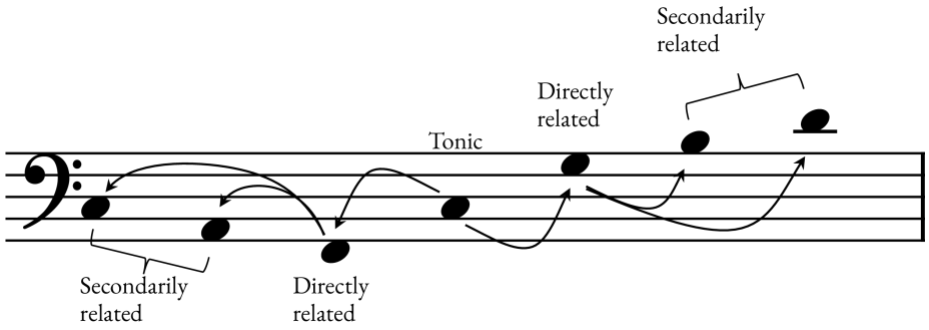

Figure 2.7: Individual arrows represent direct relations. Bracketed tones are secondarily related to the tonic, represented by the fact that they two arrows removed from the tonic [C].

[95] Riemann, 7. "*Die altgriechischen Theoretiker (Pythagoras) sahen in ihr [der Grundskala] eine Kette von Quinten: f.c.g.d.a.e.h, als welche sie freilich je nachdem man diesen oder jenen Ton zum Ausgangspunkt nimmt (als Prim) Verwandte bis zum sechsten Grade enthält (h als sechste Quinte von F* $= \frac{\left(\frac{3}{2}\right)^6}{2^3} = \frac{729}{512}$*) Seit die Bedeutung der Terzverwandtschaft der Töne erkannt wurde (vergl. des Autors 'Katechismus der Musikwissenschaft,' S. 9 ff.), führt man aber die melodische Grundskala einfacher zurück auf einen Hauptton (Prim) mit Terz und Quint und seine Ober- und Unterquinte mit ihren Terzen und Quinten.*"

[96] When Riemann was describing directly and secondarily relates tones in the overtone series, those related to a prime number ratio by an octave were considered secondarily related. For example, he would consider the partial two octaves above the fundamental as secondarily related. Here however, Riemann is observing octave equivalence, and considers tones as directly related to tonic regardless of octave.

What we have seen so far is how Riemann conceives of relationships between tones. This is the first part of Riemann's fundamental analogy for harmonic function. The next step is to show how chord relationships are analogous. This theory of chord relationships is his *Funktionstheorie*. He explains this analogy in the following quote—it is the same quote as earlier, but now complete, with bold typeface to indicate the new text;

> Just as a tone may be either the principal tone (prime) or a derived tone (and then either directly related, i.e., the plain third or plain fifth of the triad represented, or related in the second degree, i.e., the prime, third, of fifth of another tone, and then dissonant), **so also a triad may be either the main triad—in which case it is called tonic—or a derived triad; and in the latter case it is either the most nearly related triad on the overtone side or most nearly related triad on the undertone side, or again it may be only a second-degree relative, and then must be indicated as a nearest relative of a most nearly related triad (a *Nebenklang* of the latter)**.[97]

According to Riemann, triads, just like tones, can also be prime (tonic), direct relatives (over- or under-dominant), or secondary relatives (*Nebenklänge*).[98] In this analogy, the idea of a prime or tonic triad is intuitive to grasp. However, it is far less obvious how to transfer the idea of direct and secondary relations from tones to chords. For Riemann, the degree of relatedness is a matter of determining how two entities are related and then providing a rule for which relationships constitute direct and secondary relatedness. For tones, intervals are an intuitive way to measure their

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[97] Riemann, *Vereinfachte Harmonielehre*, 7–8. "*Wie ein Ton entweder Hauptton (Prim) sein kann oder bezogener Ton (und dann entweder direkt verwandt, d. h. schlichte Terz oder schlichte Quint des vertretenen Klanges, oder aber im zweiten Grade verwandt, d. h. Prim, Terz oder Quint eines anderen Klanges und dann dissonant), so ist auch ein Klang entweder Hauptklang — in welchem Falle er Tonika genannt wird — oder aber bezogener Klang; und zwar ist er im letzteren Falle entweder nächstverwandter Klang der Obertonseite oder nächstverwandter Klang der Untertonseite, oder aber wiederum nur ein Verwandter zweiten Grades und dann als Nächstverwandter eines nächstverwandten Klanges (Nebenklang von diesem) zu bezeichnen.*"

[98] Riemann reserves the term "directly related" (*direct verwandt*) for discussing tones and uses the term "most nearly related" (*nächstverwandt*) when discussing triads. I have chosen to translate both as "directly related" for the sake of more idiomatic English. However, for both tones and triads, Riemann consistently uses the qualifier "*im zweiten Grade verwandt*," which I translate as "secondarily related."

relationship. As we have seen, Riemann determines direct and secondary relatedness between tones according to their intervallic distance—that is, he regards tones that stand a major third or a perfect fifth apart as directly related. However, we lack a single intuitive equivalent "interval" for chord relationships.[99] Determining direct and secondary relatedness between chords would require an analogous relationship between chords and an analogous rule for which relationships constitute direct and secondary relations. As we will see, for Riemann, his *Harmonieschritte* fill this role.

The role of Riemann's *Harmonieschritte* in defining function becomes explicit as we continue with examining Riemann's analogy. After explaining that, just like with tones, there can be directly and secondarily related triads, he states that the dominant and subdominant (*die Dominanten*) are directly related to the tonic.[100] He then defines the dominants, and their definitions help show that he conceives of the dominant and subdominant according to the *Harmonieschritte*. For example, he explains that the dominant is the major triad a fifth above a major triad and the subdominant is the major triad a fifth below a major triad.[101] These definitions are effectively equivalent to his definitions of the *Quintschritt* and *Gegenquintschritt* from the *Skizze einer neuen methode der Harmonielehre*—the *Quintschritt* is the relationship between the tonic and the triad of the same quality on the tonic's fifth, and the *Gegenquintschritt* is relationship between the tonic and the triad of the same quality built of the tonic's opposing (under-) fifth.[102] The difference between his definitions for the dominants and for the *Schritte* is that in *Vereinfachte Harmonielehre* Riemann defines the dominants according to their relationship to the tonic, while in *Skizze* he defines the relationships themselves.

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[99] Here we can see the seeds of Lewin's generalized interval structures (GIS). For an extensive account of the topic of measuring distance between harmonies, see Cohn, *Audacious Euphony: Chromaticism and the Consonant Triad's Second Nature*.
[100] Riemann, *Vereinfachte Harmonielehre*, 8."*Nächstverwandte Klänge sind zunächst nur die unter dem Namen Dominanten bekannten.*"
[101] Riemann, 8. "*Von einem Oberklange (Durakkorde) aus ist der Oberklang (Durakkord) seiner Oberquinte, die sogenannte Oberdominante (oder kurzweg Dominante, abgekürzt durch D bezeichnet) und der Oberklang der Unterquinte, die sogenannte Unterdominante oder Subdominante (abgekürzt mit S bezeichnet)...und ebenso ist von einem Unterklange (Mollakkorde) aus der Unterklang seiner Unterquinte die Unterdominante (°S) und der Unterklang seiner Oberquinte die Oberdominante (°D).*"
[102] Riemann, *Skizze einer neuen Methode der Harmonielehre*, 70. "*Der schlichte Quintschritt, d. h. das Verhältniss der Tonika zum gleichartigen (d. h. nach dem gleichen Klangprincipe — Dur oder Moll — konsonanten) Klange ihrer Quinte.*" "*Der Gegenquintschritt, das Verhältniss der Tonika zum gleichartigen Klange ihrer Gegenquint.*"

While in minor keys the correlation between dominants and *Harmonieschritte* is opposite—the minor dominant is a *Gegenquintschritt* from the tonic and the minor subdominant is a *Quintschritt* from the tonic—it remains that Riemann effectively describes the dominants, both major and minor, according to the *Harmonieschritte.*[103] That Riemann defines the dominants in terms of his *Harmonieschritte* is made most explicit by the fact that, throughout the *Vereinfachte Harmonielehre*, he will use the terms *Quintschrittklang* and *Gegenquintschrittklang* (the triads reached by a *Quintschritt* and a *Gegenquintschritt* respectively) interchangeably with dominant and subdominant. Consider, for example, the title of his third chapter, "*Schlichter Quintschritt (Verbindung der Tonika mit dem schlichten Quintklange: T—D und °T—°S).*" Here the term "*Schlichter* (plain) *Quintschritt* " describes both the progression T—D and °T—°S.

The secondarily related triads are the *Nebenklänge* of the two dominants—their *Parallelklänge* and the *Leittonwechselklänge*. Here, the role of Riemann's *Harmonieschritte* in determining direct and secondarily related triads is made most explicit. Two *Harmonieschritte* are in play: the *Terzwechsel* and the *Leittonwechsel*. Consider Riemann's description of *Parallelklänge* in his *Vereinfachte Harmonielehre*:

> Because the feigning clang [°d in C major and g^+ in A minor] and [the subdominant] are related by a *Terzwechsel* or, which is the same thing, are related like tonics of *parallel* [relative] keys (F major and D minor, E minor and G major are so-called *parallel* [relative] keys), we will call it the *Parallelklang* and, in the sign representing the functions of the harmonies, indicate the relationship with a *p* at the side of the S or °D.[104]

[103] This difference for the minor dominants is at the heart of the accusation that Riemann's functional assignments are not fully dualist, which I will address in more detail later in this chapter.

[104] Riemann, *Vereinfachte Harmonielehre*, 77. "*Da der Scheinklang (das °a als* f_5^6 *und das g⁺ als* h_V^{VI}*) zum Hauptklange [Subdominante] im Verhältnis des schlichten Terzwechsels steht (A ist schlichte Terz für F⁺, G schlichte Terz für °H) oder was dasselbe ist, in dem Verhältnis, in welchen die Toniken von Paralleltonarten stehen (F-dur und D-moll, E-moll und G-dur sind sogenannte Paralleltonarten), so wollen wir ihn den Parallelklang derselben nennen und in der die Funktionen der Harmonie aufweisenden Chiffrierung das Verhältnis durch ein p beim S bezw. °D ausdrücken.*"

As Riemann explains, the *Parallelklänge* are those chords that are a *Terzwechsel* away from their respective *Hauptklänge*. A *Terzwechsel* is the relationship between a triad and its relative major or minor triad. In *Harmonieschritte* terms, it is the process by which a triad's prime is transposed by a major third (ascends if the first triad is major, descends if the first triad is minor) and the resultant triad changes quality. In the case of C^+, its *Terzwechselklang* is ^{o}e (i.e. an A minor triad). In C major, the *Hauptklänge* c^+, f^+, and g^+ correspond to the *Parallelklänge* ^{o}e, ^{o}d, and ^{o}b respectively (see Figure 2.2). In C minor, the *Hauptklänge* ^{o}g, ^{o}c, and ^{o}d have as their corresponding *Parallelklänge* eb^+, ab^+, and bb^+. The *Parallelklänge* in principle inherit their function from their respective *Hauptklänge*—likely because the *Parallelklänge* share two of three common tones with their respective *Hauptklänge*. Riemann indicates *Parallelklänge* by adopting the labelling convention of adding a "p" to the function symbol of that *Hauptklang*. The major *Hauptklänge* T, S, D, correspond to the *Parallelklänge* Tp, Sp, and Dp.

For the *Leittonwechselklänge*, the fact that they are determined according to the *Harmonieschritte*, specifically the *Leittonwechsel*, is made obvious by their name. A *Leittonwechsel* involves transposing a triad by a minor second (descends if the first triad is major, ascends if the first triad is minor) and then changing its quality. For instance, the *Leittonwechsel* of c^+ is ^{o}b (i.e. an E minor triad). In C major, the *Hauptklänge* c^+, f^+, and g^+ have the corresponding *Leittonwechselklänge* ^{o}b, ^{o}e, ^{o}f# (see Figure 2.3). In C minor, the *Hauptklänge* ^{o}g, ^{o}c, and ^{o}d have the corresponding *Leittonwechselklänge* ab^+, db^+, eb^+. Riemann indicates *Leittonwechselklänge* by overlaying angled brackets "<" or ">" over the function symbol. The major *Hauptklänge* correspond to the *Leittonwechselklänge* T<, S<, D<. The minor *Hauptklänge* correspond to the *Leittonwechselklänge* T>, S>, D>.[105]

[105] The "o" symbol for minor is omitted in the *Leittonwechselklänge* because their quality is indicated by the direction of the angled brackets. Left-angled brackets "<" indicate major key *Leittonwechselklänge* and right-angled brackets ">" indicate minor key *Leittonwechselklänge*.

In this subsection, examining Riemann's introduction of his function labels in the *Vereifachte Harmonielehre* (as above) has revealed that Riemann conceives of his functions according to his *Harmonieschritte*—he explicitly uses the *Harmonieschritte* to assign functions to the *Nebenklänge*, and it is clear that Riemann is thinking of the dominant and subdominant in terms of his *Harmonieschritte*. For Riemann, the *Harmonieschritte* are vital for his foundational assumption about harmony in the *Vereinfachte Harmonielehre*—that the relationships between harmonies are analogous to the relationships between tones. This analogy was suggested implicitly in Hauptmann's *Die Natur der Harmonik und der Metrik*, when Hauptmann described the tonic, subdominant, and dominant chords as a "triad of triads."[106] Riemann however worked out the idea much further by transferring his description of tones as either directly or secondarily related to the realm of harmonies.

Surprisingly, this analogy—upon which the *Vereinfachte Harmonielehre* and Riemann's entire *Funktionstheorie* is built, and which marks a significant point of development in Riemann's thought—is mostly unaddressed by scholarship. A notable exception to this is Klumpenhouwer's discussion of how "Riemann's interest in these transformations [the *Harmonieschritte*] appears within the context of his topographical conception of tonality, which in turn arises from Oettingen's topographical conception of pitch relations."[107] Klumpenhouwer also refers to the analogy as "a correspondence between internal *Klang* [chord] structure and *Klang* relations."[108] The importance of this analogy lies in the way it makes explicit the reliance of Riemann's harmonic functions on the *Harmonieschritte*. Because Riemann understands the relationships between harmonies to be analogous to the relationships between tones, and because the relationship between tones are determined by the interval between them, Riemann requires an analogous measure of distance between harmonies. As Klumpenhouwer also finds, Riemann uses the *Harmonieschritte* to measure the distances between

[106] Hauptmann, *Die Natur der Harmonik und Metrik: Zur Theorie der Musik*, 23.
[107] Klumpenhouwer, "Dualist Tonal Space and Transformation in Nineteenth-Century Musical Thought," 466.
[108] Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative," 11.

harmonies.[109] In particular, four of Riemann's *Harmonieschritte* —the *Quintschritt*, *Gegenquintschritt*, *Terzwechsel*, and *Leittonwechsel*—are analogous for fifth up, fifth down, third up, and third down, with some admitted dualistic fuzziness when applying the fifth relations.[110] In other words, Riemann has taken fifth and third relations between tones and transferred them to the realm of harmonies. In section 2.1.3, I will address counter arguments to my claims about the role of the *Harmonieschritte* in determining Riemann's functions. First however, I will describe some issues surrounding the tonic *Nebenklänge* and applied dominants.

2.1.2 Riemann's tonic Nebenklänge, applied dominants, and relatedness

Thus far, my summary has mostly portrayed Riemann's *Funktionstheorie* as systematic and consistent. The situation is however more complex, with various ambiguous or inconsistent features. This section begins to explore these features by examining how relatedness applies to the *Nebenklänge* and applied dominants.

In his *Vereinfachte Harmonielehre*, Riemann is not explicit about how the notion of direct and secondary relatedness applies to two pairs of triads—the tonic *Nebenklänge* and the applied dominants of D and S (DD and SS). The dominant of the dominant and the subdominant of the subdominant are part of larger family of triads subsumed under the topic of *Zwischenkadenzen* (intermediate cadences). For Riemann, *Zwischenkadenzen* are:

[109] Klumpenhouwer, "Dualist Tonal Space and Transformation in Nineteenth-Century Musical Thought," 467.
[110] There is also some question as to whether the analogue of intervallic thirds is the diatonic third relations like the *Terzwechsel* and the *Leittonwechsel*, or the chromatic third relations, like the *Terzschritt* and *Gegenterzschritt*. I save this discussion for section 2.4.

> cadences to harmonies characterized according to their position in the key (real and feigning consonances); these harmonies, then, are to be considered as tonics, without, however, their tonal functions being altered.[111]

They make use of *Zwischendominant* (intermediary dominants, i.e. applied dominants).[112]

> Intermediary dominants are the dominants and subdominants of diatonic harmonies that can be inserted into the tonal cadence at will, often creating complete intermediate cadences in other keys without leaving the main key.[113]

Riemann "preserves the significance" of the dominant of the dominant and the subdominant of the subdominant "by affixing a special sign [D or S]."[114] Applied dominants or subdominants of other functions use additional parenthetical marks, as in the case of a dominant of the subdominant, which would be labeled as "(D) S." While this explains how to label applied dominants, it does not address the question of to what extent the applied dominants are related to the tonic.

For applied dominants—as well as the tonic *Nebenklänge*—their relatedness depends on how relatedness is defined. Unfortunately, Riemann never defines relatedness—there are at least three implicit definitions at play in the *Vereinfachte Harmonielehre*, listed below. These three definitions each integrate fifth and third relations in a different way. This section is meant to describe these definitions, but also to finish the description of how Riemann assigns functions to various triads. In so doing, I unearth an ambiguity in how Riemann handles fifth and third relations. For now, I

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[111] Riemann, *Vereinfachte Harmonielehre*, 141. "*Wir machen, um es kurz zu sagen, Kadenzen zu den einzelnen bisher nach ihrer Stellung in der Tonart charakterisierten Harmonien (wirklichen und Scheinkonsonanzen), bei welchen diese als Toniken zu betrachten sind, ohne doch ihre tonale Funktion zu ändern.*"

[112] Rather than translate Riemann's "*Zwischendominant*" as "intermediary dominants," I simply substitute the standard American term "applied dominants."

[113] Riemann, *Musik-Lexikon*, 1909, 1597. "*Zwischendominanten sind die in die tonale Kadenz beliebig einzuschaltenden Dominanten u. auch Subdominanten leitereigener Harmonien, durch welche oft vollständige Zwischenkadenzen in anderen Tonarten entstehen, ohne das die Haupttonart verlassen wird.*"

[114] Riemann, *Vereinfachte Harmonielehre*, 110. "*Wir werden weiterhin noch manche Möglichkeit der Einführung von Dominanten leitereigener Klänge kennen lernen, wahren aber diesen uns zuerst begegnenden ihre besondere Bedeutung durch ein besonderes Zeichen, nämlich das verdoppelte D bezw.* °*S.*"

assume only the third relations Riemann uses to derive his *Nebenklänge*, but I will return to the chromatic third relations in 2.4. I summarize three of the implied definitions of relatedness in the *Vereinfachte Harmonielehre* as follows:

1. Two triads are directly related if they are connected by a *Quintschritt* or *Gegenquintschritt*, and they are secondarily related if connected by a *Terzwechsel* or *Leittonwechsel*.
2. Two triads are related if they are connected by a *Quintschritt*, *Gegenquintschritt*, *Terzwechsel*, or *Leittonwechsel*, or a combination of those *Harmonieschritte*, and the number of *Harmonieschritte* between two triads is the degree to which the two triads are related.
3. Two triads are related if they share common tones, and if triads share more common tones they are more directly related, while triads that share fewer common tones are less directly related.

Implied definition #1 prefers fifth relations to third relations—two triads are directly related if they are connected by a *Quintschritt* or *Gegenquintschritt*, and they are secondarily related if connected by a *Terzwechsel* or *Leittonwechsel* (Figure 2.8). I have assumed this definition thus far because it seems to be the most prevalent in Riemann's writing. According to this definition, the *Hauptklänge* are directly related to the tonic, while the *Nebenklänge* are secondarily related. This definition seems to be at play when Riemann states that "the *Quintklang* is, in major, the most directly related triad on the overtone side (the over-dominant), in minor, the most directly related triad on the undertone side (the under-dominant)."[115] Further, the priority of the dominant and subdominant triads, throughout all of Riemann's writings, suggests that Riemann considers fifth relations as more

[115] Riemann, 15. "*Der schlichte Quintklang ist in Due der nächstverwandte Klang der Obertonseite (die Oberdominante), in Moll der nächstverwandte Klang der Untertonseite (die Unterdominante).*"

directly related than third relations. To some extent, Riemann's foundational analogy also supports this definition—Riemann considers fifth-related tones to be nearer to one another than third-related tones, because in the harmonic series the first appearance of the fifth is closer to the fundamental than the fundamental is to the third. From this one would assume that fifth-related triads are nearer than third-related.

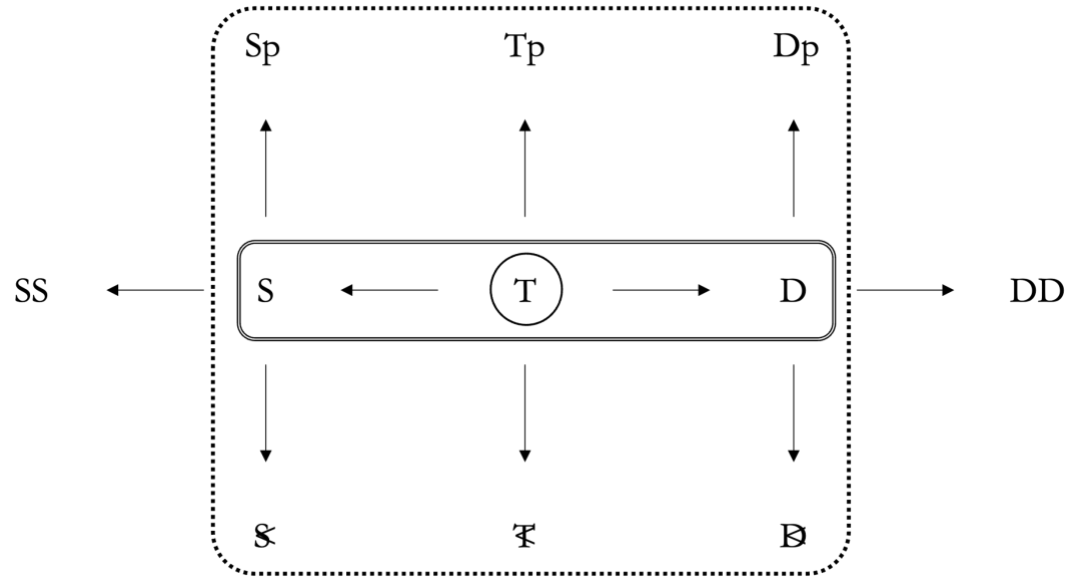

Figure 2.8: Diagram demonstrating degrees of relatedness between Riemann's functions with the first implied definition for relatedness. The circle around T indicates the tonic as the center, the compound line around S and D indicates first degree relation, and the dashed line around the *Nebenklänge* indicates second degree relation.

Implied definition #1 has some attractive features, but also raises some questions. For example, with this definition, the distinction between *Hauptklänge* and *Nebenklänge* aligns perfectly with the distinction between directly and secondarily relatedness. It also provides an answer to a question that Riemann leaves unaddressed—why do triads receive the functions they do? Of the *Hauptklänge,* the subdominant and dominant each receive a unique function because they are directly related to the tonic, and the *Nebenklänge* inherit their functions from their respective *Hauptklänge* because they are secondarily related.

This first implied definition of relatedness, which privileges fifth relations, would not consider the dominant of the dominant and the subdominant of the subdominant secondarily related to the tonic, because their derivation does not involve a *Terzwechsel* or a *Leittonwechsel*. Riemann's statement that applied chords, unlike the *Hauptklänge* and *Nebenklänge*, "are not to be understood in relation to the main key, but instead describe the immediately following triad as the tonic," suggests that they are not related to the tonic.[116] They are only understood in relation to the original tonic through this intermediate tonic, hence the term "intermediary dominant."[117] From this it follows that all applied dominants, including DD and SS, should be excluded, or simply categorized differently, from the *Hauptklänge* and *Nebenklänge*, and the fifth-preferring definition of relatedness is one way of doing so.

Riemann's second implied definition treats fifth and third relations equally—two triads are related if they are connected by a *Quintschritt*, *Gegenquintschritt*, *Terzwechsel*, or *Leittonwechsel*, or a combination of those *Harmonieschritte*, and the number of *Harmonieschritte* between two triads is the degree to which the two triads are related (Figure 2.9). With this second definition of relatedness, it would follow that the tonic *Nebenklänge* are actually directly related to the tonic, because Tp and T are only one *Harmonieschritte* away from it. Riemann comes closest to explicitly expressing this idea in *Katechism der Musik* (1888), where he describes A minor as a key that is directly related (*nächstverwandt)* to C major.[118] Similarly, in *Katechismus Der Harmonie- Und Modulationslehre* (1906), he describes the key

[116] Riemann, 142. "*Chiffren in Klammer sind nicht von der Haupttonart aus zu verstehen, sondern umschreiben den der Klammer unmittelbar folgenden Akkord als Tonika*."

[117] At first glance, it would seem that in this sense the *Nebenklänge* also are not related to the tonic, because they are related to the tonic through the dominant as an intermediary. The difference between the applied dominants and the *Nebenklänge* however is that the applied dominants treat some new triad as tonic, while the *Nebenklänge* do not necessarily treat their respective *Hauptklänge* as new tonics.

[118] Riemann, *Katechismus der Musik (Allgemeine Musiklehre)*, 68.

of Tp as directly related (*nächsteverwandt*) to the tonic.[119] Admittedly, however, in both instances, he is describing directly related *keys*, not triads.

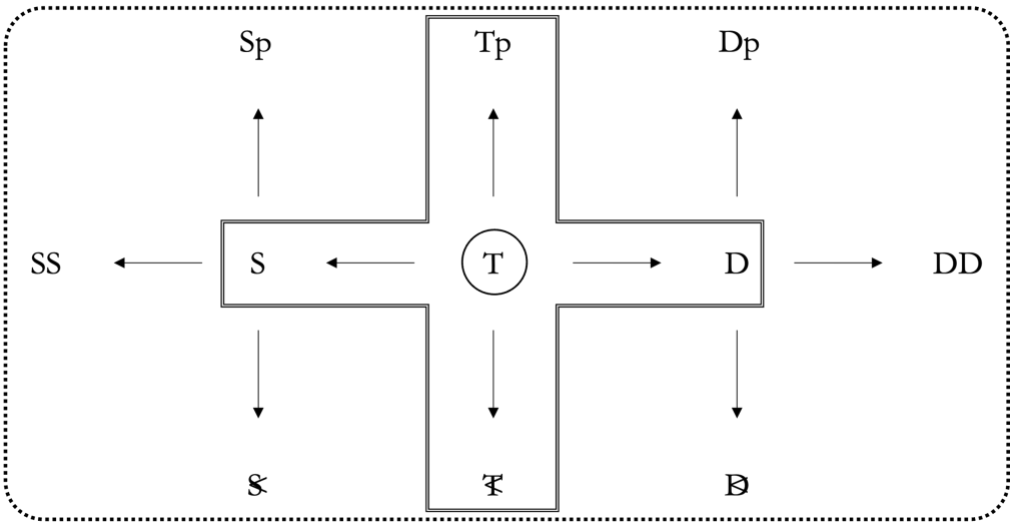

Figure 2.9: Diagram demonstrating degrees of relatedness between Riemann's functions with the second implied definition for relatedness. The circle around T indicates the tonic as the center, the cross containing S, D, Tp, and 𝔗 indicates first degree relation, and the dashed line around the rest of the functions indicates second degree relation.

The characteristic feature of this definition is that relatedness is described by tallying the number of transformations required to move from one triad to the other. There is also some evidence that Riemann is thinking this way in the *Vereinfachte Harmonielehre*. For example, he describes "the ancient Greek theorists" conceiving of the scale as "a chain of fifth—f, c, g, d, a, e, b." Setting aside the question of this account's historical accuracy, he describes this chain of fifths containing "relatives even to the sixth degree."[120] The implication is that in this conception of the scale, F and B♭ are sixth degree relatives. This is an extreme example of Riemann tallying the degrees of separation between tones. It suggests that Riemann might, as in this second definition of

[119] A more exact translation would be "most nearly related." See footenote 98 for more on this. Riemann, *Katechismus der Harmonie- und Modulationslehre (praktische Anleitung zum mehrstimmigen Tonsatz)*, 184.
[120] Riemann, *Vereinfachte Harmonielehre*, 7. "*Die altgriechischen Theoretiker (Pythagoras) sahen in ihr [der Grundskala] eine Kette von Quinten: f.c.g.d.a.e.h, als welche sie freilich je nachdem man diesen oder jenen Ton zum Ausgangspunkt nimmt (als Prim) Verwandte bis zum sechsten Grade enthält.*"

relatedness, consider relatedness between chords to be a tally of the degrees of separation between them.

Some other selections from the *Vereinfachte Harmonielehre* also suggest that this second definition of relatedness applies. Consider Riemann's statement that "nearest-related triads are in the first place [*zunächst*] only those known under the name of dominants."[121] *Zunächst* typically indicates the first of something or the beginning of a list. While here Riemann only explicitly states that the dominants are directly related to the tonic, by saying *zunächst*, it suggests that there are other directly related triads besides the dominants. He never specifies what those other triads are, but the most logical candidates would be the *Nebenklänge* of the tonic. Also, his foundational analogy to some extent supports this second definition of relatedness. Concerning tone relationships, Riemann allows both thirds and fifths to be direct relations. If tone and chord relationships are in fact analogous, then it should follow that third relations (*Terzwechsel*, or *Leittonwechsel*) and fifth relations (*Quintschritt* and *Gegenquintschritt*) would constitute direct relations between chords, and then the tonic *Nebenklänge* would be in fact directly related to it.

This second definition of relatedness suggests that Riemann's applied dominants (*Zwischendominanten*) are also secondarily related to the tonic. This inference is supported by the fact that Riemann assigns a unique function symbol to those triads two *Quintschritte* or two *Gegenquintschritte* from the tonic—that is, in C major, he assigns d^+ the symbol $\mathfrak{D}$, and $b\flat^+$ the symbol $\mathfrak{S}$. If relatedness is defined by the number of *Harmonieschritte* a triad is from tonic, then it follows that Riemann's applied dominants of dominants are in fact secondarily related to the tonic, because they are two *Quintschritten* and two *Gegenquintschritten* respectively from that chord. Riemann's foundational analogy also supports this—he considers tones related by two fifths to the tonic to be

[121] Riemann, 8. "*Nächstverwandte Klänge sind zunächst nur die unter dem Namen Dominanten bekannten.*"

secondarily related, so it follows that triads related by two fifth relations to the tonic (two *Quintschritten* or two *Gegenquintschritten*) should also be secondarily related to it.

Riemann's third implied definition stems from his (1888) statements about the relationship between chords that share common tones. He explains that "common tones are obviously of special significance for the easy comprehensibility of chord progressions," and then proceeds to separately list the *Harmonieschritte* that maintain two commons tones and those that maintain one.[122] Thus, it appears that two triads are related if they share common tones, and if triads share more common tones they are more directly related, while triads that share fewer common tones are less directly related (example Figure 2.10). Riemann is not so explicit in the *Vereinfachte Harmonielehre*, although he does still use common tones as an explanation for logic or connectedness between chords, terms that are connected to the idea of relatedness for Riemann. For example, he explains that the triads connected by a "*Quintwechsel* are very closely connected (*stehen sich sehr nahe*), as they have both notes of the interval of the fifth in common and only differ in the third."[123] That is, the triads [F, A, C] and [F, A♭, C] are close (*stehen sich sehr nahe*) because they share two common tones. While Riemann does not refer to the two triads as directly (*Nächstverwandt*) or secondarily related (*im zweiten Grade verwandt*), his expression that they stand close to one another (*stehen sich sehr nahe*) expresses a similar idea. Similarly, Riemann justifies certain cadences as "logical, because they proceed from tonic to dominant by means of notes in common."[124]

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[122] Riemann, *Katechismus der Musik (Allgemeine Musiklehre)*, 68. "*Von besonderer Bedeutung für die Leichtverständlichkeit einer Harmoniefolge ist natürlich die Gemeinsamkeit von Tönen. Zwei Töne haben gemein: Klänge, die im Verhältnis des Quintwechsels, Terzwechsels oder Leittonwechsels stehen; nur einen Ton: Klänge die im Verhältnis des Seitenwechsels, schlichten oder Gegenquintschritts, schlichten oder Gegenterzschritts, schlichten oder Gegenkleinterzschritts, Ganztonwechsels und Doppelterzwechsels stehen.*"

[123] Riemann, *Vereinfachte Harmonielehre*, 54."*Erschienen die Klänge beim Gegenquintwechsel einander sehr fremd (s. oben), so stehen sich die des schlichten Quintwechsels dagegen sehr nahe, da sie beide Töne des Quintintervalls gemein haben (doch mit umgekehrtem Sinn) und nur im Terztone sich unterscheiden.*"

[124] Riemann, 187. "*Die einfachsten Arten solcher einseitigen Kadenzen sind: T—$^{+}$S—^{o}S— T und ^{o}T— ^{o}D—D+—^{o}T, auch T—Sp —S—T, T—Tp —S—F, ^{o}F—^{o}Sp—^{o}S—^{o}F, F—Dp—D—F, ^{o}T— ^{o}Dp—^{o}D—^{o}T u.s.w., deren innere Logik in dem durch gemeinsame Töne vermittelten Vorgehen von der Tonika zur Dominante oder im vermittelten Ruckgange von derselben zur Tonika besteht.*"

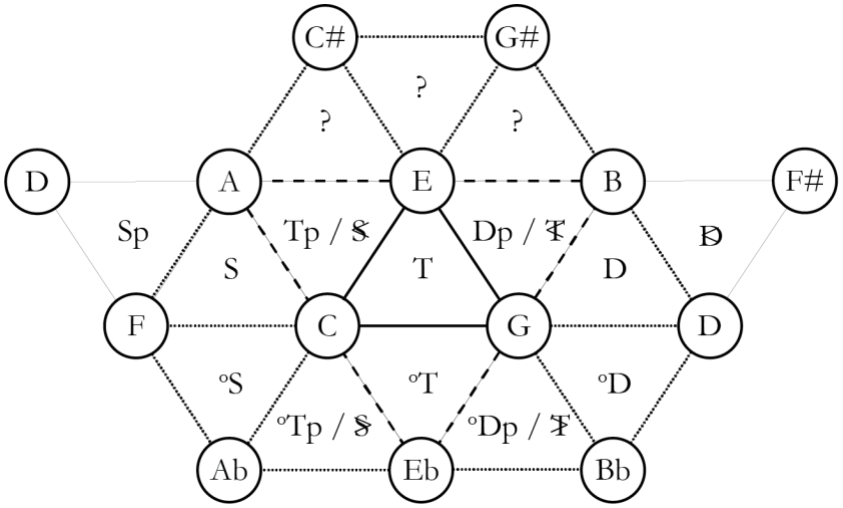

Figure 2.10: A tonnetz overlayed with function symbols demonstrating degrees of relatedness of harmonies with the third definition of relatedness. The solid line around T indicates the tonic as center, while the dashed lines indicate directly related triads, and the dotted lines indicate secondarily related triads.

This third definition of relatedness is attractive because it provides a more compelling explanation of why the *Hauptklänge* all have different functions and the *Nebenklänge* share the same function as their respective *Hauptklänge*. Consider the *Nebenklänge*, which are each either a *Terzwechsel* or *Leittonwechsel* from their respective *Hauptklänge*. These two *Harmonieschritte* preserve two common tones, so *Nebenklänge* share two common tones with their respective *Hauptklänge*. It makes sense that triads that share two common tones, which after all is the maximum number that two triads can share without being identical, should have the same function. In contrast, *Hauptklänge* are related to one another by *Quintschritt* or *Gegenquintschritt*, the only two diatonic *Harmonieschritte* that maintain only one common tone. That is, they are less related than the *Nebenklänge* and do not share the same function. Lastly, triads that do not share common tones are not related, or can only be related via some common relation of both triads. For example, dominant of the dominant can only be related to tonic through the dominant. In sum, this third definition of relatedness considers the *Nebenklänge* to be the most closely related to the tonic, the *Hauptklänge* to be less closely related, while all other triads only relate to the tonic through some other intermediary chord.

The situation is however more complicated for this third definition. Consider, as in Figure 2.10, the potential direct and secondary relatives to the C major triad. Firstly, the triads that share one or two common tones with c^+ requires modal mixture of both C major and minor. For example, ^{o}g share two common tones with c^+, but comes from the parallel minor. Secondly, if the number of common tones to the tonic chord determines a triad's relatedness, then the three triads with the common tone [E] (a^+, e^+, and ^{o}g#) should be secondarily related to the tonic. However, at least in the *Vereinfachte Harmonielehre*, Riemann assigns no function symbol for these triads.[125] These fissures between Riemann's function symbols and this third implied definition of relatedness might be resolved if we limit the third implied definition within the confines of the *Hauptklänge* and the *Nebenklänge*. That is, amongst Riemann's *Hauptklänge* and *Nebenklänge*, the triads that share two common tones with the tonic are directly related and the triads that share one common tone are secondarily related. However, a third problem complicates this. The triads ^{o}a and ^{o}f#, which respectively receive the function symbols Sp and Ɔ, have an unspecified degree of relatedness to the tonic because they share no common tones with the tonic chord. Presumably they would be either third degree relatives or simply not related at all—despite their importance implied by their unique function symbols.

In this section, I have begun to show some of the conceptual ambiguity in Riemann's *Funktionstheorie*. We saw, in the previous section, that Riemann's *Funktionstheorie* involves a transfer of his views on thirds and fifths from the realm of tones to that of harmony—from the intervals of the third and fifth to the *Harmonieschritte* of *Quintschritt*, *Gegenquintschritt*, *Terzwechsel*, or *Leittonwechsel*. I will argue later that his *Funktionstheorie* is an attempt at reconciling third and fifth relations into a single theory of harmony. Exploring how applied dominants and the tonic *Nebenklänge* fit in Riemann's

[125] See Section 2.4 below for more discussion of chromatic third harmonies and the functions Riemann assigns them in his later writings.

Funktionstheorie required considering the different definitions of relatedness—or three different conceptions of how to reconcile third and fifth relations—that Riemann implies in the *Vereinfachte Harmonielehre*. This in turn, revealed that the interaction of fifth-related and third-related harmonies is ambiguous. Does Riemann privilege one over the other, or are they equal? If the situation is so ambiguous, is it really the case that the *Harmonieschritte* are central to Riemann's *Funktionstheorie*? In response to this charge, I will now address some counterarguments to my claim that Riemann defines his functions in terms of his *Harmonieschritte*.

2.1.3 Riemann's functions without the Harmonieschritte?

Given the different, and at times contrasting, explanations that Riemann gives for his theories, it comes as no surprise that Harrison and Kopp deny the role of the *Harmonieschritte* in deriving functional categories.[126] I call the main alternative explored by Riemann the omitted-note method, while Kopp refers to it as the "concept of *Scheinkonsonanz"* (feigning consonance).[127] In this approach, Riemann derived *Nebenklänge* from *Hauptklänge* by adding dissonant tones to the subdominant and dominant triads and then omitting one of the original chord tones. These added dissonances are Riemann's "characteristic dissonances" (*charakteristische Dissonanzen*).

The term "characteristic dissonance" relies on Riemann's recognition of two types of dissonance. We can call the first acoustic dissonance, dissonance between tones, or intra-chord dissonance. This is when a chord has some dissonant combination of tones. We can call the second dissonance between two chords or inter-chord dissonance. In the *Vereinfachte Harmonielehre*, he explains that "the dominants are never perfectly consonant, in so far as they are always conceived

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[126] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 282. "[Riemann's function theory] does not come from continued development of the ideas of "Musikalische Logik," nor does it stem from the troublesome transformational approach attempted in *Musikalische Syntaxis* and *Skizze*."; Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 88. "Riemann clearly dost not say, as if often stated, that the *Parallelklänge* assume functions of their archetypes simply *because* they are their relative minors."
[127] Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 88.

and judged from the tonic."[128] Riemann then explains that because of this "it cannot be wondered at that they, far oftener than the tonic, appear with additional notes."[129] That is, the dominants can handle intra-chord dissonance because they already exhibit inter-chord dissonance. The added dissonances that Riemann allows are the added seventh above D^{+} (in C major, [G, B, D, F]; in A minor, [E, G#, B, D]; Figure 2.11A.), the added sixth above S^{+} (in C major, [F, A, C, D]; Figure 2.11B.), the added seventh below ^{o}S (in A minor, [B, D, F, A]; in C major [D, F, Ab, C]; Figure 2.11C.), and the added sixth below ^{o}D (in A minor, [D, E, G, B]; Figure 2.11D.)[130]

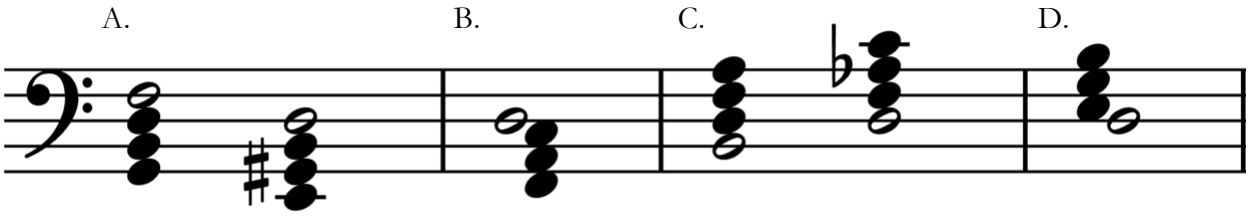

Figure 2.11: Riemann's dominant and subdominant triads in C major and A minor with added characteristic dissonances, indicated with open noteheads.

Riemann goes on to explain that omitting the fifth in an added-sixth chord will produce the subdominant parallel (Sp) and the minor dominant parallel (^{o}Dp):

> Another formation results from the omission of the fifth in the chords of the sixth; first, in those hitherto considered, namely, those arising from the addition of a characteristic dissonance [added sixth] to the *Gegenquintklänge* (S^{6} and D^{VI}); in these, by omission of the fifth a triad apparently of the opposite mode arises; i.e., $S^{6}_{\not 5}$ (the stroke through the 5 indicates its omission) apparently yields a minor chord (in c-major f a ~~e~~ d apparently = ^{o}a),

[128] Riemann, *Vereinfachte Harmonielehre*, 60. "*Da nämlich die Dominanten insofern nie vollkommen konsonant sind, als sie stets von der Tonika aus vorgestellt und beurteilt werden (also sozusagen stets mit dieser zusammen), so ist es nicht verwunderlich, dass sie ungleich häufiger als die Tonika mit Zusatztönen erscheinen.*"
[129] Riemann, 60.
[130] Riemann, 61.

and D_V^{VI} a major chord (in a-minor d e g b) apparently = g^+)…Thus Sp is the feigning minor chord arising from the omission of the fifth in the chord of the subdominant with over-sixth; and similarly, °Dp the feigning major chord arising from the omission of the fifth in the chord of the dominant with under-sixth.[131]

While omitted-note method suffices for Sp and °Dp, Riemann explicitly rejects it as a method of deriving the remaining *Nebenklänge*. Immediately after introducing the omitted-note method, Riemann explains why it cannot explain any of the remaining *Nebenklänge*:

> But the possibility thus manifested to us of substituting the *Parallelklang* for a *Hauptklang* of the key, is not confined to the *Gegenquintklang*, but also possible for the others, firstly, for the tonic itself and the *Quintklang*. These cases must be explained indeed, in a different way, since for the tonic there can be no characteristic dissonance (for, on the contrary, the characteristic of the tonic is absolute consonance), and the *Quintklang* with its own characteristic dissonance (7, VII) cannot produce any feigning consonant formations (as the 7 [VII] is dissonant not only with the 1 [I], but also with the 3 [III]).[132]

There are two problems here. The first is with deriving the tonic *Nebenklänge* with the omitted-note method. The omitted-note method, as we saw with the subdominant and dominant triads, requires

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[131] Riemann, 77. "*Ein anderes Bild ergiebt die Auslassung der Quinte in den Sextakorden, zunächst in den bisher allein in Betrachtung gezogenen, durch die Hinzufügung der charakteristischen Dissonanz entstehenden Sextakkorden der Gegenquintklänge (S⁶ und* D^{VI}*); bei diesen entsteht nämlich durch Auslassung der, wie wir sehen, sehr gut neben der Sexte möglichen Quinte scheinbar ein Klang gegenteiligen Klanggeschlechts, d.h.* S_5^6 *(das Durchstreichen der 5 bedeutet deren Auslassung) ergiebt scheinbar einen Mollakkord (in C-dur* f a e d *scheinbar =* °*a) und* D_V^{VI} *einen Durakkord (in A-moll* d e g h *scheinbar =* g^+*). Wir lernen damit eine neue Kategorie der Konsonanz (Scheinkonsonanzen) kennen. Da der Scheinklang (das* °*a als* F_5^6 *und das* g^+ *als* h_V^{VI}*) zum Hauptklange im Verhältnis des schlichten Terzwechsels steht (*a *ist schlichte Terz für* f⁺, g *schlichte Terz für* °h*) oder was dasselbe ist, in dem Verhältnis, in welchen die Toniken von Paralleltonarten stehen (F-dur und D-moll, E-moll und G-dur sind sogennante Parallel-tonarten), so wollen wir ihn den Parallelklang derselben nennen und in der die Funktionen der Harmonie aufweisenden Chiffrierung das Verhältnis durch ein* p *beim* S *bezw.* °D *ausdrücken. Es ist also* Sp *der durch Auslassung der Quinte im Dur-Subdominantsextakkord (* S_5^6*) entstehende Schein-Mollakkord; und ebenso ist* °Dp *der durch Auslassung der Quinte im Moll-Dominantsextakkord (*D_V^{VI}*) entstehende Schein-Durakkord.*"

[132] Riemann, 79. "*Die sich uns hier offenbarende Möglichkeit der Stellvertretung eines Hauptklanges der Tonart durch seinen Parallelklang ist aber nicht auf den Gegenquintklang beschränkt, sondern auch für die anderen, zunächst auch für die Tonika selbst und den schlichten Quintklang möglich. Freilich ist ihre Motivierung da eine andere, da es für die Tonika eine charakteristische Dissonanz nicht geben kann (weil das Charakteristikum der Tonika vielmehr die absolute Konsonanz ist) und der schlichte Quintklang mit seiner charakteristischen Dissonanz (7, VII) keine scheinkonsonanten Bildungen ergeben kann (da die 7 [VII] nicht nur gegen die 1 [I] sondern auch gegen die 3 [III] absolut dissoniert).*"

adding a characteristic dissonance to a triad. However, the tonic triad does not have a characteristic dissonance, and thus its *Nebenklänge* cannot be derived using the omitted-note method. Remember that for Riemann, the subdominant and dominant triads can receive intra-chord dissonance (the characteristic dissonances) because they exhibit inter-chord dissonance. The tonic triad, on the other hand, does not exhibit inter-chord dissonance. Secondly, applying the omitted-note method to either the dominant seventh chord or the minor subdominant seventh chord will not result in *Nebenklänge*. For instance, if one takes D^7 in C major [G, B, D, F], and omits the root G, one is left with the dissonant diminished triad [B, D, F]. Riemann explicitly states however that the *Nebenklang* built on B in C major is the minor triad [B, D, F#].

One might argue that Riemann's persistent use of the term *Scheinkonsonanz* suggests the prevalence of the omitted-note method and confirms it as Riemann's preferred method for deriving the *Nebenklänge*. For Riemann, only T, S, or D are properly consonant triads, and the argument would follow that all other apparent consonant triads are dissonant chords feigning consonance (*Scheinkonsonanz*). This line of argument might also find the omitted-note method attractive because it provides an explanation for why the *Scheinkonsonanzen* possess intra-chord dissonance—they are in reality just *Hauptklänge* with added dissonances. For example, the *Nebenklang* Sp in C major [D, F, A], is a *Scheinkonsonanz* because it contains the note D, which is dissonant against the actual fifth of the triad, C, even though that fifth is omitted, which allows D to sound consonant. However, besides Riemann's explanation that the omitted-note method cannot serve as the conceptual basis for the *Nebenklänge*, there are two further arguments against it.

First, the omitted-note method is inconsistent with Riemann's conception of directly and secondarily related triads. In the omitted-note method, the *Nebenklänge* are not related to the *Hauptklänge*, but instead simply are the *Hauptklänge*, just with added and omitted notes. As we have

seen, in the *Vereinfachte Harmonielehre*, Riemann explicitly conceives of triads as being directly or secondarily related to one another.

Secondly, Riemann does not invoke the omitted-note method when defining *Scheinkonsonanz*. Further, there is in fact a better definition of *Scheinkonsonanz* available to him, one based on his harmonic conception of tone relationships. Consider first two definitions of *Scheinkonsonanz* that Riemann provides, which do not invoke his omitted-note method. In the fifth edition of his *Musik-Lexikon* (1900), the first time Riemann defines the term *Scheinkonsonant*, Riemann states:

> *Scheinkonsonant*, an important concept in the speculative theory of music; *Scheinkonsonanten* are namely those dissonances which, viewed in isolation, coincide with consonances, e.g., the chord consisting of prime, third and sixth (instead of fifth) or the chord consisting of prime, fourth and sixth instead of prime, third and fifth; all *Parallelklänge* and *Leittonwechselklänge* are *Scheinkonsonanten*.[133]

And in the seventh edition (1909):

> All harmonies that, through musical context, prove to be dissonances are *Scheinkonsonant*, even though viewed in isolation they exhibit only consonant relationships, e.g., the fourth, where it is a derivative of the third, the fifth as a derivative of the sixth.[134]

Riemann's definitions here only specify that the dissonant aspect of a *Scheinkonsonanz*, the intra-chord dissonance, becomes evident in musical context. How exactly that dissonance is determined is left unspecified. While one might assume that the omitted-note method is in play, a much stronger

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[133] Riemann, *Musik-Lexikon*, 1900, 998. "*Scheinkonsonant*, *ein wichtiger Begriff der spekulativen Theorie der Musik; Scheinkonsonanten sind nämlich diejenigen Dissonanzen, welche isoliert betrachet mit Konsonanzen zusammenfallen z. B. der aus Prim, Terz und Sexte (statt Quinte) bestehende Akkord oder der aus Prim, Quarte und Sexte statt Prim, Terz und Quinte bestehende; alle Parallelklänge und Leittonwechselklänge sind Scheinkonsonant*."

[134] Riemann, *Musik-Lexikon*, 1909, 1247. "*Scheinkonsonant sind alle zusammenklänge, welche durch den musikalischen Zusammenhang sich als Dissonanzen erweisen, obgleich sie isoliert betrachtet nur konsonante Verhältnisse aufweisen, z. B. die Quarte, wo sie Vorhalt von der Terz ist, die Quinte als Vorhalt von der Sexte*."

explanation of why *Scheinkonsonanten* are dissonant can be inferred from Riemann's harmonic conception of tone relationships.

For Riemann, only the major third and perfect fifth constitute direct intervals; all other consonant intervals arise from some combination of thirds and fifths. In the case of a *Scheinkonsonanz*, the dissonant tone relies on some interval besides thirds and fifths. Take for example Sp in C major (D F A). In Sp, the D is being conceived of as a sixth of the fifth (F) below the tonic. That is, its harmonic relationship to the tonic is "sixth of under-fifth." I infer that this, and any, *Scheinkonsonanz* is dissonant because its harmonic relation involves an interval besides the major third or perfect fifth. The consonant harmonic relation of D would be a fifth of fifth in C major, which occurs as part of a dominant triad. This approach provides an explanation for why all the *Nebenklänge* are *Scheinkonsonanzen*, as opposed to the omitted-note method, that explains just a select few *Nebenklänge*—a *Scheinkonsonanz* is any triad having at least one tone whose harmonic relationship to the tonic involves any interval besides a major third or fifth, and all *Nebenklänge* fulfill this requirement.

I have set out to show that Riemann's *Funktionstheorie* and his *Harmonieschritte* are closely connected, in contrast to Harrison and Kopp, who deny the role of the *Harmonieschritte* in Riemann's *Funktionstheorie*.[135] I have shown that Riemann conceives of his *Funktionstheorie* as a theory of chord relationships that is analogous to his theory of tone relationships. This analogy alone necessitates his *Harmonieschritte*, because the *Harmonieschritte* is the chord relationship equivalent of "interval." Additionally, though, Riemann is often explicit about the role of the *Harmonieschritte* in defining his functions. The alternative to the *Harmonieschritte* that Kopp proposes—the omitted-note method—is insufficient for defining all of the *Nebenklänge*, a point made by Riemann himself. So far however, my discussion has focused simply on how to label triads in Riemann's *Funktionstheorie* or to use function

[135] See footnote 15 for Harrison's and Kopp's claims.

symbols to describe the pitch-content of triads in relationship to a tonic. The following section transitions to how Riemann's *Funktionstheorie* is also a *Kadenzlehre*.

2.2 Pitch-class content or harmonic syntax?

In the previous sections, I described how Riemann assigns function symbols to triads—or, how he defines his functional categories and their members—by means of the analogy he draws between tone relationships and chord relationships. In this section I address what it is that Riemann's function symbols convey and what it means for a triad to be a member of a functional category. On the one hand, functions convey the pitch-class content of a triad by generally describing its relationship to an unspecified tonic. It is in this sense that Riemann's *Funktionstheorie* is an alternative *Stufentheorie*, as Dahlhaus suggests.[136] On the other hand, they convey expected harmonic context of a chord. It is in this sense that Riemann's *Funktionstheorie* subsumes his *Kadenzlehre*, and we will see that Riemann's *Funktionstheorie* and *Kadenzlehre* are interdependent.

One capability of function symbols is to convey the harmonic-relation content of a triad. This is best explained through an analogy to *Stufentheorie*. Roman numerals describe the scale-degree content of a triad—they directly describe the scale degree of the root of the chord, and indirectly describe the scale degree content of the remaining chord members. If we think of scale degrees as providing a method to describe tones according to their relationship to the tonic rather than their pitch class, then Roman numerals provide a method of describing chords according to their relationship to the tonic, rather than their pitch class content. Riemann's functions also describe chords according to their relationship to the tonic rather than by their pitch-class content, but do so

[136] Dahlhaus, "Über den Begriff der tonalen Funktion," 94. "It can be concluded that the *Funktionstheorie* is a more rigorous *Stufentheorie* in which the number of *Stufen* is limited to three (I, IV and V)." "*Aus Riemanns These, daß f-a-c = S in C-dur die Grundform einer Gruppe von Akkorden sei, die durch Alteration der Terz (f-as-c) und Vertauschung der Quinte mit der Sexte (f-a-d und f-as-des) oder des Grundtons mit der Untersekunde (e-a-c und es-as-c) aus f-a-c hervorgehen, kann geschlossen werden, daß die Funktionstheorie eine rigorosere Stufentheorie sei, in der die Anzahl der Stufen auf drei (I, IV und V) schrumpft.*"

with the *Harmonieschritte*—this is explicit with the *Paralellklänge* and *Leittonwechselklänge*, and implied with the dominant and subdominant. While for roman numerals, the underlying system uses scale degrees, in his *Funktionstheorie* however, Riemann does not conceive of tones as scale degrees.[137] Instead, *Harmonieschritte*, as well as functions, describe the harmonic-relation content of a chord. For instance, labeling g^+ as dominant indicates that g^+ is a *Quintschritt* from the tonic c^+, and by extension it indicates that g^+ is made up of the following harmonic relations: Fifth [G], third of fifth [B], and fifth of fifth [D]. When provided with a particular tonic or key, this information can be used to determine the pitch-class content of a triad. If one is concerned only with describing chords in relation to the tonic, Riemann's functions and Roman numerals achieve a similar end. This is the sense in which harmonic functions describe pitch-class content.

While both Roman numerals and function symbols can communicate a triad's relationship to the tonic (and so also, indirectly its pitch class content), the two differ in that function symbols does more to describe, and is more dependent upon, harmonic context.[138] Some, like Dahlhaus, Harrison, and Kopp ignore or downplay the significance of Riemann's *Kadenzlehre* for practical analytical purposes, but Alexander Rehding recognizes that "in Riemann's thought cadential order did serve a supremely important purpose."[139] I examine this thought, in the *Vereinfachte Harmonielehre* below.

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[137] Dahlhaus comes to a similar conclusion. Dahlhaus, "Terminologisches zum Begriff der harmonischen Funktion." "Scale degree is a concept inimical to Riemann, for whom, for example, a chord based on the third scale degree may function as tonic, dominant, or dominant of the relative minor, depending on context."; Kopp also comes to a similar conclusion in Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 99. "Scale step does not figure in Riemann's system past the primary functions."

[138] Riemann's earliest discussions of *Kadenzlehre* appear in Ries, "Musikalische Logik: Ein Beitrag zur Theorie der Musik." While both the *Vereinfachte Harmonielehre* and the *Musikalische Logik* address *Kadenzlehre*, they have little in common besides describing typical harmonic progressions. The *Musikalische Logik* utilizes scale degrees and roman numerals, suggests a dialectic understanding of harmonic progression, lacks Riemann's rigorous system for categorizing triads, and does not feature Riemann's dualism. The *Vereinfachte Harmonielehre* on the other hand replaces scale degrees with harmonic relation content, replaces roman numerals with the *Harmonieschritte*, is at least mostly dualist, and does not maintain Riemann's earlier dialectic inspirations.

[139] Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*, 67.; Lewin, *Generalized Musical Intervals and Transformations*.; Dahlhaus, "Über den Begriff der tonalen Funktion."; Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*.; Kopp, *Chromatic Transformations in Nineteenth-Century Music.*

Riemann explicitly states in the *Vereinfachte Harmonielehre* that there are typical harmonic progressions. "The progressions T—S—D—T and ^{o}T—^{o}D—^{o}S—^{o}T are therefore really typical for harmonic motion in general; they are so-called complete (two-sided) cadences."[140] T—S—D—T is Riemann's major harmonic progression and ^{o}T—^{o}D—^{o}S—^{o}T is his minor progression. Notice the opposite ordering of the two progressions.

Before considering the finer details of Riemann's *Kadenzlehre*, it is important to explain that while T—S—D—T and ^{o}T—^{o}D—^{o}S—^{o}T constitute typical harmonic progressions, Riemann often describes these progressions using the *Harmonieschritte*. Notice that the major progression T—S—D—T translated to *Harmonieschritte* reads tonic—*Gegenquintklang*—*Quintklang*—tonic. Similarly, the minor progression ^{o}T—^{o}D—^{o}S—^{o}T translated to *Harmonieschritte* also reads tonic—*Gegenquintklang*—*Quintklang*—tonic. His two prototypical progressions can be expressed succinctly as T—*Gegenquintklang*—*Quintklang*—T, which he uses when describing these progressions, as we will see below while examining his *Kadenzlehre*.

Riemann begins by establishing that the *Gegenquintklang* (S in major or ^{o}D in minor) in this progression is a "forcible pressing back beyond the starting-point of harmonic relations (the tonic)"[141] and "the stretched bow which slings the arrow beyond the mark (the tonic)."[142] In the progression tonic—*Gegenquintklang*—*Quintklang*—tonic, the *Gegenquintklang* establishes an expectation, not to return to tonic, but to go past the tonic to the *Quintklang*. He then describes the rest of the progression:

> For this reason [the pressing back beyond the tonic] the *Gegenquintklang* [S in major or ^{o}D in minor] is generally not followed by the tonic itself; this simple solution of the conflict caused

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[140] Riemann, *Vereinfachte Harmonielehre*, 30. "*Die Folgen T—S—D—T und ^{o}T—^{o}D—^{o}S—^{o}T sind daher recht eigentlich typische für die Harmoniebewegung, sogenannte vollständige (zweiseitige) Kadenzen*."

[141] Riemann, 29."*Ein gewaltsames Zurückdrängen hinter den Ausgangspunkt der harmonischen Beziehungen (die Prim) definiert werden.*"

[142] Riemann, 30."*Der Gegenquintklang ist der gespannte Bogen, der den Pfeil übers Ziel (die Tonika) hinausschleudert.*"

> by its introduction is not—at least at decisive points of the harmonic development—satisfactory or sufficient; rather, the contra-fifth clang is generally followed by the *Quintklang* [D in major or °S in minor], which, then, leads back to the tonic in a thoroughly satisfactory manner, and closes restfully.[143]

Thus, the tonic serves as a starting point or point of rest and the *Gegenquintklang* necessitates a move the other side of the tonic, the *Quintklang*, which then leads back to tonic.

Riemann also allows mixing functions from major and minor keys, which he describes using his *Harmonieschritte*. He explains that:

> To introduce the *Seitenwechsel* [minor subdominant in a major key or minor dominant in a minor key] simply in place of the *Gegenquintklang* in the two perfect cadences T—S—D—T and °T—°D—°S—°T would not be right; in so doing we should simply be setting aside a highly important element of the cadence (the tension caused by the contra-fifth clang cannot be replaced by the contra-clang).[144]

Here Riemann warns against replacing the *Gegenquintklang* with the *Seitenwechsel*. In other words, if in the progression T—*Gegenquintklang*—*Quintklang*—T, the *Gegenquintklang* or *Quintklang* is being replaced by a triad from the opposite mode, then that triad should be replaced by the opposite key's *Gegenquintklang* or *Quintklang* respectively. For example, in C major, the *Seitenwechsel* is °c (i.e. an f minor triad). In C minor, °c is the *Quintklang*. According to Riemann then, °c should not replace f^+ in a C major progression, because f^+ is the *Gegenquintklang* and °c is the *Quintklang* in the opposite mode. For Riemann, the °c should appear in the same position as g^+, the *Quintklang* in C major. In other words, when mixing major and minor keys, one simply needs to maintain the order of T—

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143 Riemann, 30. "*Daher folgt dem Gegenquintklang gewöhnlich nicht die Tonika selbst; diese einfache Lösung des durch seine Einführung erzeugten Konflikts ist wenigstens für entscheidende Punkte der Harmonieentfaltung nicht befriedigend, nicht genügend; vielmehr folgt gewöhnlich dem Gegenquintklang erst der schlichte Quintklang, der dann völlig befriedigend und ruhig abschliessend zur Tonika zurück geleitet.*"

144 Riemann, 49. "*In den beiden vollständig Kadenzen T—S—D—T and °T—°D—°S—°T etwa den Gegenklang einfach an Stelle des Gegenquintklanges einstellen zu wollen, hiesse nicht das rechte treffen.*"

Gegenquintklang—*Quintklang*—T. Riemann demonstrates this principle with the two progressions T—S—D—^{o}S—T and ^{o}T—^{o}D—^{o}S—D^{+}—^{o}T.[145] An extreme example of this would be the progression T—^{o}D—S—D—^{o}S—T. The minor dominant and the major subdominant are both *Gegenquintklänge* in their respective modes, and the dominant and the minor subdominant are both *Quintklänge*, so the progression is acceptable to Riemann. The two *Gegenquintklänge* and the *Quintklänge* could potentially also switch positions, allowing for the four progressions in Figure 2.12.

T—^{o}D—S—D—^{o}S—T

T—S—^{o}D—D—^{o}S—T

T—^{o}D—S—^{o}S—D—T

T—S—^{o}D—^{o}S—D—T

Figure 2.12: Four extreme examples of mixing major and minor functions while maintaining the order of T—*Gegenquintklang*—*Quintklang*—T.

So far, we have seen how Riemann address harmonic progression with *Hauptklänge* in, and when mixing, both major and minor. The situation is more complex when considering the *Nebenklänge*. For Riemann, the harmonic function of some chords is dependent on function also being a *Kadenzlehre* because harmonic context is the only way to determine the function of some triads. In particular, some of the *Nebenklänge* have two possible functional interpretations and deciding between them is a question of harmonic context. For example, in C major, ^{o}b can be either Ƭ or Dp. This is because ^{o}b can be reached either from tonic (c+) by a *Leittonwechsel* or from dominant (g^{+}) by a *Terzwechsel* (see Figure 2.3). In all, there are four *Nebenklänge* that can receive two different function symbols in this way—in C major, ^{o}e and ^{o}b, and in A minor, c^{+} and f^{+}. I will call these bivalent triads.

[145] Riemann, 49.

Deciding between the two symbols is a matter of determining whether the bivalent triad in question belongs to one functional category or the other, which in turn depends on its harmonic context. If we again consider °b in the key of C major, it receives the symbol T when it follows directly after the tonic, or if it simply replaces the tonic.[146] However, if °b occurs before the tonic triad, then it receives Dp function.[147] That is, the function symbol °b receives will depend on its harmonic context, as is the case for all bivalent triads. In sum, a bivalent triad assumes the function of a triad it replaces (substitution), or it assumes the function of the triad that precedes it, if that triad's function is one of the two options available to the bivalent triad. I provide further evidence for this view of bivalent triads below.

Riemann explicitly describes the possibility of substitution (*Stellvertretung)*:

> If, in the first place, we retain the notion of "substitution," we must state its existence in the case of the *Parallelklang* of the tonic, particularly in the deceptive cadence, which is best explained as a real cadence disturbed by a dissonant note and as replacing the tonic with a feigning consonance; three parts make their regular progression from the plain-fifth clang back to the tonic, and the fourth (in major regularly the bass), instead of the step of a fifth or fourth from fundamental note to fundamental note, makes a step of a second upwards from the fundamental note of the *Quintschrittklang* to the third of the *Gegenquintschrittklang* (sixth of the tonic).[148]

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[146] Riemann, 87. "*Die durch die kleine Gegensekunde (grosse Septime) entstehende scheinkonsonante Nebenform der Tonika* [T] *bildet also ein natürliches Zwischenglied Zwischen Tonika und Gegenquintklang*."

[147] Riemann, 104.

[148] Riemann, 79. "*Halten wir zunächst an dem Begriff 'Stellvertretung' fest, so ist eine solche für den Parallelklang der Tonika vor allem beim sogenannten Trugschluss zu konstatieren, dessen Definition am besten dahin gegeben wird, dass er ein wirklicher Schluss ist, aber gestört durch einen dissonanten Ton und dass er die Tonika durch eine Scheinkonsonanz ersetzt; drei Stimmen machen ihre regelmässige Fortschreitung vom schlichten Quintklang zurück zur Tonika und die vierte (in Dur zunächst regelmässig der Bass) macht anstatt des Quint- oder Quartschrittes von Grundton zu Grundton vielmehr einen Sekundschritt aufwärts vom Grundtone des schlichten Quintklanges zur Terz des Gegenquintklanges (Sexte der Tonika).*"

In the case of the major mode deceptive cadences, the final triad can be either Tp or S. Riemann understands the final triad to be Tp, describing it as a substitute for the expected final T. It seems that it receives the function symbol Tp, rather than S, because Riemann's *Kadenzlehre* dictates that the tonic follows the dominant.

Riemann is more explicit about the use of the *Parallelklänge* after their respective *Hauptklänge*.[149] He explains, for example, that "the *Parallelklang* appearing after the tonic triad always indicates the anticipation of an element of the harmony which follows logically."[150] That is, the new tone in the *Parallelklang* is a chord member from chord that follows and thus the *Parallelklang* partly anticipates its successor. In C major, the triad Tp, [C, E, A], introduces the note [A], which is the third of the subdominant, [F, A, C].

For Riemann, the *Leittonwechselklänge*, when not being used as substitutes for their respective *Hauptklänge*, also normally appear immediately following their respective *Hauptklänge*. His reasoning is that "these formations arise in the simplest fashion through the plainest figuration of the harmonies by means of passing or auxiliary notes."[151] He provides the following example in major and minor:

[149] Riemann, 80. "*Es tritt nämlich in der Kadenz der reinen Durtonart zwischen* T *und* S *:* Tp*, zwischen* S *und* D *:* Sp…"
[150] Riemann, 80. "*Der Parallelklang nach dem Hauptklang auftretend bedeutet daher überall eine Anticipation (Vorausnahme) eines Elementes der logischer Weise folgenden Harmonie*."
[151] Riemann, 86. "*Diese Bildungen Entstehen in der einfachsten Weise durch die schlichteste Figuration der Harmonien mittels Durchgangs- oder Wechselnoten und zwar zunächst sogar in der komplizierteren Gestalt viertöniger Akkorde (grosser Septimenakkorde)*."

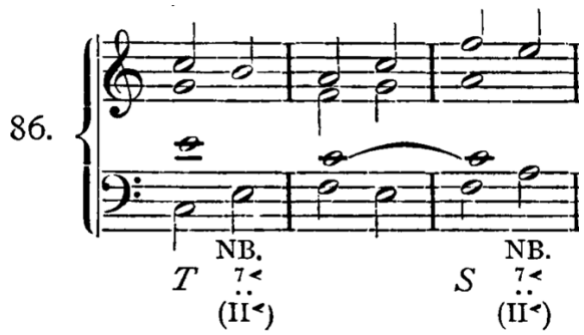

Figure 2.13 Riemann's example of how T necessarily arises as a harmonization of the descending soprano line to prevent sounding a major seventh.

Here the passing tone B in the soprano is supported by the E in the bass, preventing the major seventh dissonance from sounding directly and thus harmonizing the passing B with T. For Riemann, because the *Leittonwechselklänge* harmonize typical passing tones between two functions, they form "a natural connection link" between those two functions.[152]

Finally, Riemann exhibits the ideal progression of all his *Haupt-* and *Nebenklänge* in both major and minor:

Major: T T Tp S S D Dp T

Minor: °T T Tp °D D S °Sp °T

Figure 2.14: Riemann's ideal progressions, including *Haupt-* and *Nebenklänge,* in major and minor. If all the *Haupt* and *Nebenklänge* are present in a progression, the *Hauptklang* is first, followed by the *Leittonwechselklang* and then the *Parallelklang* before moving on to the next *Hauptklang*.

The *Leittonwechselklänge*, T and S in major or T and D in minor, both follow their respective *Hauptklänge*, as we saw Riemann suggest above. The *Parallelklänge*, Tp and Dp in major and °Tp and °Sp in minor, follow after their respective *Hauptklänge* or *Leittonwechselklänge*.

[152] Riemann, 87. "*Die durch die kleine Gegensekunde (grosse Septime) entstehende scheinkonsonante Nebenform der Tonika bildet also ein natürliches Zwischenglied zwischen Tonika und Gegenquintklang*."

In this section, I have explored the extent to which Riemann's *Funktionstheorie* is also a *Kadenzlehre*. It is clear that Riemann's *Kadenzlehre*, as it appears in *Vereinfachte Harmonielehre*, depends on his functions. His *Kadenzlehre* suggests that there are three ways that triads behave, corresponding to three functions, and Riemann's *Funktionstheorie* is the method he uses to group other triads into those functional categories. His *Funktionstheorie* however also relies on his *Kadenzlehre*, because the function of his bivalent triads only becomes clear in a harmonic context. In the following section, I discuss the problems associated with Riemann's *Kadenzlehre*.

2.3 Dualism

Riemann insists that there are only three functions.[153] If function describes harmonic context, then all subdominant and all dominant triads should in principle have the same harmonic context. However, in practice, this is not the case. Consider his two cadential progressions, T—S—D—T and the minor equivalent ^{o}T—^{o}D—^{o}S—^{o}T. Major-key subdominants lead to major-key dominants, which lead back to the tonic. On the other hand, minor-key dominants lead to minor-key subdominants, which lead back to the tonic. Thus, the order of the dominant and subdominant functions is reversed in the minor-mode case. In other words, minor subdominant and dominant chords have differing harmonic contexts from their major equivalents. It appears that there are five functions T, S, D, ^{o}S, and ^{o}D, rather than three as Riemann explicitly states.

This five-function problem stems from Riemann's arrangement of dominant and subdominant in major and minor, for which many authors have accused Riemann of inconsistent invocations of harmonic dualism.[154] The charges against Riemann can be most succinctly

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[153] Riemann, 9. "*Es giebt nur dreierlei tonale Funktionen der Harmonie (Bedeutungen innerhalb der Tonart, nämlich die der Tonika, Dominante und Subdominante).*"

[154] Ary Belinfante is usually described as the first person to level these charges against Riemann, with many notable scholars repeating the argument, include Dahlhaus, Harrison, and Rehding. Belinfante, "De leer der tonale functien in conflict met die der polaire tegenstelling."; Dahlhaus, *Untersuchungen über die Entstehung der harmonischen Tonalität*, 51–53.

summarized as follows: Riemann places both major and minor dominants above the tonic and both major and minor subdominants below the tonic. In a fully dualist version, where major and minor are treated oppositely, the opposite would be expected. That is, if the triad a fifth above a major triad (*Oberklang)* is called the dominant, then the triad a fifth below a minor triad (*Unterclang*) should also be dominant, because a fully dualist system switches up and down in the minor mode case. In other words, if major and minor are treated as symmetrical inversions of one another, then the "dominant" should be a fifth above the major tonic, and a fifth below the minor. We could also describe this with *Harmonieschritte*—in a hard dual system, the *Quintklang* would be synonymous with dominant and the *Gegenquintklang* would be synonymous with subdominant. This apparently dualistically derived assignment is, of course, the reverse of Riemann's actual theory.

This apparently inconsistent invocation of dualism stems from the fact that Riemann imports the fundamental-bass terms of dominant and subdominant—as the *Oberdominant* and the *Unterdominant*. Riemann defends himself by stating that what the accusers forget is:

> That these names (viz., the function labels Tonic, Subdominant, and Dominant) are not at all mine, but rather have been widely used since Rameau. I have properly retained these terms for the same reasons I have retained the designations Major, Minor, Parallel, *Grundton*, and a whole host of others. Accordingly, from the very beginning of my career to my most recent work, I have introduced the designations *Quintklang*, *Gegenquintklant*, *Seitenwechsel*, and the entire terminological system of *Schritte* and *Wechsel*. Although one of my students has assured me that he no longer burdens his brain with these particulars, I know for certain that, while he no longer troubles himself over terminology since I introduced the notational system of Functions, the person concerned is still a long ways from thinking that the Dominant in

Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 273.; Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*, 52.

> major tonality and in minor tonality have the same meaning. The particular form of my notational system in which the prime (*Grundton*) of the dual minor Tonic is the same as the prime (*Grundton*) of the Dominant makes such a conclusion impossible. Thus a retraction is completely out of the questions.[155]

As Riemann explains, the terms tonic, subdominant, and dominant, are not his. Imbued in the terms subdominant and dominant is the sense in which the first is the *Unterdominant* and the second is the *Oberdominant*. It follows that regardless of whether in major or minor, that the *Oberdominant* will be above the tonic, and the *Unterdominant* below the tonic. This does not however address the fundamental accusation of Riemann's critics that his approach is essentially monist, which has led to the persistent view, maintained in the overwhelming majority of scholarship on Riemann, that Riemann's *Funktionslehre* is not a dualistic conception of harmony.

There are several ways to defend Riemann's function assignments. Most notably, Henry Klumpenhouwer describes the critique as presumptuous, explaining that "there is no natural procedure for mapping function assignments onto Riemann's dualist transformations."[156] He suggests that Riemann's function assignments are actually dualistic, in the sense that they reflect Hauptmann's dualist chord structure.[157] To summarize Klumpenhouwer's claims (Figure 2.15)—he recognizes that while it is true that the major dominant is a *Quintschritt* from the tonic and the minor dominant is a *Gegenquintschritt* from the tonic, he suggests that instead, we can think of the major

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[155] Riemann, "Das Problem des harmonischen Dualismus," 69–70. "*Er vergisst, dass diese Namen gar nicht von mir gewählte, sondern seit Rameau allgemein gebräuchliche sind, und ich sie mit demselben Rechte und aus denselben Gründen beibehalten habe wie die Bezeichnungen Dur, Moll, Parallele, Grundton und eine Menge anderer, und dass ich deshalb von allem Anfange an und auch in den allerneusten Arbeiten zur Klarstellung des gänzlich verschiedenen Sinnes der Dominanten in Dur und in Moll die scharf präzisierten Bestimmungen schlichter Quintklang, Gegenquintklang, Seitenwechselklang und die gesamte Terminologie der Schritte (Gegenquintschritt etc.) eingeführt habe. Obgleich mir einmal einer meiner persönlichen Schüler versichert hat, dass er sich mit der Terminologie der Schritte nicht mehr den Kopf beschwere, seit ich die Funktionsbezeichnung eingeführt habe, so weiss ich doch ganz genau, dass der Betreffende sich nur nicht mehr um die Namen sorgte, aber weit entfernt war, nunmehr die Dominanten in Dur und in Moll für gleichbedeutend anzusehen. Dass das beim Studium nach meiner Methode nicht geschehen kann, dafür sorgt vor allem der Ausbau der Bezifferung, in welcher z. B. die Prim der Molltonika und die Prim der Durdominante derselbe Ton sind. Also mit dem Widerruf ist es ganz und gar nichts*."

[156] Klumpenhouwer, "Dualist Tonal Space and Transformation in Nineteenth-Century Musical Thought," 469.

[157] Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative," 204.

dominant as a *Quintschritt* from the tonic and the minor dominant as a *Quintschritt* towards the tonic. It is this change of direction in minor which reflects Hauptmann's dualist chord structure. Klumpenhouwer explains "whereas in major, the formative relationships extend from the *Grundton* (or here the tonic) to other parts of structure, in dual minor the same relationships extend to the *Grundton* (or tonic) from other parts of the structure: the former instantiates Hauptmann's idea about a pitch-class 'having' an interval; the latter instantiates Hauptmann's notion about a pitch-class 'being' an anterval."[158]

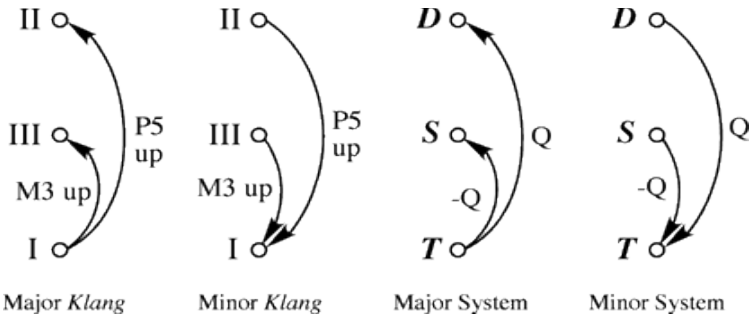

Figure 2.15 Klumpenhouwer's figures comparing Riemann's functional assignments for T, S, and D to Hauptmann's conception of the major and minor triads.

Despite the argument purposed by Klumpenhouwer, Riemann does not make the claim that his functional assignments actually are dualistically conceived. Instead, it seems that Riemann, by bringing attention to the fact that the terms tonic, subdominant, and dominant, are not his, is suggesting that his functional assignments are not dualistically conceived, and that he may have even preferred to use what his critics would consider to be fully dualist terms, presumably conceding to the use of already existing terms for the sake of clarity. The situation is made more complicated by the fact that Riemann does engage with a fully dual three-function system for describing harmonic context in the *Vereinfachte Harmonielehre*. As we have already seen, when discussing his prototypical chord progressions, he refers to them using his *Harmonieschritte*. That is, he captures both cadences

[158] Klumpenhouwer, 204.

T–S–D–T and °T—°D—°S—°T by discussing them as the progression tonic–*Gegenquintklang*—*Quintklang*—tonic. This last progression is in effect a fully dual three-member system for describing harmonic context.

If Riemann's apparently monist arrangement of the minor dominant and subdominant causes the five-function problem, and a fully dualist understanding of his functions clearly operates in the background of his thought, why then would he choose not to arrange the minor dominant and subdominant in a fully dualist manner? For one, Riemann recognizes an aesthetic difference between the major and minor progressions, even if he does usually choose to describe both by using the succinct *Harmonieschritte* form of his progressions, T—*Gegenquintklang*—*Quintklang*—T. He explains:

> In the connection of these two triads [T—D or °T—°S], the voice leading is quite analogous in both major and minor, but the aesthetic significance is very different, inasmuch as in major this connection entails rising, in minor, falling, thus in the first case strengthening the major character, in the latter, strengthening the minor character.[159]

With his monist arrangement of the *Hauptklänge*, his functions symbols can express this aesthetic difference between major and minor progressions.

Beyond this appeal to aesthetic differences, however, a fully dual revision of his theory runs into difficulties of its own. Consider my conjecture that the *Hauptklänge* and the *Parallelklänge* share the same function because they share two common tones. So far, we have focused on two *Harmonieschritte* that maintain two common tones—the *Terzwechsel* and the *Leittonwechsel*. However, a third and final *Wechsel*, the *Quintwechsel*, also maintains two common tones between triads. The *Quintwechsel* changes the quality of a triad from major to minor or vice versa. In Riemann's actual arrangement, where the minor subdominant remains below the tonic, the *Quintwechsel* can maintain

[159] Riemann, *Vereinfachte Harmonielehre*, 15.

the same function as the triad from which it is generated, satisfying the requirement that any two triads related by a *Harmonieschritt* that maintains two common tones have the same function. In C major, for example, the *Quintwechsel* takes the major tonic c^+ to the minor tonic ^{o}g, the major subdominant f^+ to the minor subdominant ^{o}c, and the major dominant g^+ to the minor dominant ^{o}d. If, however, Riemann arranged his dominants in a fully dualist manner, the *Quintwechsel* would take the major dominant, g^+, to the minor subdominant, ^{o}d. That is, the *Quintwechsel* would no longer maintain function and triads sharing two-common tones would no longer indicate shared function between triads.

The repercussion of this potentially fully dual system, where the *Quintwechsel* does not preserve harmonic function, is the inability to account for any music that mixes the major and minor modes. Consider, for example, that in the monist approach that Riemann actually adopts, in both C major and in C minor, ^{o}c (an f minor triad) has minor subdominant function. That is, the functions of the (sub)dominants are not dependent on the modal quality of the tonic, meaning that when that quality is ambiguous or shifting, the function of the (sub)dominants is not in question. In the hypothetical, fully dualist approach, the same chord, ^{o}c, has minor subdominant function in a C major and minor dominant function in C minor. In effect, any mixing of major and minor keys would require a modulation between parallel keys. In a fully dual system, where the fundamental premise of which is that major and minor are treated oppositely from each other, there must be no way to account for the mixing of major and minor.[160] Riemann, intentionally or not, addressed this by taking this one crucial departure from a fully dualist system.

So if Riemann's mixed approach is laden with problems, and he apparently is willing to sacrifice a fully dual approach, would a more monist conception of function make a theory of

[160] For an example of a fully dual system, see Sigfrid Karg-Elert, "Neue Bahnen Der Harmonik Und Ihrer Lehre," in *Grundlagen Der Musiktheorie* (Leipzig: Speka, 1921).

harmonic progression more tenable? After all, the concept of harmonic function as harmonic context that we see today tends to discard dualism. In this formulation, there is one prototypical progression, T—S—D—T, equally valid for both major and minor keys. In C major, c^{+}, f^{+}, g^{+}, c^{+}; in C minor, ^{o}g, ^{o}c, ^{o}d, ^{o}g. This approach however simply does not recognize the dual minor progression, ^{o}T—^{o}D—^{o}S—^{o}T, which Riemann certainly would not support. Further, a common argument for a monist revision of Riemann's functions is the lack of musical examples that display his typical minor progression. This same line of reasoning would also reject this monist revision because it features ^{o}d to ^{o}g as the cadential progression in a minor key on the grounds of being exceedingly rare in actual music.

If we continue to imagine a monist revision of Riemann's theory, then what of Riemann's dualistically conceived *Nebenklänge*? One could simply discard Riemann's *Nebenklänge*, as most North American theories of function do, and find some other way to determine each triads membership into the categories of T, S and D, but this would have far-reaching implications for Riemann's theory. The way that Riemann derives the *Nebenklänge* from the *Hauptklänge* using a family of dualistically conceived *Harmonieschritte* that maintain two common tones between triads is perhaps the most integral feature of his *Funktionstheorie*. The concept of T, S, and D existed before Riemann, but his innovation was finding a way to turn those triads into prototypical members of harmonic categories. To do away with Riemann's *Nebenklänge* or dualism would do away with his most significant contribution to *Funktionstheorie*. This is, of course, what many of Riemann's followers do.

An examination of Riemann's *Kadenzlehre* revealed an internal inconsistency. Are there three functions as Riemann claims, or five as his *Kadenzlehre* implies? This inconsistency partially arises because of his contentious assignment of dominant and subdominant function. However, neither making the system fully dual nor fully monist solves the problem. That is to say that Riemann's *Kadenzlehre* is dependent on Riemann's implementation of harmonic dualism. On the one hand, A

fully dual system could not account for music that mixes major and minor. On the other hand, jettisoning dualism entirely in favor of a monist *Kadenzlehre* however would also discard Riemann's entire *Funktionstheorie* along with it. Riemann's entire theory depends on the *Harmonieschritte*, which is inherently dualist, to define his *Funktionstheorie*, which is then also dualist. His functions serve as the foundation for his *Kadenzlehre*, which is also dualist, even if not entirely. Without dualism, and specifically in the way Riemann implements it, his theory collapses.

2.4 Fifth relations and third relations

We have seen that fifth and third relations figure prominently into Riemann's *Funktionstheorie*. Fifth and third relations between chords are Riemann's analog to the intervals of major third and perfect fifth. They also create the distinction between *Hauptklänge* and *Nebenklänge*. I argue that along with his *Harmonieschritte*, his harmonic dualism, and his *Kadenzlehre*, Riemann's *Funktionstheorie* also incorporates his conception of *Tonalität*, represented by his efforts to integrate fifth and third relations. That is to say that the *Vereinfachte Harmonielehre* and Riemann's *Funktionstheorie* do not represent a fundamental departure from his earlier treatises on harmony, but rather that Riemann is engaged in the same enterprise through most of his career—developing a system theory of harmony that can account for increasingly chromatic music while delimiting music's chromatic outer bounds.

The idea that Riemann's *Funktionstheorie* represents one of his attempts to reconcile fifth and third relations in his conception of *Tonalität* stems from the foundational analogy discussed towards the beginning of this chapter. We have seen that Riemann describes his function theory as an analog to his harmonic conception of tone relationships. When describing tone relationships, he provides his account of how the conception of scale changed over time. According to Riemann, "the ancient Greek theorists (Pythagoras) looked upon the scale as a chain of fifths f, c, g, d, a, e, b, and as such it

contains relatives even to the sixth degree, according to the note that is taken as starting point."[161] For Riemann, the vital discovery however was the third relationship. "Since the significance of the third relationship of notes has been recognized, it is simpler to refer the melodic fundamental scale to one principal note (prime) with its third and fifth, and its upper and under fifths with their third and fifths."[162] Riemann sees in music history a development from the fifth being the primary interval to an equality between the fifth and the third.

Riemann makes similar claim about the development of harmony—that there was a development from fifth relations as primary to an equality between fifth and third relations. When discussing third relations in 1890, Riemann states "Marx also puzzled over why it is that E major and A♭ major seem less foreign than D major and B♭ major; earlier theorists simply judged key relations only through fifth-intervals."[163] This of course implies that theorists contemporary to Riemann would judge these triads as third relations. Thus, if Riemann conceives of music history as a development from fifths to fifths and thirds, and also from fifth-related harmonies to fifth- and third-related harmonies, then it seems likely that his *Funktionstheorie,* which he explicitly describes as a transferring of his theory of tone relationships to the relationships of harmonies, is an attempt at reconciling fifth- and third-related harmonies.

This discussion is part of a larger trend through Riemann's career to integrate fifth and third relations in his harmonic theories. It is well known that Riemann believed that chromatic triads are

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161 Riemann, *Vereinfachte Harmonielehre*, 7. "*Die altgriechischen Theoretiker (Pythagoras) sahen in ihr [der Grundskala] eine Kette von Quinten: f.c.g.d.a.e.h, als welche sie freilich je nachdem man diesen oder jenen Ton zum Ausgangspunkt nimmt (als Prim) Verwandte bis zum sechsten Grade enthält*." Riemann's historical account here is wildly untrue. For an accurate account, see Barker, *Greek Musical Writings: Harmonic and Acoustic Theory*.

162 Riemann, *Vereinfachte Harmonielehre*, 7. "*Seit die Bedeutung der Terzverwandtschaft der Töne erkannt wurde (vergl. des Autors 'Katechismus der Musikwissenschaft,' S. 9 ff.), führt man aber die melodische Grundskala einfacher zurück auf einen Hauptton (Prim) mit Terz und Quint und seine Ober- und Unterquinte mit ihren Terzen und Quinten.*"

163 Riemann, *Katechismus der Harmonielehre (theoretisch und praktisch)*, 38. "*Noch einem Marx machte es Kopfzerbrechen, warum E-dur und As-dur gegenüber C-dur weniger fremd erscheinen als D-due und B-dur; man beurteilte eben früher Tonarten-Verwandtschaft nur nach Quinten-Abständen!*"

intelligible in relation to the tonic and that he sought to reflect this in his theoretical work.[164] In the *Skizze*, Riemann describes a shift from thinking about keys, derived from the diatonic scale, to *Tonalität*, in which a certain tonic is maintained so long as it continues to be understood as tonic.[165] A famous example from Riemann's *Musik-Lexikon* shows Riemann's commitment to the idea (Figure 2.16). With this example, Riemann explains that "the C major tonality is in control as long as the harmonies are understood in their relation to the C major chord...the old harmonic practice is incapable of defining this progression in terms of a single key; in terms of C major tonality it is Tonic–*Gegenterzklang*–Tonic–*Terzklang*–Tonic [tonic—the triad a major third below—tonic—the triad a major third above]."[166] We see that the dichotomy Riemann is grappling with, between third and fifth relations, can also be conceived of as a dichotomy between a scale-based conception of tonality and his harmonic conception of *Tonalität*. The scale- or key-based conception is essentially diatonic. On the other hand, the harmonic conception of *Tonalität*, or a theory of harmonic satellites orbiting around the tonic at with particular *Harmonieschritte*, allows for chromaticism. Engebretsen explains that, "rejecting the standard, scale-based conception of tonality, Riemann argues that tonality should instead by understood as a system of acoustically defined relationships around a tonal center, and that diatonic and chromatic chords alike may stand in direct relation to the tonal

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[164] Addressed in Engebretson, "Neo-Riemannian Perspectives on the Harmonieschritte, with a Translation of Riemann's Systematik Der Harmonieschritte"; Kopp, *Chromatic Transformations in Nineteenth-Century Music*; Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*; Rehding, "Tonality between Rule and Repertory; Or, Riemann's Functions—Beethoven's Function."

[165] Riemann, *Skizze einer neuen Methode der Harmonielehre*, 68–70. "*Der alte Begriff der Tonart in der Bedeutung der leitertreuen Harmonik ist durch die 'alterirten Accorde' längst wankend geworden; die Kategorie der alterirten Accorde in dem alten Sinne von 'Accorde mit nich leitereigenen Tönen' müsste aber doch allzu unverhältnissmässig erweitert werden, wenn man angesichts unserer heutigen freien Harmonik an der Tonleiter-Tonart noch festhalten wollte…Tonart ist nichts weiter als die Bedeutung eines Klanges als Hauptklang; die Tonart ist verlassen, sobald diese Bedeutung wechselt, was ohne Einführung chromatisch veränderter Töne geschehen kann. Der moderne Name für Tonart in diesem Sinne ist: Tonalität.*"

[166] Riemann, *Musik-Lexikon*, 1882, 923. "*So ist also die C dur-T. herrschend, wenn die Harmonien in ihrer Beziehung zum C dur-Akkord verstanden werden; z. B. die Folge: … ist im Sinn einer Tonart der ältern Harmonielehre gar nicht zu begreifen, obgleich niemand behaupten kann, daß die fürs Ohr unverständlich ist. Im Sinn der C due-T. ist sie: Tonika — Gegenterzklang — Tonika — schlichter Terzklang — Tonika.*" This example is also cited in Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 80.

center, so long as the primacy of that tonic remains undisputed."[167] For Riemann, earlier theories—that is, *Stufentheorie*—were diatonic, and his efforts throughout his *Harmonielehren*, were to subsume chromatic relationships into an understanding of tonality.

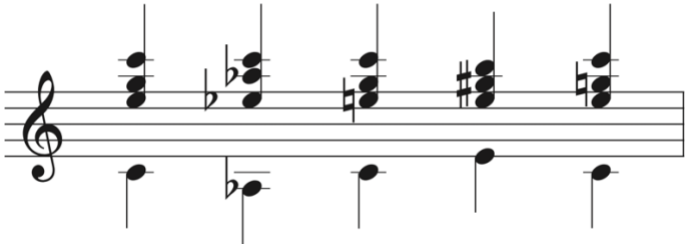

Figure 2.16: Riemann's provides this example in the *Musik-Lexikon* of 1882 to show how the C major tonality can be maintained despite chromatic third-related harmonies.

The relationship between Riemann's *Funktionstheorie* and *Tonalität* becomes explicit when, years later, he explained that:

> The theory of tonal functions is nothing but the development of Fétis's concept of tonality (*Tonalität*). The sustained relation of all harmonies to one tonic has found its most concise expression in the denomination of all chords as a more or less modified appearance of the three primary pillars of the harmonic logical conception: the tonic itself and its two dominants.[168]

It seems that, in Riemann's mind at least, his *Funktionstheorie* is very much part of his efforts throughout most of his career in creating a *Harmonielehre* that accounts for *Tonalität* that is not based on diatonic constraints and can accommodate third and fifth relations.

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[167] Engebretson, "Neo-Riemannian Perspectives on the Harmonieschritte, with a Translation of Riemann's Systematik Der Harmonieschritte," 361.

[168] Riemann, *Handbuch der Harmonielehre*, 214. "*Unsere Lehre von den tonalen Funktionen der Harmonie ist nichts anderes als der Ausbau des Fétis'schen Begriffes der Tonalität. Die festgehaltene Beziehung aller Harmonien auf eine Tonika hat ihren denkbar prägnantsten Ausdruck gefunden in der Beyeichnung aller Accorde als mehr oder minder stark modifizierte Erscheinungsform der drei Hauptsäulen des harmonisch-logischen Aufbaues: der Tonika selbst und ihrer beiden Dominanten*."

While the connection between *Funktsiontheorie* and *Tonalität* is clear, that does not mean that Riemann's *Funktionstheorie,* as it appeared in the *Vereinfachte Harmonielehre,* was necessarily successful at reconciling third and fifth relations, explicating how chromatic chords can stand in direct relation to the tonic, or capturing his conception of *Tonalität*. Consider Riemann's statement that,

> if our musical system, as we have seen, stops with the representation of the sound by the partials at the third (cf. p. 6), it stops with the representation of the key by sounds already at the fifths, i.e. although the natural relationship of the upper and lower thirds is beyond doubt (e. g. the E-major chord is easily understandable against the C-major chord as the upper sound of its third), the E-major chord is not possible as a representative of the C-major key, but rather, as we will see, usually appears as a second-degree relative (dominant of the parallel, as we will be able to prove in more detail later).[169]

Riemann brings attention here to the problem of fifth and third relations in the *Vereinfachte Harmonielehre*. On the one hand, Riemann claims that an E major chord is easily understandable in C major (despite the chromatic relationships). On the other hand, he admits that the E-major chord is not a possible representative of C major (i.e., does not have a function in C major). In other words, it seems that Riemann wants to somehow incorporate the chromatic third relation (the *Terzschritt*), but simply admits that he cannot. Interestingly though, near the end of his career, in the sixth edition of the *Handbuch,* Riemann introduces a mechanism that allows for expressing these relationships directly to the tonic. The *Terzschritt* receives a place of privilege in Riemann's function theory with the inclusion of the new symbols "3" (e+ in C major) and "III" (^{o}eb in C minor).[170] As Rehding

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[169] "*Macht unser Musiksystem, wie wir gesehen, mit der Vertretung des Klanges durch die Teiltöne bei der Terz Halt (vgl. S. 6), so macht es mit der Vertretung der Tonart durch Klänge schon bei den Quintklängen Halt, d. h. obgleich die natürliche Verwandtschaft auch der Ober- und Unter-Terzklänge ausser Zweifel steht (z. B. ist der E-dur-Akkord gegen den C-dur-Akkord leicht verständlich als Oberklang von dessen Terz), so ist doch der E-dur-Akkord nicht wohl als Vertreter der C-dur-Tonart möglich, erscheint vielmehr, wie wir sehen werden, gewöhnlich als Verwandter zweiten Grades (Dominante der Parallele, wie wir erst später ausführlicher nachweisen können)*."

[170] Riemann, *Handbuch der Harmonielehre*. For more on these new function symbols, see Rehding, "Tonality between Rule and Repertory; Or, Riemann's Functions—Beethoven's Function."

explains though, Riemann does not elevate 3 and III to the state of functions proper—as *Hauptklänge*—in that Riemann does not allow for the possibility *parallelklang* or *Leittonwechselklang* forms of these triads.[171] That is, he does not allow for a ☇ or a IIIp. Kopp's statement about Riemann's treatment of chromatic mediants in the *Vereinfachte Harmonielehre* captures the situation nicely. "Riemann attempts to have it both ways: he seriously considers the result of accepting all the chromatic mediants, but stops short at making them independent components of the functional system, justifying this attitude with the logic of diatonic thinking."[172]

Through the course of Riemann's career, we can trace a progression of his *Harmonielehren* from more chromatic (the *Skizze*), to more diatonic (the *Vereinfachte Harmonielehre*), and landing somewhere in the middle with the addition of his extra functions 3 and III. In the *Skizze*, Riemann describes 25 *Harmonieschritte*, most of which are chromatic, in direct relation to a tonic triad. On the other hand, Riemann's *Funktionstheorie*, as described in the *Vereinfachte Harmonielehre*, is much more restricted, despite not being strictly diatonic. Consider that of 18 total *Hauptklänge* and *Nebenklänge* in major and minor (Figure 2.2 and Figure 2.3), only two are chromatic. Of course he does allow for the chromatically altered major dominant in a minor key, and the minor subdominant in a major key, but these are merely instances of modal mixture. Kopp also demonstrates the diatonic limits in the *Vereinfachte Harmonielehre* by bringing to attention Riemann's explanation for why he did not give the chromatic mediants their own function symbols. Despite recognizing the cadential power of the chromatic mediants, Riemann states that "we shall not require new signs for them, particularly as on account of the chromatic steps their direct power of making a cadence appears problematical."[173]

[171] Rehding, "Tonality between Rule and Repertory; Or, Riemann's Functions—Beethoven's Function," 114.
[172] Kopp, *Chromatic Transformations in Nineteenth-Century Music*, 92.
[173] Kopp puts this on page 169.

Some authors do not, however, describe Riemann's *Funktionstheorie* as necessarily restrictive or diatonic.[174] Daniel Harrison, for example, states that "a student of Riemann's system can analyze virtually any chord into any one of the three functions should the occasion demand."[175] Here it will be productive to distinguish between Riemann's *Funktionstheorie* as a theoretical system and Riemann's analytical practice that incorporates his *Funktionstheorie*. As I have described above, Riemann's *Funktionstheorie* is relatively restrictive and diatonic. On the other hand, Harrison is correct that Riemann, in practice, allows for dissonant tones added to triads, leading to a situation where "the entity [a single chord], could be so freighted with non-chord tones, suspensions, and passing tones, and even have its own chord tones so chromatically altered, that one would be hard put to recognize the resulting monstrosity as having any relationship to the original."[176] Here is where we ought to distinguish between Riemann's theory and his analytical practice. Riemann's *Funktionstheorie*, as a theory of harmony, is relatively restricted, especially when compared to *Skizze*. The alterations that Harrison describes above however, I will argue, are not necessarily a part of Riemann's *Funktionstheorie*—they have no relation to the *Harmonieschritte* or Riemann's foundation analogy. Instead, they are product of Riemann's practice of grafting figured bass theory onto into his function theory. That is to say that there is nothing proper to Riemann's *Funktionstheorie* that can account for any chord that is not precisely one of the *Hauptklänge* or *Nebenklänge*. Seventh chords, ninth chords, and any altered chords require figured bass symbols to alter Riemann's function symbols.

Scholarship has well established the tension in Riemann's thought between chromatic freedom in music and prescribed musical boundaries.[177] When Harrison, Engebretsen, and Dahlhaus describe the prescriptiveness of Riemann's *Funktionstheorie*, we can see that while Riemann's

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[174] For a summary of these arguments see Engebretson, "Neo-Riemannian Perspectives on the Harmonieschritte, with a Translation of Riemann's Systematik Der Harmonieschritte," 370.
[175] Harrison, *Harmonic Function in Chromatic Music: A Renewed Dualist Theory and an Account of Its Precedents*, 284.
[176] Harrison, 285.
[177] See especially Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*.

analytical practice demonstrated very little prescription, his *Funktionstheorie*, when considered with figured bass theory grafted upon it, is perhaps the most prescriptive of his theories of harmony.

If Riemann's *Skizze* is the most chromatic of his theories of *Tonalität*, and the *Funktionstheorie* of the *Vereinfachte Harmonielehre* is the most prescriptive, then his *Funktionstheorie* in the sixth edition of the *Handbuch* represents an attempt to meet in the middle somewhere. None of these approaches however seem to be a fully satisfactory and systematic account of *Tonalität*. Clearly the *Skizze* was, for Riemann, an incomplete theory of harmony as he developed his *Funktionstheorie* in the *Vereinfachte Harmonielehre*. Throughout this chapter, I have highlighted many of the deficiencies or inconsistencies of Riemann's *Funktionstheorie* in the *Vereinfachte Harmonielehre*. Riemann's new five-function approach in the sixth edition of the *Handbuch* is similarly questionable for his treatment of the new symbols 3 and III. It seems that Riemann never fully commits to a *Harmonielehre* that embraces all of the third relations; he does not fully abandon diatonic restrains; and he does not succeed in creating a *Harmonielehre* that captures the sense of *Tonalität* that he describes earlier in his career.

2.5 Conclusion

I have argued, in opposition of the consensus view, that Riemann's *Funktionstheorie*, his *Harmonieschritte*, his *Kadenzlehre*, his commitment to harmonic dualism, and even his conception of *Tonalität* are intimately linked. His *Funktionstheorie* relies on the dualist *Harmonieschritte* to define function. His *Kadenzlehre* necessitates the functional categories provided by his *Funktionstheorie*, while the function of bivalent chords can only be determined when given harmonic context. His particular implementation of harmonic dualism was also necessary for his *Kadenzlehre* to apply to music that fluctuates between major and minor. His elaborate tapestry of ideas, however, is frayed at the edges and sloppily stitched together, as we have seen with its numerous problems and ambiguities.

I have also describe Riemann's *Funktionstheorie*, with an aim towards understanding to what extent its reception in the Czech lands embraces, builds on, or changes from it. Fundamentally, with his *Funktionstheorie*, Riemann attempts to create a *Harmonielehre* that transfers his theoretical and historical understanding of fifths and thirds to the harmonic realm with fifth- and third-related harmonies. For Riemann, his *Harmonieschritte* are vital to this *Funktionstheorie*, because they are the equivalent measure of distance between triads, like intervals are to tones. However, we have explored much of the slippage that occurs with this analogy, and as we explore the reception of these ideas, we might examine to what extent the *Harmonieschritte* are necessary for a *Funktionstheorie*.

Riemann's *Funktionstheorie* is also an alternative to *Stufentheorie*, in that it proposes symbols that describe triads in relation to a tonic, not according to the scale degree of a triad's root, but rather according to its *Harmonieschritt* relationship to the tonic. On the other hand, Riemann's *Funktionstheorie* is also a *Kadenzlehre*, in that it prescribes normative harmonic progressions. This raises the question of whether these two aspects of *Funktionstheorie*—*Stufentheorie* and *Kadenzlehre*—are separable? For Riemann, they are not. We have seen that a product of Riemann's *Funktionstheorie* labels is certain bivalent harmonies that can only be defined in their harmonic context, and that Riemann's *Kadenzlehre* in the *Vereinfachte Harmonielehre* is defined according to his functions.

In the next chapter, I begin examining how Czech music theorists interpret and modify Riemann's *Funktionstheorie*, specifically how they handle the ambiguities and problems latent in Riemann's approach, to see if they are in fact avoidable, or if they are perhaps latent in the idea of harmonic function itself.

Chapter 3 Otakar Šín's Theory of Harmonic Function

In the previous chapter, I began investigating Riemann's *Funktionstheorie*—the theory itself, its fundamental assumptions, and its intrinsic ambiguities—offering correctives to previous scholarship on Riemann's theory and revealing many previously unaddressed aspects of his approach. In particular, I argued that his *Funktionstheorie* simultaneously describes pitch-class content, harmonic syntax, and voice leading between chords. These three aspects correspond to his *Funktionstheorie* as a replacement for *Stufentheorie*, his *Kadenzlehre*, and his *Harmonieschritte*. Now, I begin to trace the reception of Riemann's *Funktionstheorie* among his Czech followers—that is, to consider how they develop, change, or abandon various aspects of Riemann's function theory, how they approach its various loose ends, and how their work can encourage us to reexamine Riemann—all of this with the goal of uncovering general tenets of harmonic function. That is, to see what the typical problems are of developing a theory of harmonic function and how might one solve those problems. This chapter provides an account of the first Czech theory of harmonic function: that of Otakar Šín. In so doing, I not only offer the first substantial account of his work in English, but more importantly, I show how Šín's thinking can inform our understanding both of Riemann's *Funktionstheorie* and of function theory in general.

Otakar Šín (1881–1943) is a central figure in Czech music theory and Czech theories of harmonic function. With his *Nauka o harmonii na základě melodie a rytmu* (1922), Šín provides what is the first theory of harmonic function written in the Czech language or by a Czech author. His text becomes the primary source on harmonic function upon which later Czech theorists build or to which those theorists respond. Šín was a composer and music theorist, beginning his appointment as

professor of music theory at the Prague Conservatory in 1920. His pupils, and their pupils in turn, would go on to teach music theory in the Music and Dance Faculty in The Academy of Performing Arts in Prague (*Adamedie múzických umění v praze, hudební a taneční fakulta,* i.e. HAMU) and they would subsequently write their own works on harmonic function and other music-theoretical topics. Šín's *Nauka* was a pedagogical text intended as a textbook for the Conservatory.[178] According to his pupil, Karel Janeček, Šín wrote this text in response to the dearth of Czech-language music-theory textbooks in the early twentieth century—Foerster's *Nauka o harmonii* was, he thought, too limited in scope, while Leoš Janáček's *Úplná nauka o harmonii* was a "bold experiment, unusable as a textbook."[179] Janeček also states that Šín's main dissatisfaction with Czech harmony books was their deep silence about function theory.[180] Šín's *Nauka* was not however, simply a translation of Riemann's work. Janeček explains, and it is clear from the text, that Šín found Riemann's construction of the minor triad from the fifth down a shortcoming, and as such made significant changes to Riemann's function symbols.[181]

Šín's theory of harmonic function develops in the first two editions of his harmony textbook. In particular, these are the first edition of *Nauka o harmonii na základě melodie a rytmu* (*The Study of Harmony on the Basis of Melody and Rhythm*, 1922), and the second edition, which received a slightly modified title—*Úplná nauka o harmonii na základě melodie a rytmu* (*The Complete Study of Harmony on the Basis of Melody and Rhythm*, 1933). I will refer to them as the first edition of *Nauka* (1922) and

[178] Janeček, *Otakar Šín*, 40. "*První vydání bylo myšleno jako učebnice pro konservatoř.*"
[179] Janeček, 35. "*Foersterova 'Nauka o harmonii', byť byla s hlediska pedagogického výtečně sestavena, omezovala se téměř výlučně na výklad k vypracování číslovaného basu, zatím co harmonisování melodie věnovala až někde v závěru několik skoupých stránek; ve vlastní theoretické látce přinášela pak předpisy bez hlubšího výkladu podstaty hudebního dění…Zapomenutá příručka Skuherského byla odvážným experimentem, jehož nebylo možno používat jako učebnice. Totéž platí o 'Úplné nauce o harmonii' od Leoše Janáčka*;'" Foerster, *Nauka o Harmonii*; Janáček, *Úplná Nauka o Harmonii.*
[180] Janeček, *Otakar Šín*, 36. "*Co hlavně nemohlo Šína uspokojit u českých učebnic harmonie, bylo hluboké mlčení o funkční theorii.*"
[181] Janeček, 36. "[*Šín*] *odmítá jeho výklad stavby mollového trojzvuku od kvinty dolů. Přejímá však celý systém funkční s pozměněnými značkami."*

the second edition of *Nauka* (1933) for the remainder of this text. The three subsequent editions published during Šín's lifetime do not differ significantly from the second.

Šín's theory of harmonic function differs significantly between his first (1922) and second (1933) editions of *Nauka*. In this sense, he is not only in conversation with Riemann, but also himself, as he works out the various aspects of his theory. What we find in the first edition of *Nauka* (1922) is a relatively conservative theory of harmonic function, in the sense that the theory given there resembles Riemann's original *Funktionstheorie* more closely than in the later version. In the first edition, Šín maintains Riemann's function labels in the first edition (1922), as opposed to followers like Louis and Thuille, who replace them with Roman numerals.[182] Šín shares Riemann's view on the difference between a close and a cadence. His understanding of chord progression is mostly in-line with Riemann's. Despite the similarities, Šín is, to borrow Harrison's language, a reconciler of Riemann—as opposed to a conservator or a radical. That is, he reimagines Riemann's *Funktionstheorie* without harmonic dualism and without the dualistically conceived *Harmonieschritte*. Nonetheless, his theory remains closely tied to Riemann in many ways. Unsurprisingly, by renovating the foundation of Riemann's *Funktionstheorie*, while adapting much of its notation system, Šín creates internal inconsistencies, some of which he resolves in the second edition, while others remain unsettled.

In the second edition of *Nauka* (1933), Šín's revised theory of harmonic function, though not itself especially radical, lays the foundation for the radical refiguring of function theory that would be advanced by his students. Šín no longer attempts to maintain Riemann's *Harmonieschritte*-based function labels, but proposes instead his own novel combination-function labels. However, unlike his approximate contemporaries Hermann Erpf or Sigfrid Karg-Elert, for instance, Šín does not boldly traverse new and complex harmonic territory.[183] Šín, like Riemann, continues to focus on

[182] Louis and Thuille, *Harmonielehre*.
[183] Erpf, *Studien zur Harmonie- und Klangtechnik der neueren Musik*; Karg-Elert, "Neue Bahnen der Harmonik und ihrer Lehre."

tertian harmonies and their alterations. Šín's combination functions are indeed novel, but Šín still assumes the existence of three primary triads, that other triads are derived from those primary triads, and the practice of labeling those functions with tertian extensions and alterations borrowed from figured bass. Nonetheless, Šín does lay the groundwork for later Czech music theorists like Karel Janeček and other music theorists at HAMU, theorists who went on to author more radical approaches that rival Erpf and Karg-Elert in their inventiveness.

My approach in this chapter consists of introducing Šín's theory and examining how, in both editions of *Nauka,* it differs from Riemann's. Though I do provide the English-speaking reader an account of Šín's untranslated work, my focus is on how examining Šín's theory informs our understanding of Riemann's *Funktionstheorie*. I will address questions like: if Riemann's *Funktionstheorie* requires the *Harmonieschritte*, what does a theory of harmonic function without the *Harmonieschritte* look like? What would be required to make the omitted-note method—an approach abandoned by Riemann but later taken up by Šín—a viable approach to assigning function to neighbor triads?[184] This process will reinforce my earlier observation that Riemann's *Funktionstheorie* is inextricably linked with *Kadenzlehre*, his *Harmonieschritte*, and his understanding of *Tonalität*. It will also continue to question current positions in Riemann scholarship, like the assumption that Riemann's function symbols for the *Nebenklänge* constitute "hard dualism." What follows is divided into four main parts. In the first (Section 3.1), I present Šín's theory of harmonic function as advanced in the first edition of *Nauka* (1922). I concentrate on how it differs from the *Vereinfachte Harmonielehre:* in particular, on the topics of primary triads (3.1.1), neighbor triads (3.1.2), chord progressions (3.1.3), and neighbor dominants (3.1.4). In Section 3.2, I compare Šín's theory of harmonic function as advanced in the first edition of *Nauka* (1922) to Riemann's *Funktionstheorie*. In Section 3.3, I show how the second edition of *Nauka* (1933) differs from the first edition by

[184] See Section 2.1.3 for the omitted-note method in the *Vereinfachte Harmonielehre*.

addressing the topics of neighbor triads (3.3.1), Šín's "natural dominants" (3.3.2), and what he calls "exchange dominants" (3.3.3). In section 3.4, I compare Šín's theory of harmonic function as advanced in the section edition of *Nauka* (1933) to the previous edition and to Riemann's *Vereinfachte Harmonielehre*.

3.1 The first edition of *Nauka o harmonii na základě melodie a rytmu* (1922)

Arguably the most important difference between Riemann's and Šín's theories, as it appears in the first edition of *Nauka* (1922), is that Šín allows for a dissonant tonic chord.[185] For Šín, vertical consonance is fluid, depending both on musical parameters and the interpretation of the individual. For example, he claims that the chord [C, E, G, B] is dissonant when played fortissimo, that it is more euphonious (*libozvučnější*) at mezzo-forte, and that it almost sounds-consonantly (*téměř konsonuje*) at pianissimo.[186] He continues, "let us imagine this chord colored with orchestration; who could doubt the euphony, or who feels non-euphony? The individuality of the listener decides."[187] Šín's understanding of consonance and dissonance is so exceptional, he even claims that ninth chords are more euphonious than triads.[188] To understand how his view of the consonant tonic chord fits in with the rest of his theory, and its implications, I first summarize Šín's presentation of this theory.

3.1.1 Primary triads

Šín takes four steps in defining his theory of harmonic function. First, mirroring the beginning of the *Vereinfachte Harmonielehre*, he begins the first edition of *Nauka* (1922) with an examination of the

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[185] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:13. "*Harmonicky, tonálně konsonantní je jen tónika, jež může býti i efektivně dissonující*."
[186] Otakar Šín, I:12. "*Současné zaznění akordu c' e' g' h' ve fortissimo dissonuje, v mezzo-forte je mnohem libozvučnější a c g e' h' v pp téměř konsonuje*."
[187] Otakar Šín, I:16–17. "*Představme si tento akord orchestrálně barevný; kdo může pochybovati o libozvučnosti, nebo kdo cítí nelibozvuk? Rozhoduje individualita posluchačova*."
[188] Otakar Šín, I:12. "*Zní tudíž septakord a nonový akord libozvučněji než kvintakord!*"

overtone series. He uses the overtone series to begin discussing "energy for motion" (*energie pohybu*) and the need for resolution—that is, instability.[189] He asserts that the perfect fifth almost merges with the fundamental tone and that thirds, in contrast, have the largest energy for motion. Second, he observes that chords can also have an energy for motion. He proposes to examine where this energy aims by looking at the chord [C, E, G, B♭, D, F, A], which he describes as a chord of overtones—a combination of the overtones of [C] and [G]. Šín considers the chord [C, E, G, B♭, D, F, A] as an example of a chord that desires motion that resolves ideally to [F, A, C], which requires no additional motion.[190] Later, he identifies the relationships between these two chords as the dominant relationships.

Third, Šín defines two different types of consonance and dissonance—effective (*efektivní*) or harmonic (*harmonický*). Effective dissonance, which he often refers to as vertical (*vertikální*), concerns the relation of notes placed above each other, while harmonic dissonances are, as he explains, horizontal (*horizontální*)—"the cause of harmonic dissonance is the relation of consecutive chords, i.e. [it is] horizontal."[191] Šín's effective dissonance is simultaneous, while harmonic dissonance is subsequent. Fourth, Šín defines the tonic, dominant, and subdominant—his primary chords (*základní akordy*)—according to his understanding of horizontal consonance and dissonance. Šín defines the tonic chord as the only chord to possess harmonic consonance, and he explains that "chords with dissonance of movement are called dominant and subdominant."[192] The term

[189] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*, 9. "*Týž pokus s g vysvětlí nám rozdíl mezi souzvukem čisté kvinty a velké tercie. Čistá kvinta skoro splývá se základním tónem a napětí je nepatrné. V kvintakordu je tercie ohniskem napětím, tercie charakterisuje souzvuk, projevuje největší energii pohybu. K seznání, kam její pohybová energie směřuje, bude nám nápomocen souzvuk aliquotních tónů.*"
[190] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:10.
[191] Otakar Šín, I:13. "*Příčinou harmonické dissonance je poměr akordů za sebou, tedy horizontální (vodorovný), nikoliv poměr tónů nad sebou, vertikální (svislý).*"
[192] Otakar Šín, I:11. "*Akordy pohybově disonantní [nazýváme] dominanta nebo subdominanta*."

dissonance of movement (*pohyblivá dissonance*) is a synonym of harmonic dissonance.[193] Šín describes dissonance of movement as "a certain tension emanating from a tone or chord, which we feel as a necessity of movement."[194] If then, for Šín, the tonic is the harmonically consonant chord, the dominant and subdominant are harmonically dissonant—they have a necessity for movement. To return to the opening discussion in this section, Šín only stipulates that the tonic must be *harmonically* consonant, but adds that "it [the tonic] can be effectively dissonant."[195]

Šín proceeds to stipulate the relationship between the dominants and the tonic. Interestingly, he first addresses his "natural" dominant and subdominant. He states that "the dominant is the chord, whose root is in a ratio of the perfect upper fifth, and the subdominant (lower dominant) is the chord, whose root is in a ratio of perfect fifth below the root of the tonic."[196] While this statement is perfectly typical of function theory, his proceeding invocations of the "natural" chord are more idiosyncratic. He explains that "the combination of the natural chord [C, E, G, B♭, D] with the triad [F, A, C] was the dominant relationship, because the natural chord stands on top of the pure fifth of the triad [F]."[197] With his natural chord, Šín also identifies the subdominant relationship. First, he splits [C, E, G, B♭, D] into [C, E, G,] and [G, B♭, D]. Then, he explains that the major triad [C, E, G] points towards the tonic [F, A, C] and the minor triad [G, B♭, D] points towards the minor triad [D, F, A], leading him to claim that the major triad is naturally dominant and the minor triad is naturally subdominant.[198] Šín makes the association of the dominant chord with

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[193] Otakar Šín, I:13. "*Harmonická dissonance je poměr tónů nebo akordů k jistému základnímu tónu nebo akordu jako pohybově konsonantnímu, t. j. k tónice*."
[194] Otakar Šín, I:12. "*Měli jsme na mysli disonance pohybovou, určité napětí z tónu nebo akordu vyzařující, které vycit'ujeme jako nutnost pohybu*."
[195] Otakar Šín, I:13. "*Harmonicky, tonálně konsonantní je jen tónika, jež může býti i efektivně dissonující*."
[196] Otakar Šín, I:11. "*Dominanta je akord, jehož základní ton je v poměru vrchní čisté kvinty, subdominanta (spodní dominanta) je akord, jehož základní tón je v poměru spodní čisté kvinty k základnímu tónu tóniky*."
[197] Otakar Šín, I:11. "*Spojení přirozeného akordu C E G B D s kvintakordem F A C byl poměr dominantní, neboť přirozený akord stojí na vrchní čisté kvintě kvintakordu F A C*."
[198] Otakar Šín, I:11. "*Z toho lze souditi, že durkvintakord je od přírody dominantou, mollkvintakord subdominantou*."

major quality and resolution down by fifth on the one hand, and the subdominant chord with minor quality and resolution down by fourth on the other. Rather quickly after this however, Šín drops this association of mode with function when he explains that "the natural major key is obtained by combining a major-tonic with a major-dominant and a major-subdominant."[199] As in Riemann, these functions are represented with the symbols T, S, and D; the minor equivalents of these functions receive the symbols ^{o}T, ^{o}S, ^{o}D.

In sum, Šín's theory of function, as it appears in the first edition of *Nauka* (1922) appears to be quite similar to Riemann's, concerning the topic of primary functions. However, even in this preliminary portion of the theory, Šín diverges from Riemann in significantly ways. First, Šín mirrors the *Vereinfachte Harmonielehre* by appealing to the overtone series. He then observes that some chords have a tendency towards motion, while others do not. He describes this tendency as harmonic dissonance, and explaining that chords with harmonic dissonance we call dominant, and those without we call tonic. This stands in contrast to vertical dissonance, which he expressly states that a tonic chord—and dominant chords as well—can possess. He then proceeds to clarify that dominant chords and subdominant chords are a fifth above or fifth below their respective tonic. He makes the unusual claim that dominant chords are naturally major while subdominant chords are naturally minor before conceding to the typical understanding that all three functions, tonic, subdominant, and dominant, can be either major or minor.

3.1.2 Neighbor triads[200]

Given that Šín differs so significantly from Riemann on the topic of vertical consonance, one would assume that the remainder of Šín's theory of harmonic function would be quite different from

[199] Otakar Šín, I:17. "*Přirozenou tóninu dur obdržíme, spojíme-li dur-tóniku s dur-dominantou a s dur-subdominantou.*"
[200] Presumably, the Czech "*vedelší kvintakordy*" (neighbor triads), is a translation of the German "*Nebenklänge*," which could be translated into English as "neighbor triads."

Riemann's. However, Šín's approach to labeling neighbor triads provides an interesting example of how Šín, while reimagining Riemann's *Funktionstheorie*, attempts to maintain as much of Riemann's approach as possible. In this case, it shows how Šín undertakes to imagine Riemann's approach without the *Harmonieschritte*. For Šín, all chords besides the primary chords (T, S, and D) are either modifications of the primary chords, or they are independent chords that are in direct conflict with the prevailing key.[201] Šín calls the other diatonically occurring triads neighbor triads (*vedlejší kvintakordy*).[202] He criticizes figured-bass theory for implicitly equating primary and neighbor triads, and he suggests that his proposed system better addresses the relationship between these two categories.[203] In an approach that is clearly, but not explicitly, borrowed from Riemann, Šín recognizes two ways in which neighbor triads are modifications of primary triads.

First, a neighbor triad can be a substitute (*zástupce*) for its primary triad.[204] For Šín, in a major key, the triad built on scale degree II is a substitute for the subdominant, and is labeled S_z, with the subscript "z" to indicate that the triad is a substitute.[205] Unless otherwise indicated, as in the case of chromatic alteration, these substitutes are always the opposite mode of the original triad—in a major key the substitutes are minor, while in a minor key the substitutes are major. The triads built on scale degrees III and VI are respectively D_z and T_z. In a minor key, Šín's $^{o}T_z$, $^{o}S_z$, and $^{o}D_z$ correspond respectively to the triads built on scale degrees VI, II, and III. Figure 3.1 compares all primary and neighbor function labels for Riemann and Šín in C major and C minor.

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[201] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:18. "*Vyjděme od těchto tří základních akordů, tóninu jasně charakterisujících, k poznání ostatních harmonií, jež jsou jednak jen jejich obměnami, nebo i samostatnými akordy, vcházejícími přímo s tónikou, nebo i s jinými zprostředkujícími akordy (zdánlivou tónikou) ve spor*."

[202] Otakar Šín, I:63. "*Mimo Kvinta kord tónický, subdominantní a dominantní, nacházíme v dur na II., III. a VI. stupni mollkvintakordy. Na rozdíl od hlavních kvintakordů nazýváme je kvintakordy vedlejší*."

[203] Otakar Šín, I:63. "*Harmonie opírající se o číslovaný bas a hlavně o staré tóniny, stavěla je na roveň kvintakordům hlavním, nečiníc mezi nimi rozdílu. Takové pojetí vedlejších kvintakordů je jen částečně správné*."

[204] Another translation of "*zástupce*" could be "representative."

[205] In this chapter I maintain Šín's use of upper-case roman numerals to aide in initially assigning harmonic function to neighbor triads.

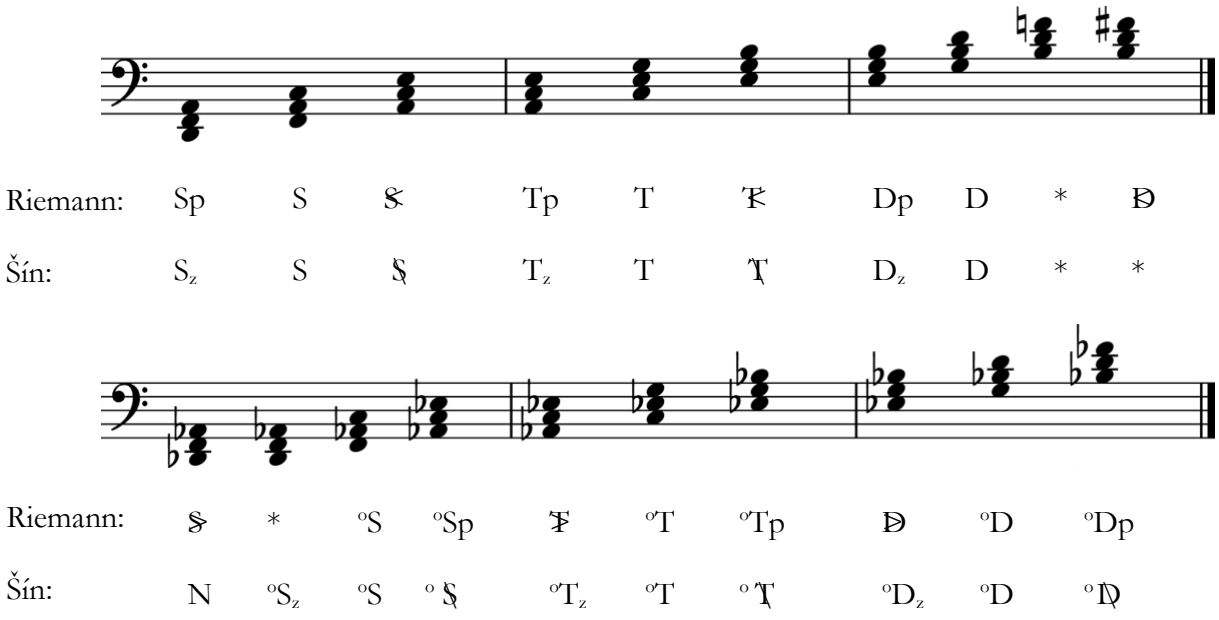

Figure 3.1 All of Riemann's and Šín's function labels for primary and neighbor triads realized in C major and C minor. Asterisks denote triads that do not receive unique function symbols by that author.

It is important to note that Šín's substitutes do not correlate to the relative major and minor relationship like Riemann's *parallel* triads. See in Figure 3.1 that Šín's T_z and $^{o}T_z$ are built on scale degree VI in their respective scales, [A] and [A♭], but Riemann's Tp and ^{o}Tp are built on scale degree VI in major [A] and III in minor [E♭]. As opposed to Riemann, Šín generates these substitutes using what I called in Chapter 2 the "omitted-note" method. For Šín, in any triad, the fifth can be replaced with the sixth above the root.[206] Consider first the neighbor triads in a major key—those whose roots are II, III, and VI. Šín shows that if you take the three primary triads and replace theirs fifths with the sixth above the root, you are left with the neighbor triads.[207] In C major, when the fifth of S is replaced by the sixth above the root ($S_{(5)}^{6}$), the resultant triad, [F, A, D], corresponds to II, $D_{(5)}^{6}$

[206] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:31. "*U každého kvintakordu se stává, že kvinta bývá zastoupena vedlejší sextou*."
[207] Otakar Šín, I:33.

corresponds to III, and $T_{(5)}^{6}$ corresponds to VI.[208] Based on this observation, Šín considers II to be the substitute S_z, III to be D_z, and VI to be T_z.

Šín's substitutes, which are derived via the omitted-note method, differ from Riemann's *parallel* triads in minor because Šín does not adopt Riemann's harmonic dualism, in which minor triads are conceived of as emanating from the fifth of the triad. As such, the fifth that Šín omits in minor is the fifth above the root, as opposed to Riemann, who, in minor, omits the dualistically conceived fifth below the prime. (I.e. to use monist terms—Riemann omits the roots of minor triads.) For example, Šín describes the triad built on II (in minor, a diminished triad) as ${}^{o}S_{5}^{6}$ with the fifth omitted (${}^{o}S_z$), the triad built on bVI as ${}^{o}T_{5}^{6}$ with the fifth omitted (${}^{o}T_z$), and the triad built on bIII as D_{5}^{6} with the fifth omitted (${}^{o}D_z$). Thus, while in major keys, Šín's substitutes are identical to Riemann's *parallel* triads—the omitted note method produces a minor triad that is in a *parallel* relationship to the original major triad—in minor keys, Šín's substitutes (${}^{o}T_z$, ${}^{o}S_z$, and ${}^{o}D_z$) correspond to the triads built on VI, II, and III. Riemann's respective minor parallel triads (${}^{o}Tp$, ${}^{o}Sp$, and ${}^{o}Dp$) correspond instead to the triads built on III, VI, and VII.[209] If Šín were to observe harmonic dualism, then his substitutes would be identical to Riemann's.

While the first way that Šín generates secondary chords is by omitting the fifth in primary chords with an added sixth, the second method he uses is omitting the root of primary chords with added sevenths. For example, in a major key, he labels the triads built on III and VI as $\mathfrak{T}$ and $\mathfrak{S}$. Šín suggests that these chords are incomplete seventh chords, or seventh chords with the root omitted. For example, consider the triad [E, G, B] in C major. Šín conceives of this triad as a C

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[208] Otakar Šín, I:33. "$S_{(5)}^{6}$ *t. j. u subdominanty je kvinta vynechána a nahražena sextou.*"

[209] As we saw in Section 2.1.3, Riemann ultimately rejects the idea that the *Nebenklänge* are derived via the omitted-note method. However, the resulting *Nebenklänge* are the same, regardless of whether they are derived via Riemann's dualist omitted-note method, or as *Parallelklänge* (*Terzwechselklänge*).

major seventh chord, [C, E, G, B], with the root [C] omitted, and he labels it T. Likewise, the triad [A, C, E,] is an F major seventh chord, [F, A, C, E], with an omitted root (S). At first, this might seem equivalent to Riemann's *Leittonwechselklänge*. Indeed, Šín's T and S are equivalent in pitch-class content to Riemann's T and S. In major, the results are the same, despite the procedure being different. In minor however, both the results and the procedure are different. Like with Šín's substitute triads and Riemann's *parallel* triads, Šín's non-dualist approach to deriving his incomplete seventh chords differs substantially from Riemann corresponding *Leittonwechselklänge* in minor. Šín continues to derive the minor equivalents by omitting the roots from seventh chord forms of the primary triads, resulting in the triads built on III, VI, and VII to be labeled respectively °T, °S, and °D. For example, in A minor, he considers the C major triad, [C, E, G], as a derivation of the tonic seventh chord as an A minor seventh chord, [A, C, E, G], with the root omitted (°T). The F major triad, [F, A, C], is a derivation of the subdominant seventh chord as a D minor seventh chord, [D, F, A, C], with the root omitted (°S). The G major triad, [G, B, D], is a derivation of the dominant seventh chord as an E minor seventh chord, [E, G, B, D], with the root omitted (°D.). In contrast, Riemann's minor *Leittonwechselklänge*, T, S, and D, correspond to the triads built on VI, II, and III.

3.1.3 Chord progressions

In the first edition of *Nauka* (1922), Šín's understanding of the role of function in chord progressions is mostly in-line with Riemann's, but as with most of the ideas he borrows from Riemann, that understanding of progression is significantly less developed. Despite the overlap with Riemann on this topic, I include Šín's approach to harmonic progression in the first edition of *Nauka* for three reasons. First, because Šín is unique in his emphasis on the role of metric placement in determining function. Second, because in the second edition of *Nauka* (1933), his understanding of function in chord progression changes thanks to the new way in which he addresses secondary

chords. Third, because Šín surprisingly includes the harmonic dual progression in minor (^{o}T—^{o}D—^{o}S—^{o}T), despite his apparent avoidance of harmonic dualism throughout the text.

For Šín, "the connection of the tonic with some dominant and vice versa is straightforward and natural."[210] He understands the relationship between primary triads as one of conflict (*spor*). He explains that when the dominant or the subdominant follows after the tonic, each enters into conflict (*vchází ve spor*) with the tonic, and that when the tonic follows after the dominant or the subdominant the conflict is relaxed.[211] Comparing the subdominant and dominant, he finds that the dominant has a much more intense desire for relaxing by resolving to the tonic then the subdominant does, because the constituent tones of the dominant triad are more dissonant than those of the subdominant.[212] As such, when the dominant follows the subdominant, there is a sharpening of the conflict initiated by the subdominant.[213] If the subdominant follows the dominant however, "It would be an unnatural succession in opposition to the tendency of the dominant and the dissonant tones contained therein."[214] Thus, Šín allows for any progression of T, S, and D, so long as the progression D to S is avoided.[215]

After this follows Šín's definition of the various closes. Like Riemann, who refers both to a close (*Schluss*) and a cadence (*Kadenz*), Šín also uses the terms close (*závěr*) and cadence (*kadence*). His closes resemble the cadence types commonly identified today in anglophone music-theory pedagogy. He explains that they can be authentic (*autentický*) and full (*celý*) (D–T), authentic and half (*poloviční*)

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[210] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:19. "*Spoj tóniny s některou dominantou a naopak je jasný a přirozený*."
[211] Otakar Šín, I:19. "*Dominanta nebo subdominanta vchází s tónikou ve spor, opačný spoj spor uklidňuje*."
[212] Otakar Šín, I:19. "*Subdominanta v dur obsahuje základní tón tóniky vedle mírných disonantních tónů, tónické čisté kvarty a velké sexty, kdežto dominanta vedle tónické kvinty, citlivý tón a dissonantnější velkou sekundu. Je přirozeno, že snaha po uklidnění jeví se u dominanty mnohem intensivněji než u subdominanty*."
[213] Otakar Šín, I:19."*Sled S—D přináší zostření sporu vyvolaného subdominantou*."
[214] Otakar Šín, I:19. "*Kdybychom nechali po dominantě následovati subdominantu, byl by to nepřirozený sled proti snaze dominanty a v ní obsažených dissonantních tónů*."
[215] His use of the term dissonant above blurs the lines between vertical and horizontal dissonance, because he is describing the vertical (simultaneous) dissonance of subsequent between horizontal (subsequent) tones. He explains that the dominant triad contains tones that are a half-step and a whole step away from the tonic, which are more dissonant than the perfect fourth and major sixth of the subdominant triad.

(T—D), plagal (*plagální*) and full (S—T), plagal and half (T—S), or simply half (S—D).[216] For Šín's definition of cadence, which is also in line with Riemann's use of the term, one must look to the second edition of *Nauka* (1933). When explaining how to construct a phrase, Šín explains:

> Such a longer melody, neither motivically nor visibly metrically divisible, is usually unified as a so-called cadence. By cadence we mean a sequence of harmonies, clearly characterizing the key, which are concluded with a close. Such a cadence was the combination of T-S-D-T, which was to be transposed into all keys.[217]

It is clear here that cadences and closes are distinct entities. The close "is a connection of two chords capable of ending a musical movement satisfactorily."[218] The cadence is a longer progression that ends with a close. For example, there is an instance where Šín describes a cadence with a deceptive close (*s klamným závěrem*).[219] His exercises also frequently include assignments to compose a cadence in the form of a period.[220] Consider also the eight-measure period in Figure 3.2, the consequent phrase of which he describes as an expanded cadence (*má rozšířenou kadenci*).[221] He describes mm. 5–6 as a progression of T to S and mm. 7–8 as D to T. Presumably, the intervening harmonies of S and T^6 in m. 5 are of "inferior importance" (*podřadný význam*) to the overarching cadential progression of T (m. 5), S (m. 6), D (m. 7), and T (m. 8).

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[216] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:23.
[217] Otakar Šín, I:69. "*Taková delší melodie, ani motivicky, ani viditelně metricky dělitelná, bývá jako celek ohraničena t. zv. kadencí. Kadencí rozumíme sled harmonií, jasně charakterisující tóninu, jež jsou zakončeny závěrem. Takovou kadencí bylo již spojení* T—S—D—T, *jež bylo úkolem transponovati do všech tónin*."
[218] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*, 45. "*Závěr je spoj dvou akordů, schopný ukončiti uspokojivě hudební větu*."
[219] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:70.
[220] Otakar Šín, I:75. "*Dalším úkolem jest komponovati kadence ve formě periody.*"
[221] Otakar Šín, I:45.

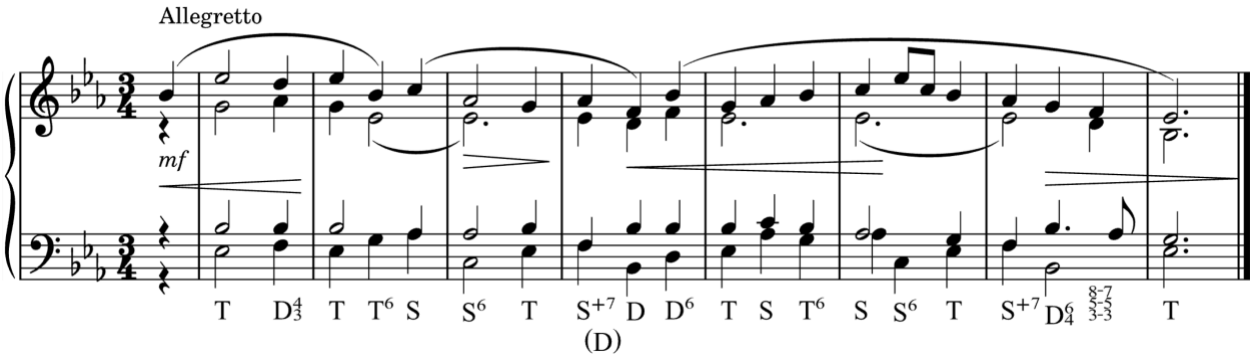

Figure 3.2 A reproduction of Šín's Figures 66. It is a phrase, composed by Šín, that he describes as an expanded cadence.[222]

Šín's views on harmonic progressions become more complicated when minor equivalents are considered. He explains that the progression of minor dominant to minor tonic is unnatural, because the minor dominant lacks the half step relationship between its third and the root of the tonic.[223] Instead, he suggests that "in the case of the minor dominant and subdominant, the relationship is reversed. Here the progression ^{o}D—^{o}S sharpens the conflict and the opposite progression [^{o}S—^{o}D] is the unnatural one."[224] That is, the minor subdominant has a more intense desire for relaxing by resolving to the tonic then does the minor dominant. Presumably, this has to do with the minor subdominant's third resolving by half step to the fifth of the minor tonic, as opposed to the minor dominant, which has lost the leading-tone resolution to the tonic typical of the major dominant.[225] This is, in fact, a surprising inclusion: it would seem that Šín has gone to significant lengths to repackage Riemann's *Vereinfachte Harmonielehre* in monist terms, but here he includes Riemann's

[222] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, II:23.
[223] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:18. "[*Měkká*] *dominanta nemá zde půltónového kroku od tercie k základnímu tónu tóniky, nýbrž k tercii, subdominanta za to půltónový krok ke kvintě tóniky (v tvrdé tónině byl k tercii). Malá dominantní tercie je malou tónickou septimou, která směřuje dolů k sextě a brání se kroku nahoru do oktávy. Spoj D—T byl bz tak nepřirozený.*"
[224] Otakar Šín, I:19. "*U měkké dominanty a subdominanty je poměr opačný. Tu bude sled ^{o}D—^{o}S zostřením sporu a opačný sled nepřirozeným.*"
[225] This line of reasoning assumes that there is something special about the half-step resolution of the third of the chord, because the minor dominant still has a half-step resolution—the fifth of the minor dominant can resolve up by half step to the third of the tonic. If the possibility of half-step resolution, regardless of which tone is resolving, is the only requirement for the desire to resolve, then presumably S and D should be equivalent in Šín's understanding.

harmonic dual progression. Riemann recognizes two typical harmonic progressions. The first is the broadly accepted progression of T—S—D—T. The second is the contentious dualistically conceived ^{o}T—^{o}D—^{o}S—^{o}T, which inverts the order of the subdominant and the dominant. Šín, despite rejecting the concept of harmonic dualism, echoes Riemann's dualist view of harmonic progression by claiming that in minor, the progression ^{o}D—^{o}S is the natural progression.

I have described how, for Šín, function influences, or perhaps describes normative harmonic progressions. Like Riemann however, Šín also recognizes situations in which harmonic context influences function. Consider Šín's neighbor triads, which, he explains, "stand in for the primary triads, to which they are related by third."[226] In the first edition, Šín, like Riemann, includes what I call bivalent triads—triads with more than one possible function symbol. Unlike Riemann however, Šín explicitly names them. For example, he describes III as a double (*dvojník*) that can be labelled either D_z or $\overline{T}$.[227] The functional identity of these bivalent triads depends on their context in particular harmonic progressions. For example, Šín describes how III is most compelling with the third in the bass, as part of the progression $D\binom{6}{(5)}$ — T, but he also claims that III often appears before a subdominant chord with $\hat{7}$ descending by step, labeling it as $\overline{T}$.[228] That is, the function of the bivalent chord depends on the surrounding progression.

Metric placement can also affect the functional interpretation of bivalent chords. Šín explains that "the primary harmony will precede or follow the neighbor triad…when they [both

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[226] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:67. "*Vedlejší kvintakordy zastupují hlavní harmonie, s nimiž jsou ve vrchní aneb ve spodní terčové příbuznosti.*"

[227] Otakar Šín, I:67. "As can be seen, [the triad built on the third scale degree] is a kind of double, moving from one function to another and cannot replace or represent either of them, as, for example, the fifth chord of the second degree represents the subdominant." "*Jak je patrno, je to jakýsi dvojník, pohybující se z jedné funkce do druhé a žádnou z nich nemůže nahraditi nebo zastupovati tak, jako na př. kvintakord II stupně zastupuje subdominantu.*"

[228] Otakar Šín, I:67. "*Nejpůsobivější je [kvintakord III. stupně] s tercií v basu, která se zdvojuje a pak je to vlastně* $D\binom{6}{(5)}$. *Ale i tak je spoj* $D\binom{6}{(5)}$ — T *slabou kopií authentického závěru. Tóniku vůbec nemůže zastupovati, jen tónický septakord. Tak se často vyskytuje před subdominantou, když citlivý tón kráčí dolů. Zkratka* $\overline{T}$."

harmonies] occur within the confines of a measure, i.e. whenever we do not expect a change in harmony."[229] In contrast, when a primary and neighbor harmony are separated by a bar line, and if the two chords are significantly different in voice leading or register, Šín suggests that it is better to read the bivalent chord as expressing a different function.[230] For example, when the progression I — III in a major key occurs within a bar, he labels it as T — T, but when that same progression occurs across a bar line, he labels it as T — D_z.[231]

In sum, Šín's understanding of harmonic function and chord progression is mostly in-line with Riemann's, although Šín's is admittedly less worked-out than his predecessor's. Riemann, for example, goes to the trouble of prescribing how the *Nebenklänge* should interact with the primary triads in larger cadences. On the other hand, Šín's understanding is more explicit than Riemann with respect to bivalent chords, and Šín also considers how metric placement can affect functional interpretation.

3.1.4 Neighbor dominants

With his neighbor dominants Šín departs significantly from Riemann's *Funktionstheorie*.[232] Šín's neighbor dominants appear in the first edition of *Nauka* (1922), where they appear in the context of a discussion of the spectrum of ways that a tonic chord's tonic identity might be displaced. Šín considers four cases: a permanent change in tonic, a change of tonic that eventually returns to the original, a brief change in tonic, or a change in tonic that is only apparent.[233] The first two categories are simply modulations, either permanent or eventually returning to the original key. The third

[229] Otakar Šín, I:67. "*Hlavní harmonie předchází pravidelně vedlejšímu kvintakordu aneb mu následuje. V obou případech děje se tak v mezích taktu, tedy vždy, když nečekáme změnu harmonie*."
[230] Otakar Šín, I:68.
[231] Otakar Šín, I:68. "T—III | = T — D_z | T…D | III — T = D | T — T."
[232] Šín's neighbor dominants (*vedlejší dominanty*) are not to be confused with his neighbor triads (*vedlejší kvintakordy*) that I discussed above in Section 3.1.2.
[233] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:70.

category describes, under the title of "non-tonic" (*mimotonální*) dominants, what Anglophone music theory calls chromatic applied (or secondary) chords. Unlike modern American theorists, however, Šín also allows for applied subdominant chords—that is, for the subdominant of the subdominant and of other non-tonic chords. As Riemann does with his *Zwischendominanten*, Šín indicates these non-tonic dominants and subdominants with parentheses.

Šín's fourth category—"tonic displacement," in which there is only an apparent change of tonic—depends on his conception of neighbor (*vedlejší*) dominants. Neighbor dominants are, in effect, diatonic applied chords. Šín explains that neighbor dominants and subdominants "are either seventh chords or triads with added sixths built on scale degrees," excluding the original dominant seventh and subdominant added sixth chord, presumably.[234] By way of clarification, consider Šín's statement that "any four-note chord [seventh chord or added sixth chord] can be resolved either like a dominant seventh to tonic, on whose fifth it stands, or like a subdominant with an added sixth to tonic, of which it is a fourth below, and sometimes to a dominant, which stands a step higher."[235] For Šín, every diatonic seventh chord is potentially a dominant seventh chord and every diatonic added sixth chord is potentially a subdominant chord, in any inversion, and irrespective of chord quality. That is, minor–minor, major–minor, half-diminished, and fully diminished seventh chords all count as "neighbor dominants." Similarly, the added-sixth chord might have a major or a minor third above its root. These sonorities are Šín's neighbor dominants and subdominants. Whether a chord is a neighbor dominant or subdominant depends on its resolution. It is a neighbor dominant

[234] Otakar Šín, I:71. "*Vedlejšími dominantami jsou buď septakordy nebo kvintakordy s přidanými sextami, postavené na stupních stupnice.*"
[235] Otakar Šín, I:64. "*Každý čtverozvuk může býti rozveden buď jako dominantní septakord k tónice, ne jejíž kvintě stojí, nebo jako 'subdominanta s přidanou sextou' do tóniky, stojící o kvartu níže, častěji však do dominanty, stojící os stupeň výše.*"

if it is resolved like a dominant seventh, which Šín explains means that the seventh is resolved down by step, and it is a neighbor subdominant if the added sixth resolved up by step.[236]

It is important to note that Šín's neighbor dominants do not replace his system of harmonic functions already described, but rather supplement it. For example, consider Figure 3.3, reproduced from Šín's Figure 140. Here, Šín provides the neighbor dominant analysis in parentheses between staves, while providing his primary analysis below. The neighbor dominant analysis highlights fifth relationships which are otherwise obscured by the substitute functions in the primary analysis. However, aside from this and a few other examples, neighbor dominants mostly do not figure in the rest of the first edition of *Nauka* (1922). Šín simply acknowledges that these neighbor dominants exist and that they are to be understood in the way just described, but otherwise he labels chords according to the system of harmonic function already introduced.

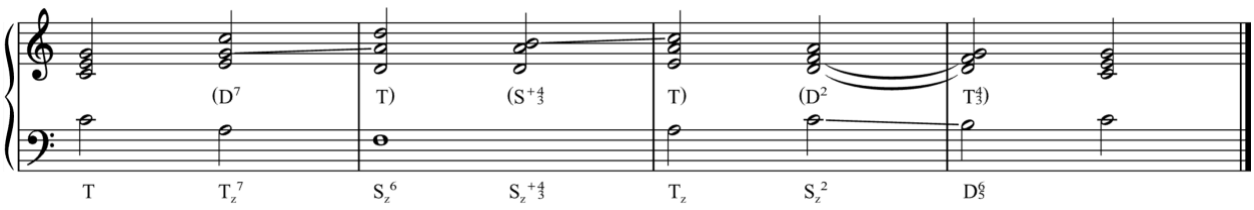

Figure 3.3 A reproduction of Šín's Figure 140. It is an example, composed by Šín, for which he provides a primary analysis below the staff and a neighbor dominant analysis between staves.[237]

Šín also mentions, very briefly, one further type of dominant chord that does not fit neatly into the categories above. This type is the "exchange dominant" (*střídavá dominanta*), not to be confused with Riemann's *Wechseldominante*. In a major key, the exchange dominant is the minor chord built on II.[238] The exchange dominant is a dominant in the sense that the root of the chord

[236] Otakar Šín, I:71. "*1. Čtverozvuk rozvedený jako D7 — **septima kráčí stupňovitě dolů** (výjimkou stupňovitě nahoru.) 2. Čtverozvuk rozvedený jako S+$\frac{6}{5}$ — přidaná sexta kráčí **stupňovitě nahoru**. Poněvadž je subdominanta s přidanou sextou shodna se septakordem, **kráčí základní tón septakordu nahoru**.*"
[237] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, II:53.
[238] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:65.

built on II is in a dominant relationship to the dominant. In the first edition of *Nauka* (1922), the term simply appears in a passing remark; the chord so described does not receive a function symbol and Šín does not posit a corresponding exchange subdominant. We will see that the exchange dominants are more explicitly explored in the second edition of *Nauka* (1933).

3.1.5 Summary of the first edition of Nauka (1922)

In this first section (Section 3.1), I have introduced Šín's theory of harmonic function. Šín, explaining that chords can have horizontal dissonance, defines the tonic chord as horizontally consonant while the dominant and subdominant chords as horizontally dissonant. Strangely, he allows tonic chords to be vertically dissonant. While he also makes the unusual claim that dominant chords are natural major and subdominant chords are naturally minor, he comes to the expected conclusion that the primary functions are either three major chords (T, S, and D in major) or three minor chords (^{o}T, ^{o}S, ^{o}D in minor), with the dominant is a fifth above the tonic and the subdominant is a fifth below the tonic in both major and minor. For the remaining diatonic triads in major and minor keys, Šín proposes a labeling system that can be described as a monist re-imagining of Riemann's labels for the *Nebenklänge*, based on a monist interpretation of the "omitted-note" method from Riemann's *Vereinfachte Harmonielehre*. Šín also suggests that there are typical harmonic progressions (T—S—D—T and the unexpected harmonic dual ^{o}T—^{o}D—^{o}S—^{o}T), while directly addressing the topic of bivalent chords and how metric placement can affect functional interpretation. Lastly, Šín describes a category of chords called "neighbor dominants," which seem to be added to his theory as an afterthought. While on the surface, it might seem like Šín's theory of harmonic function is simply a monist reimagining of Riemann's *Vereinfachte Harmonielehre*, we will see in the following section that Šín actually departs from Riemann is several fundamental ways.

3.2 The first edition of Nauka (1922) in comparison

In this section, I begin to compare the function theories of Šín, according to the first edition of *Nauka* (1922), and Riemann, according to his *Vereinfachte Harmonielehre*. I examine three different topics: how the authors differ in their use of the overtone series; how Šín interacts with Riemann's foundational analogy between tone relationships and chord relationships; and how Šín borrows or adapts elements of Riemann's approach.

While Šín adopts the same assignments and labels for tonic, subdominant, and dominant, as Riemann, the approach that underlies it differs significantly. Consider first the authors' differing uses of the overtone series. Broadly speaking, Riemann treats the overtone series as a consonant entity, while Šín treats it as a dissonant one. Consider first the correlation between the overtone series and consonance for Riemann. In the *Vereinfachte Harmonielehre*, Riemann distinguishes between overtones (and undertones in the undertone series) that are in a direct relationship to the fundamental and those that are secondarily related to it.[239] Together, the prime and the directly related tones constitute triads. Compare that to the definitions Riemann provides for consonance and dissonance in the *Musik-lexikon*:

> *Consonance* [*Konsonanz*] (Lat. *Consonantia*, 'sounding together') is the fusion of several tones to a unified significance of the *Klang*. The consonance of the major principle (the major triad) is the sounding together of a principal tone with its upper fifth and upper third; the consonance of the minor principle (the minor triad) is the sounding together of a principal tone with its lower fifth and lower third. Tones are only consonant if and while they are actually understood in context as components of one and the same *Klang* (see *Klang, Dissonance*). In deviation from this precise definition of musical consonance, physicists have

[239] See Section 2.1.1 for more on Riemann's account of the overtone series.

> defined consonant tones as those that *can* be understood as components of the same *Klang*. (Cf. *Apparent consonance*).
>
> *Dissonance* [*Dissonanz*] (Lat. *Dissonantia*, 'sounding apart') is the disturbance of the unified conception (consonance) of those tones pertaining to one *Klang* by one or several tones that must be understood as representatives of different *Klänge*. There are therefore no dissonant intervals, but only dissonant tones. Which tone is dissonant within a physically (acoustically) dissonant interval depends on the *Klang* in whose context the interval is heard (take C–D: in the context of a C major triad, D is dissonant; in the context of a G major triad, C is dissonant). Musically speaking, even acoustically consonant intervals can be found to be dissonant (e.g. C–G in the context of an A♭ major chord with G as an appoggiatura to A♭).[240]

What I aim to demonstrate by presenting Riemann's definitions of consonance and dissonance is that they are effectively equivalent to Riemann's description of the overtone series in the *Vereinfachte Harmonielehre*. In the *Vereinfachte Harmonielehre*, Riemann distinguishes between directly related tones and secondarily related tones. According to the definitions of consonance and dissonance from the *Musik-lexicon*, directly related tones (those which can form a major or a minor triad with the prime) are consonant, and the secondarily related tones (those which must be understood as being part of a different triad) are dissonant. Consonant tones are those that Riemann understands in context of the overtone or undertone series, while dissonant tones are those that he understands as being outside of it. That is, Riemann treats the overtone series as a consonant entity.

[240] Riemann, *Musik-Lexikon*, 1900, 254–55, 596. I borrow these translations from Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*, 186–88.

Mirroring the *Vereinfachte Harmonielehre* in the first edition of *Nauka* (1922), Šín also begins with an examination of the overtone series. However, Šín's examination in the *Nauka* serves a very different purpose. For Riemann, the overtone series provides a natural foundation that justifies the stability he attributes to the tonic triad and accordingly the prominence that he gives that triad. Šín on the other hand, uses the overtone series to begin discussing "energy for motion" (*energie pohybu*) and the need for resolution—that is, instability.[241] Šín treats the overtone series as a dissonant entity.

The fact that Riemann treats the overtone series as a consonant entity while Šín treats it as a dissonant one is relevant to our discussion of Riemann's foundational analogy. For this discussion, remember that Šín, in the *Nauka*, introduces a distinction between vertical and horizontal consonance. Here, I facilitate a discussion of Riemann's foundational analogy by first examining the extent to which we can conceive of Riemann's *Funktionstheorie* in the terms of vertical and horizontal dissonance. If vertical consonance concerns the relationship of simultaneously sounding tones, then Riemann's understanding of the overtone series as the basis for consonance and dissonance is a matter of vertical consonance. On the other hand, if harmonic consonance is a matter of the relationship of consecutive chords, Riemann's *Funktionslehre* is clearly a horizontal phenomenon, in the sense that it describes relationships between chords. We can then use the terms vertical and horizontal to describe Riemann's fundamental analogy. Remember that Riemann's harmonic functions are defined by chord relationships (*Harmonieschritte*) that he found to be analogous to tone relationships. To use the terms vertical and horizontal—Riemann's *Funktionstheorie* is a theory of horizontal consonance built analogously to his theory of vertical consonance. That is, Riemann's *Funktionstheorie* horizontalizes his vertical understanding triad structure.

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[241] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, II:9. "*Týž pokus s g vysvětlí nám rozdíl mezi souzvukem čisté kvinty a velké tercie. Čistá kvinta skoro splývá se základním tónem a napětí je nepatrné. V kvintakordu je tercie ohniskem napětím, tercie charakterisuje souzvuk, projevuje největší energii pohybu. K seznání, kam její pohybová energie směřuje, bude nám nápomocen souzvuk aliquotních tónů.*"

Given the importance of Riemann's fundamental analogy for his *Funktionstheorie*, as explored in Chapter 2, does this analogy figure into Šín's theory of harmonic function? While Riemann conceives of his primary triads (T, S, and D) by means of a horizontalization of vertical triad structure, Šín defines the tonic, dominant, and subdominant—his primary chords (*základní akordy*)—according to his understanding of horizontal consonance and dissonance, which has no basis in vertical consonance or dissonance. This is made clear by the fact that he defines the tonic, dominant, and subdominant, according to their horizontal dissonance—tonic chords are the only chord to possess harmonic consonance, while horizontally dissonant chords are called dominant and subdominant.[242] Šín does not use vertical consonance or dissonance to determine function. For Šín then, there is no analogy between vertical and horizontal consonance.

If Šín had attempted to preserve Riemann's analogy between the vertical and horizontal, Šín would run into two problems. The first problem is that Šín did not adopt Riemann's *Harmonieschritte*. For Riemann, the *Harmonieschritte* facilitated his analogy because his *Harmonieschritte* acted as analogues for intervals. Without the *Harmonieschritte*, or some other analogue to replace it, Šín does not have a way to make vertical and horizontal dissonance analogous. The second problem is that Šín does not have a discriminating understanding of vertical consonance—Šín describes vertical consonance as depending on both musical parameters and the interpretation of a listener. Not having a discriminating understanding of vertical consonance has significant implications for the analogy. The purpose of the analogy in the first place is to transfer a concept of vertical consonance to the realm of the horizontal. Without a discriminating understanding of vertical consonance, there is nothing to transfer to the horizontal realm. In other words, there would have been no point for Šín to observe Riemann's fundamental analogy.

[242] See Section 3.1

Despite the fact that Šín dispenses with many of Riemann's fundamental views, such as harmonic dualism, the *Harmonieschritte*, and the fundamental analogy, Šín repurposes many features from the *Vereinfachte Harmonielehre*. The most interesting of these are Šín's labels for the neighbor triads. In the first edition of *Nauka* (1922), Šín's provides a monist reimagining of Riemann's *Nebenklänge* labels that jettisons the baggage of Riemann's harmonic dualism and the *Harmonieschritte*. Because Riemann understands the *Nebenklänge* in term of his *Harmonieschritte*, Šín is forced to find a different way to conceive of the neighbor triads. He does not, however, conceive of a novel way to do so. Instead, as we saw in Section 3.1.2, Šín borrows the omitted-note method from the *Vereinfachte Harmonielehre*. The interesting thing about Šín adopting Riemann's omitted-note method is that in the *Vereinfachte Harmonielehre*, Riemann ultimately rejects the method on the grounds that the tonic triad cannot accept a dissonance (Section 2.1.3). To use the language we have gained in this chapter, for Riemann, the tonic triad must be both vertically and horizontally consonant, and the omitted-note method requires the possibility of a vertically dissonant tonic. Šín, however, as we know, does allow for a vertically dissonant tonic chord, which makes the omitted-note method for deriving neighbor chords available to him.

Šín continues to borrow from Riemann by justifying his arrangement of the tonic, dominant, and subdominant chords in two ways that can also be found in the *Vereinfachte Harmonielehre*. First, Šín observes that together, the tonic, subdominant, and dominant triads make up all the notes of a major scale, with the same being true for their respective minor forms and the natural minor scale.[243] A more compelling justification however is Šín's appeal to similarity. Šín justifies his arrangement of the tonic, dominant, and subdominant chords with the observation that the dominant and

[243] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:17. "*Přirozenou tóninu dur obdržíme, spojím-li dur-tóniku s dur-dominantou a s dur-subdominantou;*" "*Tonika, subdominanta a dominanta obsahují všechny tóny diatonické stupnice a lze tedy melodii, pohybující se v mezích tóniny, jimi harmonisovati;*" For Riemann's discussion of this, see Riemann, *Vereinfachte Harmonielehre*, 7.

subdominant constitute a balance between similarity and contrast to the tonic. Namely, he recognizes that the dominant and subdominant both share one common tone with the tonic, and that of the remaining tones, there is the possibility of one voice moving by half-step to a tone of the tonic and another moving by whole step.[244] All other chords he explains, when compared to the tonic, either do not contrast enough or have two much contrast.[245] Thus, despite lacking the *Harmonieschritte*, which is Riemann's vehicle for transferring the concept of relatedness from tones to chords, Šín nevertheless appeals to the concept of relatedness between chords. Of course, for Riemann, the concept of relatedness is a robust idea that permeates his whole theory, despite its problems. Šín on the other hand simply appeals to relatedness to briefly justify the arrangement of the tonic, dominant, and subdominant chords.

As a summary of the first edition of *Nauka* (1922), it might appear that Šín's theory of harmonic function is simply a monist reimagining of Riemann's *Funktionstheorie*. Šín's primary triad labels are identical to Riemann's, Šín's neighbor triad labels are mostly a monist version of Riemann's *Nebenklänge* labels, and Šín maintains Riemann's conception of typical harmonic progressions called cadences. Šín even addresses some aspects of Riemann's *Funktionstheorie* more explicitly than Riemann, like bivalent chords (*dvojníky*) and the distinction between vertical and horizontal consonance. However, Šín not only introduces new elements into his theory that are foreign to Riemann's *Funktionstheorie*, like Šín's neighbor dominants, but also departs significantly from one of Riemann's fundamental assumptions. That is, Šín does not preserve Riemann's fundamental analogy between tone relationships and chord relationships. Despite the differences between their two theories, Šín curiously maintains a variety of elements from the *Vereinfachte*

[244] Otakar Šín, *Nauka o harmonii na základně melodie a rytmu*, 1922, I:17. "*Vidíme, že vždy dvěma dissonujícím tónům, spor způsobivším, odpovídá jeden tón společný, tedy kondolující a jeden půltónový krok od disponujícího tónu ke konsonujícímu, t. j. co nejužší přechod od dissonance ke konsonanci.*"
[245] Otakar Šín, I:17. "*Mají buď málo kontrastu proti tónice, nebo jsou s ní příliš úzce spiaty, někdy mají příliš mnoho kontrastu, nejsouce s ní spřízněny.*"

Harmonielehre that are contradictory to either Šín's approach or Riemann's. One example of this is the omitted-note method for deriving neighbor triads, which Riemann introduces but ultimately rejects in the *Vereinfachte Harmonielehre*. Another is that Šín allows for Riemann's typical minor progression (^{o}T—^{o}D—^{o}S—^{o}T), which is a product of harmonic dualism. In total, Šín's theory of harmonic function is a patchwork reinterpretation of Riemann's *Funktionstheorie* clarifies some elements, but mostly obfuscates and confuses Riemann's thought. However, in examining Šín's theory of harmonic function, we observed some points of interest. Namely, we saw some latent dualism in Šín's understanding of progressions and in the way that he correlated dominant and subdominant with major and minor respectively. We also saw Šín appeal to relatedness between chords when justifying the arrangement of the primary triads. In the following section, we will see how these ideas develop in the second edition of *Nauka* (1933).

3.3 The second edition of Šín's *Úplná nauka o harmonii*

While in the second edition of *Nauka* (1933), many of Šín's claims are similar to those in the first, they are worked out in greater detail or with more clarity; there are also some significant changes from the first edition, such as Šín's more normative understanding of vertical consonance, and his novel approach to labeling neighbor triads. In a general sense, Šín brings his theorizing more closely into line with Riemann's and dispenses with some of the peculiarities—the fundamentally non-Riemannian ideas—of the first edition. However, his theory also becomes more novel—whereas the first edition is a relatively conservative reimagining of Riemann's *Funktionstheorie*, the second edition develops Riemannian ideas in a unique way that paves the way for Šín's students and their more radical theories of harmonic function.

3.3.1 Neighbor triads

The most apparent difference between the first and second edition of the *Nauka* is in how Šín assigns harmonic functions to neighbor chords. Remember that in the first edition, the neighbor chords in major keys received function symbols that were effectively equivalent to Riemann's, with differences arising for the neighbor chords in minor keys. However, in the second edition, Šín proposes a novel approach in which these chords are understood as combinations of functions. Take for example, an E minor triad [E, G, B] in the key of C major. Šín explains that E minor is between T and D, is made up of thirds from both triads, and as such has a composite of the two functions.[246] It then receives the function symbol ~~T~~~~D~~. The simultaneous presence of T and D indicates that the chord is a combination of those two functions. Crossing out the two symbols is meant to indicate that notes are omitted. In the case of the left symbol, the root of that chord has been omitted, while in the case of the right symbol, the fifth of that chord has been omitted. The table below provides the remaining combination functions in major and minor, comparing them to Riemann's *Nebenklänge* labels and Šín's labels from the first edition. Two of Šín's neighbor triad labels are exceptional however. Both ~~S~~ and ~~D~~, the triads built respectively on II and VII, are represented as single crossed out functions.

[246] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*, 21. " [*Kvintakord III. stupně*] *obsahuje tercové tóny T i D, je tedy jejich složkou. Složení ze dvou funkcí vyjádříme kombinovanou funkční zkratkou.*"

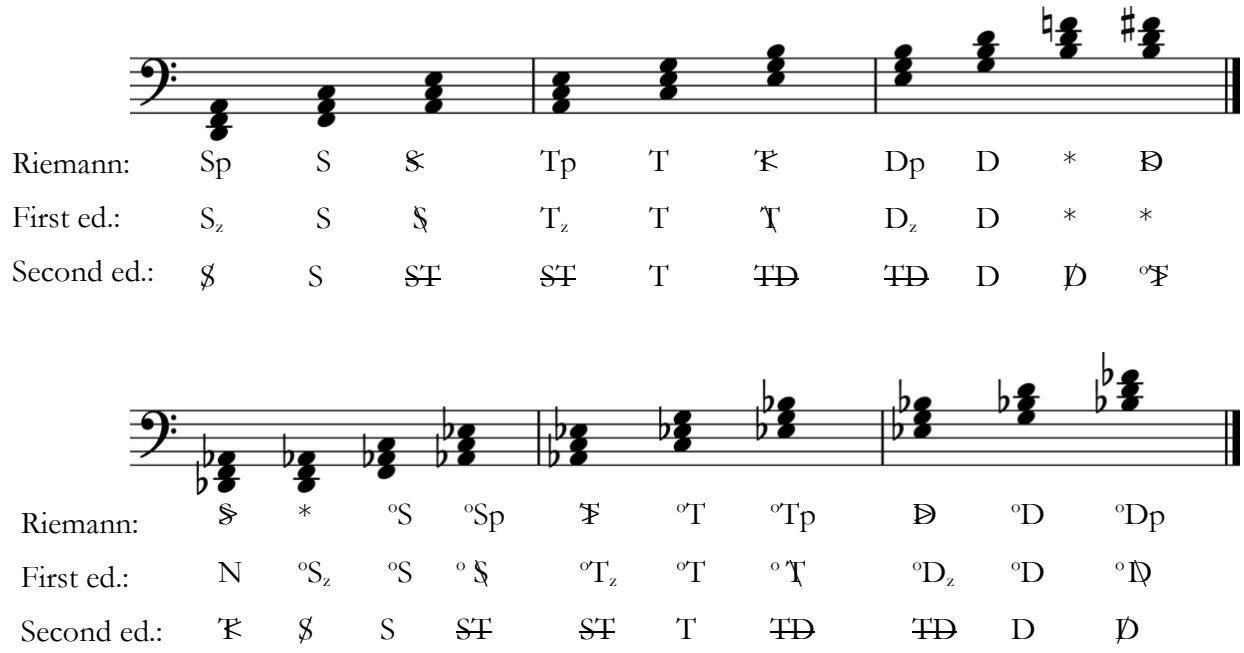

Figure 3.4 Realizations, in C major and C minor, of the primary and neighbor triads with the neighbor triad function labels from Riemann, as well as both the first and second edition of the *Nauka*.

Šín's three functions, along with his combination functions and the standard figured-bass symbols for alterations and inversions, allow him to label most tertian harmonies in a relatively predictable way. One slightly unusual case, however, concerns half and fully diminished seventh chords. For these, he invokes a six-note tertian harmony built on V (in the key of C major, [G, B, D, F, A(♭), C]). He calls this a combined DS° function chord (DS if [A♮]). The fully diminished seventh chord [B, D, F, A♭] is a subset of the full DS° chord, while the half-diminished seventh chord [B, D, F, A♮] is a subset of the full DS chord. Leading-tone fully diminished and half diminished seventh chords are thus ~~DS°~~ and ~~DS~~ function chords, respectively, with omitted bottom and top notes.

Another unusual case is Šín's treatment of the so-called "Neapolitan" (*Neapolský*) and "Lydian" (*Lydický*) chords. The Neapolitan is, unsurprisingly and in keeping with Riemann's nomenclature, the major triad built on ♭II ([D♭, F, A♭] in C minor). The Lydian is the minor triad

built on the leading tone ([B, D, F#] in C major) and gets its name from the raised $\hat{4}$ in the fifth of the chord.[247] Šín describes these chords as a combination of three leading tones. In the case of the Lydian chord in the key of C minor, he considers the [B] as leading tone to [C], the [F#] as a leading tone to [G], and the [D] as a leading tone to [E♭]. Šín calls the chord a "combined dominant" (*kombinovaná dominanta*) or a "tri-dominant" (*trojdominanta*).[248] In the case of the Neapolitan, he considers [D♭] as a leading tone down to [C], [F] as a leading tone down to [E], and [A♭] as a leading tone down to [G], and he calls the chord a combined subdominant or "tri-subdominant."

Admitting the potential complexity of labeling the Lydian and Neapolitan chords as tri-dominant or tri-subdominant, Šín also labels them in terms of the chords "to which they resolve, to which they have the closest relation."[249] To explain, Šín labels the Neapolitan chord in C major, [D♭, F, A♭], as Ƭ, because each chord tone of the Neapolitan is in a leading tone relationship from below with a chord tone from the tonic triad, [C, E, G]. He labels the Lydian chord in C minor, [B, D, F#], as °Ƭ, because each chord tone of the Lydian chord is in a leading tone relationship from above with a chord tone from the tonic triad, [C, E♭,G].

Šín choices of labels for the Lydian and Neapolitan chords is strange. While these function symbols are taken directly from Riemann, they have a very different meaning. For Riemann, to recall, Ƭ and °Ƭ are the tonic *Nebenklänge*. In C major, Riemann's Ƭ is [E, G, B], and in C minor, Riemann's °Ƭ is [A♭, C, E♭]. That is, they are tonic *Leittonwechselklänge*, not the Neapolitan or the Lydian chords. Interestingly, Riemann does have his own internally consistent labels for these

[247] Riemann acknowledges that the major triad built on ♭II is conventionally referred to as the Neapolitan. However, he seems to prefer thinking of it as the chord with the characteristic note of the Phrygian scale. We will see later that Janeček prefers to refer to these two chords as the Phrygian and Lydian chords.
[248] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*, 161.
[249] Otakar Šín, 161. "*Poněvadž by takové kombinování bylo příliš složité, odvozujeme je z akordů, do nichž se rozvádějí, k nimž mají nejbližší poměr.*"

Neapolitan and Lydian chords. He labels the Lydian chord Ð and the Neapolitan chord S̶. Šín choices of labels for the Lydian and Neapolitan chords is also strange because it is internally inconsistent with his views on chord progression. As we have see, Šín observes that there are typical chord progressions (like T—S—D—T), and that a chord's function label indicates how it participates in such a progression. To label the Neapolitan and Lydian chords as altered tonic chords is bizarre because Šín explicity describes them as being subdominant and dominant, respectively.[250] However, both chords inexplicably receive a modified function label T.

3.3.2 Natural dominants

In the second edition of *Nauka* (1933), Šín explicitly distinguishes between three types of dominants—tonal, natural, and exchange. His tonal dominants are the standard S and D in major, and °S and °D in minor.[251] The term "tonal" (*tonální*) here is the adjective form of the word for key (*tónina*), indicating that these dominants are those that are derived from, or diatonic to, their respective major or minor keys.

Šín's natural dominant is the major triad a fifth above the tonic and his natural subdominant is the *minor* triad a fifth below the tonic. These natural dominants stem from his observations about the first nine notes of the overtone series. In contrast to the first edition, where Šín constructed the chord [C, E, G, B♭, D, F, A] from the overtones of, presumably, [C] and [G], in the second edition, he builds a ninth chord with a flat seventh, [G, B, D, F, A]. He makes the claim that if this chord requires resolution to another chord, "the most appropriate chord will be one built on a note a perfect fifth lower than the fundamental note of the ninth chord," and that the relationship between these two chords is the dominant relationship.[252] Besides claiming that this chord of resolution

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250 Otakar Šín, 163. "Ŧ *je subdominantou a* °Ŧ *dominantou*."
251 Otakar Šín, 5.
252 Otakar Šín, 3. "*Zkoušíme-li, který akord nejlépe vyhovuje požadavku uspokojujícího přechodu, zjistíme, že nejvhodnějším bude akord, který bude postaven na tónu o čistou kvintu nižším, než je základní tón akordu nonového*."

provides the most "satisfying transition" (*uspokojujícího přechodu*), Šín does not explain why it is the most appropriate chord, but from his example, reproduced in Figure 3.5, we can surmise that the decisive consideration is the particular voice leading made possible by the dominant relationship. Namely, he observes that all five of the voices move, that the B and F both resolve by half step, and that all the voices resolve to a consonant triad. Importantly, Šín then explains that the ninth, the seventh, and even the root could all be omitted while maintaining this dominant relationship.[253] For this reason, he goes on to take the major triad a fifth above the tonic as the dominant.

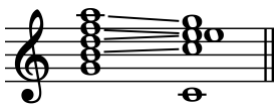

Figure 3.5 Reproduction of the Šín's Figure 4 from the second edition of *Nauka* (1933).[254]

On the other hand, Šín explains that omitting the root [G] and third [B] of the ninth chord would leave a D minor triad [D, F, A]. He notes that this minor triad can be connected to that same goal triad as before, but it is more suitable for it to resolve up a fifth to an A minor triad.[255] Šín describes this relationship as a subdominant relationship. He uses these observations to establish that the natural dominant ([G, B, D] in C major) is major, while the natural subdominant ([D, F, A] in A minor) is minor.

For both the natural dominant and the natural subdominant, Šín allows for up to two tertian extensions. In the case of the natural dominant, these are the minor seventh and the major ninth above. For the natural subdominant, on the other hand, he allows for the added lower seventh (or

[253] Otakar Šín, 3. "*Na tomto poměru a jeho působivosti neztratí se nic, vynecháme-li na př. nonu, takže zbude jen septimový akord. Jen kontrastu ubude. Vynecháme-li i septimu a zbude nám pouze durový kvintakord, i tak poměr zůstane týž, stejně uspokojující, ovšem kontrast jednotek bude mnohem slabší. Bylo by možno vynechati i základní tón a poměr by stejně uspokojoval.*"
[254] Otakar Šín, 3.
[255] Otakar Šín, 4. "If we omit the fundamental and the third, leaving the minor fifth chord d f a, it could also be combined with the chord c e g. But the connection will no longer be satisfactory to that extent. The chord a c e would seem much more appropriate." "*Kdybychom vynechali základní tón a tercii, takže by zbyl kvintakord mollový d f a, bylo by ho možno spojiti rovněž s akordem c e g. Ale spoj nebude již do té míry uspokojovati. Mnohem vhodnějším bude se jeviti akord a c e.*"

upper sixth) and the lower ninth (or upper fourth).[256] Thus, both dominants, when both extensions are added/included, comprise the same notes. We can see this in figure (Figure 3.6), which reproduces an example from the second edition. Not only do the two dominants differ in their resolution, as described above, but the example also shows that they emanate from different tones. Unsurprisingly, for Šín the natural dominant emanates from the bottom pitch. However, the natural subdominant emanates from the fifth [A]. That is, all the notes of the ninth chord contain the top note in their respective overtone series.[257] Šín's natural dominants are thus conceived dualistically—a very curious thing in a text that otherwise seems to have mostly shrugged off Riemann's harmonic dualism. Also, in contrast to his treatment of the tonal and exchange dominants, Šín does not provide a unique function label for natural dominants. He discusses them, but then mostly moves on. In these ways, Šín's natural dominants are quite disconnected from the main body of his theory of harmonic function.

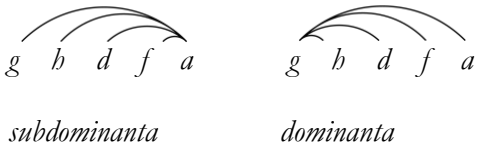

Figure 3.6 Reproduction of an unlabeled figure from Šín's second edition of *Nauka* (1933).[258]

3.3.3 Exchange dominants and neighbor dominants

Šín's exchange dominants are unchanged from the first edition of this text, but they receive more explanation in the second edition. Firstly, Šín identifies an exchange subdominant in addition to the exchange dominant from the first edition. Secondly, he gives these two chords special symbols, as

[256] Otakar Šín, 4."*Přirozenou subdominantou* je tudíž *mollový kvintakord, mollový* kvintakord se *spodní malou septimou* nebo *přidanou vrchní sextou* a tento septakord se *spodní velkou nonou.*"
[257] Otakar Šín, 4."*U akordů subdominantních je tomu jinak. Není zde soustředěnosti v základním tónu, neboť není příbuznosti v základním tónu. Naproti tomu je příbuznost v kvintě mollového akordu, neboť v tomto tónu soustřeďují se tónové řady všech součástí, jinak řečeno, kvinta mollového akordu je obsažena v řadách všech ostatních tónových jednotek*."
[258] Otakar Šín, 4.

shown in Figure 3.7. He explains that the exchange dominant (*střídavá dominanta*) is the minor triad built on the fifth above the major dominant chord and labels it "𝄫D". The exchange subdominant is the major triad built on the fifth below the minor subdominant, and he labels it "§". These modified forms of the letters S and D clearly borrow Riemann's 𝄫D and §, but their meanings are different. Riemann's 𝄫D and § refer to the chromatically altered dominant of the dominant (a major triad built on II of a major key) and the chromatically altered subdominant of the subdominant (a minor triad built on natural VII of minor key). Šín's 𝄫D and § are the unaltered diatonic forms of those triads.

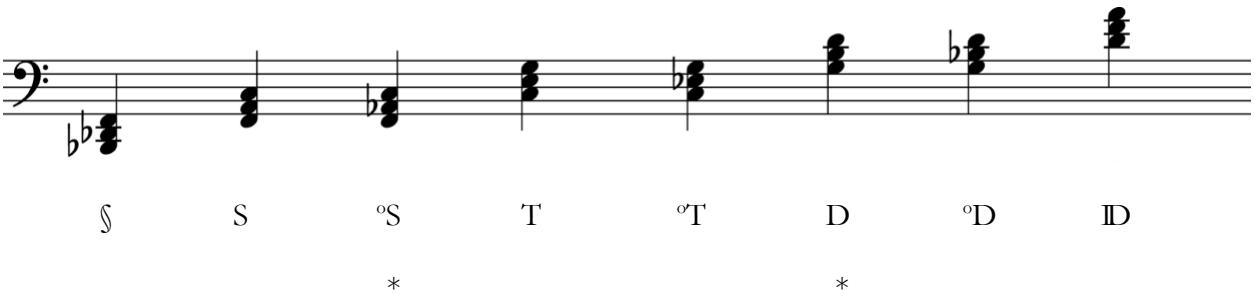

Figure 3.7 An example with Šín's three types of dominants and subdominants in C Major/Minor. Tonal dominants are labeled with the standard function symbols T, S, and D. Exchanges dominants are labeled with 𝄫D and §. Natural dominants are indicated with an asterisk.

Šín's exchange dominants are peculiar however because, like his natural dominants, they also seem ancillary to Šín's approach. That is, these two function symbols seem grafted onto an otherwise internally consistent approach. Generally speaking, in this approach, every function is either T, S, or D, or some combination of these three with some pitches potentially omitted; and standard figured bass symbols for inversion and alterations can be added to those symbols. Why then, would Šín add the exchange dominants? Answering this question requires examining the relationship between exchange dominants and neighbor dominants. Remember that in the first edition, Šín uses the term "neighbor dominant" to refer to any diatonic seventh chord and "neighbor subdominant" to refer to any diatonic added sixth chord (tacitly excluding, of course, the primary dominant and subdominant seventh chords). In the second edition, any diatonic seventh

chord that does not contain a diminished fifth is a neighbor dominant or subdominant.[259] This means, and Šín explicitly confirms, that the exchange dominant—the bivalent seventh chord built on II, is a neighbor dominant.[260]

There are important differences, however, between exchange dominants and the other neighbor dominants. While the exchange dominants alter a chord's function label, neighbor dominants do not have any bearing on a chord's functional interpretation—or at least on the function label it is assigned. While in the first edition, Šín explains that neighbor seventh chords can be either neighbor dominants or neighbor subdominants, Šín never suggests that they should be labeled as such. Presumably, what he had in mind is what we find in the second edition: when explaining the neighbor dominants, he describes them as chords that can have different types of resolutions. That is, they can have a completely dominant resolution (*úplné dominantní rozvedení*), a partially dominant resolution (*částečné dominantní rozvedení*), a completely subdominant resolution, a partially subdominant resolution, or a combined resolution (*kombinovaném rozvedení*). Šín explains that:

> With a completely dominant resolution, the upper seventh resolves to the third, with a partially dominant resolution, it resolves to the prime, with a completely subdominant resolution the lower seventh resolves to the third, with a partially subdominant resolution it resolves to the fifth, with a combined resolution the upper and lower tones progress in contrary motion to the interval of a fifth and the inverse of the seventh, the second, progresses in contrary motion to the interval of a fourth. [261]

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[259] Otakar Šín, 81–82.

[260] Otakar Šín, 61. "*Septakord II. stupně má však ještě jednu funkci v tónině. Budeme-li ho pojímati tak, že jeho prima bude základním tónem a disonující tón bude nahoře, vrchní septima, pak bude celý útvar dominantou, avšak nikoliv přirozenou, která má durovou tercii, nýbrž vedlejší dominantou.*"

[261] Otakar Šín, 83. "*Při úplném dominantním rozvedení rozvádí se vrchní septima do tercového tónu, při částečném rozvedení rozvádí se do primy, při úplném sub dominantním rozvedení rozvádí se spodní septima do tercového tónu, při částečném rozvedení do kvinty, při kombinovaném rozvedení postupuje vrchní i spodní tón stažmo k intervalu kvintovému, obrat septimy sekunda stažmo do kvartového intervalu.*"

Even though these resolutions are named according to the functional terms dominant and subdominant, the resolution of these chords has no bearing on their function label.[262] Rather, Šín is invoking voice leading inherent to particular functions to describe the different possible resolutions of seventh chords.

3.4 The second edition of *Nauka* (1933), in summary and comparison

The first and second editions of *Nauka* differ most significantly in their approaches to neighbor triads. In the first edition (1922), Šín provides a modified monist version of Riemann's *Nebenklänge*. In the second edition (1933) however, Šín proposes a novel combination function approach where he considers neighbor chords to consist of a simultaneous combination of primary functions with some notes omitted. In the second edition of *Nauka* (1933), Šín also describes the difference between his tonal, natural, and exchange dominants more explicitly.

Examining Šín's new approach to neighbor triads in detail reveals several underlying conceptual differences not only between the two editions of Šín's text, but also between Šín's and Riemann's approaches. These differences include how they approach the topics of bivalency, consonance, the foundational analogy, and natural dominants. Consider first bivalent chords and how Šín's approach in the second edition of *Nauka* diminishes the role harmonic context plays in his theory of harmonic function. Remember that in the first edition, many neighbor triads were presented as bivalent—they could receive one of two function labels—and their function labels were dependent on the harmonic context in which they occurred. Bivalent triads, in both Šín and Riemann, show that harmonic function is more than just a description of the pitch-class content in a chord in relation to a specified key. It is also a description of harmonic context, or perhaps

[262] Otakar Šín, 86. Here Šín provides an example of the various resolutions of the chord [F, A, C, E] in C major. Regardless of resolution, this chord maintains the label S, changing only to include the appropriate inversion label.

harmonic behavior. In other words, bivalent triads show that harmonic function describes not only vertical information, but also horizontal. If a bivalent triad's functional identity depends on its harmonic context, then function is, at least to some degree, a description of harmonic context. However, Šín's combination function labels are different. A bivalent triad requires a decision to be made about whether, for example, an e minor triad in C major has tonic or dominant function. Šín's combination-function labels on the other hand, avoid any such decision, by labeling such a triad as two functions simultaneously. With combination function labels, harmonic context becomes almost irrelevant to Šín's theory of harmonic function. That is, in his second edition, his theory has a greater focus on the vertical than in the first edition (or, for that matter, than in Riemann's *Vereinfachte Harmonielehre*). To label a chord with combination function label, like ~~TD~~, only requires knowledge about that chord's pitch-class content in the context of a particular key, while it requires no information about that chord's harmonic context. Assuming that the key of an excerpt is clearly defined, there is now only one possible function label for each of what were previously bivalent triads.

The question of bivalency is complicated by Šín's exchange dominants. While I just showed that Šín's new approach to labeling neighbor triads removed the possibility of bivalent chords from his theory, and thus made it less capable of conveying horizontal information, Šín's exchange dominants reintroduce some bivalency. Notice that his ♭D is equivalent in pitch-class content to ♯, and § is equivalent to °Ø. For example, in C major, ♭D and ♯ are both chords made up of the pitch classes [D, F and A], while in a minor, § and °Ø are both [G, B, D]. Whether these chords receive the regular function label or the exchange label depends on what chord follows them. Šín explains that if the triad occurs "before D, this triad will have ♭D function, otherwise always ♯," and the same

occurs in minor with S, §, and °Ø.[263] These triads are thus essentially bivalent, in that they bear two distinct labels and the choice between these alternatives depends on the harmonic context. This is another way in which Šín's exchange dominants are peculiar in Šín's approach, introducing inconsistency to his theory of harmonic function.

In the second edition of *Nauka* (1933), Šín understanding of consonance and dissonance becomes more normative than in the first edition. Remember that in the first edition, he considers ninth chords more euphonious than triads, and he also allows for a vertically dissonant tonic chord. In the second edition, he states that "the tonal entities in seventh and ninth chords are much more contrasting [than major triads]," and as a result, "music theory counts them among dissonant chords."[264] Thus, it seems that Šín no longer considers ninth chords to be more euphonious than triads, as he did in the first edition. Further, he also returns to a normative view of a necessarily consonant tonic chord. He explains that "in music, harmonic consonance and dissonance in the key are applied, where we put a single consonant tonic against dissonant dominants and subdominants, which can be either effectively consonant or dissonant."[265] Note that in the section edition of *Nauka* 1933), the possibility of a vertical dissonant tonic chord is no longer necessary for his theory of harmonic function. Remember that in the first edition of *Nauka* (1922), Šín's omitted-note method for deriving neighbor triads required the possibility of a vertically dissonant tonic chord. However, given that in the section edition of *Nauka* (1933), Šín proposes his novel combination function approach to labeling neighbor triads, the possibility of a vertically dissonant tonic is no longer necessary.

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[263] Otakar Šín, 22. "*Funkce rozlišujeme tak, že před D bude míti funkci* D*, jinak vždy* S." Based on Šín's use of these two symbols through the second edition, this rule is either untrue, or the situation is significantly more complicated than he explains. Regardless of whether these chords properly are bi-valent, Šín does at least describe them as such.
[264] Otakar Šín, 7. "*Mnohem více kontrastují již tónové jednotky v akordech septimových a nonových. Tyto počítá hudební theorie již k akordům disonujícím.*"
[265] Otakar Šín, 7. "*V hudbě dochází uplatnění harmonická konsonance a disonance v tónině, kde proti jediné konsonantní tonice uvádíme v poměr disonující dominanty a subdominanty, které ovšem mohou býti efektivně konsonující nebo disonující.*"

Examining both Šín's and Riemann's approaches to neighbor triads also reinforces that Šín does not adopt Riemann's foundational analogy between tone relationships and chord relationships. To use Šín's terms, Riemann's theory of harmonic function is, or at least attempts to be, a theory of harmonic (horizontal) consonance and dissonance built analogously to a theory of effective (vertical) consonance and dissonance. That correspondence assumes that chord relationships are somehow analogous to tone relationships. Šín's new neighbor triad labels, however, no longer describe neighbor triads according to their relationship to primary triads. Rather, Šín now defines neighbor triads according to the constituent parts of the primary triads. Consider, for example, an A minor triad [A, C, E] in the key of C major. According to the first edition of *Nauka* (1922), it would receive the label "T_z," while according to the second edition of *Nauka* (1933), it would receive the label "~~ST~~." The label T_z implies that that chord is a substitute for the tonic, derived via the omitted-note method, the label ~~ST~~ implies that the chord is simply made up of notes from the subdominant triad [A, C] and tonic triad [C, E]. The new combination function labels describe what the triad is made up of, instead of what it is related to. Thus, there is not a relationship between primary triads and neighbor triads, and there is no analogous relationship to be had.

Šín's natural dominants are a curious feature of his texts, given that they receive relatively little mention and that they do not receive unique function labels. Why, then, does Šín bother to introduce this additional category of dominant? By recognizing both the category of tonal dominants and natural dominants, Šín is able to discuss and benefit from both possible assignments of the primary functions in minor. Remember, that in minor, the typical view is that one can either label the primary triads in the same directions as major, with the dominant a fifth above and the subdominant a fifth below, or those directions can be reversed, with the dominant a fifth *below* and the subdominant a fifth *above*. Typically, the first is considered a monist arrangement, while the

second is considered dualist, despite Klumpenhouwer suggesting the opposite.[266] In the *Vereinfachte Harmonielehre*, both conceptions exist simultaneously, but under different names. Riemann primarily refers to his functions according to the supposedly monist method, with the minor dominant a fifth above the tonic. However, Riemann also often will use the labels *Quintschritt* and *Gegenquintschritt*, which is effectively the dualist method of referring to the dominants, because the *Quintschrittklang* is a fifth above the tonic in major, and a fifth below the tonic in minor. Thus, Šín's tonal dominants correspond to Riemann's actual functional assignments, but Šín's natural dominants correspond to Riemann's *Harmonieschritte* labels for the dominants. That is, for both Riemann and Šín, T, S, and D in C major are the triads C major, F major, and G major, while ^{o}T, ^{o}S, ^{o}D are the triads C minor, F minor, and G minor. However, Šín's natural dominant (G major triad in C major) and natural subdominant (F minor triad in C minor) both correspond to Riemann's *Quintschrittklang*.

Thus, just as *Harmonieschritte* labels do for Riemann, Šín's natural dominants allow him to draw a parallel between the voice leading of the natural dominant and subdominant. Šín's explains that "the semitone progression of the third tones of the natural dominants, i.e. the major third of the dominant and the minor third of the subdominant, is characteristic of both harmonies and directly necessary for our harmonic sense."[267] That is, the third of the natural dominant, which is major, proceeds upwards by semi-tone to the root of the tonic chord, while the third of the natural subdominant, which is minor, proceeds downwards by semi-tone to the fifth of the tonic chord. There are, nonetheless, certain problems with Šín's approach. First, Šín's natural dominants seem entirely ancillary to his theory of harmonic function (while for Riemann, the *Harmonieschritte* are tightly woven into his *Funktionstheorie*). Secondly, Šín's natural dominants are relatively shallow, only

[266] See Section 2.3 for Klumpenhouwer's objection.
[267] Otakar Šín, *Úplná nauka o harmonii na základě melodie a rytmu*, 10. "*Půltónový postup tercových tónů přirozených dominant, tedy velké tercie dominantní a malé tercie subdominantní, je pro obě harmonie charakteristický a. pro naše harmonické cítění přímo nutný.*"

accounting for the parallel voice leading between D and °S, while Riemann's *Harmonieschritte* can account for any similar pair chords with inverted voice leading.

In the second edition of *Nauka* (1933), we saw that Šín diverged from the first edition, and fell back in-line with Riemann, by returning to a normative understanding of consonance and dissonance. Namely, Šín recognized that triads are vertically more consonant than larger harmonies, and that the tonic triad must be both vertically and horizontally consonant. This change makes his omitted-note method for deriving the neighbor triads impossible. However, the second edition features a new approach to labeling neighbor triads. That is, the second edition introduces Šín's combination function labels. Šín's new combination function labels mark a significant departure from Riemann, not only because of the novelty of the method, but also because it removes much of the bivalency latent in Riemann's *Nebenklänge*. In Chapter 4, we will see how Šín's new combination function inspires Janeček's innovative approach to harmonic function.

3.5 Conclusion

Otakar Šín, with his *Nauka*, is responsible for importing Riemann's *Funktionstheorie* in the Czech lands and in the Czech language. This heritage is obvious, not only from explicit statements to that effect by both Šín and his student Janeček, but also thanks to the many obviously Riemannian features of his theory. Šín takes over the three primary function from Riemann, identifies neighbor triads derived from those functions, and allows for the addition of tertian extensions and other alterations. He uses these functional labels to discuss chord progressions and cadences. Some topics he addresses more explicitly than Riemann, like bivalent triads (in the first edition), the role of metric placement in function, the tension between the so-called dualist and monist assignments of function in minor, and the distinction between vertical and horizontal consonance and dissonance. In other ways, however, Šín offers significant revisions to Riemann. These include the omission of the

Harmonieschritte, of Riemann's harmonic dualism (for the most part), and of Riemann's analogy between chord structure and chord relationships. There is also the inclusion of tonic dissonance in the first edition of the *Nauka* (1922), and the novel combination function approach forwarded in the second edition of the *Nauka* (1933). Despite these changes, Šín also goes out of his way to reimport Riemannian features into his theory in any way possible. In the first edition, we saw Šín using Riemann's omitted-note method to derive neighbor triads, even though Riemann ultimately rejects the omitted-note method in the *Vereinfachte Harmonielehre*. In the second edition, Šín adapts Riemann's *Nebenklänge* function labels (Ƒ and °Ƒ) to label the Lydian and Neapolitan chords. Šín's latent dualism, especially his recognition of the progression °D—°S in the first edition and the downward emanating minor chord in the second edition, suggests an attempt to maintain Riemannian features, even at the cost of internal consistency.

Taken as a whole, and despite Šín's changes to Riemann's approach, Šín's approach remains substantially Riemannian, in the sense that Šín's theory of harmonic function proposes a labeling system of harmony, utilizing three primary labels, that conveys not only pitch-class content information via a chord's relationships to a central tonic chord, but also information about how that chord behaves. However, Šín's approach loses much of the depth of Riemann's *Vereinfachte Harmonielehre*, especially the way Riemann attempts to integrate pitch-class content, harmonic syntax, and voice leading cohesively into a single theory of harmony. Šín's approach instead comes off as more of a patchwork. Šín theory of harmonic function does still address pitch-class content, harmonic syntax, and voice leading, but less cohesively than Riemann. For example, Šín's function labels lack the bivalency of Riemann's *Nebenklänge*, and as such, provide less information about harmonic syntax. Further, Šín does attempt to discuss the relationships between harmonic function and voice leading—for example, with his natural dominants and his neighbor dominants—but that information does not inform his functional analyses. While Riemann's *Funtionstheorie* has its own

inconsistencies, it seems fair to considers Šín's approach to be less worked out and less coherent. In the final chapter of this dissertation, I will explore the extent to which Šín's theory of harmonic function, and my reading of Riemann's *Funktionstheorie*, can inform our understanding of harmonic function in general. For now however, I progress to the theory of harmonic function proposed by Šín's student, Karel Janeček.

Chapter 4 Karel Janeček's Theory of Harmonic Function

In the previous chapter, I began tracing the Czech reception of Riemann's *Funktionstheorie* by examining the writings of Otakar Šín, and I considered how that reception developed across the two editions of *Nauka o harmonii na základě melodie a rytmu*. Observing Šín's efforts to adapt Riemann's *Funktionstheorie* without departing too significantly from it has also helped to further develop our understanding of Riemann's own approach. On one hand, the discussion in Chapter 3 reaffirmed many of the claims about Riemann's theory that I made in Chapter 2. For example, the importance of the *Harmonieschritte* in Riemann's work becomes ever more obvious in light of Šín's efforts to do without it. As a consequence of jettisoning the *Harmonieschritte*, Šín proposed the omitted-note method for deriving neighbor triads, which required him to allow for vertically dissonant tonic chords. While Šín's theory of harmonic function was relatively conservative at first, in the second edition of his *Nauka* (1933), Šín introduced his novel combination functions, which serve as the foundation upon which his students later build their own much more radical theories. In this chapter, I continue to trace the reception of Riemann's theory amongst his Czech followers by examining one of these more radical theories: namely that advanced by Karel Janeček (1903–1974).

Although Šín was the first to import the concept of harmonic function into Czech music theory, it was the work of his student Karel Janeček that caused harmonic function to become a central topic among music theorists in Prague. Janeček was a professor of music theory at the Academy of Performing Arts (HAMU) in that city and the head of its department of music theory.[268]

[268] For other English-language accounts of Karel Janeček's life and work, see Hons, "Karel Janeček's Concept of Music Theory Teaching."; or Mackay, "An Overview of Karel Janeček's Foundations of Modern Harmony."

Janeček describes his work as growing out of Šín's experimental and analytical efforts.[269] He published a variety of scholarly articles and pedagogical books on topics including counterpoint, form, harmony, melody, composition, and many others. Perhaps his most inventive text, however, was *Základy moderní harmonie* (Foundations of Modern Harmony, 1965). In it, Janeček details his theory of harmonic function, which evoked responses from theorists like Karel Risinger, Jaroslav Volek, and Vladimír Tichý. While Šín's adaptation of Hugo Riemann's *Funktionslehre* was relatively conservative, Janeček provided an innovative take on the concept of harmonic function. Perhaps most strikingly, he claimed that there exist five harmonic functions, as opposed to the three harmonic functions proposed by Hugo Riemann. This claim encouraged subsequent theorists to advance alternate theories with varying numbers or differing types of functions.

Despite his innovations, Janeček considered himself part of a lineage of thinking about harmonic function that stemmed from Riemann.[270] However, Janeček did also distinguish himself from Riemann. For example, Janeček criticizes Riemann's dualistic conception of minor triads. At first glance, it seems appropriate that Janeček chooses to distance himself from Riemann, given how many hallmarks of Riemann's approach are missing in Janeček's theory of harmonic function. For example, Janeček replaces Riemann's *Harmonieschritte* with Šín's combination functions from the second edition of *Nauka* (1933); Janeček rejects the notion of harmonic dualism; he prefers a descriptive approach to harmonic progression rather than Riemann's prescriptive approach; and, most conspicuously of all, he proposes that there are five, instead of three functions. Despite these differences however, a close examination of Janeček's theory of harmonic function reveals

[269] Janeček, *Základy moderní harmonie*, 15. "My own task has been made somewhat easier, especially thanks to his [Otakar Šín's] experimental and analytical work." "*Měl jsem však práci již poněkud ulehčenu, v neposlední řadě právě též dík jeho pokusnickému a rozvážnému dílu.*"

[270] He describes harmonic function as a "system introduced by H. Riemann, and preserved in Czechoslovakia by O. Šín," and he also states that "in the theory of functional chords, I have adopted Otakar Šín's system." Janeček, 237. "*Podle způsobu, zavedeného H. Riemannem a u nás zachovávaného O. Šínem…*"; Janeček, 13. "*V nejvlastnější oblasti harmonické kinetiky, v nauce o funkcích, přijal jsem systém Šínův.*"

underlying similarities to Riemann. I will argue that Janeček's theory of harmonic function, despite being significantly more progressive than Šín's approach, is nonetheless more Riemannian in its actual method. Comparing Janeček's and Riemann's approaches will suggest several features that define a Riemannian understanding of harmonic function.

I divide this chapter into two sections. In Section 4.1, I address Janeček's main five functions, while in Section 4.2, I address Janeček's combination function approach. Given how novel Janeček's theory is, I will begin each section by introducing Janeček's approach, before comparing and contrasting it to those of Riemann and Šín.

4.1 Janeček's five functions

Základy, in which Janeček sets out to provide a "system of modern harmony," falls into two main sections.[271] The first concerns "static harmony" (*harmonická statika*), while the second treats "kinetic questions" (*kinetický otázky*).[272] In the section on static harmony, Janeček proposes what we can anachronistically call a variety of set theory.[273] He uses this theoretical approach to organize all harmonies into a chord quality taxonomy according to T_n-type. That is, he organizes all possible harmonies in the equal tempered twelve-note system into classes of transpositionally equivalent harmonies.[274] Janeček's section addressing kinetic questions introduces his theory of harmonic functions. Importantly, his chord quality taxonomy and his function theory are not opposed, in the sense that one might imagine that the first is a theory of atonal music and the second a theory of

[271] Janeček, *Základy moderní harmonie*, 15. "*Soustava moderní harmonie*."
[272] Janeček, 11.
[273] If we are to believe Janeček's statement that he worked out this taxonomy in 1949, then it pre-dates Allen Forte's "A Theory of Set-Complexes for Music" by 15 years. "I began work on *Základy moderní harmonie* in 1942 and finished the book in May 1949." "*Na* Základech moderní harmonie *jsem pracoval od r. 1942 a knihu jsem dopsal v květnu 1949*." Janeček, 11.; Forte, "A Theory of Set-Complexes for Music."
[274] This proto-set theory differs most noticeably from Forte in that it utilizes successive interval arrays (SIA) instead of pc sets, and in the fact that Janeček categorizes harmonies according to T_n type (best normal order transposed to 0) rather than T_n/T_nI type (prime form). For more on Janeček's chord quality taxonomy, see Lill, "A Chord Quality Taxonomy from Karel Janeček's Základy Moderní Harmonie (Foundations of Modern Harmony, 1965) and an American Set-Theoretical Interpretation."

tonal music. Rather, they are complementary. One describes how pitches combine vertically into individual harmonies, while the other describes how pitches interact in time, either supporting or loosening what he calls "an awareness of the tonic" (*vědomi tóniky*). Janeček links the two together by building his (kinetic) theory of harmonic function on his understanding of static harmony. This distinction between the simultaneous and the subsequent, and the desire to link them, is not new. Both Riemann and Šín address the interrelationship in a of variety ways, with both authors appealing to the overtone series when considering vertical elements, and with Riemann especially tying the overtone series into harmonic function. In *Základy* however, there is no trace of the overtone series—the short examinations of that series in Riemann and Šín and have been replaced by an expansive section addressing static harmony. Thus, understanding Janeček's theory of harmonic function requires appreciating how he links the static and the kinetic.

In this Section 4.1, I introduce Janeček's theory of five harmonic functions as it appears in *Základy* and highlight how it differs from the work of his predecessors Riemann and Šín. First, I illustrate how Janeček navigates the transition from the vertical to the horizontal—from his set theory to his theory of functions. He achieves this transition with his concept of real and imaginary pitches, theorizing how pitches continue to have a musical effect even after they cease to sound (Section 4.1.1). I then show how Janeček uses his concept of real and imaginary pitches to develop three underlying principles of harmonic function (section 4.1.2). For Janeček, these underlying principles justify not only the selection of tonic, subdominant, and dominant functions, but also his two extra harmonic functions, Phrygian and Lydian (Section 4.1.3).

4.1.1 Real and imaginary pitches

Janeček's theories of static harmony (his set theory) and kinetic harmony (his theory of harmonic function) are linked by his distinction between real and imaginary pitches.[275] Real pitches are those that do or would physically sound when a piece is being performed.[276] According to Janeček however, after a real pitch ceases to sound, it continues to have an effect as an imaginary pitch, "existing only in the mind, rather than actually sounding."[277] Later, he will also distinguish between harmonic imaginary pitches and tonal imaginary pitches.

As a demonstration of Janeček's real and imaginary pitches, consider Janeček's Example 89 reproduced here as Figure 4.1. The top staff indicates real pitches. On the bottom staff, larger note heads indicate those same real pitches. The smaller noteheads indicate imaginary pitches left over from real pitches that are no longer sounding. Because the imaginary pitches persist, they have a harmonic effect—that is, the cumulative effect of the imaginary pitches imparts the sense of the harmonic progression indicated on the lower stave. The arrows indicate that those harmonies are partially felt at the beginning of the measures and then made clearer. In this way, Janeček's imaginary pitches are a method of describing how pitches can continue to be efficacious even after they cease to sound. Or in other words, the theory describes how pitches produce a cumulative effect by interacting over time, rather than just as vertical entities.

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[275] Janeček, *Základy moderní harmonie*, 13. "*Pojem imaginárního tónu je mi pak vůbec pojítkem mezi statickým a kinetickým pojetím harmonie.*"
[276] Janeček, 157. "*Tón, který skutečně zní, nazýváme tónem* reálním. *Reální tóny jsou samozřejmým podkladem veškerého harmonického materiálu. Bez reálních tónu není harmonie…Mluvíme o reálních tónech i tehdy, kdy jejich skutečný zvuk se jenom předpokládá.*"
[277] Janeček, 157. "*Tón který reálně dozněl, avšak působí dále, nazýváme* tónem imaginárním *(tj. pouze myšleným, ve skutečnosti neznějícím).*"

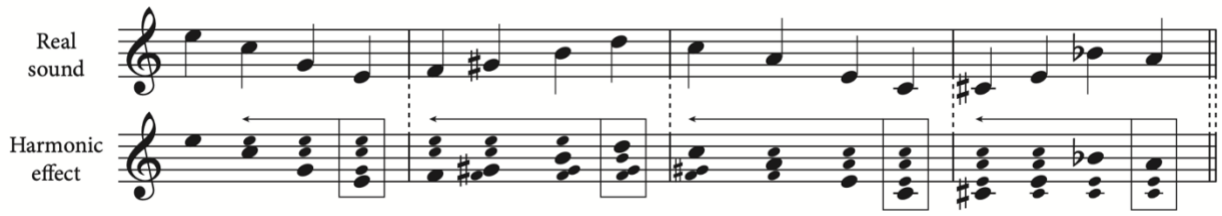

Figure 4.1 Reproduction of Janeček's Example 89 demonstrating how real pitches (top stave) create imaginary pitches and a cumulative harmonic effect (bottom stave).[278]

An important feature of Janeček's approach is that tones can be cancelled, after which they cease to have any harmonic effect. While the relative duration of a real pitch is intuitively clear, that is not the case so for imaginary pitches. As Janeček explains, "the duration of an imaginary pitch does not always have precise limits; it depends on the nature of the harmonic activity that follows the moment of its appearance. In contrast to a real pitch, which simply stops sounding, an imaginary pitch can either be canceled, or it can gradually die away."[279] Cancellation occurs when some real pitch sounds that is in a particular relationship to an imaginary pitch, causing that imaginary pitch to be superseded. In contrast, "dying away" is the gradual eclipse of an imaginary pitch that occurs without the influence of a real pitch. Janeček explains that "cancellation is due to the intervention of the composer, so it can reliably be determined, while the length of time before an imaginary pitch has died away can only be estimated."[280] He provides the following rules for cancellation:

[278] Janeček, 163.
[279] Janeček, 157. "*Trvání imaginárního tónu není vždy přesně omezeno a závisí na povaze harmonického dění, které po jeho vzniku následuje. Na rozdíl od reálního tónu, který prostě přestane znít, může být imaginární tón buď* zrušen, *nebo může pozvolně* zanikat."
[280] Janeček, 157. "*K zrušení dochází zákrokem skladatelovým — lze je tudíž spolehlivě stopovat; naproti tomu dobu zániku imaginárního tónu je možno jen odhadnout.*"

A harmonic imaginary pitch will be cancelled [or entirely prevented] by:

1) The appearance of a real pitch a semitone higher or lower [Figure 4.2, mm. 1–2 and 3–4]
2) The appearance of a real pitch a whole tone lower [Figure 4.2, mm. 5–6]
3) The appearance of a real pitch a whole tone above the imaginary pitch if:
    a. The imaginary pitch that is to be canceled is not emphasized
    b. The pitch that is to do the canceling is longer or more significant metrically than the pitch that is to be canceled
    c. The pitch that is to be canceled is preceded by at least one lower neighboring pitch.
4) Lastly, harmonic imaginary pitches will also die away naturally after some time.[281]

To summarize, a harmonic imaginary pitch will be cancelled if there appears a real pitch a semitone higher, a semitone lower, or a whole tone lower. A real pitch a whole tone above will only cancel the previous pitch if the imaginary pitch is not emphasized rhythmically, metrically, or melodically. Janeček provides the examples in Figure 4.2 as a demonstration of how a real pitch continues as an imaginary pitch until cancelled.

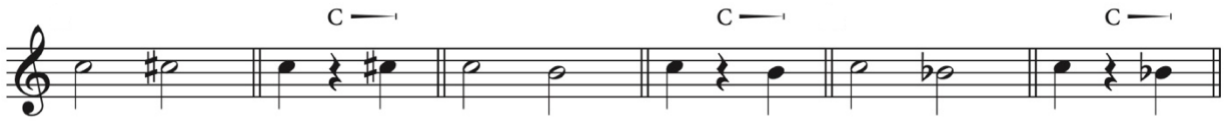

Figure 4.2 Reproduction of Janeček's Example 77 for demonstrating cancellation.[282]

[281] "*Jednotlivý harmonický imaginární tón* se zruší 1) *nástupem reálního tónu* o půltón vyššího nebo nižšího, 2) *nástupem reálního tónu* v celotónové vzdálenosti pod imaginárním tónem: Někdy se zruší *jednotlivý imaginární harmonický tón* 3) *nástupem reálního tónu* v celotónové vzdálenosti nad imaginárním tónem. *Stane se tak za těchto podmínek: a) imaginární ton, který má být zrušen, není zdůrazněn, a to ani metricky, ani délkou; b) tón kterým má být zrušení provedeno, je závažnější metricky nebo délkou než tón, který má být zrušen; c) před tónem, který má být zrušen, předchází aspoň jeden sousední tón nižší (v celotónové nebo půltónové vzdálenosti).*" Janeček, 158.

[282] Each example provides the real pitches in the first measure, and the imaginary pitches in the next. In mm. 1–2 the appearance of a real pitch a half step above the original pitch cancels the remaining imaginary pitch. In mm. 3–4 the same occurs with a real pitch a half step below. In mm. 5–6 the same occurs with a real pitch a whole step below. Janeček, 158.

Besides having a harmonic effect, Janeček explains that imaginary pitches can also have a tonal effect:

> We speak of harmonic and tonal imaginary pitches, depending on the extent of their effect. Harmonic imaginary pitches are capable of creating or taking part in creating harmonic formations. Tonal imaginary pitches cannot do this, since they are weaker, but they can still influence the tonal design of a passage in a composition or the composition as a whole. Harmonic imaginary pitches also function tonally, and thus are considered tonal as well as harmonic. However, tonal imaginary pitches are not also harmonic.[283]
>
> Both harmonic and tonal imaginary pitches appear after a real pitch has finished sounding. The harmonic imaginary pitch dies away earlier, however, and is more easily canceled than the tonal imaginary pitch. This means that a harmonic imaginary pitch can continue to act in its weaker form, as a tonal imaginary pitch, after it has been canceled or has died away.[284]

Thus, for Janeček, imaginary pitches have both a harmonic and a tonal effect. The harmonic imaginary pitch imparts a sense of harmony to the listener. However, after the harmonic imaginary pitch is cancelled or dies away, it no longer imparts a harmonic effect, though it may continue to have an influence as a tonal imaginary pitch.

In contrast to what he says about harmonic imaginary pitches, Janeček provides no rules for the cancellation of tonal imaginary pitches, but rather explains which pitches are most disruptive to a sense of tonic being formed: specifically those that are a tritone away from a pitch in the final triad. Janeček demonstrates the influence of tonal imaginary pitches with the example reproduced in

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[283] Janeček, 157. "*Trvání reálného tónu je dáno dobou jeho znění. Jeho začátek i konec je objektivně dán skladatelovým notovým předpisem. Trvání imaginárního tónu není vždy přesně omezeno a závisí na povaze harmonického dění, které po jeho vzniku následuje. Na rozdíl od reálného tónu, který prostě přestane znít, může být imaginární tón buď zrušen, nebo může pozvolně zanikat. K zrušení dochází zákrokem skladatelovým — lze je tudíž spolehlivě stopovat; naproti tomu dobu zániku imaginárního tónu je možno jen odhadnout.*"
[284] Janeček, 157. "*Imaginární tóny harmonické i tonální vznikají po doznění tónu reálného. Po této stránce není mezi nimi rozdílu. Imaginární tón harmonický zaniká však dříve a ruší se snadněji než imaginární tón tonální. Znamená to, že harmonický tón může po svém zániku nebo zrušení působit dále ve své slabší formě jako imaginární tón tonální.*"

Figure 4.3. At a), we see a relatively simple cadential progression ending with an authentic cadence in C major, however both instances of [F] in the example are raised. In both cases, the [F#] is immediately cancelled and prevented from ever existing as harmonic imaginary pitches, yet both continue to have an effect as tonal imaginary pitches. Because of them, Janeček says, "the final consonances are not reliable, i.e. expressing calm and devoid of all movement tension."[285] That is, the [F#] prevents us from, if only partially, hearing C major as the key. If both were instead [F], the example would clearly be in C major. The same occurs at b), but here [B♭] prevents us from reliably hearing C major as the key. In both instances, the disruptive quality of the note in question is made stronger by the fact that each is in a tritone relationship to notes of the tonic triad. [F#] is a tritone removed from root of the tonic chord, whereas [B♭] is a tritone removed from the third of the tonic chord.

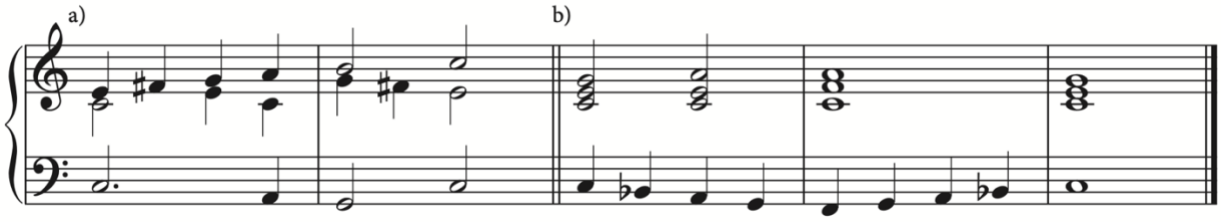

Figure 4.3 Reproduction of Janeček's Example 127 demonstrating tonal imaginary pitches preventing a sense of tonic.[286]

As Janeček goes on to explain, imaginary pitches link his theories of static and kinetic harmony. After a pitch ceases to sound, it has a harmonic effect and if it is not cancelled, it continues to sound as an imaginary pitch. It is in this way, for Janeček, that pitches can interact without being vertically aligned. Or, to borrow Janeček's terminology, static pitches and harmonies can interact with other pitches and harmonies because of their ability to persist in the form of

[285] Janeček, 180. "*Závěrečné konsonance nejsou spolehlivé, tj. klid vyjadřující a veškerého pohybového napětí zbavené tóniky.*"
[286] Janeček, 180.

imaginary pitches. In the following section, we will see Janeček using imaginary pitches to define three principles upon which he will build his theory of harmonic function.

4.1.2 The three principles underlying Janeček's theory of harmonic function

Janeček's harmonic functions are determined according to three principles—the *principle of the pure tonic*, the *principle of the leading tone*, and the *functional principle*—all of which employ his ideas concerning harmonic and tonal imaginary pitches. Janeček's defines the principle of the pure tonic as follows:

> A harmonic phrase gravitates most naturally to a final consonant chord that is disturbed neither by uncancelled or incompletely cancelled harmonic imaginary pitches, nor by any tonal imaginary pitches that form a tritone with the real pitches of the final tonic.[287]

This definition highlights several requirements that Janeček places on functional chords. First, the final chord (the tonic) must be consonant. This requirement stems from his observation that cadences give "the impression of the balancing of forces, of equilibrium, of a calming down with no further subsidiary prospects."[288] For Janeček, this calming down implies that the final chord of the cadence be without tension in itself, i.e. be a vertically consonant triad.[289] According to Janeček, "a consonance is any chord-type that under favorable conditions [voicing, location in pitch space, harmonic surroundings, etc.] does not arouse tension in the listener."[290] While Janeček never defines tension (*napětí*), he uses the term "tension" synonymously with unrest as part of his definition of

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[287] Janeček, 200. "Princip čisté tóniky lze podle uvedeného vyjádřit takto: *Harmonická věta tíhne nejpřirozeněji do takového konsonantního souzvuku závěrečného, do jakého nepřežívají nedokonale zrušené imaginární tóny harmonické, anebo popřípadě též takové imaginární tóny tonální, jež jsou v tritonovém poměru k reálním tónům závěrečné tóniky."*

[288] Janeček, 200. "*Lze jej doložit všude, kde závěr má působit dojmem vyrovnání sil, rovnováhy, uklidnění bez dalších postranních výhledů.*"

[289] Janeček, 200. "*Tím je zároveň řečeno, že jako závěrečný souzvuk se tu předpokládá* konsonance*, neboť jedině konsonance, nechovajíc v sobě napětí, může být prosta pohybových sil.*"

[290] Janeček, 46. *"Konsonance je takový souzvukový druh, který může za příznivých okolnosti působit na posluchače tak, že v něm nevzbuzuje napětí.*"

dissonance. "A dissonance is any chord-type that arouses a sense of unrest (*neklid*) and tension in the listener under all conditions, that is, in any disposition and without regard to its place in a chord succession."[291] For Janeček, the only consonant chords are the major and the minor triads, and therefore they are the only suitable chords to serve as tonic chords.[292]

While the principle of the pure tonic necessitates that the tonic chord be consonant, it sets requirements for what Janeček calls pre-tonic chords—i.e. those chords that immediately precede the tonic. In particular, Janeček requires that the final consonance of the tonic not be disturbed by any uncanceled imaginary pitches. A suitable pre-tonic is therefore one of which the pitches are all cancelled by the tonic chord. If the pre-tonic chord has pitches that are not cancelled by the tonic, then those pitches will persist as imaginary pitches that disrupt the consonance of the final chord and thus disturb its ability to be the tonic. For this reason, a sense of tonic is only facilitated by some pre-tonic chords and not others.

Janeček uses these conditions concerning cancellation together with his observations about disruptive tonal imaginary pitches to determine which pitches to avoid in pre-tonic chords, so as to prevent these chords from disrupting the consonance of the tonic. Figure 4.4 reproduces Janeček's explanatory example for determining the ideal pre-tonic pitches. Because we know the tonic must be a major or minor triad, Janeček determines which pitches will be cancelled by each of these triads. As an example, he considers C+.[293] Of the twelve chromatic pitches, [C], [E], and [G] do not need to be cancelled because they are the very pitches that make up the tonic chord. Janeček goes on to label

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[291] Janeček, 47. "*Disonance je takový souzvukový druh, který vzbuzuje v posluchači pocit neklidu a napětí za všech okolností. Tj. v jakékoliv úpravě a v jakémkoliv postavení v souzvukovém sledu.*"
„Disonance je takový souzvukový druh, který vzbuzuje v posluchači pocit neklidu a napětí za všech okolností, tj. v jakékoliv úpravě a v jakémkoliv postavení v souzvukovém sledu."

[292] Janeček, 46. "There are only two basic consonances: the major triad (with orientation scheme 43, e.g. C E G) and the minor triad (with orientation scheme 34, e.g. A C E)" "*Jsou jen dvě základní konsonance: trojzvuk dur* (s orientačním schématem 43, např. *c e g*) a *trojzvuk moll* (s orientačním schématem 34, např. *a c e*)"

[293] In this chapter, I label triads according to their root and their quality, with a "+" designating major and a "-" designating minor.

all those instances from among the remaining pitches in which a note has a whole step or half step relationship to any pitch from the tonic triad. He draws attention to the fact that, except for [B♭], all of these pitches are a half step away from, or whole step above, a tonic triad pitch, and thus would be automatically cancelled by the appearance of the tonic triad.[294] He also highlights all the pitches that are a tritone from a note of the tonic triad. As we have already seen, [B♭] is particularly problematic for Janeček in establishing C+ as tonic, even if it were to be cancelled, because as a tonal imaginary pitch it is a tritone away from [E], the third of C+.[295] He finds [F#] and [D♭] to be similarly problematic, because they are respectively a tritone away from the root [C] and the fifth [G]. Thus, Janeček suggests that pre-tonic chords to C+ should avoid [B♭], [F#], or [D♭].

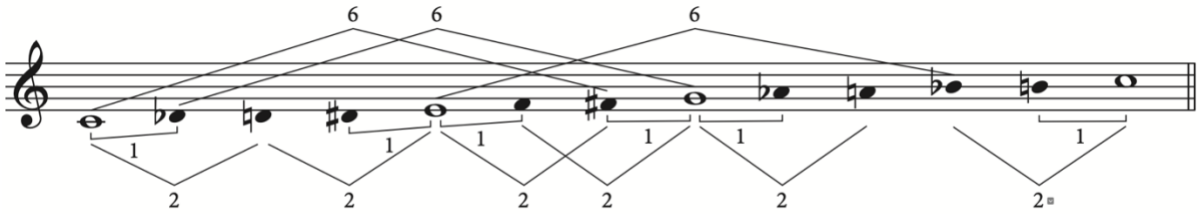

Figure 4.4 Reproduction of Janeček's example in which he indicates all pitches that are related by half-step, whole-step, or tritone to tonic triad pitches in C major to determine eligible pre-tonic pitches.[296]

Janeček then performs the same exercise with C- (Figure 4.5). Of the twelve chromatic pitches, [C], [E♭], and [G], do not need to be cancelled because they are chord tones of the

[294] Janeček, *Základy moderní harmonie*, 201. "Of the pitches in the negative (in our example those with black noteheads) only Bb cannot always be thoroughly cancelled by the triad C E G." "*Z tónů negative (v našem přehledu jsou to černé noty) jedině tón* hes *nelze vždy trojzvukem* c e g *dokonale zrušit.*"

[295] Janeček, 201. "B♭ also forms a tritone with the differentiating pitch (the third) of the triad and so can easily be appropriated by the triad. Thus, if the triad C E G is to function as a pure final tonic it cannot be preceded by a chord containing Bb, since as a tonal (and sometimes also harmonic) imaginary pitch Bb would complicate and blur the final real triad." "*Tón* hes *tvoří zároveň tritonový vztah k rozlišujícímu tónu trojzvuku* c e g (*k tercii* e). *Může tudíž být tón* hes *trojzvukem* c e g *velmi snadno kooptován. Je pak zcela přirozené, že má-li působit trojzvuk* c e g *jako čistá závěreční tónika, nelze mu předeslat souzvuk, který by obsahoval tón hes, neboť právě tento tón jako imaginární tón tonální (ale někdy též harmonický) zkomplikuje a zakalí závěrečný reální trojzvuk.*"

[296] Janeček, 201.

hypothetical tonic chord. Of the remaining nine pitches, [B♭] again cannot always be cancelled by the triad C-. However, in minor, he finds that pitch less problematic, because it does not form a tritone with any C- chord tones as a tonal imaginary pitch. Instead, he identifies [F#], [A], and [D♭] as particularly problematic pitches in light of their tritone relationships to the chord tones of C-. Thus, Janeček suggests that pre-tonic chords in C minor are unlikely to contain [B♭], [F#], [A], or [C#].

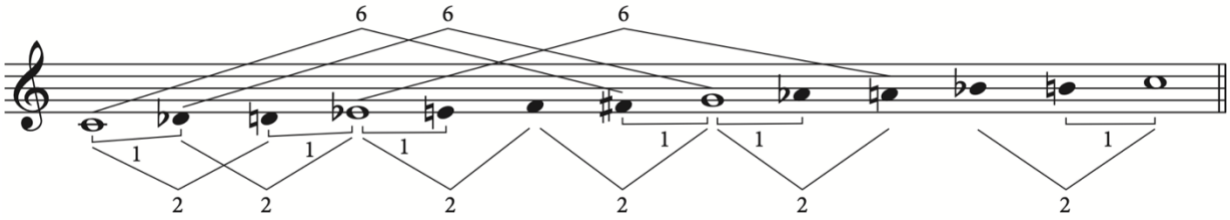

Figure 4.5 Reproduction of Janeček's example in which he indicates all pitches that are related by half-step, whole-step, or tritone to tonic triad pitches in C minor to determine eligible pre-tonic pitches.[297]

Janeček defines the principle of the leading tone by stating that "if a closing chord progression is to give the impression of coming to rest and reaching its destination, there must be at least one possibility of the progression by melodic interval 1."[298] That is, at least one voice has to move by half step, up or down, to a chord tone of the tonic triad. He explains that if there is no such half step, then the progression is not "sufficiently directed to make a true conclusion."[299] He continues: "we see the leading tone as the vehicle of the chord's kinetic energy, as its tendency to flow into the tonic," and he says that the leading tone causes "the gravitation of the pre-tonic chord

[297] Janeček, 202.
[298] Janeček, 203. "*V závěrečném souzvukovém sledu, pokud skutečně má působit dojmem uklidnění a dosažení cíle, vyskytuje s vždy aspoň možnost pro jeden postup v intervale 1.*"
[299] Janeček, 203. "*není-li tato možnost, znamená to buďto, že některý souzvuk je neúplný, nebo že sled nebyl zaměřen jako cílový, jako skutečný závěr.*"

to the tonic."[300] Clearly, Janeček assumes that chords with a leading tone gravitate towards the tonic. Like his predecessor Šín, he also allows for leading-tones in either direction and for more than one leading-tone simultaneously. For example, he suggests, in C major, that both B+ and D♭+ triads contain three leading-tones to the tonic triad.[301]

The final principle that Janeček introduces is the functional principle, which is a collection constraints Janeček places on potential pre-tonic chords. The goal of these constraints is to find pre-tonic chords that could serve as a standard for perceiving or judging all other practically possible chord relations."[302] That is, to find pre-tonic chords such that the tonic is a sound without tension or kinetic tendencies and the pre-tonic chords are bound to the tonic by their gravitation to it.[303] He refers to such pre-tonic chords as "representative chords, which could not only stand alone, but whose pitch material could serve as the basis for forming other chords."[304] He is seeking to find representative pre-tonic chords.

Janeček's first constraint under the umbrella of the functional principle is that every pitch or chord has some corresponding pitch or chord on the other side of a certain fixed pitch axis.[305] This

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[300] Janeček, 204. "Na citlivý tón se díváme jako na *nositele pohybové síly souzvuku*, jeho *tendence po vplynutí do tóniky*. Je to citlivý tón, který způsobuje, že celý předtónický souzvuk tíhne do tóniky."

[301] Janeček, 204. "The gravitation of the pre-tonic chord to the tonic, caused by the leading tone (whether directed upward or downward), can be increased, in that there can be more than one leading tone. If we presuppose a consonant final chord (at most a three-note chord), the number of leading tones can reach six—three rising (to the triad C E G: B, D#, F#), and three falling (to C E G: D♭, F, A♭)." "*Tíhnutí předtónického souzvuku do tóniky, způsobené přítomností at' již vzhůru nebo dolů směřujícího citlivého tónu, lze stupňovat; místo jednoho citlivého tónu uplatňuje se jich pak* více. *Počítáme-li jen s konsonantním cílovým souzvukem (tj. nejvýše trojzvukem), může počet citlivých tónů dostoupit šesti; budou to tři citlivé tóny stoupající (např. k trojzvuku* c e g: h, dis, fis*) a tři klesající* (*k* c e g: des, f, as)."

[302] Janeček, 204. "*Jde tu v podstatě o nalezení takových předtónických souzvukových útvarů, jež by mohly být ustáleny v normu, podle níž budou pojímány nebo posuzovány všechny prakticky možné souzvukové vztahy jiné*."

[303] Janeček, 204. "*Tónika představuje zvuk bez napětí a pohybových sklonů, dvojice předtónických souzvuků, a to jedna nebo více, je pak poutána k tónice tím, že k ní tíhne*."

[304] Janeček, 207. "*Nám zde však jde o souzvuky reprezentační, a to hned o dva, jež by mohly vystupovat samy, jež by však mohly zároveň sloužit svým tónovým materiálem jako základny k vytváření jednotlivých souzvuků jiných, buďsi disonantních*."

[305] Janeček, 204. "It follows from the nature of pitch material, namely from its regular layering within pitch space, that opposite every chord formation as well as any of its parts, there can be constituted another formation, situated in the opposite direction in relation to a certain fixed pitch axis. A pitch that is a certain distance above the axis corresponds to a pitch that is the same distance below the axis. Similarly, opposite every chord can be placed another chord, as a rule its simple transposition, sometimes the transposition of its inversion, as a pitch space counterpart." "*Z povahy tónového*

leads to his requirement that pre-tonic chords must come in pairs equidistant from the tonic.[306] Janeček second constraint is that "consonance is required for representative pre-tonic harmonies".[307] He provides two justifications. First, he requires that pre-tonic harmonies are consonant because he wants the inclination of the pre-tonic chords to move towards tonic to be "derived from their relation to tonic rather than from their own inner tension or dissonance."[308] Here, Janeček introduces the reader to the distinction between inner and outer tension—that is, the distinction between unrest caused by a chord's horizontal relationship to tonic and unrest caused by a chord's vertical sounding dissonance. Janeček wants to isolate the gravitation of pre-tonic chords towards the tonic (i.e., their horizontal dissonance) from vertical dissonance.

The second reason for Janeček's insistence that representative pre-tonic chords must be consonant is that he needs a method of measuring distance between chords, and his method for measuring distance between chords require they be consonant triads. As we have already seen, Janeček contends that every pre-tonic chord must have an equally suitable and usable pre-tonic chord on the other side the tonic, which represents the axis. He explains further:

> If we are to determine a certain distance from this triad [the tonic] upward, and then to measure the same distance downward, we need to know from which pitch to measure; we know…that this must be the root as the pitch representing the entire triad. However, a measured distance again yields only a single pitch, which by itself cannot assume the function of a pre-tonic harmony. Thus, this again must be the root on which the harmony

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materiálu, totiž z jeho pravidelného rozvrstvení v tónovém prostoru, plyne, že proti každému souzvukovému útvaru i každé jeho části lze tvořit útvar jiný, který by ležel ve vztahu k určité tónově fixované ose v opačném směru. Tónu ležícímu v určité vzdálenosti pod osou odpovídá tón, který leží v téže vzdálenosti nad osou; stejně i proti každému souzvuku lze postavit souzvuk jiný, zpravidla jeho prostou transpozici, někdy též transpozici jeho inverze, jako zvukově prostorový protějšek."

306 Janeček, 204. "Thus if a suitable pre-tonic chord is found above the tonic, which represents the axis, there is another equally suitable and usable pre-tonic chord the same distance below the tonic." "*Je-li pak nalezen vhodný předtónický souzvuk nad tónikou, jež představuje osu, je tím zároveň určen stejně vhodný a použitelný předtónický souzvuk jiný, který leží v téže vzdálenosti pod tónikou.*"

307 Janeček, 207. "*Výsledkem naší obecné úvahy tedy je přece jen* požadavek konsonantnosti i pro reprezentační akordy předtónické."

308 Janeček, 207. "*Sklon k tónice musí být u obou reprezentačních předtónických akordů vlastností, jež vyplývá z jejich postavení vůči tónice, nikoliv z vlastního vnitřního ustrojení, z vlastního napětí, z disonantnosti.*"

> representing a pre-tonic function is built. Only consonant triads have but a single basic pitch.[309]

For Janeček to be able to identify pre-tonic chords that are equidistant from the tonic, he requires some way to measure that distance. Janeček method for measuring the distance between chords involves measuring the interval between some representative pitch in each chord. He claims that consonant triads have one representative pitch—the root.[310] However, for Janeček, only consonant triads have only one representative pitch, while all dissonant chords have multiple representative pitches.[311] This is because, as we will see later, Janeček conceives of all dissonant harmony as some combination of complete or partial consonant triads. Thus, for Janeček, pre-tonic chords must be consonant because they have single representative pitches, and these representative pitches can in turn be used to measure the distance between chords.

Janeček's functional principle further constrains which chords can be representative pre-tonic chords with rules relating to common tones between pre-tonic chords and the tonic. Janeček's third constraint is that representative pre-tonic chords cannot have any common tones with each other. He explains that "if two representative pre-tonic harmonies are to be mutual counterparts that are distinct from each other, they cannot have pitches in common. There must run a distinct

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[309] Janeček, 207. "Tónika, *jíž jsme znázornil v obrazci* [*v příkladu*] *103 jako jedinou přímku, třebaže silnou, je* trojzvuk. *Máme-li stanovit určitou vzdálenost od tohoto trojzvuku nahoru a naměřit ji pak ve zvukovém prostoru také dolů, musíme vědět, od kterého tónu máme měřit; podle připomínek a úvah* [*v příkladu*] *53 víme, že od* tónu základního *jakožto tónu reprezentačního, představujícího celý trojzvuk. Určitá naměřená vzdálenost udává však zase jen jediný tón, který zajisté sám nemůže převzít funkci předtónického akordu. Musí to tedy být zase tón reprezentační, základní, na němž je akord, představující určitou předtónickou funkci, vybudován. Jeden základní tón však mají jen* akordy **I**, *tedy* konsonance."

[310] Janeček, 140. "The basic (representative) pitch of major and minor triads is always the root, the lowest pitch in the tertian scheme (which is also the orientation scheme). It is as if the entire weight of the triad were concentrated in the root; the root reflects the entire triad. We can refer to the fifth, the highest pitch in the orientation scheme, as a supplementary pitch; this indicates its considerably lesser importance as well as its dependence on the root, the basic pitch. The third, the middle pitch of the scheme, then becomes the differentiating pitch; it is the needle on the balance, determining the family of the triad." "Základním (reprezentačním) tónem *akordů dur i moll je vždy prima, nejspodnější tón terciového schématu (jež je zároveň orientačním schématem). Do primy je jakoby soustředěna celé váha akordu, celý akord se v primě obráží. Kvintu (tj. nejvrchnější) tón orientačního schématu) bychom mohli kvalifikovat jako* tón doplňující*; tím naznačujeme jeho podstatně menší závažnost i jeho závislost na primě, základním tónu. Tercie (střední tón schématu) je pak zřejmě* tónem *rozlišujícím, je to jazýček na váze, který rozhoduje o rodu.*"

[311] Janeček, 207. "*Disonantní souzvuky patří vesměs do kategorií vyšších a akordy těchto vyšších kategorií mají víc rovnoprávných základních tónů.*"

dividing line between them."[312] If they were to have common tones, then neither "would be a pure pre-tonic harmony, but a derivation, a formation put together from other pre-tonic chords."[313] That is, for Janeček, representative pre-tonic chords must be distinct from one another. With his fourth constraint, he stipulates that representative pre-tonic harmonies can have no more than one pitch in common with the tonic. His final constraint is that both representative pre-tonic harmonies must have the same number of tones in common with the tonic. Janeček explains that "because the functional system is symmetrical, the two representative pre-tonic harmonies must have equal but opposite relations to the tonic."[314] For example, in C major, the dominant [G, B, D] and the subdominant [F, A, C] both have one tone in common with the tonic [C, E, G].

In this section, I have shown how Janeček builds on his concept of imaginary tones to define three underlying principles of harmonic function. The principle of the pure tonic requires the tonic to be vertically and horizontally consonant; the principle of the leading tone requires a leading tone, either from above or below, between pre-tonic harmonies and the tonic; and the functional principle is a collection of five constraints on what constitutes a representative pre-tonic chord. In the following section, I will demonstrate how Janeček uses these principles to determine not only the typical harmonic functions of tonic, subdominant, and dominant, but also his two new functions—Lydian and Phyrgian.

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[312] Janeček, 207. "Mají-li být oba (předpokládáme-li jen dva) reprezentační předtónické akordy přísně oddělenými vzájemnými protěšky, *nemohou mít společné tóny*. Musí mezi nimi probíhat přesná rozdělovací čára."
[313] Janeček, 207. "*Souzvuk, jehož protějšek by obsahoval některou jeho součást, by nebyl 'čistý' předtónickým akordem, nýbrž už odvozeninou, útvarem, který sestaven z jiných ('správných') předtónických souzvuků*."
[314] Janeček, 208. "*Poněvadž funkční systém je symetrický, musí být oba předtónické reprezentační akordy* ve stejném protikladném vztahu k tónice."

4.1.3 How Janeček's three principles determine harmonic function

Janeček uses his three principles to demonstrate that his representative pre-tonic chords must be the traditional subdominant and dominant functions. For ease of reference, I summarize these principles here:

1) The principle of the pure tonic
    a. The tonic must be consonant
    b. The consonance of the tonic must not be disturbed by uncancelled imaginary pitches
2) The principle of the leading tone
    a. Pre-tonic chords must contain at least one leading tone (that is, any chord tone either a half-step below or above and tonic chord tone)
3) The functional principle
    a. Pre-tonic chords must come in pairs equidistant from the tonic
    b. Pre-tonic chords must be consonant
    c. Pre-tonic chords must not have tones in common
    d. Pre-tonic chords can have no more than one tone in common with the tonic chord
    e. Both chords of a pre-tonic pair must have the same number of tones in common with the tonic chord

Using these principles, we can trace how Janeček comes to the conclusions that the representative pre-tonic chords must be the traditional subdominant and dominant triads. The requirement that pre-tonic chords must be consonant limits the pre-tonic chords to just the 24 major and minor triads. Janeček is looking for a pair of pre-tonic chords, and allows them to be either the same quality (major and major or minor and minor) or two different qualities (major and minor). This gives us 576 (24^2) possible pairs of major and minor chords. Then there is the requirement that the pairs must be equidistant from the tonic. There are pairs of triads equidistant from the tonic by five intervals: a half step, a whole step, a minor third, a major third, and a perfect fourth. Larger intervals are simply inversions of these smaller. I also exclude: the contradiction of having a pair of pre-tonic

chords built on the tonic; and a pre-tonic chord pair a tri-tone equidistant from the tonic, because those chords would have the same root. With five options of distance between the pre-tonic pairs and the tonic, and four possibilities for mixing quality (major/major, major/minor, minor/major, and minor/minor), 20 possible pre-tonic chord pairs remain. The requirements about common tones then limit the possibilities to 8 pairs in major and 8 in minor, as shown in Figure 4.6. From these remaining pairs, Janeček excludes any pairs in which either chord does not contain a leading tone to at least one tonic chord tone. Leading tones are indicated by slanted lines. This excludes, in *minor* keys, the pairs F+/G+, F+/G-, and F-/G-. He further reduces away any pair of pre-tonic chords which pitches that could disturb the final consonance of the tonic with uncancelled imaginary pitches. These are any pitches that stand a whole-tone or tritone away from a tonic chord tone, indicated by the numerals 2 and 6 in square brackets. This leaves the pairs F+/G+ and F-/G+ in *major* and the pair F-/G+ in *minor*, outlined in Figure 4.6. For Janeček, "these are the only pairs of pre-tonic harmonies that constitute representative harmonies suitable in all respects."[315]

[315] Janeček, 209. "*Jedině tyto dvojice předtónických akordů jsou tedy po všech stránkách vyhovující reprezentační akordy.*"

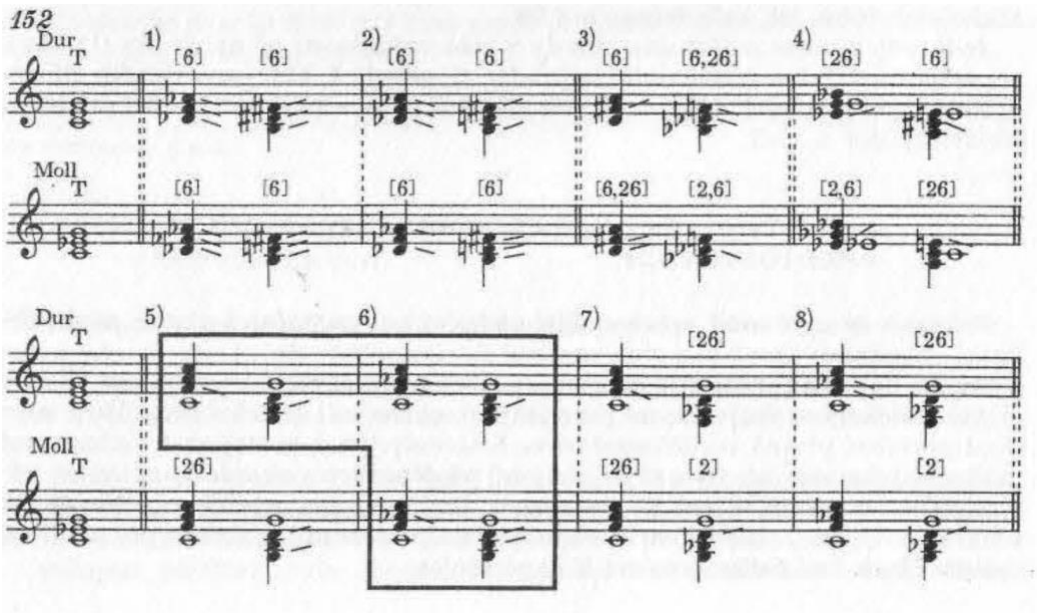

Figure 4.6 A reproduction of Janeček's example detailing possible pre-tonic chord pairs after removing chords that are not major or minor, any pre-tonic pairs that have common tones, and any pre-tonic chords that will have more than one tone in common with the tonic.[316]

These pre-tonic chord pairs, along with the tonic, are Janeček's "primary functions" (*hlavní funkce*) and constitute what Janeček calls "the classical functional system of three members."[317] He explains that "the functional system for major and minor keys, as established by older harmonically conceived music, has three members. At its center is the tonic (C+, C-); situated symmetrically on either side are the dominant D (G+ in major and minor), and the subdominant S (in C major F+ or F-, in C minor only F-)."[318]

[316] Diagonal lines near note heads represent a leading tone relationship to a tonic chord tone in that direction. The numerals 6 and 2 in square brackets indicate that the chord in question has some tritone or whole tone relationship to a tonic chord tone. The bold line framing the pairs 5) and 6) indicate Janeček's selection for pre-tonic chord pairs. Note that there are several errors here in Janeček's original. In 4) "*Moll*," [E♭] should have a diagonal line 5) "*Moll*," [G] should not have a diagonal line. In 8) "*Moll*," [A♭] should have a diagonal line. Janeček, 208.

[317] Janeček, 209. "*Tříčlenný funkční systém klasický*."

[318] Janeček, 209. "*Funkční systém pro tóninu dur i moll, jak k němu dospěla starší hudba harmonicky myšlená, je* tříčlenný. *Středem je* tónika T (c e g, c es g), *symetricky po obou stranách jsou pak* dominanta D (g h d *v dur i v moll*) *a* subdominanta S (*v* C *dur* f a c *nebo* f as c, *v* c *mol jenom* f as c)."

Janeček does not, however stop here with the three functions of tonic, subdominant, and dominant. Janeček finds this system—what he considers to be the functional system of Riemann and Šín—to be insufficient for new music, and suggests an expanded system. He recognizes that his functional system thus far comprises only 9 out of 12 pitches (in C major/minor, for example, it excludes [D♭], [G♭], and [B♭]), and that the remaining pitches can only occur as pitches from other keys or in altered chords.[319] That is, the three remaining pitches cannot be understood in the context of the prevailing tonic. Janeček also states that both Riemann's and Šín's conceptions of harmonic function are unable to account for "chord formations containing both pitches belonging to the scale and the same pitches altered (for example, [D] and [D♭])."[320] According to Janeček, these are frequent occurrences in new music and therefore "it became necessary to expand the classical functional system of three members."[321] That is, he recognizes that the "classical functional system" is appropriate to some music, but Janeček is interested in expanding those chromatic limits to account for twentieth century music.

Janeček therefore undertakes to expand the three-member system by including an additional pair of consonant triads.[322] As we have seen though, Janeček's requirements for pre-tonic harmonies only allow for the subdominant and the dominant as pre-tonic chords.[323] Thus, the new pair cannot "meet all the conditions fulfilled by the pair S and D," but instead must "have some pronounced

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[319] Janeček, 209. "*Materiál tohoto systému zabírá devět tónů temperované chromatiky: c, d, es, e, f, g, as, a, h. Ostatní tóny se mohou uplatnit a) buď jako součásti funkčních systémů transponovaných (z jiných tónin), nebo b) jako tóny, jimiž jsou tónový systém i jednotlivé akordy deformovány. Klasická harmonie mluví pak o mimotonálních akordech a modulacích (a) nebo o alterovaných akordech (b).*"
[320] Janeček, 210. "*Co však zůstávalo mimo možnost jakéhokoliv teoretického pojetí, byly souzvukové útvary, obsahující zároveň původní (doškálné) i alterované tóny (např. d, des), tady útvary, jež se v nové hudbě vyskytují velmi často.*"
[321] Janeček, 210. "[*Oní*] *se v nové hudbě vyskytují velmi často. A tak bylo třeba klasický tříčlenný funkční systém rozšířit*."
[322] Janeček, 210. "Thus the functional system must be expanded to include another pair of consonant triads." "*Je třeba funkční sytém rozšířit o další dvojici konsonantních trojzvuků*."
[323] Janeček, 210. "it is only possible to form one pair of representative pre-tonic harmonies that are suitable in every respect, namely the pair S, D." "*Lze utvořit jenom jednu dvojici reprezentačních předtónických akordů, jež by vyhovovaly po všech stránkách totiž dvojici S, D.*"

virtues not shared by the harmonies of the original more limited system."[324] Of the remaining pre-tonic chord pairs that meet Janeček's requirements for common tones, none of them meet the conditions of the principle of the pure tonic, so Janeček instead looks for a "counterbalance to this inadequacy in the principle of the leading tone."[325] That is, he seeks to counterbalance the deficiency of the remaining pre-tonic chord pairs, which all contain some imaginary pitches that will disturb the final consonance of the tonic, with a pre-tonic chord pair that maximizes the number of leading tones (read: semi-tonal voice leading) to the tonic chord. In C major, these are the chord pairs D♭+ and B+, and in C minor they are D♭- and B-. Figure 4.7 reproduces Janeček's example of this new five-member system in both major and minor. While the new chords do not satisfy the principle of the pure tonic—in that they create imaginary pitches that conflict with the tonic—they more completely fulfil the principle of the leading tone. These new chords also satisfy the constraints Janeček's functional principle puts on pre-tonic chords. Janeček identifies the D♭+ triad in Figure 4.7 as a triad built on "the Phrygian second" and labels it "F" for the Czech *frygický* (Phrygian).[326] Likewise, he notes that the B+ triad contains "the Lydian [*Lydický*] fourth" and accordingly labels it "L."[327] While tonic, subdominant, and dominant constitute Janeček's primary functions, the Lydian and Phrygian functions constitute "helper functions" (*pomocní funkce*). Janeček allows all five functions to appear as either major or minor, indicated respectively by a "+" or a "-" before the function symbol. In effect, Janeček's primary departure from Šín lies in elevating Phrygian and Lydian chords to the status of functions proper. While both Riemann and Šín had indeed

[324] Janeček, 210. "Nebylo při tom možno vyhovět některému z požadavků, jimž vyhovuje dvojice S, D." "*Budou-li pak mít nově přibrané akordy výrazné přednosti, jichž nemají akordy původního chudšího systému, budou vítanými (poněvadž účelnými) členy rozšířeného systému.*"
[325] Janeček, 210. "*Vidíme-li že většina akordů nepoužitých v klasickém systému S T D nevyhovuje principu čisté tóniky, bude třeba hledat* protiváhu *proti tomuto nedostatku v principu druhém, v* principu citlivého tónu."
[326] Janeček, 210–11.
[327] Janeček, 210–11.

highlighted what they too called Phrygian and Lydian chords, only Janeček identifies them as independent functions.[328]

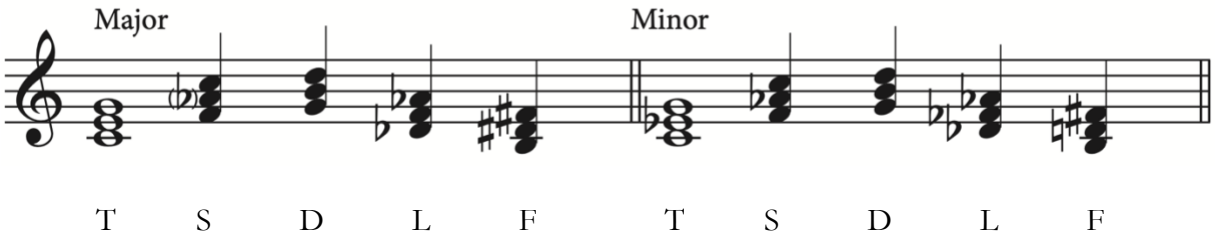

Figure 4.7 Janeček's five harmonic functions in C major and C minor. They include tonic (T), subdominant (S), dominant (D), Phrygian (F), and Lydian (L).[329]

Janeček further explains his assignment of these five functions in a later article titled "*Doplňující poznámky k některým jevům harmonického a tonálního myšlení*" (Additional Notes on Some Phenomena of Harmonic and Tonal Thinking).[330] In that article, Janeček answers unnamed criticisms directed at his theory of harmonic function—especially his helper functions. He defends his Phrygian and Lydian triads by appealing to different types of distance. Consider first distance measures in fifths. In the circle of fifths, the dominant and subdominant triads are both adjacent to the tonic and thus are functionally close to it.[331] I think of "functionally close" as the fullest realization of the principle of the pure tonic. The helper functions, in contrast, are quite far from tonic, each being five positions away from the tonic in opposite directions along the circle of fifths. Janeček's diagram, reproduced as Figure 4.8, makes this distance perspicuous. Starting from a tonic C+ on the left side, fifth-related chords extend from that tonic chord in either direction (fifth above or fifth below) until converging on the enharmonically equivalent F#+ and G♭+. Janeček also labels

[328] Riemann describes these two chords as the chord that contain, respectively, the characteristic lowered 2nd note from the Phrygian scale and the raised 4th note of the Lydian scale. For more on Riemann's description of these chords, see Riemann, *Vereinfachte Harmonielehre*, 95–102. Šín refers to them by name as the Lydian chord (*Lydický akkord*) and the Phrygian chord (*Frygický akkord*). See Section 3.3.1for more on Šín's use of these chords.
[329] Janeček, *Základy moderní harmonie*, 210.
[330] Janeček, "Doplňující poznámky k některým jevům harmonického a tonálního myšlení."
[331] Janeček, 27–28. "*Funkčně blízké jsou zajisté dominanta a subdominanta*."

the triads according to their distance from the tonic by number of root motions by fifth. Written in pencil across the top of the page, C major is labeled 0, the dominant and subdominant are labeled 1, and Lydian and Phrygian are labeled 5. In terms of the circle of fifths, the helper functions are much further from tonic than the primary functions.

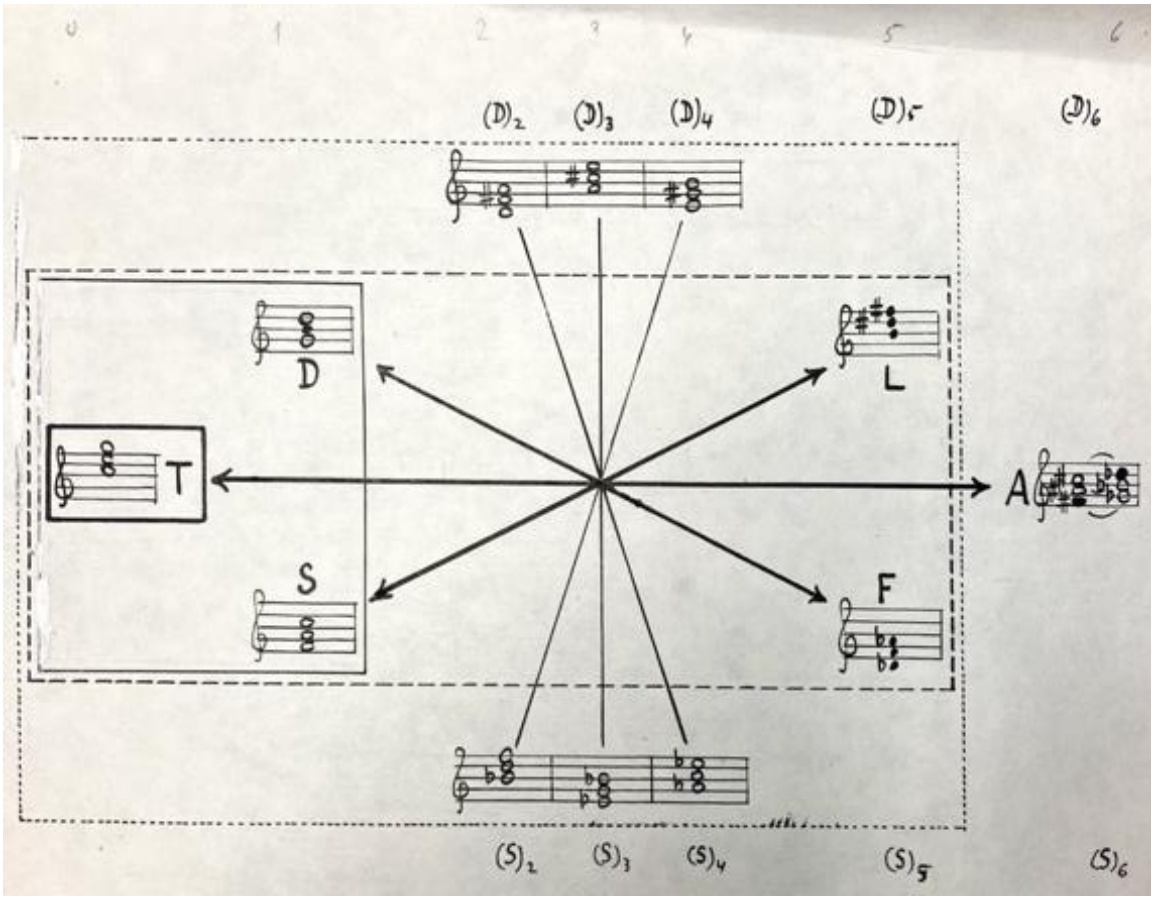

Figure 4.8 Unpublished figure found in the Karel Janeček collection (#631) at the Literary Archive of the Museum of Czech Literature, in the box labeled "II F 24 4 75 46."

Janeček explains, though, that "in spite of being in close harmonic relation with distant harmonies and therefore being themselves distant too, [the Lydian and Phrygian triads] lie in close

proximity to the original tonic [in regards to semi-tonal space]."[332] He defends his choice of the Lydian and Phrygian triads because they are the closest triads to the tonic in semi-tonal space, much like the subdominant and dominant are the triads nearest the tonic on the circle of fifths. This semi-tonal proximity represents how his Lydian and Phrygian triads are the fullest realization of the principle of the leading tone. Janeček explains that it is the capacity of these triads to be at once very distant and very near that makes them the ideal representatives of helper functions.[333] It seems that for Janeček, the distance of his Lydian and Phrygian from the tonic in the circle of fifths prevents them from being primary functions, but their proximity in semi-tonal space makes ideal candidates to be helper functions, effectively a lower class of representative functions.

While Janeček's diagram in Figure 4.8 visualizes the principle of the pure tonic by placing dominant and subdominant adjacent to the tonic, the diagram also visualizes the prevalence of the principle of the leading tone with its various frames. The C major chord is labeled tonic and framed by a bold line. G major and F major are labeled D and S, respectively, and framed with the tonic by a non-bold line. Presumably, by reducing the thickness of the frame, or reverting to a frame with a dashed line, Janeček is indicating a more distant relationships between chords. The next frame does not, as might be expected, expand to include the second dominant and subdominant, the two chords that are next in the order of fifths. Instead, it stretches out to include Lydian and Phrygian, and so indicates that those triads are in a closer relationship to the tonic than the other remaining triads. By organizing the diagram according to the circle of fifths, and giving dominant and subdominant a frame with a non-dashed line, Janeček emphasizes the significance of the primary functions over the

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[332] Janeček, 28. "*Ale těsně před tímto nejvzdálenějším bodem procházíme dvěma harmoniemi (in C: h dis fis, des f as), které, byť byly svým spřízněním se vzdálenými harmoniemi samy taktéž vzdálené, leží prostorově v těsné blízkosti původní tóniky. Tato prostorová blízkost je sice něco jiného než spřízněnost, má však ve své podstatě povahu pouhého vychýlení, nepodobnou vychýlení jednotlivých tónů dominanty nebo subdominanty od nejbližších tónů příslušné tóniky. Blízkost je navíc půltónová, tedy zvlášť naléhavě spádná. Zvláštností páté dominanty a páté subdominanty tedy je, že je můžeme pojímat jako velmi vzdálené a tonálně odcizené harmonie, ale zároveň i jako harmonie blízké, jen apartně posunuté.*"

[333] Janeček, 28. "*Myslím, že zvláštnost, na kterou zde upozorňuji, je také důvodem, aby za reprezentanty lydičnosti a frygičnosti byly považovány právě tyto dva akordy, a nikoliv jiné, sice ne tak vzdálené (např. d fis a, b d f v C dur), nikoliv však blízké.*"

helper functions. Likewise, by giving Lydian and Phrygian a frame with a fuller line than the remaining triads, he implies their closer status to the primary functions. In other words, the diagram demonstrates how dominant and subdominant are ideal pre-tonic functions, given that they fully satisfy the principle of the pure tonic, while Lydian and Phyrgian are also significant, since they fully satisfy the principle of the leading tone, even if they are ultimately less significant than the primary functions.[334] Janeček is explicit about this distinction between primary and helper functions in *Základy*. There, he states that "we have already indicated by distinguishing between primary functions (T, D, S) and helper functions (F, L) that they are not equal."[335] Not only they are not equal because helper functions are derived differently from subdominant and dominant, but also because they are less common in repertoire. Later, Janeček will make a further distinction between the primary functions and the helper functions, explaining that despite the status of Lydian and Phrygian as independent functions, he considers them to be phenomena that work towards eliminating a sense of tonic, rather than creating it.[336]

In this section, I have shown how Janeček, with the help of his three principles of harmonic function, determines not only the typical three functions of tonic, subdominant, and dominant, but also two new functions, called Lydian and Phyrgian. Janeček's primary functions (T, S, and D), are meant to fully satisfy his principle of the pure tonic. Janeček's helper functions (F and L) do not

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[334] Janeček's diagram also introduces us to his concept of "antitonic." The fifth-related chords two, three, and four clicks away from the tonic are relatively further from the tonic than the Lydian and Phrygian chords. However, those chords are still closer to the tonic than the A#/G♭ major triad. Janeček labels the tri-tone related chord with an A for "antitonic." The antitonic is the triad that is furthest away from the tonic both in the fifth cycle and in the semitone cycle, because an additional fifth or semitone would move closer to the tonic triad. According to Janeček's principles, it is the perhaps the least suitable option for a pre-tonic chord possible. First, the antitonic's equidistant pair would be enharmonically respelled version of itself (F+ and G♭+). Secondly the antitonic's three chords tones each stand in a tri-tone relationship to a tonic chord tone, violating Janeček's requirement that the consonance of the tonic chord not be disturbed by unresolved tonal imaginary tones. Looking at this diagram, it becomes clear that the Lydian and Phrygian triads are in a dominant and subdominant relationship to the antitonic. One could conceive of a 6-member system in which there are two groups of T, S, and D related triads a tritone apart, creating T, S, D, L, F, and A.

[335] Janeček, *Základy moderní harmonie*, 224. "*Avšak již rozlišením funkcí na hlavní* (T, D, S) *a pomocné* (F, L) *jsme naznačili, že tu rovnosti není* !"

[336] Janeček, 296.

fully satisfy the principle of the pure tonic—in that they create imaginary pitches that conflict with the tonic—but they more completely fulfil the principle of the leading tone. Looking at Figure 4.8, we also saw that Janeček's primary functions are the nearest triads to tonic in fifths space, while his helper functions are the nearest triads to the tonic in semi-tonal space. In the following section, I will demonstrate how Janeček labels all other possible major and minor triads.

4.2 Combination functions

Janeček's approach to neighbor triads differs significantly from those of his predecessors. Riemann, as well as Šín in the first edition of his *Nauka* (1922), treats neighbor triads as different realizations of prototypical primary triads. To this both authors add the possibility of inversion symbols and a variety of other diatonic and chromatic alterations. In the second edition of *Nauka* (1933), Šín introduces his combination functions, which no longer treat neighbor triads as different forms of primary triads, but he does still allow the use of inversion symbols and other alterations. Janeček, in contrast, further develops the combination-function idea without inversion symbols and alterations. In Section 4.2.1, I will show three ways in which Janeček interprets the remaining major and minor triads not accounted for by his primary or helper functions. In section 4.2.2, I consider how Janeček contends with potentially superfluous or ambiguous combination functions. Finally, in section 4.2.3, I explain how these topics coalesce in his understanding of harmonic progression.

4.2.1 Neighbor triads

As we saw in Chapter 3, Šín understands neighbor triads as combinations of the three primary triads, and thus as a combination of distinct functions. Janeček sees in Šín's approach the potential "to understand functionally even those chord formations that cannot be arranged into a

tertian scheme."[337] However, given that Šín only used the three primary functions for combinations, he was only able to describe a limited number of chords. Janeček, however, adopts Šín's combination approach while adding two new functions, something that allows him to describe all 350 possible octave- and enharmonic-equivalent chords, as combination functions in relation to tonic. His first step however is to provide labels for all 24 complete major and minor triads. He provides three methods for labeling these chords that do not constitute his primary (T, S, and D) or helper (L and F) functions. His first method involves labeling them with an M, for *Mezifunkční Akordy* (intermediate function chords).[338] He adds a + or – to indicate their quality and super or subscript numbers to indicate how many half steps the root of that M chord stands from the root of the tonic triad. Superscript numerals indicate distance above the tonic and subscripts indicate distance below the tonic. For example, E+ in C major is labeled $+M^4$ because it is a major triad whose root is four half steps above the tonic of the tonic.[339] On the other hand, A- in C minor is $-M_3$, because it is a minor triad three half steps below the tonic. Janeček does not initially demonstrate how M chords combine with other functions, but we will see how Janeček does so later to address non-triadic harmonies.

Janeček's M chords are curious for the extent to which they resemble Riemann's *Harmonieschritte* labels for triads. While the *Harmonieschritte* are primarily transformations that describe chord relationships, Riemann also uses them to label chords themselves, by taking any *Harmonieschritt* and adding the noun, *Klang*. For example, a *Quintschrittklang* is the triad a *Quintschritt* away from the tonic. Riemann's *Harmonieschritte* chord labels describe the distance of the new chord from the first and indicates if the quality has changed. Janeček's M chord labels however describe the distance of

[337] Janeček, 210. "*Výhoda Šínova projetí je v tom, že podle něho je možno funkčně pojímat i souzvukové útvary, jež se nedají srovnat do terciového schématu.*"
[338] Janeček, 213.
[339] Janeček, 213.

the new triad from the first, and then simply indicate the quality of the new chord. The most significant difference of course between these two is that Riemann measures distance from his dualistically conceived triad primes, while Janeček measures from triad roots. Thus, in contrast to Šín's efforts to reimagine harmonic function without Riemann's *Harmonieschritte*, Janeček reintroduces a monist version of them by means of his M chord labels.

At the same time, Janeček's M chords have a different utility however from Riemann's *Harmonieschritte* labels for triads. One advantage of the *Harmonieschritte* is in demonstrating the correspondence in voice leading between triad duals. For example, the *Quintschritt* label is attractive for capturing the similarity between the triad G+ in C major and the triad F- in C minor. Both triads receive the label *Quintschrittklang*, which indicates their mirrored voice leading when resolving to tonic. [G, B, D] and [C, E, G] have a common tone [G], an ascending half step between [B] and [C], and an ascending whole step between [D] and [E]. Similarly, [F, A♭, C] and [C, E♭, G] have a common tone [C], a descending half step between [A♭] and [G], and a descending whole step between [F] and [E♭].[340]

Janeček's M chords do not capture this mirrored voice leading, however. These same two triads would be labeled $+M_5$ (G+ in C major) and $-M^5$ (F- in C minor), which only labels the distance of their chord roots without explicitly indicating any voice leading correspondences. In fact, Janeček tends not to label any chord as an M chord if it can be labeled as a primary (T, S, and D) or helper (F and L) function chord instead. For example, the dominant and subdominant can be labeled as either $+M_5$ or $+M^5$ in major or $-M_5$ or $-M^5$ in minor, while the Phrygian and Lydian function triads are either $+M_1$ or $+M^1$ in major or $-M_1$ or $-M^1$ in minor. Instead, Janeček almost exclusively makes use of M chord labels for whole step- or chromatic third-related chords ($-M_2$ and $+M_2$ in major or

[340] Šín, by naming the major dominant and the minor subdominant the "natural" dominants, also highlights this mirrored voice leading.

minor, $+M^3$ in major, $-M^4$ in minor, etc.) that are difficult to describe even with combinations of his five functions. While Riemann's *Harmonieschritte* highlight special correspondences between chords that are otherwise obscured, Janeček's M chords, which are very similar to Riemann's *Harmonieschritte*, serve to fill the chromatic holes in his expanded functional system.

Janeček's second approach to labeling non-primary and non-helper triads involves labeling them as combinations of primary and helper functions by writing each of the functions involved in the chord and using dots to indicate how many of each function's chord tones are represented.[341] For example, E+ in C major could be written as $\frac{+D\cdot}{\overline{+T\cdot}}$, which indicates that this chord is made up of one note from the major tonic triad [E], one from the major subdominant [A♭ or G#], and one from the major dominant [B]. While this example uses only primary functions, Janeček also allows for the combination of helper functions (L and F).

The third approach is the most precise. Again, Janeček writes all the function symbols involved in the combined chord. However, instead of using dots to indicate the number of chord tones from each triad, he uses symbols to indicate exactly which chord tones are involved. A complete consonant triad is represented with a circle and a vertical line "⏀", the root alone with the lower half of a circle "◡", the fifth alone with a half circle opened downwards "◠", the third alone with a vertical line "|", an open fifth with an empty circle "◯", the root and third with an upward facing half circle with a vertical line "⏔" and a third and fifth with a downward facing circle and a vertical line "⏃".[342] For example, E+ in C major could therefore be labeled $\begin{matrix}+D\\+S\\+T\end{matrix}\Big|$. Here the vertical lines indicate that the chord tones being used are the thirds of the indicated primary triads.

[341] Janeček, *Základy moderní harmonie*, 214.
[342] Janeček, 214.

Janeček's approach to neighbor triads allows him to describe all major and minor triads either with an M chord label, or as some combination of primary (T, S, and D) or helper (F and L) functions, either complete or incomplete. Figure 4.9 is a reproduction of Riemann's table listing how to label all triads in the key of C major or C minor, excluding the triads that are already accounted for with his primary and helper functions. The left-hand column lists the pitch-classes of the triad with the suffix "-is" indicating a sharp and "-es" indicating a flat. For example, "*d fis as*" indicates [D, F#, A], while "*es g hes*" indicates [E♭, G, B♭].

Příklad v *C* dur nebo v *c* moll	Z n a č k a		
	způsob 1)	způsob 2)	způsob 3)
d fis a	+M²	+S· +S· —L: nebo L· D·	+S| +S| —L⌒ nebo L⌒ D⌒
es g hes	+M³	—D: nebo —D: —T: +L·	—D⌣ nebo —D⌣ —T⌒ +L|
e gis h	+M⁴	+D· —S· +T·	+D| —S| +T|
fis ais cis	+M⁶ nebo +M₆	F· —D· L·	F⌣ —D| L⌒
as c es	+M₄	—T: nebo +L· —S: nebo —S:	—T⌣ +L| —S⌒ nebo —S⌒
a cis e	+M₃	—F: +T· +S· nebo F· +S·	—F⌣ +T| +S| nebo F⌣ +S|
hes d f	+M₂	S· —D:	S⌣ —D⌒
h dis fis	+M₁ nebo +L	—T· L:	—T| L○

Příklad v *C* dur nebo v *c* moll	Z n a č k a		
	způsob 1)	způsob 2)	způsob 3)
d f a	—M²	+S: D·	+S⌣ D⌒
es ges hes	—M³	—D· —D· +L: nebo L· —T·	—D| —D| +L⌒ nebo L⌒ —T|
e g h	—M⁴	+D: +T:	+D⌣ +T⌒
fis a cis	—M⁶ nebo —M₆	F· +S· L·	F⌣ +S| L⌒
gis h dis	—M₄	+L: +L· —S· nebo +D· —S·	+L⌣ nebo +L| —S| +D| —S|
a c e	—M₃	+T: +S:	+T⌣ +S⌒
hes des f	—M₂	+F: S· —D· nebo F· —D·	+F⌣ S⌣ —D| nebo F⌣ —D|
cis e gis	—M¹ nebo —F	+T· F:	—T| F○

Figure 4.9 Reproduction of Janeček's tables indicating the different ways to label neighbor chords both in major and minor keys.[343]

In this section, I have shown how Janeček labels triads as a combination of his primary or helper functions. This included different combination function approaches that Janeček adapts from Šín, and also his M chord labels, which bear some resemblance to Riemann's *Harmonieschritte*. In the following section, I will show how Janeček accounts for all remaining harmonies, and how he removes many of the redundant function labels that his theory introduces.

[343] Janeček, 222–224.

4.2.2 Superfluous and ambiguous functions

Thus far we have only seen how Janeček labels consonant neighbor triads. However, Janeček also uses his three approaches to labeling neighbor triads to label dissonant chords of any size. An extreme example of this would be an eleven-note chord, such as [C, E, G, B, D, F, A, C#, G#, D#, F#] in the key of C major, which we can received the combined symbol of $\begin{smallmatrix}+\mathrm{L}\\+\mathrm{F}\\+\mathrm{S}\\+\mathrm{D}\\+\mathrm{T}\end{smallmatrix}$. With this chord, [C, E, G] correlates to +T, [G, B, D] to +D, [F, A, C] to +S, [C#, F, and G#] correlates enharmonically to +F, and [B, D#, F#] to +L.

While Janeček's approaches to labeling these chords is thus extremely versatile, it has the disadvantage of offering an unwieldy number of ways to analyze any given chord. Consider, for example, in C major, the chord [C, E, G, B, D, F], which could be labeled as $\begin{smallmatrix}\text{—L}\\+\mathrm{D}\\+\mathrm{T}\end{smallmatrix}$, combining a major tonic [C, E, G], major dominant [G, B, D], and a minor Lydian [B, D, F]. However, it could also be labeled as $\frac{\text{—L}}{+\mathrm{T}}$, combining only a major tonic [C, E, G] and a minor Lydian [B, D, F]. Realizing this, Janeček states that "in reality, this versatility is limited by the general practical principle that if a phenomenon can be understood more simply it is superfluous to understand it in any more complex way."[344] That is, he recognizes some dissonant combinations are superfluous because they can be expressed in simpler ways. As such, he sets out to demonstrate how to determine which dissonant combinations are superfluous.

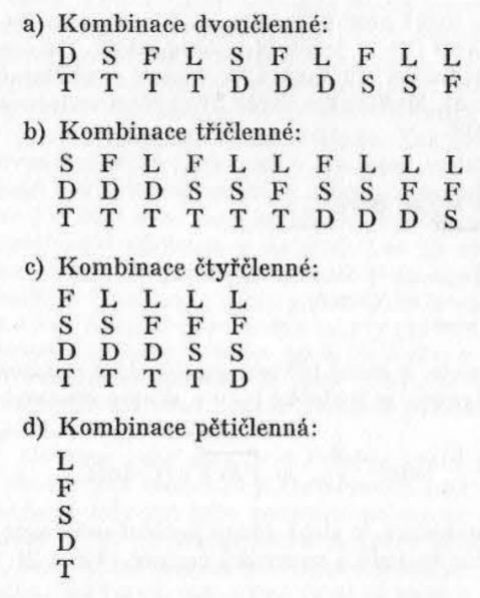
Janeček's approach of combining his five-functions in order to represent any chord produces many instances where a single chord might have a variety of functional interpretations. While such ambiguity is not novel—both Riemann and Šín had bivalent triads in their respective theories—

[344] Janeček, 216. "*Ve skutečnosti je tato všestrannost omezována obecnou praktickou zásadou, že lze-li pojímat nějaký jev jednodušeji, je zbytečno pojímat jej jinými, složitějšími způsoby.*"

Janeček's approach introduces significantly more functional ambiguity. Thus, he sets out to limit the ambiguity of his combination function labels. Janeček provides the example of the chord [G, B, D, F, A♭, D♭].[345] His approach allows for this chord to be functional in a variety of keys. In particular, it can be interpreted as a combination of Dominant and Phrygian triads in either C major or F# major. However, this chord could also be interpreted as a combination of an incomplete tonic triad [G], an incomplete Lydian triad [B, D], and a complete Phrygian triad [D♭, F, A♭]. In response to this functional ambiguity, Janeček maintains that "the more complex interpretations, although theoretically possible, cannot capture the functional essence of the chord; the correct functional interpretation is always the simplest."[346] Janeček thus sets out to determine the simplest possible interpretations of these chords that his system allows.

In his effort towards determining the simplest possible interpretations of combination function chords in his system, Janeček removes any functionally impossible combinations, as well as any interpretations that are made superfluous by a simpler functional interpretation. He begins by first imagining all possible combinations of his five functions in both their major and minor forms. Figure 4.10 shows these combinations, while leaving the fact that these combinations could have any mix of major and minor triads implicit. For example, $\frac{D}{T}$ could be $\frac{+D}{+T}$, $\frac{-D}{-T}$, $\frac{+D}{-T}$, or $\frac{-D}{+T}$. This gives us 232 possible functional combinations.

[345] Janeček, 216.
[346] Janeček, 216. "*Z uvedeného příkladu je jasně vidět, že teoreticky možné složité výklady nemohou postihnout je jasně vidět, že teoreticky možné složité výklady nemohou postihnout pravou funkční podstatu souzvuku; správné funkční pojetí je vždy nejjednodušší.*"


a) Kombinace dvoučlenné:

D	S	F	L	S	F	L	F	L	L
T	T	T	T	D	D	D	S	S	F

b) Kombinace tříčlenné:

S	F	L	F	L	L	F	L	L	L
D	D	D	S	S	F	S	S	F	F
T	T	T	T	T	T	D	D	D	S

c) Kombinace čtyřčlenné:

F	L	L	L	L
S	S	F	F	F
D	D	D	S	S
T	T	T	T	D

d) Kombinace pětičlenná:

L
F
S
D
T

Figure 4.10 Janeček's list of potential combination functions. A) two-member combinations B) three-member combinations C) four-member combinations D) five-member combinations.[347]

Janeček continues by eliminating combinations from his 232 possibilities based on a few criteria. First, he eliminates any combination that features the minor dominant. He explains that the minor dominant is a very rare chord that "can only be supported by its harmonic surroundings."[348] As we have already seen, Janeček determined that the minor dominant is a poor candidate to be a pre-tonic chord. Imagining the minor dominant in C major (G-), it is problematic because the [B♭] might remain as a harmonic imaginary pitch uncancelled by the tonic. Also, as a tonal imaginary pitch, the [B♭] stands at a tritone away from the third of the tonic and thus is especially prone to disrupting the consonance of the tonic. For the same reason, Janeček also eliminates any combination of +S with –T. Again, imagining this in the key of C minor, [A] in +S [F, A, C] stands a

[347] Janeček, 218.

[348] Janeček, 219. "*Je třeba uvážit, že -D je funkce nadmíru vzácná. Je to funkce, jejíž existence musí být opodstatněna harmonickým okolím; pro určování tonálně funkční víceznačnosti, jíž se zde právě chceme zabývat nepřichází funkce -D téměř v úvahu, a nebudeme k ní tudíž přihlížet.*"

tritone apart from [E♭] in –T [C, E♭, G], and thus [A] is especially prone to disrupting the consonance of the tonic.

Janeček also eliminates any combinations of –F with +T, or +L with –T. Take, for example, $\begin{smallmatrix}+T\\-F\end{smallmatrix}$ in C major, the simultaneous sounding of C+ and Db- [C, E, G, D♭, F♭, A♭]. Their respective thirds are [E] and [F♭]. As Janeček explains, the third of the tonic cannot also sound as the third of the Phrygian chord (observing enharmonic equivalence), because the third of the tonic is stable while the third of the Phrygian acts as a leading-tone.[349] This combination tries to express the impossibility of one tone being both stable and a leading-tone at the same time. The same problem occurs with $\begin{smallmatrix}+L\\-T\end{smallmatrix}$. In C minor, [D#] in +L [B, D#, F#] and [E♭] in –T [C, E♭, G] are the same pitch, yet one indicates stability as a tonic chord tone and the other a leading tone as a Lydian chord tone.

Because Janeček restricts the combination of +S with –T and –F with +T, the combination of +S and –F also becomes impossible. +S can only occur with a major tonic, and –F can only occur with a minor tonic, so when +S and –F are combined, they would require a tonic that is neither major nor minor, which is impossible in Janeček's view. A similar situation occurs with +L and –F. +L requires a major tonic, and –F requires a minor tonic, so the two cannot be combined.

Lastly, Janeček eliminates any combination of functions that could be expressed by invoking fewer functions. For example, $\begin{smallmatrix}+T\\+D\\-L\end{smallmatrix}$ can also be expressed as $\begin{smallmatrix}+T\\-L\end{smallmatrix}$, and he prefers the latter version on the grounds of its greater economy.

With these criteria Janeček weeds out the functionally impossible, unlikely, and superfluous combinations from 232 possible to a total of 74, listed below (Figure 4.11). Despite his efforts however, a certain amount of ambiguity remains in these 74 combinations. The problem is that, as

[349] Janeček, 219. "*rozlišující tón vedlejších funkcí F a L nemůže být zároveň rozlišujícím tónem tóniky, neboť má-li působit jako citlivý tón, dožadující se pohybu, nemůže působit zároveň jako stabilizovaný tón tóniky*."

with the example we considered above, which could be interpreted in either C major or F# major, 54 of those combinations can still be interpreted in more than one key.[350]

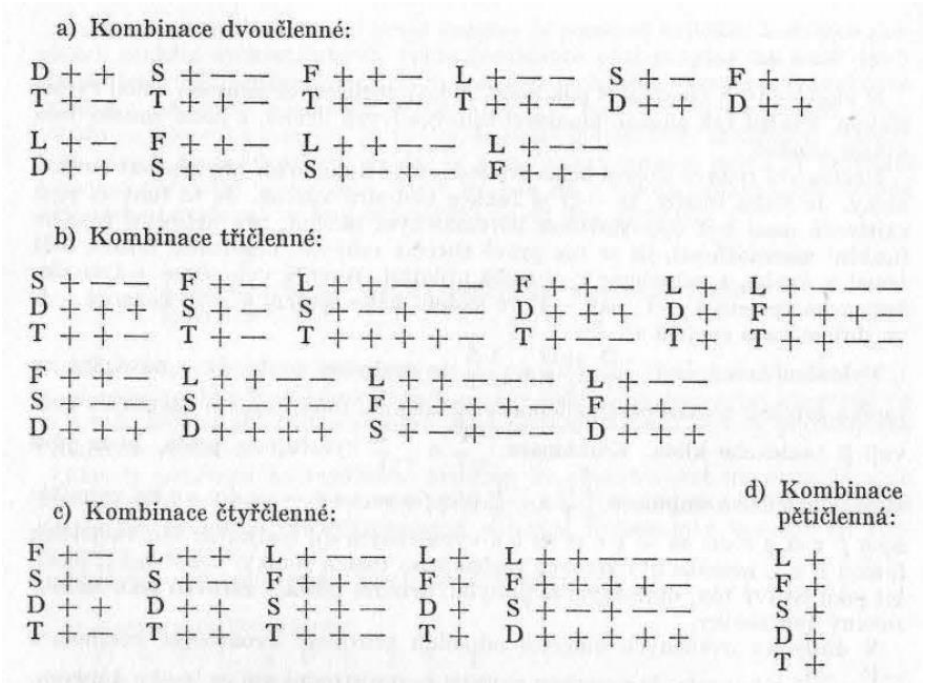


Figure 4.11 Janeček's list of non-superfluous combination functions.[351]

While we just saw how Janeček significantly reduces the number of possible functional interpretations in his system, he nevertheless introduces additional analytical freedom into functional interpretation with his conception of functional significance. He recognizes that when a chord combines more than one function, that one or more of those functions may be relatively more significant. To express the significance of one function over another in a simultaneity, he replaces that function symbol with dots. For example, a hypothetical $^{+F}_{+D}$ chord could be represented as $_{+\ddot{D}}$,

[350] Janeček erroneously claims that there are 55 combinations that can be interpreted in more than one key, but he overlooks $^{-L}_{-F}_{-S}$, making a total of 54.

[351] Janeček, *Základy moderní harmonie*, 220.

if it is necessary to represent the +D as more significant than the +F. The consequence of this approach is that it obfuscates the pitch-class content of the tones represented by those dots.

He proposes three rules for determining functional significance. The first is tonal significance. Put simply, Janeček prefers interpretations of chords that invoke common functions rather than rarer ones. In Figure 4.12, he provides his classification of function according to their rarity. The leftmost functions are the most common, and the rightmost are the most rare. He provides the example of B+ in C major, which could be represented as the relatively uncommon function +L, but is more likely to arise as an applied chord of E+.[352]

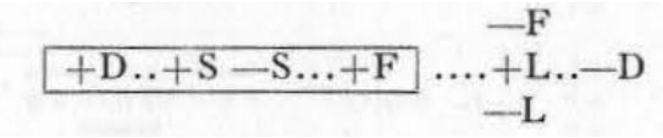


Figure 4.12 Janeček diagram demonstrating function rarity. Leftmost functions are most common, rightmost are the most rare, and those outside the frame as especially rare.[353]

The second consideration in assigning significance is disposition. By this, Janeček argues that those pitches "placed lower have greater significance than those placed higher."[354] Janeček provides the example of a six-note chord [D♭, A♭, F, B, D, G] that has the combined function of $^{+F}_{+D}$ in C major. If [G, B, D] is lower in the chord, then Janeček suggests representing the entire chord as $_{+\ddot{D}}$. If [D♭, F A♭] is lower, then he suggests labeling instead as $_{+\ddot{F}}$. Further, he states that "a triadic component representing a particular function has a stronger effect when perceived as a unit than when its pitches are dispersed or pitches belonging to other functions are inserted between its

[352] Janeček, 225. "*Např. akord* h dis fis *v* C *dur*, *který v přímém vztahu k tónině představuje vzácnou funkci +L, lze chápat ve vztahu k mezi funkčnímu akordu* e g h (–M^4) *jako běžnou mimotonální* +D." Janeček has yet to describe applied chords here, but his approach follows Riemann, labeling applied chords with parentheses.
[353] Janeček, 224.
[354] Janeček, 225. "Níže *položené součásti mají* větší závažnost *než části položené výše*."

pitches."[355] In lieu of an example from Janeček, we can again imagine the above six-note chord [D♭, A♭, F, B, D, G] in C major: If [G], [B], and [D] are stacked in thirds while [D♭], [F], and [A♭] are separated by octaves, Janeček would likely label this triad as $_{+\dot{D}\dot{}}$.

The third consideration is representation. So far, Janeček has assumed combinations of complete triads, but he also allows for the combination of triads that have only one or two pitches. In these cases, if one triad is more complete than the other, it is likely to have a more significant effect on the function of the chord. Take, for example, the dominant seventh chord in C major [G, B, D, F]. The dominant triad, [G, B, D], can obviously be expressed as +D, but there remains an unaccounted-for F. One way to express this chord would be as $^{+S\cdot}_{+D}$. However, Janeček chooses to represent this chord as $_{+\dot{D}}$. Instead of providing the function symbol of S for just one pitch, the dot alone suffices for Janeček. Placing the dot above indicates that the non-triad tone is above the dominant triad, and placing the dot below would indicate that this note is below the dominant triad.

This example also demonstrate a very stark, and perhaps unexpected, way that Janeček departs from both Riemann and Šín—Janeček does not utilize figured bass symbols to indicate tertian extensions or chord inversion. Both Riemann and Šín indicate a dominant seventh chord as a D^7, or if that chordal seventh were to be in the bass, they would label it D^4_2. In Janeček's theory of harmonic function however, everything is either a triad, an incomplete triad, or some combination of triads or incomplete triads.

In this section, I have shown how Janeček accounts for the ambiguous or redundant function labels that his combination function approach introduces. In the following section, I will

[355] Janeček, 225. "*Dále je třeba si uvědomit, že trojzvuková složka, představující určitou funkci, působí výrazněji* jako celek, *než je-li rozptýlena a proložena jednotlivými tóny jiných funkcí.*"

demonstrate how harmonic context informs Janeček's interpretation of those still functionally ambiguous chords.

4.2.3 Harmonic progressions

Given the variety of functional interpretations that Janeček allows, including his 54 functional combinations that ambiguously fit in up to six keys and the many combinations that occur with incomplete triads, functional ambiguity is significantly more prevalent in Janeček's approach than those of his predecessors. Janeček's final factor for disambiguating a chord's harmonic function is harmonic context. As a demonstration of the role harmonic context can play in determining function, Janeček provides the extreme example in (Figure 4.13). Here Janeček shows eight different ways to interpret a single voicing of a functionally ambiguous seven-note chord [F, C, A, E♭, B, D, G], which I will call chord x. In all A) examples, chord x occurs immediately prior to a final tonic chord. Each realization of chord x is also in a different key. In all B) examples, chord x is the antepenultimate chord. The functional interpretation of this chord differs significantly in each case. Almost all of the progressions take a different chord as the tonic. Sometimes, Janeček defines chord x as a single function with added notes, sometimes as multiple functions, sometimes taking the bottom three pitches as the representative triad, and sometimes taking the top.

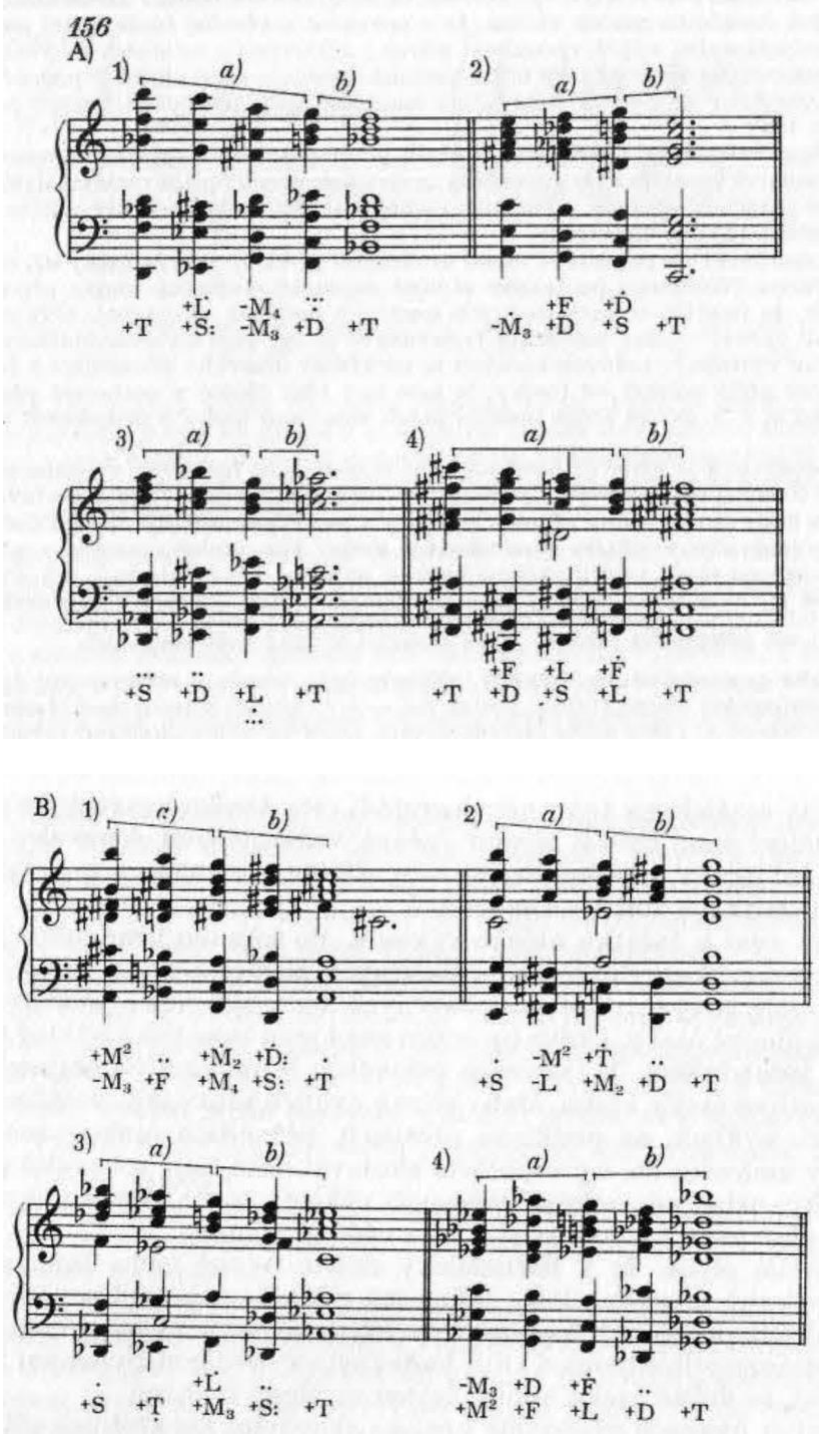


Figure 4.13 Reproduction of Janeček's Example 156, demonstrating eight different ways to interpret the seven-note chord [F, C, A, E♭, B, D, G].[356]

[356] Janeček, 231–32.

In the first measure, the [F, A, C] of chord x is represented as +D in the key of B♭ major. The [E♭] is represented with the singular dot above +D. The additional dots indicate the remaining triad [G, B, D]. In the second measure, the [F, A, C] of chord x is represented as +S in the key of C major. Above that, [G, B, D] is represented as +D, and presumably the dot above +D is meant to indicate the [D#] in between the two triads. In the third measure, we see chord x again, but this time the upper triad [G, B, D] receives the label +L in the key of A♭ major, while the lower four notes are simply represented with dots. Across these three different realizations of chord x, Janeček has labeled chord x in very different ways. Notice especially that Janeček changed which internal triad ([F, A, C] vs [G, B, D]) received a proper function label each time. It seems that he wants to avoid invoking M chord labels, if possible. For example, in measure 1, [G, B, D] in chord x could have been labeled as $+M_3$, but instead, he labeled it with dots. In measure 3, [F, A, C] in chord x could have also been labeled $+M_3$, but again, he labeled it with dots instead.

Janeček gives the following guidance for determining the function of an ambiguous chord or chord progression. First, he explains that "we should consider as simpler, and thus more correct, that functional conception of a chord succession in which the largest number of chords can be subordinate to a single tonic."[357] Secondly, he states that "we should further consider as simpler that functional interpretation of a chord succession in which successions of consecutive chords are perceived as the most common and most intelligible functional progressions."[358] But what constitutes common and intelligible function progressions? Answering this question requires a more comprehensive understanding of Janeček's motivations for writing his treatise.

[357] Janeček, 229. "Za jednodušší (a tudíž i správnější) je třeba považovat takové funkční pojetí souzvukového sledu, podle něhož lze *co největší počet souzvuků podřídit jediné tónice*."
[358] Janeček, 230. "Za jednodušší je dále třeba považovat takové funkční pojetí souzvukového sledu, podle něhož jednotlivé harmonické postupy (sledy sousedících souzvuků) jsou chápány jako *funkční postupy co nejběžnější a nejsrozumitelnější*."

Janeček's goal, as the title of his text tells us, is to understand modern harmony. Janeček finds that modern music often employs an expanded sense of tonality, lying somewhere between tonal and fully atonal idioms. In contrast to Riemann, the goal for Janeček is not to prescribe what is tonal, but rather to describe harmony that lies on this spectrum of tonal and atonal music. His goal is to identify the phenomena that, to use his terms, not only establish a "sense of tonic," but also those that loosen or subvert it. On either end of this spectrum are phenomena that either fully realize or completely negate his underlying principles of harmonic function. The typical three functions, T, S, and D, constitute harmonies that fully agree with Janeček's underlying principles, and therefor clearly establish and maintain a sense of tonic. A progression that negates these principles, like a progression utilizing non-triadic tri-tone related harmonies, completely prevents a sense of tonic from emerging. Importantly however, Janeček's helper functions (F and L) and combination functions do not lie on either extreme of the spectrum between tonality and atonality. Rather, they are in the middle of it, not entirely destroying a sense of tonality, but certainly loosening it. Generally speaking, that which is functionally ambiguous loosens a sense of tonic, while that which is functionally clear establishes a sense of tonic. Distinguishing between the different roles of Janeček's prime functions and helper function is pivotal for understanding his approach to harmonic progressions.

For Janeček, harmonic progressions can either support a sense of tonic or loosen it—that is, they can be tonally clear or ambiguous. He describes two ways that the tonic can be established. Firstly, "by introducing the tonic in a significant place, within a harmonic phrase, emphasizing it, and following this introduction with a progression of non-tonic chords that strengthen, preserve, or at least do not disturb the sense of the tonic."[359] This requirement for the tonic not to be disturbed is

[359] Janeček, 230. "*Uvedením tóniky na význačném místě harmonické věty a jejím zdůrazněním; po tomto uvedení následuje sled souzvuků netónických, jimiž se vědomí posiluje, udržuje nebo aspoň neruší.*"

essentially the principle of the pure tonic (the first of Janeček's three principles underlying harmonic function) and it thus implies his conception of imaginary tones and their cancellation. As we have already seen, the principle of the pure tonic can be summarized as the requirement that the tonic be consonant, and to not be disturbed by uncancelled dissonances from pre-tonic chords. The second way in which a tonic can be created is "by selecting successive non-tonic chords that reliably gravitate toward the tonic; the tonic itself may, although it need not, follow this succession."[360] In this sense Janeček's conception of tonality also requires the principle of the leading tone (the second of his two principle underlying harmonic function). If, for Janeček, a sense of rest is to occur at the end of a closing chord progression, then semi-tone motion in at least one voice is required. Thus, we see that "the leading tone [is] the vehicle of the chord's kinetic energy of the impetus in the chord, as its tendency to flow into the tonic."[361]

Janeček also describes several ways to destroy or loosen a sense of tonic in a harmonic progression, one of which is relevant here.[362] Namely, his helper functions and his combination functions work towards eliminating a sense of tonic. While the subdominant and dominant are functionally close chords that can be used to strengthen the tonic, Lydian and Phyrgian are functionally distant chords that subvert the sense of tonic.[363] This subversion is the product of the inherent ambiguity of Lydian and Phyrgian, which could sound like the subdominant and dominant of the tritone-related key if the original tonic is not established strongly enough. Combination functions also subvert the tonic through their ambiguity. Consider, for example, the fact that many

[360] Janeček, 230. "*Vhodným výběrem do řady sestavených netónických souzvuků, jež do tóniky spolehlivě tíhnou; po této řadě může, avšak nemusí následovat tónika sama; uvedením tóniky se soustředěné tíhnutí předcházejících souzvuků potvrzuje*."
[361] Janeček, 203. "*Na citlivý tón se díváme jako na nositele pohybové síly souzvuku, jeho tendence po vplynutí do tóniky*."
[362] Janeček, 243.
[363] Janeček, "Doplňující poznámky k některým jevům harmonického a tonálního myšlení.," 27."*Přeneseno do řeči hudební teorie to znamená, že existují harmonie funkčně blízké, jichž lze použít při posilování centra - tóniky, a funkčně vzdálené, jejichž nasazení centrum podvrací*."

of Janeček's combination function chords are ambiguous as to their key. If a chord can be equally well interpreted in more than one key, then it is not clearly establishing a sense of tonic.

When Janeček proposes that "we should further consider as simpler that functional interpretation of a chord succession in which successions of consecutive chords are perceived as the most common and most intelligible functional progressions,"[364] he is invoking a view of harmonic function that differentiates between the effect of primary and helper functions. Progressions that utilize primary functions are natural, perfect, classical, simple, stable, etc.[365] Progressions that utilize helper functions or combination functions are unnatural, imperfect, unstable, compound, ambiguous, etc. Thus, when confronting multiple possible interpretations for a chord or a harmonic progression, one should prefer the one that uses more primary functions and fewer helper functions or combination functions. For example, Janeček suggests that it is better to interpret the progression +G to +C as D to T in C major rather than as M_2 to M^3 in A minor.

In this section, I have shown how Janeček uses harmonic context to determine the harmonic function of functionally ambiguous chords. Broadly speaking, he prefers, when given the option, the simplest interpretation of a chord or chord progression. However, questioning what Janeček considers to be "common and intelligible" progressions, emphasized the categorical distinction he draws between primary and helper functions. Primary functions are natural, and they serve to establish a sense of tonic, while helper functions are the opposite, loosening or destroying a sense of tonic.

[364] Janeček, *Základy moderní harmonie*, 230. "Za jednodušší je dále třeba považovat takové funkční pojetí souzvukového sledu, podle něhož jednotlivé harmonické postupy (sledy sousedících souzvuků) jsou chápány jako *funkční postupy co nejběžnější a nejsrozumitelnější*."
[365] Janeček, 227–29.

4.3 Conclusion

Janeček presents his theory of harmonic function as a theory of kinetic forces that arise from static elements and are in relationship to a central tonic chord. Particular kinetic forces, that is functions, are ascribed to triads that serve as representatives of a key. These representatives are determined by three underlying principles: the principle of the pure tonic, the principle of the leading tone, and the functional principle. The three triads that best satisfy the requirements of these principles are the tonic, subdominant, and dominant triads. However, Janeček, in a desire to accommodate modern music, posits two new functions by loosening the requirements of the principle of the pure tonic while fully embracing the principle of the leading tone. The two resulting helper functions are the Lydian and Phrygian functions. To account for other possible harmonies, Janeček adapts Šín's system of combining functions. With it, Janeček is able to assign function to any harmony. Recognizing, however, the number of redundant function labels that this approach makes introduces, Janeček limits to possibilities of functional combination so as to reduce the total number of sonorities in play. Further, since he recognizes that many of these chords are ambiguous in key, he describes how the function of these harmonies depends on harmonic context. Thus, his theory of harmonic function describes kinetic principles, in the sense that the identity of his five functions is based on how chords interact to create an awareness of tonic, and in the sense that the function of a chord depends on the harmonic context in which it appears.

Chapter 5 Conclusions

In this dissertation, I have sought to provide a critical intervention in the field of music theory by undertaking to answer the music-philosophical question of what harmonic function is. To that end, I have provided a history and critical overview of the Czech tradition of conceptualizing harmonic function up to Janeček's *Základy*. I began with Riemann, as the progenitor of harmonic function in general and thus of the Czech tradition as well. I demonstrated, in contrast to prevailing accounts of Riemann's work, that his *Funktionstheorie* is meant to synthesize his most distinctive ideas about harmony—function symbols as a replacement for *Stufentheorie*, his *Kadenzlehre*, his *Harmonieschritte*, his harmonic dualism, and his conception of *Tonalität*—and that this synthesis is facilitated by his foundational analogy between tone relationships and chord relationships. I then examined the work of Otakar Šín, who imported the concept of harmonic function into the Czech lands, but of course, not without first adapting Riemann's *Funktionstheorie* to his own needs. Reading across the two editions of Šín's *Nauka*, I showed the variety of ways that Šín either maintained, jettisoned, or repurposed aspects of Riemann's *Funktionstheorie*. I then proceeded to the harmonic function theory of Karel Janeček, who built on Šín's combination-function labels to create a novel theory featuring a total of five different harmonic functions.

In this chapter, I aim to demonstrate how reading Riemann, Šín, and Janeček in the context of a single lineage of harmonic function can inform our understanding of harmonic function in general. First, in Section 5.1, I clarify the terminology I will use to examine the theories of these three authors. Second, I compare the harmonic functions theories of Šín and Riemann (Section 5.2), and then Janeček and Riemann (Section 5.3). Last, from the interaction of these three theories of harmonic function, I extrapolate hypothetical principles of a generalized theory of harmonic function (section 5.4).

5.1 Clarifying terminology

In this section, I clarify some terminology to facilitate comparisons between the theories of Riemann, Šín, and Janeček. Namely, I distinguish between harmonic function's ability to describe pitch-class content, harmonic syntax, and voice leading between successive chords, which all feature in Riemann's *Funktionstheorie*. In Chapter 2, we saw that function symbols are meant to replace the need for *Stufentheorie* by providing a new approach to describing pitch-class content. We also saw Riemann use his function symbols to define harmonic syntax (T—S—D—T, for example) and the role of individual harmonies within harmonic progressions. Concerning voice leading, Riemann's most powerful approach for conveying information about voice leading is his *Harmonieschritte*, which serve as the basis for his function symbols.

I suggest that conceiving of harmonic function according to the three aspects of pitch-class content, harmonic syntax, and voice leading facilitates comparison between apparently disparate theories of harmonic function, such as those of Riemann, Šín, and Janeček. Consider Šín first. His function symbols, like Riemann's, convey the pitch-class content of a chord, so long as a key is provided. Šín also recognizes the typical progression T—S—D—T, showing how Šín uses harmonic function to describe harmonic syntax. While pitch-class content and harmonic syntax are relatively apparent comparisons to make between Šín and Riemann, examining how Šín treats voice leading reveals a non-obvious connection between the two authors. Šín's natural dominants, which highlight the similar voice leading of D–T and ^{o}S—^{o}T, correlate to Riemann's *Gegenquintschritt* and show at least some interest on Šín's part in using harmonic function to describe voice leading between consecutive chords. For Janeček, pitch-class content and harmonic syntax are also apparent comparisons to make with Riemann—his function symbols specify the pitch-class content of a chord and the function symbols he chooses often rely on the surrounding harmonic context. Again, however, examining how Janeček addresses voice leading—with his imaginary tones and his three

principles of harmonic function—reveals an underlying connection between Riemann's *Harmonieschritte* and Janeček's three principles of harmonic function.

I also suggest that we can draw even finer distinctions and similarities between these theories by adopting Šín's conception of vertical and horizontal consonance. To recall, vertical consonance concerns the relationship of simultaneously sounding tones, while horizontal consonance is a matter of the relationship of consecutive chords. Using these terms, we can say that in the *Vereinfachte Harmonielehre*, Riemann first proposes his theory of vertical consonance and dissonance when discussing the overtone series and tone relationships. He then uses his *Harmonieschritte*, effectively a theory of voice leading between successive chords, to create an analogous theory of horizontal consonance and dissonance—his *Funktionstheorie*. That is, his *Funktionstheorie* is a horizontalization of his understanding of vertical consonance and dissonance. The significance of this statement lies in the fact that the vast majority of Riemann reception broadly treats these three aspects of Riemann's *Funktionstheorie*—the vertical (pitch-class content), the horizontal (harmonic syntax), and voice leading—as separable. Thus, I take the fact that Riemann goes to significant effort to link these three as a hallmark of Riemann's *Funktionstheorie*, and that we can, again, facilitate comparisons between disparate theories of harmonic function, by assessing how they treat vertical and horizontal consonance.

Compare Riemann's treatment of vertical and horizontal consonance to Šín's. In the sense that Šín uses harmonic function to describe harmonic syntax, or the role of individual harmonies in that syntax, we can see that his theory concerns horizontal consonance and dissonance. Where he differs from Riemann however is that his theory does not have a basis in vertical consonance and dissonance. Šín's starting point for his theory of harmonic function is an inherent horizontal dissonance in the overtone series, as opposed to Riemann, who sees the overtone series as the basis for his understanding of vertical consonance and dissonance. For Šín, there is no link between

vertical and horizontal consonance. Šín simply does not maintain this fundamental aspect of Riemann's thought.

Janeček however, like Riemann, does link vertical and horizontal consonance, and he is quite explicit about doing so. In Janeček's terms, he is linking his theory of static harmonic (vertical consonance and dissonance) with his theory of kinetic harmony (harmonic function). Janeček differs from Riemann however in how he makes this link. Riemann connects vertical consonance with horizontal consonance via an analogy facilitated by his *Harmonieschritte*. Janeček has no such analogy. Rather, Janeček's theory of kinetic harmony is simply an extension of his theory of static harmony, facilitated by his imaginary tones, which allow subsequent real pitches to interact. Both vertical and horizontal consonance are a matter of dissonance between real pitches. Vertical dissonance is simply the dissonance of *simultaneous* real pitches, while horizontal dissonance is the dissonance of *subsequent* real pitches, which interact as simultaneously sounding real and imaginary pitches. This is all to say that Janeček assumes this fundamental aspect of Riemann's thought—the inextricability of horizontal consonance from vertical consonance. Despite the fact that Janeček's theory of harmonic function seems very different from Riemann's *Funktionstheorie*, in the sense, Janeček is more "Riemannian" than Šín.

In this section, I demonstrated that the three aspects harmonic function describes (pitch-class content, harmonic syntax, and voice leading), as well as the distinction between vertical and horizontal consonance, are fruitful for facilitating comparison from otherwise disparate theories of harmonic function, like those of Riemann, Šín, Janeček. In the following section, I go into greater detail examining how Šín's treatment of voice leading differs from Riemann's.

5.2 Riemann and Šín

In this section, I continue to examine how Šín's and Riemann's theories of harmonic function differ in their treatment of voice leading, as an exploration of how voice leading can figure into harmonic function. Šín does not adopt Riemann's primary tool for describing voice leading—the *Harmonieschritte*. However, Šín does address voice leading in a variety of ways. The most explicit, and the most Riemannian, is his invocation of "natural dominants." His term "natural dominants," which are the major dominant and the minor subdominant, highlights the similar voice leading of D–T and ^{o}S—^{o}T. Riemann's *Quintschrittklang* highlights the same voice-leading relationship, but more concisely as *Quintschrittklang*—tonic. Another way that Šín discusses voice leading is with his "neighbor dominants," and their various resolutions. In the cases of both natural and neighbor dominants though, voice leading is detached from Šín's theory of harmonic function proper, because both natural and neighbor dominants do not actually impact Šín's approach to harmonic function. Neither Šín's natural or neighbor dominants receive function symbols, nor does he use them in the process of determining his harmonic functions, or in any other way that is integral to his theory of harmonic function. Rather, his natural and neighbor dominants seem to be a case of Šín addressing matters of voice leading or harmonic resolution couched in harmonic function terms.

Where voice leading does figure more significantly into Šín's theory of harmonic function proper is when he establishes both his primary triads and his neighbor triads. For example, in the second edition of *Nauka* (1933), Šín discusses the ideal resolution between the dominant ninth chord and the tonic triad to justify the dominant to tonic relationship. In the first edition of *Nauka* (1922), Šín uses the omitted-note method to derive neighbor triads, which can be understood as a voice leading process. For example, in C major, Šín derives his tonic substitute T_z [C, E, A] from the tonic [C, E, G], via a process where he adds a dissonant sixth to the tonic [C, E, G, A], and then

omits the fifth of the chord [C, E, A]. Going from T [C, E, G] to T_z [C, E, A] is ultimately a matter of voice leading, in which two chord tones are held in common while one moves up by step.

While voice leading figures into both Riemann and Šín's treatment of neighbor triads, We can distinguish between the kind of diatonic voice leading at issue in Šín's theory of harmonic function and the chromatic voice leading considered in Riemann's *Funktionstheorie*. The distinction is most evident when comparing how the two authors label the triad built on [B] in C major. For Riemann, this chord is a minor triad [B, D, F#], with the symbol Ƽ, indicating that it is the *Leittonwechselklang* of the dominant. Clearly, the [F#] is what makes this voice leading chromatic, as opposed to being beholden to the local key or scale. For Šín, this chord is a diminished triad [B, D, F], with the symbol Ø, indicating that it is a dominant seventh chord with the root omitted. Šín's preference here for the diatonic [F], as opposed to the [F#] makes the chord diatonic rather than chromatic. Šín approach is therefore scale-based, while Riemann's aligns with his more chromatic conception of *Tonalität*. If Riemann's considers his *Funktionstheorie*, as I showed in Chapter 2, as part historical development away from scale-based theories of harmony and towards his conception of *Tonalität*, then Šín approach represents a reversion to an older understanding of harmony.

With this section, I hope to have demonstrated the benefit of conceiving of theories of harmonic function in terms of pitch-class content, harmonic syntax, and voice leading. In the case of comparing Šín and Riemann, I focused on how they approach voice leading, showing that despite many surface level ways that Šín follows the *Vereinfachte Harmonielehre*—whether in organization, scope, function symbols, etc.—Šín departs from many of Riemann's fundamental premises. Those included the Riemann's connection of vertical and horizontal consonance, and the Riemann's view of harmony progressing towards *Tonalität*. In the following section, I examine how Šín theory of harmonic function can encourage us to reconsider dualism in Riemann's *Funktionstheorie*.

5.2.1 Dualism and neighbor triads

Another point of comparison between Šín and Riemann questions the extent to which either author's approach to labeling neighbor chords amounts to a hard dualism. As we have seen, the fact that Šín does not conceive of minor triads as emanating from their top note causes significant differences between how Šín and Riemann label neighbor triads. As a reminder, compare Riemann's tonic *parallel* triads in major and minor to Šín's tonic T_z in major and minor. In C major and C minor, Riemann's Tp is [A, C, E], and his ^{o}Tp is [E♭, G, B♭]—Riemann's major and minor *parallel* triads lie on opposite sides of the tonic. Also, with C major and C minor, Šín's T_z is [A, C, E], but his $^{o}T_z$ is [A♭, C, E♭]—Šín's major and minor substitute triads thus lie on the same side of the tonic.

It therefore appears that Šín's neighbor triad labels are conceived in monist terms, whereas Riemann takes the hard dualist approach to his *Nebenklänge*. After all, Riemann's *Nebenklänge* function labels assume that minor triads are generated downward from their prime, while Šín's neighbor triad labels assume minor triads emanate from their root. Specifying *neighbor* triads is important here. While Riemann's assignment of *primary* triads has been criticized for not being fully dual (see Section 2.3), there is widespread agreement that his assignment of *Nebenklänge* is. In Chapter 2, I found it productive to question the dualist critique levelled against Riemann's primary triads. Now, given that we have an apparent dichotomy between dualist and non-dualist assignments of neighbor triads (Riemann's approach vs Šín's), I will question our assumptions about dualism in the assignments of neighbor triads. I will do so by extending Klumpenhouwer's claim about dualism in Riemann's primary triads to Riemann's *Nebeklänge*.

First, let me briefly recapitulate the case of the primary triads, before going on to examine neighbor triads in a similar fashion. Riemann assigns dominant function to the triad a fifth above the tonic and subdominant function to the triad a fifth below the tonic in both major and minor keys.

Most commenters contend that this is not a dualist assignment of functions. Instead, they suggest that Riemann's assignment ought to have been just the opposite in the minor-mode case, on account of harmonic dualism. That is, they suggest that the dominant should have been a fifth above the tonic in major and a fifth below in minor, while the subdominant should have been a fifth below the tonic in major and a fifth above in minor. However, Klumpenhouwer has presented a contrasting, albeit minority, view. He suggests that Riemann's arrangement of the primary triads is, in fact, a hard dualist arrangement.[366] With the example reproduced in Figure 5.1, Klumpenhouwer argues that in major triads the two non-prime elements emanate from the prime, and in minor triads the same intervals between elements are maintained, but their direction is reversed, providing the necessary inversion between major and minor triads for harmonic dualism. You can see this inversion by looking at the Major and the Minor *Klänge* in Figure 5.1. Notice that the arrows are pointing away from the prime "I" in major, but they point towards the prime in minor. Then, addressing Riemann's actual assignment of primary functions, the subdominant and dominant emanate from the tonic via *Quintschritt* and *Gegenquintschritt*, and in minor those *Harmonieschritte* are maintained, but again, the direction of those operations is reversed. This reversal provides the necessary inversion between major and minor. Figure 5.2 then, is my rendering of the supposed hard dualist assignment of primary functions. Here, there is no reversal in the direction of the operations, and thus, Klumpenhouwer argues, it lacks the necessary inversion between major and minor. That is, comparing the major system in Figure 5.1, to the minor system in Figure 5.2, both arrows point away from the tonic, so there is no reversal in direction and no inversion.

[366] Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative." Also summarized in Section 2.3.

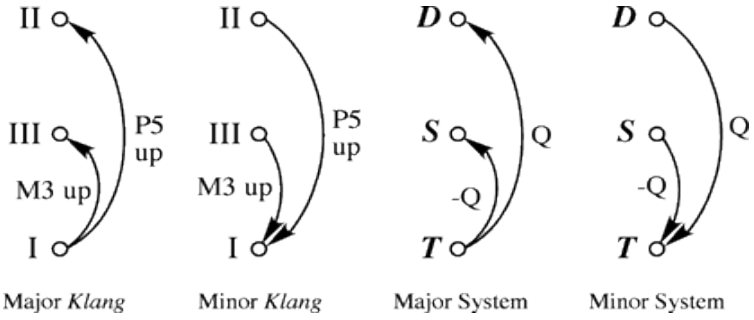


Figure 5.1 Klumpenhouwer's figures comparing Riemann's functional assignments for T, S, and D to Hauptmann's conception of the major and minor triads (*Klänge*).

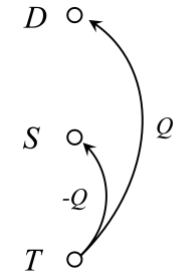
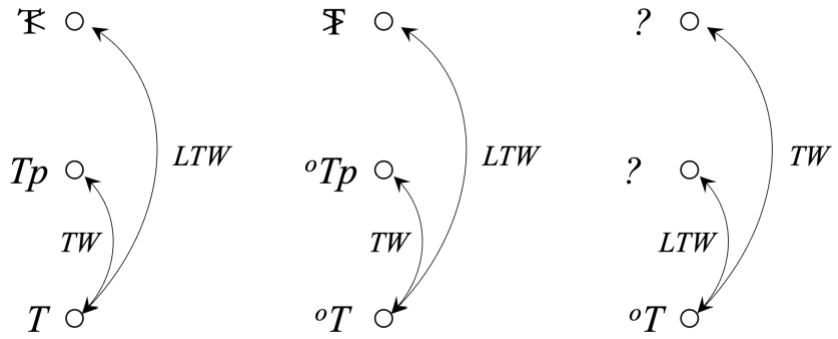


Figure 5.2 A redrawing of Klumpenhouwer's chord structure diagram to convey the "fully dual" arrangement of Riemann's function labels for the minor system.

Now I will use the same method to assess the assignment of harmonic functions to neighbor triads in Riemann and in Šín. That is, I extend Klumpenhouwer's argument about Riemann's *Hauptklänge* to Riemann's *Nebenklänge*. The first step involves examining how, in Riemann's approach, the tonic triad is related by *Terzwechsel* to the *Parallelklang* and by *Leittonwechsel* to the *Leittonwechselklang* (Figure 5.3). These relationships hold true for both the major and minor cases, so there is no inversion in play. Because *Wechseln* are involutions—any *Wechsel* is its own inverse—reversing the operation does not give a new result, which I demonstrate with the double-headed arrows in Figure 5.3. If harmonic dualism necessitates that there be some inversion between major

and minor, as Klumpenhouwer suggests, then by that definition Riemann's *Nebenklänge* assignments are not fully dual.



Riemann Major Riemann Minor Minor with swapped *Harmonieschritte*

Figure 5.3 Diagrams, after Klumpenhouwer, comparing Riemann's *Nebenklänge* function labels to a hypothetical arrangement of minor *Nebenklänge* with swapped *Harmonieschritte*. TW stands for *Terzwechsel*, while LTW stands for *Leittonwechsel*.

The second step is to then consider if there is some way to achieve an inversion with the minor *Nebenklänge*. There are, in fact, other ways to achieve an inverse relationship between major and minor besides reversing the direction of the operation. Looking back at Klumpenhouwer's argument about primary triads provides this alternate way. When we considered the inversion in Riemann's *Quintschritt* and *Gegenquintschritt* (Figure 5.2), which was brought about by changing the direction of those *Harmonieschritte*, the same effect could have been produced by simply swapping the *Harmonieschritte*; that is, by replacing the *Quintschritt* with a *Gegenquintschritt* and vice versa. This suggests that an inversion can be achieved by swapping *Harmonieschritte*, rather than reversing them.

The third step then is to apply this swap to the minor *Nebenklänge*. In lieu of reversing the direction of these *Wechseln*, we could instead cause an inversion by swapping the operations, as show in Figure 5.3. The key difference is that in the third diagram, labeled "Minor with swapped *Harmonieschritte*," the *Terzwechsel* and the *Leittonwechsel* have swapped positions.

The result of this swap is an arrangement of tonic neighbor triads that matches Šín's arrangement. That is, while Riemann's *Nebenklänge* lie on opposite sides of the tonic whether in a major or a minor key, swapping the *Harmonieschritte* in minor causes the corresponding *Nebenklänge* to lie on the same side of the tonic in both major and minor, which is how Šín arranges his neighbor triads. For example, as we have already seen in Šín's arrangement, the neighbor triad built on VI in major corresponds to the neighbor triad built on ♭VI (both are below the tonic), while the neighbor triad built on III in major corresponds to the neighbor triad built on III in minor (both are above the tonic). If a dualist arrangement of triads requires some sort of inversion of operations, then it would appear that Šín's neighbor triad labels are in fact dualist.

This conclusion however—that Riemann's *Nebenklänge* labels are not dual, and that Šín's neighbor triad labels are fully dual—is remarkably unintuitive. In fact, it is so unintuitive that it can serve as a *reductio ad absurdum* of Klumpenhouwer's dualist reading of Riemann's primary triads. As we saw, the primary reason for the difference between Riemann's *Nebenklänge* labels and Šín's neighbor triad labels are that Riemann claims that minor triads are generated downwards from their prime, while Šín holds that minor triads emanate upwards from their root. That is, Riemann's view is inarguably the dualist position, while Šín's is the monist one. Suggesting the opposite, which working out Klumpenhouwer's argument to its conclusions does, is entirely contradictory.

The contradiction above stems from the fact that there are many ways that harmonic dualism can be defined. The *Oxford Handbook of Neo-Riemannian Music Theories* describes a dualistic framework as one in which "the minor triad is recognized as the mirror-symmetric image of the major."[367] This definition is open ended, because it does not specify how exactly the minor triad mirrors or inverts the major. Further, this definition specifies nothing about how dualism applies to

[367] Gollin and Rehding, *The Oxford Handbook of Neo-Riemannian Music Theories*, 578–79.

entities besides the major and minor triads.[368] Can major and minor *keys* participate in a dualistic framework? How would harmonic dualism apply to scales, chord progressions, and any other musical phenomena? The problem that Klumpenhouwer seems to be addressing is the question of where the necessary inversion between major and minor actually takes place. Those, like Ary Belinfante, who suggest that Riemann's minor dominant should be below the tonic see inversion as a changing of direction between major and minor—if something is above the tonic in major, it should be below the tonic minor, and *vice versa*. Klumpenhouwer instead suggests that the requisite inversion takes place by changing the direction of the *Harmonieschritte*—there is a *Quintschritt* between the tonic and the dominant, but in major it proceeds from the tonic, while in minor it proceeds from the dominant. My extension of Klumpenhouwer's argument to neighbor triads also differs because it required that the necessary inversion take place by swapping *Harmonieschritte*.

My point here is to disagree with Klumpenhouwer, in that I do not find Klumpenhouwer's understanding of Riemann's primary triads to be a "reasonable structural refutation of Belinfante's criticism."[369] Klumpenhouwer's counter argument, as we saw above, is not perfect, and it ignores an intuitive understanding of harmonic dualism. That is, we saw that swapping *Harmonieschritte* led to the unintuitive conclusion that Riemann's *Nebenklänge* labels are not fully dual. These contradictory claims stem from the question of where exactly one places the necessary inversion when devising how to implement harmonic dualism. Given the above unintuitive conclusion, I do not agree that "the traditional attacks on harmonic dualism that focus on putative structural contradictions in the system," such as Belinfante's, are "entirely unjustified." In place of Klumpenhouwer's argument against Belinfante, as I suggest in Chapter 2, Riemann has good reasons for not taking the "fully

[368] Stephanie Venturino comes to a similar conclusion about dualism in general: "Dualism does not represent a single project but an assortment or family of projects. While the equal generation of major and minor objects—often achieved via symmetry, inversion, or reversal—stands at the center of any dualism, the musical objects under consideration vary. Dualist principles can be applied independently to theories of intervals, chord models, tonality, and harmonic function." Venturino, "Dualist Approaches to Resonance in French Music and Music Theory, 1900–1960," 254.
[369] Klumpenhouwer, "Harmonic Dualism as Historical and Structural Imperative," 203.

dual" approach, and focusing on whether or not Riemann's approach constitutes hard dualism ignores the more interesting question of why he arranged his functions the way he did.[370]

5.3 Riemann and Janeček

In this section, I argue that despite what appear to be significant differences in their theories, Janeček's and Riemann's theories of harmonic function are similar in some fundamental ways. There are of course, many differences between Riemann and Janeček. Riemann utilizes harmonic dualism, while Janeček does not. Riemann has three functions, while Janeček has five. Riemann focuses on tertian harmonies, while Janeček can interpret any chord as some function. However, there are many ways that Janeček's theory resembles Riemann's *Funktionstheorie*. One of those we have already discussed in Section Figure 5.1—that both Riemann and Janeček link vertical consonance with horizontal consonance.

The first additional similarity I highlight between Riemann and Janeček is that: both explore different ways to measure relatedness; both suggest new functions according to those measures; both treat those new functions as deficient. Consider Janeček first, who is concerned with fifth and semi-tone related chords. The fifth-related harmonies, the subdominant and the dominant, constitute his primary functions, while the semi-tone-related harmonies, the Phyrgian and Lydian chords, constitute his new helper functions. While he considers these helper functions to be independent functions, they are deficient in the sense that they loosen a sense of tonality, rather than establish a sense of tonality. The situation is similar with Riemann, who is concerned with fifth-related and third-related harmonies. In the *Vereinfachte Harmonielehre*, Riemann suggests that much as dominants are essentially triads built on the nearest related note of the tonic triad (the fifth), there

[370] I do however agree that harmonic dualism can be a "good, legitimate, and useful perspective which can generate enlightening accounts of tonal pieces of music." Klumpenhouwer, 194.

could also be triads built on the third of the tonic triad with a kind of dominant significance.[371] To paraphrase, he suggests that in C major, the E major triad and the A♭ major triad could be elevated to the status of *Hauptklänge*. In the sixth edition of *Handbuch der Harmonielehre* (1917), Riemann labels these chords with the symbols "3" and "III" (in the key of C major, E+ and Ab+). Riemann's suggested new functions are deficient in the sense he never treats them as *Hauptklänge* proper. That is, he never derives *Nebenklänge* from them.[372]

Another similarity is to be found between the three principles that underlying Janeček's harmonic functions (the principle of the pure tonic, the principle of the leading tone, and the functional principle) and Riemann's *Harmonieschritte*. Even though Janeček does not adopt Riemann's *Harmonieschritte*, I want to suggest that his three principles replace Riemann's *Harmonieschritte* in some ways. For example, Janeček's functional principle requires that pre-tonic chords come in pairs equidistant from the tonic. This requirement is implicit in Riemann's *Funktionstheorie*, because Riemann's functions come in pairs of *Harmonieschritte*, like the dominant and subdominant triads, which are either a *Quintschritt* or its opposite (the *Gegenquintschritt*) from the tonic. Janeček's requirement that both pre-tonic chords must be consonant is also implicit in Riemann's *Funktionstheorie*, because Riemann's *Harmonieschritte* only connect major and minor triads, which are by definition consonant. Janeček's requirement that pre-tonic chords have the same number of common tones with the tonic, as well as his leading tone principle, captures the way that Riemann's

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[371] Riemann, *Vereinfachte Harmonielehre*, 181. "Namely — considered purely harmonically without having regard to scales — the *Quintschrittklang* (D in Major and S in Minor) is nothing more than the nearest related partial note of the tonic triad, detached, so to speak, and rendered independent as representative of its own clang, the idea suggests itself of rendering the third-note independent in the same fashion, separating from the triad of the tonic and confronting it with the latter as the bearer of its own triad; then a kind of dominant significance will attach to the *Terzschritt* [E major in C major] of the major tonic, similar to that of the *Quintschrittklang*, and the *Gegenterzschritt* [A♭ Major in C Major] may also lay claim to a kind of under-dominant significance, while in minor, here as everywhere, the relations will turn out exactly reversed."

[372] For more discussion of this, see Rehding, "Tonality between Rule and Repertory; Or, Riemann's Functions—Beethoven's Function."

Harmonieschritte preserve voice leading relationships with opposite *Schritte*, like the *Quintschritt* from the dominant to tonic and the *Gegenquintschritt* from the tonic to the subdominant.

The final similarity I highlight between Riemann and Janeček is in the scope of their projects. I have argued that Riemann's theory of harmonic function constitutes an attempt to reconcile a diatonic understanding of tonality with chromatic third-related progressions. In a similar way, Janeček's theory of harmonic function constitutes an attempt to reconcile Riemannian harmonic function with the new harmonic possibilities of twentieth century music. That is, Janeček recognizes the appropriateness of what he calls the "classical three-member system of harmonic function" in analyzing music of a particular style, but Janeček is devising a theory for twentieth-century music. With both Riemann and Janeček, harmonic function is a tool used by the theorist to address what they consider the expanding outer bounds of tonality. Janeček's bounds are much wider than Riemann's, but that is just a matter of degree.

5.4 Harmonic function in general

In this section, I propose several ways in which my examination of the Czech tradition of harmonic function from Riemann to Janeček informs our understanding of harmonic function in general. First, I summarize this tradition. With his *Funktionstheorie*, Riemann develops a theory of chord relationships (or horizontal consonance and dissonance) understood analogously to tone relationships (or vertical consonance and dissonance). This analogy is facilitated by his dualistically conceived *Harmonieschritte*. His larger goal is to develop a theory of harmony this is in line with his conception of *Tonalität*, breaking free of scale-based conceptions of harmony.

Though Riemann's aspiration is grand, his *Funktionstheorie* is not without its inconsistencies and ambiguities, nor are his goals wholly achieved. Riemann's harmonic dualism is inconsistent, even if, as I have argued, there are good reasons for it to be so. His understanding of third- and fifth-

related harmonies is ambiguous—not only in defining musical relatedness, as I address earlier in this chapter, but also in the question of how chromatic third relations fit into his *Funktionstheorie*. If we think of Riemann's *Funktionstheorie* in terms of its ability to describe pitch-class content, harmonic syntax, and voice leading, it is exciting to see that Riemann attempts to integrate these three aspects that were treated separably in his previous writings. Nevertheless, it seems that by integrating these three aspects into one theory, Riemann is also limited in his ability to describe those aspects. For example, Riemann's *Harmonieschritte* can more clearly describe the voice leading between many more chords than his *Funktionstheorie* can; at times, it also seems that Riemann's *Harmonieschritte* are better at capturing Riemann's dualist understanding of harmonic progressions than his *Funktionstheorie*; further, his function symbols are simply less efficient than his *Klangschlüssel* at describe the pitch-class content of a harmony.

Šín reimagined Riemann's *Funktionstheorie* without the *Harmonieschritte* and mostly without harmonic dualism, despite occasionally making suggestions consistent with harmonic dualism. Without the *Harmonieschritte*, Šín had to devise a different way to derive his neighbor triads. In the first edition of *Nauka* (1922), he borrowed Riemann's omitted-note method, which was only possible because Šín allowed for a vertically dissonant tonic chord. In the second edition of *Nauka* (1933), he instead proposed his novel combination function approach. With both editions, his neighbor triads demonstrate a scale-based understanding of harmony, given that his neighbor triads are entirely diatonic, especially in comparison to Riemann's, whose neighbor triads introduce some chromaticism.

In terms of the three aspects of harmonic function, Šín is much less concerned with aspects of voice leading than Riemann. While his natural dominants and neighbor dominants show some concern with voice leading, their ancillary treatment in his theory of harmonic function reveals that Šín did not integrate voice leading into the theory itself. In terms of vertical and horizontal

consonance, Šín did not take up Riemann's foundational analogy. Where Riemann used voice leading to horizontalize his understanding of vertical consonance and dissonance into his *Funktionstheorie*, Šín's theory of harmonic function (also a theory of horizontal consonance and dissonance), ultimately is not affected by voice leading or his understanding of vertical consonance and dissonance.

Janeček returns to idea of linking the vertical and the horizontal—in Janeček's terms, static and kinetic harmony. He does so without the *Harmonieschritte*. Instead, he suggests that there are several principles underlying harmonic function, many of which seem to overlap with qualities of Riemann's *Harmonieschritte*. He then uses those principles to justify the primary triads of tonic, subdominant, and dominant, or, as he explains, the established three-function approach of his predecessors Riemann and Šín. Recognizing that this approach to harmonic function is not sufficient for describing more chromatic music, he seeks to expand the limits of harmonic function. He does so by suggesting his two new functions, Lydian and Phrygian, which he sees as the next best candidates for harmonic functions based on his underlying principles of harmonic function.

In terms of the three aspects of harmonic function, voice leading figures heavily into Janeček's underlying principles of harmonic function. In terms of Riemann's foundational analogy, Janeček is, like Riemann, concerned with linking the vertical and the horizontal. Janeček however does it without an analogy. Instead, his imaginary tones extend pitches in time, allowing subsequent pitches to interact according to his rules of vertical consonance and dissonance. For Janeček, there is not analogy between the vertical and the horizontal. Rather, horizontal consonance and dissonance is a product of vertical consonance and dissonance. However, Janeček's approach is also not without its problems, the most significant of which being the fact that he considers his Lydian and Phrygian functions as loosening an awareness to tonic, which calls into question the extent to which these can be functions at all.

The first suggestion that I make for harmonic function in general is that, like we have seen with Riemann and Janeček, harmonic function can describe not only the vertical and the horizontal, but it can be conceived of in a way where the horizontal is intertwined with the vertical. For Riemann, this was via an analogy facilitated by the *Harmonieschritte*. Janeček achieved this link with his imaginary tones, in effect dispensing with the distinction between vertical and horizontal consonance and instead allowing horizontal consonance to be a product of vertical consonance. These two different approaches suggest, at least, that linking the vertical and the horizontal is attractive and that there might be many ways to do so. This is not to say that theories of harmonic function need to link the two, but to acknowledge this as a trend in theories of harmonic function for further examination.

My second suggestion is that, if we accept that there can be more than the three harmonic functions, the additional function need not necessarily be Riemann's chromatically third-related harmonies—3 and III. Kirkegaard-Larsen finds that a focus on third-related chords to be characteristic of the European tradition of what he calls "Post-Riemannian" theories.[373] However, Janeček showed use that other chords besides those that are third-related might serve as strong candidates for extra functions. In particular, I found it appealing that Janeček's subdominant and dominant correspond to fifth cycles, while his Lydian and Phrygian functions correspond to semi-tone cycles, which are the only interval cycles that complete the chromatic aggregate.[374]

My third suggestion is that the *Harmonieschritte* and harmonic dualism either are, or capture some aspects that are, in some sense integral to harmonic function, or at least to any theory of harmonic function that is concerned with linking the vertical and the horizontal. I suggest this

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[373] Kirkegaard-Larsen, "Analytical Practices in Western Music Theory," 430.

[374] Later Czech theorists will suggest other interesting alternatives. For example, Karel Risinger suggests that the opposite of the dominant triad (take [G, B, D] in C major, for example) should be [B♭, D♭, F], because [G, B, D] resolves to C via a perfect fourth up, a half-step up, and a whole step down, while [B♭, D♭, F] resolves to C via a perfect fourth down, a half-step down, and a whole step up.

because both Šín and Janeček import aspects of the *Harmonieschritte* or harmonic dualism into their thought, despite the fact that they both explicitly reject Riemann's harmonic dualism, and the fact that they both do not assume his *Harmonieschritte*. With Šín, we saw this with his natural dominants, which correspond to Riemann's *Quintschrittklang*. With Janeček, we saw this in the way that his underlying principles overlap with the *Harmonieschritte* in a variety of ways.

5.5 Final remarks

In this dissertation, I have examined the Czech tradition of theorizing harmonic function. Beginning with Riemann as the term's progenitor, I have offered several corrections to prevailing accounts of his *Funktionstheorie*. I showed the Riemann conceives of harmonic function as a theory of chord relationships developed analogously to his understanding of tone relationships—that his *Funktionstheorie* horizontalizes his theory of vertical consonance and dissonance. I also showed how Šín and Janeček maintained, jettisoned, or repurposed aspects of Riemann's *Funktionstheorie*, leading to some general observations about harmonic function. I hope to have provided a sufficient framework for continuing to examine Riemann's reception with the goal of providing a broad answer to the music-philosophical question of what harmonic function is.

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