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Neo-Riemannian Theory at the Movies

Theoretical Background

There is a strain in musicology that holds pantriadic chromaticism to be, at its heart, anomalous. On this view, pantriadicism subverts normative functional tonality but does not offer a systematic tonal practice in its place. It is a daub of harmonic color, a phenomenon of the musical surface whose disruptiveness lends it expressive power but not coherence. Suzannah Clark, noting the persistence of this attitude in the reception of Franz Schubert's music, cautions us not to use the inherent otherness of chromaticism as an excuse to abandon analytical precision. The otherworldliness of, for example, the hexatonic pole relation (e.g., CM⇨A♭m) ought not imply "that the theoretical explanation needs to match the sound, or that we need to be kept in the dark" (2011b: 202). Rather, it should be a call to action, a spur to invent new and more inclusive forms of coherence, for "music theory to catch up with the musicological imagination." Clark claims that providing a theoretical account of an uncanny harmonic effect no more divests it of wonder than does explaining a good magic trick. Indeed, it offers a new form of wonder, the kind that arises from deeper understanding. The theoretical lacuna located around chromaticism can, Clark argues, be filled (in part) with the tools of neo-Riemannian theory. And it is therefore to the nuts and bolts of this system that we now turn.

The goal of this chapter is to take the three issues previously described in mostly abstract terms—expressivity, transformation, and pantriadicism—and develop from them the methodology of neo-Riemannian theory. In the following pages I hope to provide a user-friendly introduction to the NRT toolkit. Admittedly, neo-Riemannian techniques alone cannot fully describe how we parse triadic chromaticism in film, either unconsciously as passive viewers or actively as close readers. But when it comes to providing a way of thinking about the "*ars pantriadica*" on its own terms—not as a distorted form of tonality or a transitional step on route to atonality—no framework is more illuminating, no approach more able to open our minds to broader issues of musical coherence and expressivity.

NRT helps articulate many aspects of how chromatic harmony operates in film. But there remains a curious tension innate to filmic pantriadicism that makes the idiom resist theorization: it is at once (a) clichéd and well-understood and

(b) intrinsically challenging and disruptive. The comprehensibility of pantriadic harmony resides in a strategic feeling of tonal ambiguity, a kind of easily intelligible form of musical unintelligibility. This is not as paradoxical as it sounds. Plenty of other cinematic techniques, like jump cuts and nonlinear editing, are inherently unruly, but become understood after sufficient exposure. Pantriadicism's "weirdness" nevertheless does lead to a tricky question: can we make sense of this music without at the same time stripping it of its disruptiveness, its intended feeling of difference?[1] It is my belief that NRT can thread this needle, largely thanks to its transformational nature and its eclectic collection of analytical tools. I sketched some of these assets in the previous chapter and now expand on them more thoroughly.

NRT revolves around a fundamental conceptual dichotomy, first formulated by music theorist David Lewin.[2] Lewin proposed two modes of understanding musical relationships: the **interval**, which is discrete and object-like; and the **transformation**, which is dynamic and predicate-like. The intervallic perspective approaches musical relationships with the attitude of a passive witness, measuring out distances between discrete objects. The transformational perspective, as we have seen, treats these relationships as processes and actions that the music, and/or an engaged auditor, enact in some way. (Whether these actions are performed, discovered, or imagined depends on the analyst's preference, plus some assumptions concerning listener psychology).[3] Transformational analyses emphasize motion, energy, and action; they invite us to see harmony not as something that is, but something that *does*.[4] When cultivated in the study of film music, this ***transformational attitude*** ensures precedence is given to the harmonic gestures that power meaning, impart expressivity, and erect dramatic structures in time.

Despite its acceptance into the disciplinary mainstream of music theory, NRT is less a theoretical monolith than a web of interconnected insights and tools, all of which aim to inform the analysis of nonfunctional, noncentric triadic chromaticism. The designation of "Riemannian" stems from Lewin's revival of a cluster of ideas originating from the theorist Hugo Riemann (1849–1919), and nineteenth-century German music theory more generally. Especially relevant to Lewin was Riemann's interest in formalizing the relationships between triads. During his long career, Riemann put forth a number of systems for analyzing triadic harmony. One such system revolved around his basic tonal functions, which we now take almost for granted in modern music theory: the tonic, dominant, and subdominant. In Riemann's scheme, these tonal pillars could be subjected to an assortment of alterations based on small pitch displacements, without the chord's underlying tonal identity changing. The resulting alterations ("apparent consonances," in Riemann's lingo) allow for aberrant chords to be related to a more paradigmatic tonal function. For example, a D♭ major triad in the key of C might be interpreted as an altered form of the minor subdominant, with D♭ a semitonal substitute for the chordal fifth of the iv chord, C♮. That minor subdominant, in turn, is the product of a displacement of the normally natural sixth scale degree, A♭ for A♮. Strange, nondiatonic sonorities may thus be tamed, treated as modified and displaced variations of an underlying tonal pillar.[5]

Despite the relational quality of these descriptions, they remained for Riemann adjectives *for* chords, rather than actions performed upon them. However, Riemann also proposed a different system, the *Harmonieschritte* (harmonic steps), which had a more patently transformational character. Like the apparent consonances, this system could result in elaborate, pseudo-algebraic labels for chords, but the emphasis is more clearly on the relationship *between* triads rather than the identity of one triad within the context of a given key. These relationships are based not so much on pitch displacement as on transposition by root interval (chiefly by fifths and major thirds) and inversion (chiefly by flipping the direction a triad was built from its root, either up or down).[6] Sticking with the example of a CM to D♭M progression, Riemann's account for the chromatic chord is *Gegenleittonschritt* (counter-leading-tone step). This term derives not from a step relationship as the German label suggests, but a conjunction of a mode-flipping fifth transformation (yielding an intermediary Fm, like before) and then a downward major third. The combinatorial potential of these operations is high, enabling the listener another means of relating extremely distant tonal regions to one another in a rational and systematic way.[7]

Lewin's innovation was to take a number of the Riemannian non-transformational functional displacements and treat them *as if* they were *Harmonieschritte*—that is, as actions on a chord, rather than intrinsic properties of a chord. This change in perspective thereby infuses a useful, if inert, system of relating triads with transformational energy. Three displacements, adapted into a group of transformations, have become synonymous with neo-Riemannian theory: **L**, **P**, and **R**. I formally define these neo-Riemannian operations (NROs) in the next section, but for now it is worth noting that they can be thought of as actions that displace a single pitch by one or two semitones. **L** turns C major into E minor and vice versa (swapping the pitch C for B). **P** flips a triad's mode, transforming C major into C minor (swapping E♮ for E♭). And **R** takes us from C major to A minor (exchanging G for A).[8] Relevant to Lewin's project is the fact that these three transformations do not alter the underlying function of a triad. For example, applying **L**, **P**, or **R** to a F-major triad in the key of C does not change the chord's essential subdominant function. The resulting chords of Am, Fm, and Dm are all syntactically, if not sonically—and certainly not qualitatively—interchangeable.

The functional implications of these neo-Riemannian operations retreated in importance as more people began exploring this new theory. Further refinements to the neo-Riemannian system of relations came from scholars like Brian Hyer, Henry Klumpenhouwer, and Richard Cohn, who continued Lewin's project of actualizing the transformational potential of Riemann's labeling system.[9] They accomplished this project by (a) laying out the algebraic group structure formed by these transformations, and (b) more explicitly wiping away the need for functional tonal context. This process makes NRT quite distinct from its function-obsessed paleo-Riemannian predecessor. As Nora Engebretsen (2011: 355) observes, modern neo-Riemannian theorists "retain names associated with Riemann's function theory" while adopting the mindset of the *Harmonieschritte*, describing "only local relationships between chords, saying nothing about the meaning of those chords within a key."

While listeners of all sorts of music are already aurally well accustomed to these transformations, the act of providing them with an explicit name and a system for combining them is tremendously useful. The neo-Riemannian lexicon makes recognizing triadic transformations easier; it assists in relating diverse harmonic phenomena (or distinguishing superficially similar phenomena); and it invites all sorts of larger-scale textual and stylistic explorations, which we will embark on shortly. However, despite serving as neo-Riemannian's unofficial emblems, **L**, **P**, and **R** do not represent all that the theory is interested in, nor must they be recruited in order for an analysis to be neo-Riemannian in spirit. NRT, as expanded and codified over the course of the 1990s and 2000s, involves a number of conceptual priorities that together render it highly useful for the analysis of pantriadic film music. These attributes also distinguish it from other theories of "Second Practice" tonality, such as tonal pairing or chromaticized diatonicism, which we encountered back in Chapter 1. The five traits outlined below, inspired by a similar list by Cohn (1998) all relate in some way back to the shift in perspective from intervallic to transformational thinking.

Combinatoriality: A well-defined group of triadic transformations like **L**, **P**, and **R** can model any conceivable relation between the twenty-four major and minor triads. (In fact, **L** and **R** alone are sufficient.) By themselves, these *unary* transformations assume the status of NRT's harmonic atoms. More complex progressions can be provided with unary labels, or they can be "built" out of these atoms, resulting in transformational *compounds* of varying length and intricacy. Repeating compound transformations can generate harmonic cycles and the pitch collections (e.g., hexatonic, octatonic) associated with them.

Parsimony: The neo-Riemannian transformations privilege progressions with smooth, incremental voice leading and retained common tones. **L**, **P**, and **R** all hold two pitch classes (pcs) fixed while shifting the remaining pc by no more than a major second. The NROs are the only progressions that can do so, and accordingly they are esteemed highly in a repertoire in which harmonic shifts—and so some argue, harmonic coherence—are accomplished with parsimonious voice leading.[10] The emphasis on parsimony also alerts the analyst to instances of linear *roughness*, which may arise through complex progressions lacking common tones, but also from abstractly parsimonious progressions in cases in which literal voice leading is disjunct rather than smooth.

Contextuality: Neo-Riemannian transformations are context-sensitive, with differing transformations able to convey differing interpretations of the same harmonic event. The individual members of the **LPR** group possess another, more mathematical kind of context dependency; they act in equal and opposite ways on triads of opposing mode. This "dualistic" symmetry allows, for example, for apparently different-sounding progressions to be treated in a highly specific sense as equivalent.[11] Other transformations, including all transpositions, are by contrast less contextually driven, responding in the same way to major and minor triads.

Tonal Agnosticism: As actions on pitch classes rather than diatonically specified scale steps, the NROs are noncommittal with regard to both tonal function and enharmonic spelling. This agnosticism frees the analyst from some of the stumbling blocks inherent in studying pantriadic chromaticism, such as the way functional theories can break down when swamped with symmetrical progressions, enharmonic paradoxes, and ambiguous tonal centers.[12] Tonal agnosticism does not so much repudiate the existence of stable pitch centers as it brackets the issue, allowing analysts to concentrate on other interesting aspects of harmony without distraction.

Spatiality: Triadic transformations can model how listeners traverse tonal space, allowing the analyst to represent harmonic progressions visually in such a way that reveals interesting structural or perceptual features. Tonal geometries can be used for a variety of purposes, including representing musical pathways, calculating intertriadic distances, and discovering musical patterns. A predetermined geometry may be determined by the iteration of a number of operations, which grants it consistency and generalizability. Alternatively, the music being analyzed may itself determine the shape of a network; though more ad hoc, such diagrams are often more visually elegant and better at reflecting the transformational particularities of a specific piece.

Taken together, these features provide a framework for approaching cinematic chromaticism. The highly formal nature of some of these tools should not dissuade more critically oriented readers, however. A good neo-Riemannian analysis is neither a statement about the group structure of a set of operations, nor the presence of tight voice leading, nor the path taken within tonal space. Least of all is it a rote application of transformational labels. Rather, NRT provides a means for characterizing the harmonic relations that a listener experiences, or might wish to entertain, while parsing a musical text. Every transformation label amounts to an *interpretation* of a musical event. NRT's richest resource lies in how it enables events to be read in terms of others, as part of a network of musical potentialities. It allows the characterization of relationships readily apparent, and the discovery of relationships buried but significant.

Triadic Transformations in Theory

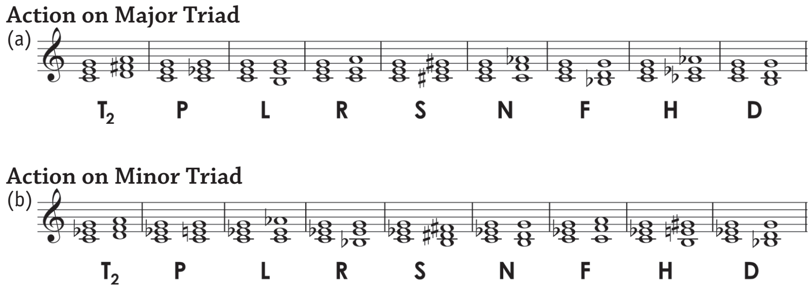
Triadic transformations are the basic words in neo-Riemannian theory's vocabulary. Having a precise language for triadic progressions saves us from the under-descriptive catch-alls that frequently afflict discussions of chromatic repertoires—ideas like the evocative but non-explanatory adjective "coloristic" or the far too loosely applied notion of polytonality.[13] Particularly problematic is the term "unrelated" when it is used to describe any unconventional succession of keys or chords. Smuggled in by this descriptor is the erroneous assumption that only diatonic intervals can serve as yardsticks for meaningful tonal relationships.[14] However, what seems genuinely erratic or unrelated by diatonic logic can exhibit just as sturdy a logic by other relational parameters.

The inventory of transformations employed for the rest of this book is presented in Table 3.1. The supplementary Table 3.2 illustrates each transformation using the smoothest possible voice leading, once on C major and once on C minor. Even readers already familiar with the standard neo-Riemannian nomenclature

Table 3.1 **Triadic transformations**

	Transformation	*Action on CM/Cm*	*Definition*
Basic	$\mathbf{T}_n$	$\mathbf{T_2}$(CM) = DM $\mathbf{T_2}$(Cm) = Dm	Transpose by *n*-many semitones
	Parallel	**P**(CM) = Cm **P**(Cm) = CM	Go to parallel major/minor
	Leading Tone	**L**(CM) = Em **L**(Cm) = A♭M	Go to leading-tone exchange major/minor
	Relative	**R**(CM) = Am **R**(Cm) = E♭M	Go to relative major/minor
Derived	**S**lide	**S**(CM) = C♯m **S**(Cm) = BM	Go to triad with same third ($\hat{3}$)
	Near Fifth	**N**(CM) = Fm **N**(Cm) = GM	Go to fifth-related triad where common tone is $\hat{1}$ of major triad/$\hat{5}$ of minor triad
	Far Fifth	**F**(CM) = Gm **F**(Cm) = FM	Go to fifth-related triad where common tone is $\hat{5}$ of major triad/$\hat{1}$ of minor triad
	Hexatonic Pole	**H**(CM) = A♭m **H**(Cm) = EM	Go to hexatonic pole
	Dominant	**D**(CM) = FM **D**(Cm) = Fm	Go to triad of same mode up a perfect fifth
Supplemental	**I**dentity	**I** (CM) = CM **I** (Cm) = Cm	Leave triad unchanged
	f ′(x)	**D**′(CM) = GM **D**′(Cm) = Gm	Inverse form of transformation.
	fg(x)	**LSP**(CM) = E♭m **LSP**(Cm) = AM	Compose multiple transformations in left-right order
	f ·*g*(x)	**L**·**SP**(CM) = E♭m **L**·**SP**(Cm) = Am	Emphasize or clarify a particular subdivision of a compound transformation
	~*f*	~**LP**(CM) ≈ EM^{Ma7} ~**LP**(Cm) ≈ A♭m^{Ma7}	Fuzzy transformation, where input and/or output chords are not pure triads

Table 3.2 **Triadic transformations on C major and C minor**



should spend some time with this chart, as there are a few idiosyncrasies specific to *Hollywood Harmony*. For true newcomers, it is worth memorizing, playing, and seeking out all of these progressions.

Table 3.1's first column presents the name and symbol that stands for each transformation, and the second column demonstrates how it acts on a sample triad. The third column provides the simplest definition possible for each transformation. Note that these are not necessarily the most mathematically elegant definitions. Triadic transformations may be defined in a variety of ways, and differing characterizations will capture differing relational qualities. Generally, definitional criteria for triadic transformations involve root progressions and the presence of common and displaced tones, but they can also be described, somewhat less intuitively, as inversions about fixed pitches or dyads.

The inventory is organized into three families of transformations: basic, derived, and supplemental. The first four entries fall within the basic family and constitute the most atomic types of transformations. First is the transposition operation $\mathbf{T}_n$, which acts on all three triadic pitches simultaneously and treats major and minor triads in the same way. As we have seen, transposition is at play whenever a cue's tonal center moves up or down by step. The $\mathbf{T}_n$ operation also proves useful in accounting for ambiguous modal progressions, parallel voice leading, and repetitions of the same thematic material at differing pitch levels. When transpositions are tinted by a change in mode, such as happens with the filmically commonplace progression Cm⇨DM, $\mathbf{T}_n$ can be appended with a **P** operation. For example, $\mathbf{T_2P}$(Cm) = DM.

The other three basic transformations are the canonical neo-Riemannian operations (NROs) introduced a few paragraphs earlier: **P**, **L**, and **R**. The *Parallel* operation **P** reverses a triad's mode. By shifting a triad's third by chromatic semitone, **P** will always technically be chromatic within a diatonic context, even though the triadic root remains fixed. The *Relative* transformation **R** takes a triad to what, in a functional setting, would be considered its relative major/minor cousin—a chord rooted a minor third away. This change involves moving one voice by a whole step, making it slightly "rougher" than the other two, consummately smooth, basic NROs. The *Leading Tone* transformation **L** may be less familiar for English-speaking musicians, but it describes a move similar to its counterpart, **R**. With **L**, one pitch moves by semitone to produce a chord a major third away.[15] It is worth re-emphasizing that, while the terms parallel, relative, and leading tone might be used in diatonic theories to refer to specific scale degrees or chords, those functional echoes are relics of earlier modes of thinking and can be ignored (or, perhaps better, bracketed). The NROs presume no fixed point of tonal reference; whether acting on a major or minor triad, **P**, **L**, and **R** say nothing of which side of the progression bears more tonal stability. This looseness is in keeping with the overarching tonal agnosticism of neo-Riemannian analysis.

Together, the basic NROs capture the three unique ways one can get from one consonant triad to another by moving one pitch by step. Voice-leading parsimony is thus implied between the pitch classes of NRO-related triads, though smoothness might or might not be realized in a specific musical texture.[16] The NROs represent minimally complex ways of navigating tonal space when our yardstick is voice leading and common-tone retention. Because of this capability, and the fact that they can be chained to form more complicated compound transformations, the NROs serve as a useful way of gauging harmonic proximity/distance. Transformational complexity can thus be added to our preexisting intuitions about tonal distance as, for example, a function of intervallic span, complexity of frequency ratios, and relatedness to a contextual tonal center.

The next family in Table 3.1 includes derived NROs, which, like the canonical NROs, all yield triads of the opposite mode of the input triad. The "derived" aspect of these particular transformations stems from the fact that they may be defined, if one wishes, in terms of compounds of the basic operators.[17] However, there are good reasons for assigning these progressions unary labels. **S, N**, and **F**, in addition to being common and highly distinctive progressions in Hollywood, can be thought of as mirror images of **P**, **L**, and **R**.[18] For example, where **P** preserves a triad's fifth (ic5) and shifts its third ($\hat{3}$) by semitone, *Slide* (**S**) preserves the third and shifts its fifth by semitone.[19] **N** and **F** work analogously, although one must use an admittedly peculiar definition of triadic root in order to define the preserved scale degree. It is easiest to think of *Near Fifth* (**N**) as the comparatively smooth mode-flipping fifth relation, the one that nudges two voices in parallel by semitone. *Far Fifth* (**F**), by contrast, is the comparatively rough fifth relation, moving the two unfixed pitches by whole tone.[20] **H**, the *Hexatonic Pole,* is a rare but extensively theorized progression, and has to it a marked quality that ensures it leaps out of almost any context.[21] It may defined in terms of simpler operations (as **LPL** or **PLP**) or, alternatively, as the transformation that takes a triad to the M3-related chord with which it shares *no* common tones.

One last derived progression is a nod to Riemann's original functional conception of triadic interrelationships: *Dominant* (**D**). This transformation is defined as the operation that takes a chord to its tonic in the manner of a V⇨I or v⇨i resolution. It is algebraically equivalent to $\mathbf{T_5}$ but implies a functional resolution while transposition merely describes upward or downward motion.[22] Note that, in a system I have touted as being tonally agnostic, **D** is the inventory's sole functional operator. Its inclusion is justified because it is *the* fundamental progression of diatonic tonality and has a way of showing up even in the most digressive pantriadic patches.[23] The interface of functional and nonfunctional chromaticism will be dealt with in a sustained way in the final chapter.[24] Until then, the reader is asked to accept that the oddball **D** behaves differently from the way that standard NROs do. **D** is unique in possessing a sense of what Steven Rings (2011b) calls harmonic intentionality; the **D**ominant transformation "points" toward a tonic and to the broader harmonic hierarchy that tonality implies. Along with $\mathbf{T}_n$, **D** is also non-dualistic, meaning it acts in the same way for triads of both modes. Compare the behavior of the dualistic neo-Riemannian operators: **L**, for example, takes a major triad up to the minor triad sitting an M3 above it, while it does the exact opposite for a minor triad, sending it *down* an M3. This behavior is part of the reason that the NROs are *contextual*, producing equal but opposite effects on input triads of differing mode.

A third family of supplementary relations in Table 3.1 includes a few formally necessary transformations like the identity (**I**) and inverse (′) operations, the latter of which is chiefly useful for transmuting **D** into **D**′, meaning "go *to* the dominant." This portion of the inventory also describes how transformations are combined. Any single unary operation can be joined with another to form a *compound*, thereby describing a more complex move across tonal space. Normally, compound transformations will be written without gaps, as with the ternary compound **LSP**. Because NROs are not commutative, it is important to read these in the correct order, as acting on triad from left to right, Given **LSP**, for instance, perform **L** first, then **S**, then **P**. On occasion, it may be useful to demarcate subdivisions within a more complex transformation. In those cases, the algebraic symbol for composition (the dot "•" symbol) is employed. **LS•P**, for example, achieves the same result as **LSP**, but the orthography implies that **LS** groups separately from **P**. This notation may be useful to illustrate if, for example, **LS** is a motivic transformation in a score, and at some point it is subjected to a variation involving an additional shift of mode (**P**).

The final supplementary component of our inventory is the symbol ~, which indicates that the attached progression is a *fuzzy transformation*. Fuzzy transformations are required because, however appealing pure triadic harmony is to many film composers, other sorts of sonorities find their way into pantriadic textures all the time: incomplete triads, diminished and augmented triads, seventh chords, chords with suspensions, polychords, and so on.[25] In some cases, reducing out the non-triadic components so that only an abstracted pure triad remains (a "*Klang*," in neo-Riemannian terms) represents an acceptably small tampering with the harmonic content of a passage, and no special labels will be employed. However, for cases in which those components are sonically essential, I use the ~ symbol to denote a *strictly informal* degree of fuzziness, and the affected transformation still operates on the underlying triadic subsets within the specified chords. For example, an **~LP** transformation could take a C-major triad to an E-major^{Ma7} chord, or, just as consistently, C major^{Ma7} to E major.[26]

One of the benefits of the transformational inventory I have presented is that it shrinks the universe of triadic progressions down to a manageable number. Progressions that are superficially dissimilar, like CM⇨AM and E♭m⇨F♯m, can be collapsed into a single category defined by some important commonality. All the NROs are **involutions**, meaning that they are their own inverse, returning to the input triad after two applications; this characteristic is in contrast to all transpositions except $\mathbf{T_0}$ and $\mathbf{T_6}$, and many, but not all, compound transformations. The fact that a single transformation can describe progression backward and forward in this way makes the NROs well tailored for analyzing chordal oscillations between triads of opposite mode. This is a hugely widespread practice in Hollywood, no doubt because modal contrast equals affective contrast, and oscillatory progressions are capable of delivering such contrasts efficiently and repeatedly.

Occasionally, the transformational apparatus can get in the way of the simplest explanations of chromatic harmony. For example, the NROs privilege progressions between modally mismatched triads, while rendering progressions between like-moded triads more transformationally complex—even, as is often the case with absolute progressions, when they sound indivisible in context. (It may also be desirable to describe modally mismatched progressions that are complex according to the NROs, like, say, **PRPRL**, in simpler terms.) There is utility in separating out "major" and "minor" versions of dualistic progressions, particularly when one is describing absolute progressions or *leitharmonies* with strong extramusical associations. One can envision scenarios in which it is *not* advantageous to conflate, say, a motivic CM⇨AM-type transformation with its dualistically equivalent E♭m⇨F♯m motion, even though both can be analyzed as **RP** compounds.

Transformation theorists have found a variety of ways of addressing these issues. One approach is to craft a system that grants every pairing of triads a unique label. This is the strategy taken by Scott Murphy in his own (2014a) study of transformation theory and film music.[27] Murphy's triadic-tonal progression classes (TTPCs) account for every conceivable intertriadic relation—all forty-eight of them—with a simple and economical description.[28] Murphy's framework has advantages and trade-offs. Unlike the NROs, Murphy's TTPCs are defined in terms of centricity, with one of the chords in a two-triad progression counting as "more tonic" than the other. This characteristic makes the TTCPs adept at describing chromatic transformations when one of the triads feels comparatively stable, and the TTCPs can therefore help distinguish patterns of differential weighting of certain progressions across film idioms.

At the same time, the TTPCs lose the tonally agnostic quality of the neo-Riemannian operators. Because they provide each progression a unique name, the TTPCs work best at characterizing absolute progressions, but they fare less well in extended pantriadic passages. As Murphy acknowledges, the TTPCs are not true transformations: they describe a class of musical objects and thus do not really "act" on triads. This limitation means they cannot be deployed in the same combinatorial fashion as the NROs. Murphy's TTPCs provide a simple and uniform way of describing inter-triadic relationships, but this elegance comes at the expense of some of the explanatory power and analytical flexibility of **L**, **P**, **R,** and company.

Another answer to the potential shortcomings of neo-Riemannian analysis is proposed by Richard Cohn. Cohn challenges the assumption that compound transformation labels necessarily imply mediation. He suggests instead that a transformation like **LP** can represent a "unitary Gestalt whose name happens to have two syllables" (2012: 30).[29] This attitude is embodied by his decision to assign the hexatonic pole relation the **H** label, rather than **LPL** or **PLP**; one can see that Cohn views the **LPR** group as being useful but not entirely required to characterize intertriadic relationships. Still, something is undoubtedly lost when all transformations are reduced to unary progressions—chiefly, the algebraically built-in metrics of distance, and the ability to interpret complex transformations contextually.

My solution to the issues that motivated Murphy and Cohn's alternative systems is a compromise. In certain cases, I might refer to the application of a transformation *f* to a triad of a specific mode: *f*(M) for major or *f*(m) for minor. Thus, all CM⇨AM-type progressions may be described by **RP**(M), and all E♭m⇨F♯m-type progressions by **RP**(m).[30] This description restores modal specificity without implying tonicity and can be useful for conveying like-moded progressions as being, in a sense, "unitary Gestalts." Just like Murphy's TTPCs, these are no longer true transformations; they act in only one direction, and need to be paired with their reversed forms to capture oscillations.

In general, my preference is not to add additional machinery to the neo-Riemannian apparatus, but rather to acknowledge that, like any theory, it is necessarily reductive and cannot convey all aspects of music with perfect fidelity. It is better to let NRT tell its own analytical story and to rely on prose and diagrams to fill out a more holistic picture of how a musical passage works. Though having labels aids analysts in noticing the occurrence of certain progressions more readily, triadic transformations are not an end in themselves. It is incumbent upon analysts to decide from among the various different operations and compounds at their disposal, to determine what interpretation this or that particular progression suggests in context. Then the analysts must impute meaning into the patterns they play out in actual music, just as one would for other descriptive vocabularies, like diatonic Roman numerals or pc sets. This richer, more interpretive stage is of course the most rewarding part of any music analysis.

Triadic Transformations in Context

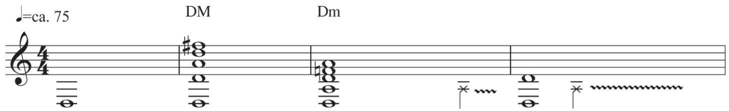
EXAMPLES FROM ELLIOT GOLDENTHAL

With the technical background of neo-Riemannian theory now established, we can return to analyzing film music. The next few pages display Table 3.3. Each row is populated with a musical excerpt by Elliot Goldenthal (▶) that illustrates one of the triadic transformations. Only the identity (**I**) operation is omitted, as it is usually a trivial transformation to depict in an analysis.[31] As much as possible, I have chosen moments that accompany a striking visual image or dramatic event. The passages are transcribed in such a way that the pertinent operation always occurs between measures 2 and 3. (In a few cases, this choice leads to some creative re-barring or re-metering). Some of the examples include multiple iterations of the transformation being highlighted, or a series of interesting chromatic progressions beyond the showcased operator; readers are encouraged to play through each and to see if they can assign transformational labels to anything not already indicated.

I have assembled this transformational menagerie from Goldenthal's oeuvre for a few reasons beyond simple consistency. Despite the limited extent of his filmic output, Goldenthal has been one of Hollywood's most dependably chromatic composers, with a special taste for ear-catching pantriadic harmony. Goldenthal's compositional craftsmanship is exceptional, his orchestrations particularly inventive. But when it comes to triadic chromaticism, he often eschews complex counterpoint, busy melodies, and densely active textures. This restraint brings his triadic transformations into high relief, making them unusually affecting in context and useful for study when taken in isolation. The foregrounding of pure triads distinguishes the eclectic Goldenthal from his similarly polystylistic mentor, John Corigliano, another (much less frequent) film composer whose music also skirts tonal boundaries but less often presents triadic transformations so nakedly. Stylistically, Goldenthal's chromaticism draws more heavily from German late Romantic models, with strong echoes from Mahler, Strauss, and early Schoenberg.

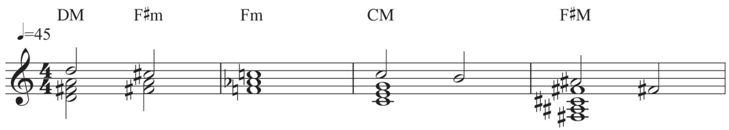
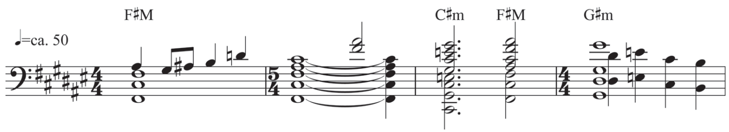
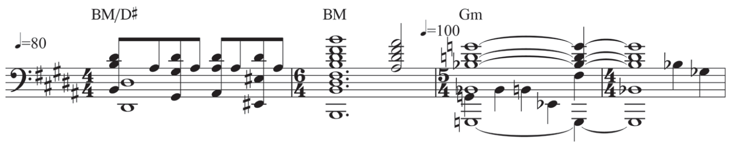
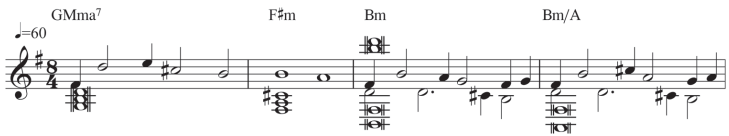
Most of Goldenthal's scores, even those for non-fantastical films like *Michael Collins* (1996), positively swirl with triads in unusual relationships. At the same time, the hallmarks of functional diatonicism—especially V⇔I motions—can be astonishingly scarce. One instance of fairly conventional diatonic syntax is the (minor) **D**ominant that occurs within in an expansive lament in his score to *Public Enemies* (2009). More typical, however, are examples like the merely functionally allusive **N** progression in *Demolition Man* (1993). In this excerpt, the near-fifth relation is flanked by destabilizing chromatic moves (**PRP** and **PRPR**) and supports a melodic line driven by a semitonal descent. A passages like this one raises the question of where to place Goldenthal's music along the spectrum of tonal idioms. The composer attests that he holds no "differentiation in my head between tonal and atonal; I either hear melody or I hear sonority" (Wherry: 2003). This claim seems odd when one takes into account only the

Table 3.3 **Triadic transformations in the scores of Elliot Goldenthal**

Film, Transformation, and Description	*Progression*
Final Fantasy (1:05:45) $\mathbf{T}_6$ (Am) = E♭m *Giant spirit monster looms over soldier, who resigns herself to her imminent death*	
Titus (0:07:30) **P**(DM) = Dm *Ceremonial war choreography concludes; general removes mask*	
Alien[3] (1:47:15) **L**(DM) = F♯m *Heroine prepares to sacrifice self into giant vat of molten metal*	
Michael Collins (0:03:20) **R**(Am) = CM *Somber street scene of aftermath of failed 1916 Dublin uprising*	
Sphere (0:33:34) **S**(Fm) = EM *Scientists marvel at impossible, glimmering sphere*	

(continued)

Table 3.3 **Continued**

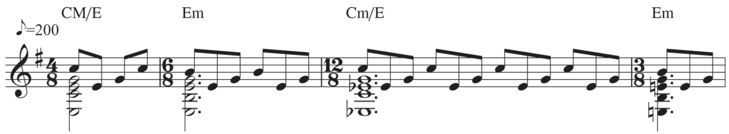
Film, Transformation, and Description	***Progression***
Demolition Man (1:37:50) **N**(Fm) = CM *Villain schemes about creating perfect society right before betrayal by henchmen*	
Cobb (1:34:40) **F**(F♯M) = C♯m *Ty Cobb travels to Georgia to meet estranged daughter*	
Interview with the Vampire (1:08:45) **H**(BM) = Gm *New Orleans consumed in inferno as protagonists escape by boat.*	
Public Enemies (1:43:00) **D**(F♯m) = Bm *Dillinger's moll Frechette is arrested*	

Pet Sematary

(0:02:40)

LP(Em) = Cm

Opening credits, scene of creepy ramshackle cemetery, Steven King's name



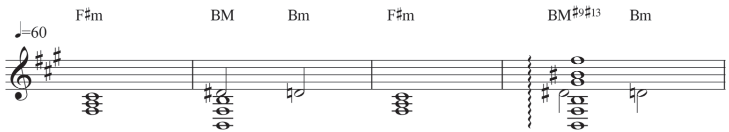
A Time to Kill

(0:53:20)

F(F♯M) = **P·LR**(F♯M)

= Bm

Imprisoned vigilante has conversation with wife.



Batman Forever

(1:22:26)

$\sim\mathbf{T_6P}(D^{7(\flat 9)}) \approx A\flat m^{add6}$

Batman and love interest have nighttime romantic liaison.

rampaging Pendereckisms (incontrovertible atonality) or stirring adagios (incontrovertible diatonic tonality) that turn up in Goldenthal's filmography. But considering the pervasive, terrifically "chordy" brand of nondiatonic, noncentric, nonfunctional harmony typified by these excerpts, it is clear that Goldenthal's pantriadicism fits accurately into the strange space "between tonal and atonal."

ASSOCIATIVITY OF NEO-RIEMANNIAN TRANSFORMATIONS

In addition to illustrating the sound of the neo-Riemannian transformations, the cues in Table 3.3 exemplify the associative content of these progressions. While it is not my intention to provide a thorough guide to the cinematic associations of every intertriadic progression—they are too many, and too semiotically changeable—a few quick generalizations can nevertheless be drawn. Hollywood, after all, prizes accessibility and legibility, and Elliot Goldenthal's chromatic progressions, for all their power and craftsmanship, trade in some very well-established expressive conventions. I provide an extremely cursory overview of the bulk of the triadic relations, followed by a more in-depth exploration of two of the most arresting of the lot, $\mathbf{T_6}$ and **S**.[32]

Goldenthal's use of the **P**arallel progression to shift from D major and minor in *Titus* (1999) draws on that transformation's connotations of duality and opposition. In this particular case, **P** provides an early suggestion of the two sides to the title character's fractured personality—honor and barbarity, eloquence and insanity. Compared to **P**, the affect of the **L**eading Tone operation is more determined by the modal quality of the input triad. **L**(M) is frequently tied to a feeling of sadness and loss, as evidenced by a study from Murphy on the progression (2014b). The undulation between DM and F♯m in the example from *Alien*^{3} draws on **L**(M)'s bittersweet disposition, with Goldenthal's music providing a preemptive elegy for Ripley as she prepares to sacrifice herself. While similarly capable of expressing both delicate sentiment and profound loss, **L**(m) is more often tied to matters of mythic significance in Hollywood, a connotation to which we will return in Chapter 5.[33] Compared to the other NROs, the **R**elative progression is too familiar a diatonic functional progression to shoulder particularly robust associations for either of its modal guises. However, in the right settings it conveys a feeling of authenticity, resolve, and seriousness, as demonstrated in the *Michael Collins* excerpt.

The **N**ear Fifth progression can conjure up an alluringly exotic feeling—an association no doubt linked to the $\hat{5}$-$\flat\hat{6}$ modal mixture the transformation strongly implies, which has a tradition, especially in Romantic era music, of connoting non-European cultures. The delicate orchestration surrounding this transformation in *Demolition Man* suits the villain's conceit of a pure society with "the beauty of a flawless pearl," all imperfections of human conflict polished away. The similarly allusive **F**ar Fifth transformation has a variety of associations—nature, ominous portent, depth, venerability, vastness. Goldenthal's autumnal music for *Cobb* (1994) seems particularly inspired by the music of Strauss, with the nexus source for the undulating **F** progression being the expansive opening to the early tone poem, *Aus Italien*.[34]

Two hexatonic progressions, **H**exatonic Pole and **LP/PL**, are heavily freighted with extramusical associations in Hollywood. As the most tonally extreme transformation involving major thirds, **H** has a long history of intimating catastrophe, death, and transcendence. It is progression with one foot in the grave, so to speak. Cohn (2004) characterizes the relation's affect as "uncanny" in the sense theorized by Ernst Jentsch (1995 [1906]) and Sigmund Freud (2003 [1921]): the eerie, paradoxical familiarity that can accompany seemingly unfamiliar phenomena. The clash of BM and Gm that occurs during a city-consuming conflagration in *Interview with the Vampire* (1994) draws more on the catastrophic connotations of the progression than its uncanniness, though considering the film's undead *dramatis personae*, Goldenthal's progression remains generically appropriate.

Though less chromatic than its polar cousin, **LP/PL** has perhaps the most emphatic and consistent expressive content of all triadic progressions in film, though its connotations are more strongly constrained by mode than many other transformations. The major version, **LP**(M), is a favored device for suggesting amazement, both as a floating pantriadic progression or as a tonally tethered I⇨III♯. Its expansive and bright quality owes to the upward root motion and implication of "sharpward" key shift; C major, for example, hosts four fewer sharps than the **LP**-related E major. The same wondrous connotations hold even more strongly for the reverse form of the transformation, **PL**(M), whose diatonic correlate is the Romantic dream progression par excellence, I⇨♭VI (Taruskin 2005: III/96). Curiously, neither transformation appears to be a major part of Goldenthal's harmonic idiolect, though examples can be found throughout the work of nearly every other major contemporary film composer.[35]

Both "major" and "minor" versions of the **LP** transformation turn on a feeling of harmonic unnaturalness, a contravention of the accustomed diatonic order in which major-third based progressions like i⇨♭VI or vi⇨IV are commonplace. **PL/LP**(M) exploits the positive potential of this "otherness," swinging the door open to new, utopic worlds. On the other hand, the progression's evil twin, **LP**/**PL**(m), bear a strong attraction to the affective "dark side." In his study on the nineteenth-century origins of the transformation and its importation into Hollywood, Matthew Bribitzer-Stull (2012) dubs it the "Tarnhelm progression." His label derives from its prototypical use in Wagner's *Ring*, in which it denotes an evil artifact and maleficent magic in general. Bribitzer-Stull observes the progression's lasting linkage to matters of "mystery, dark magic, the eldritch, and the otherworldly" (2015: 144). It is the tonal calling card of Darth Vader, Voldemort, Gollum, and many other memorable cinematic villains. Goldenthal's deployment of **LP**(m) as part of a i⇨♭vi^6 motion in *Pet Sematary* (1989) is textbook "Tarnhelm" in its suggestion of spooky, concealed malevolence.[36] Note the characteristic semitonal displacements of the pillars $\hat{1}$ and $\hat{5}$ of the home triad, pitches that are flayed outward in opposite directions, as though being tugged by invisible tonal tendrils of ill intent. Their function as chromatic neighbor notes may be clear, but this linear clarity is at the expense of triadic coherency, as these displaced notes fall on enharmonically contradictory scale degrees $\flat\hat{6}$ and $\sharp\hat{7}$ (or stranger still, $\flat\hat{1}$). **LP**(m) is a tonal corrupting influence, perverting the expected diatonic ♭VI—a precious outpost of major brightness within the dreariness of the natural minor mode—with vile darkness.

TRITONAL TRANSPOSITION

Progressions between triads of the same mode whose roots are related by tritone ($\mathbf{T_6}$) are frequently associated with encounters of an alien or inhuman nature. The interval of the tritone hosts long-standing diabolical connotations that are routinely exploited by film composers, particularly within horror films (and horror comedies), as demonstrated by Janet Halfyard (2010). Maximizing this satanic ambience, the *minor* $\mathbf{T_6}$ progression (or **PRPR**[m]) is a favored tonal trope for conveying threats and evils beyond human understanding. The shift from an A-minor tonic to E♭ minor in Goldenthal's *Final Fantasy* (2001) fits this expressive pattern nicely, functioning as a harmonic death knell for one of the film's soon to be devoured protagonists.

Scott Murphy has shown that the progression between *major* triads a tritone apart (e.g., **PRPR**[M]) has held special fascination for composers working within the genre of science fiction, particularly when the transformation is linked with cosmic spectacles like mysterious planets and awe-inspiring spaceships.[37] For extrinsic evidence of this association, Murphy catalogues a variety of uses in and outside Hollywood, including, notably, "Mars" and "Saturn" from Gustav Holst's *The Planets*—a work that serves as a wellspring for several other chromatic absolute progressions in film.[38] Murphy argues that $\mathbf{T_6}$'s cosmic vibe owes to four intrinsic factors ripe for mapping onto weird interstellar sights:

1. Remoteness according to intervallic metrics, with the tritone being the longest distance between pitches judged by the standard chromatic-scale generators, ic1 or ic5
2. Remoteness according to overall voice-leading work and voice-leading distance spanned by individual voices
3. Ambivalence due to the tritone's symmetrical bisection of the octave
4. Unfamiliarity from the standpoint of functional tonality, with I⇨♯IV/♭V progressions being as prolongationally inadmissible within standard monotonal hierarchies[39]

Danny Elfman, Hollywood's preeminent purveyor of zaniness, makes use of modally matched tritone progressions frequently in his scores for science-fiction and fantasy films (Halfyard 2010: 24–28). A particularly knowing example can be found in his music for Tim Burton's *Mars Attacks* (1996), a travesty of alien invasion films like *The War of the Worlds* and *The Day the Earth Stood Still*. Along with orchestrational

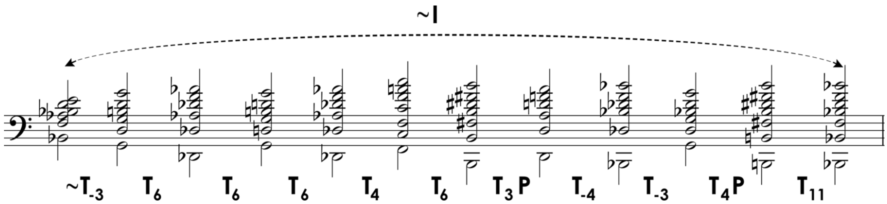


Figure 3.1 Elfman, *Mars Attacks*, "The Landing."

tropes like theremin and wordless choir, Elfman imports aspects of those earlier scores' harmonic language, particularly their abundant $\mathbf{T_6}$ transformations. The most dramatic reference is during "The Landing," when a Martian spacecraft approaches an awestruck crowd. Figure 3.1 supplies a harmonic reduction of the relevant passage (35:00, ▶), along with a simple transpositional analysis. (The excerpt could easily be interpreted with the **PLR** group as well, though I stick with the $\mathbf{T}_n$ nomenclature to emphasize $\mathbf{T_6}$'s prominent, unary role). As the alien ship comes into view, Elfman transitions from B♭$_{\text{lyd}}$—a region that already emphasizes the tritone interval—to a grand pairing of G major and D♭ major. These two chords oscillate twice before "modulating" to another tritonal coupling, now between F major and B major. Those triads then meander off into more discursive minor pantriadic harmony, culminating in the recapture of B♭. In no sense has B♭ been "prolonged" during this extraterrestrial encounter; yet its recurrence does nevertheless provide a loose sort of bookend to the passage, indicated by an overall ~**I**dentity relation.

SLIDE

Unlike many of the other examples given in Table 3.3, the excerpt from *Sphere* (1998) is quiet and understated. Rather than grabbing listeners by the collar and throttling them with a bombastic collision of triads, Goldenthal's use of **S**lide in "Sphere Discovery" is meant to instill a feeling of hushed amazement. The music accompanies a group of scientists upon their first encounter with the titular glowing globe of unknown origin. When the **S** relation occurs, shuttling F minor to E major, it is not underlined by other musical parameters, as is often the case with absolute progressions. Goldenthal makes hardly any change to the cue's subdued texture, dynamics, or orchestration. And yet the change in harmonic perspective is enormous. The arrival on E major stands as "Sphere Discovery"'s most affectively marked moment, a carefully calculated injection of musical frisson, right as the impossibility of the huge orb sinks in. What is it about this progression that makes it so unusually capable of sending chills down the spine of listeners?

The black sheep within the traditional neo-Riemannian family, **S**lide is a profoundly uncommon transformation in common-practice tonality but becomes surprisingly prevalent in some twentieth- and early-twenty-first-century harmonic dialects (Segall 2011, Lehman 2014a). It has found a truly welcome home in film music, particularly around the turn of the twenty-first century.[40] If a single association can be assigned to this slippery tonal motion, it is ambivalence. The progression has a vigorously unsettled affect, as though it were being wrenched between irreconcilable tonal pulls. On one hand, it can sound "close" according to several intrinsic distance metrics. **S** facilitates a semitonal root motion—literally the nearest any two triads can be, at least as far as simple difference of frequency between chord roots is concerned. It is also a parsimonious transformation, involving only two semitonal displacements and leaving the triadic third in place as a common tone, often treated as an effective axis of inversion, as it is in *Sphere*. And, despite its chromatic nature, **S** is not altogether immiscible with functional tonality. Modally mixed chords based on the same Roman numeral (e.g., vi and ♭VI) quite literally hinge on this oddball progression, as do a few odd but legible progressions like ♭vi⇨V.

At the same time as it can suggest tonal closeness, **S** is capable of communicating great distance. If it powers a modulation, **S** implies a shift of four accidentals to the overall key signature. It likewise requires at the very fewest four turns around the circle of fifths, and at most eight. If derived from the canonical NROs, it is a ternary compound, either **LPR** or **RPL**. It can suggest bizarre, even impossible tonal functions like ♯i or ♭I. And the fact that the third remains a fixed common tone is as much an alienating factor as a familiarizing one, as it draws the radical change of tonal context into high relief. In terms of its intrinsic structure, the progression is therefore something of a tonal paradox.

The way in which **S** is able to imply both proximity and distance accounts for its filmic association with boundary spaces—dream, afterlife, artificial intelligence, virtual reality, and other states in which the border between two fundamentally opposing conditions is straddled. It is a favored transformation of James Newton Howard, who mines its uncanny effect with eyebrow-raising insistence in the contemplative horror movie *The Sixth Sense* (1999, ▶). Figure 3.2 presents the "densely enigmatic musical sign" that Lloyd Whitesell identifies as the film's main musical motto (2010: 211), here in the guise in which it appears during the movie's main title. A slender melody glides atop the theme's undulating **S**lide progression from G♯m to G♮M. A whiff of acoustic scale-derived dissonance in the second chord is sufficient to prevent a facile ♭ii⇔I tonal interpretation. The motif could just as easily signal i⇔VII♯, or, perhaps absurdly,

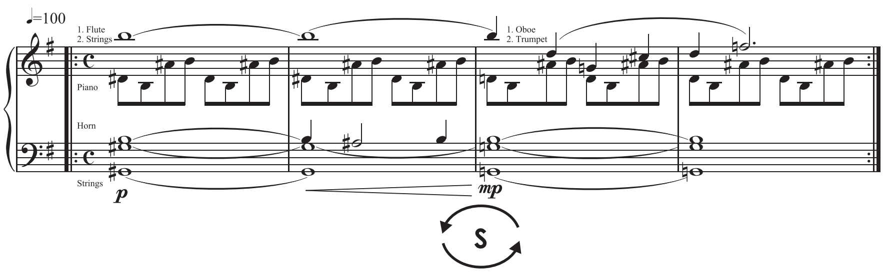


Figure 3.2 Newton Howard, *Sixth Sense,* theme.

i⇔♭I. The registrally and metrically prominent third, B6, stitches the two harmonies together, insisting upon the eerie shared element between these otherwise starkly contrasted tonal signposts. The thematic kernel hovers unattached to any particular signified through most of the film, suggesting a nagging mystery at the edge of the narrative. It is not until *The Sixth Sense*'s dénouement that the true meaning of this ambivalent *leitharmonie* is disclosed. At that point it is revealed that the ghostly oscillatory progression has been a covert indicator throughout the narrative of the main character's state of undeath—the *ne plus ultra* of boundary states. **S**lide is a harmonic hint, a clue hidden in plain sight (or, rather, plain sound).

Two Neo-Riemannian Analyses

So far, we have inspected harmonic transformations in isolation, clear absolute progressions that garner a single neo-Riemannian description like **S** or **LP**. As expressively potent as these atoms of harmonic meaning can be, cinematic pantriadicism consists of much more than one-off chord changes. What follows are two short analyses, one straightforward and one more problematic, that demonstrate how transformational analysis can be conducted on discursively pantriadic music.

WALTZ WITH BASHIR

To begin, let us consider a cue that lends itself to the neo-Riemannian methodology quite naturally: "I Swam Out to Sea," from Max Richter's score to the Israeli animated war documentary, *Waltz with Bashir* (2008, 33:38, ▶). Richter's cue accompanies a flashback told by Ronny Dayag, a Israeli veteran who made a harrowing escape during the 1982 Lebanon War. After the rest of his unit is killed in an ambush, Ronny manages to evade enemy detection and swims into the Mediterranean Sea under the cover of darkness, continuing south until being

Figure 3.3 Richter, *Waltz with Bashir,* "I Swam Out to Sea."

rescued by friendly forces. Figure 3.3 displays a reduction of the cue's central harmonic module, specifically the forth and fullest of its five full iterations.

Ronny's escape possesses a dreamlike quality, much of which owes to Richter's hypnotic music, its synthetic timbres churning and bubbling with Phillip Glass–style arpeggios.[41] The steady chord progression on which "I Swam Out to Sea" is based is, in a sense, self-motivated. There is no theme or traditional melody that impels it forward, no overarching harmonic teleology or push for resolution. Admittedly, none of the constituent chords are completely estranged from a hypothetical G-minor tonic—all their roots, for example, belong to the G-minor scale. However, the impression is decidedly not of a conventional prolongation of G. Each individual triad is drawn away from its immediate predecessor by minute voice-leading shifts and displacements, and these small moves add up quickly. Richter's minimalistic module is always drifting away from G, only to be yanked back abruptly to the starting point every eight measures, as if by some sort of irresistible tonal undertow.

This is about as "textbook" pantriadicism as it comes, both in construction and expressive content. Figure 3.4 offers a neo-Riemannian analysis, here presented in a more step-by-step way than I generally adopt, so as to make plain what each transformational label means and how it links up with discrete stages of Richter's tonal journey. "Swam" is reduced down to a three-voice texture that captures the essential polyphonic structure, and only the canonical NROs are needed to account for the cue's harmonic makeup. Text below the entire system conveys the overall chord-to-chord transformations, while the smaller labels and slurs above indicate how each individual voice moves to arrive at the next chord. Every measure contains the literally sounding chord (open note heads), as well as incrementally moving voices (filled note heads), which, while not necessarily heard, are implicit for compound transformations. For instance, the initial change from Gm to E♭m is interpreted as an **LP** transformation, which involves two implicit steps. First, **L** moves the middle voice's D4 up to E♭4, resulting in E♭ major. Secondly, **P** shifts the bass note G3 to G♭3, flipping the chord's modality to E♭ minor. Tracing out the incremental changes implied by a complex progression like this one illustrates why order matters in spelling transformational compounds. Taking the

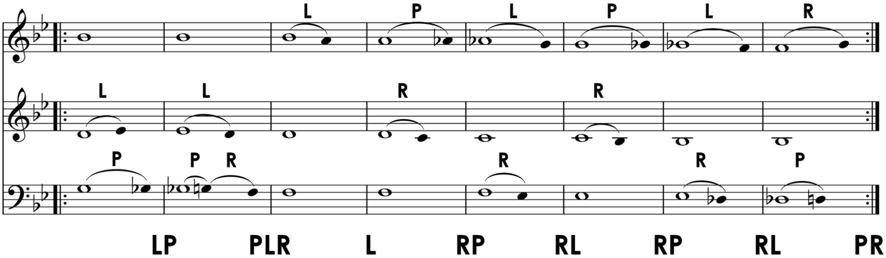


Figure 3.4 Richter, "I Swam Out to Sea," neo-Riemannian analysis.

same starting triad of Gm, for example, and applying **PL** instead of **LP** would result in Bm instead of the desired E♭M.

My analysis of "I Swam Out to Sea" has thus far been purely descriptive. But a bigger question remains: how does Richter's harmony relate to the scene's meaning? The key to the cue's expressive and semantic content lies in its musical uniformity. In describing his experience, Ronny recalls that the sea was "really calm, no waves. I felt calm and at peace. Just me and the sea." This feeling of calm amid incredible danger finds an expressive correlate in the cue's several near-perfect uniformities—transformational characteristics that smooth out harmonic disruptions and impart a sense that the music is flowing freely and naturally, of its own accord. At least four such uniformities are active in Richter's music: parsimony, directionality, modality, and sequential design.

1. *Parsimony*: The way in which Richter realizes this eight-chord progression is maximally smooth at almost every juncture. Every possible common tone is retained and no voice ever moves by anything other than a step. All chord-to-chord motions involve the preservation of at least a single common tone. The sole exception is the seam between mm. 6 and 7, in which the progression's top and middle voices trade pitch classes. This small instance of linear disjunction enables a parsimonious transition back to the initial G-minor chord when the progression restarts (otherwise, the cue would endlessly crawl downward in tessitura).
2. *Directionality*: Not only do the cue's voices always move by step, but they also do so in the same direction—down. This motion creates a sinking effect, what theorists call downshifting, that is perfectly apt for the oceanic setting. Again, there is a single exception: the initial Gm⇨E♭m, which involves one voice moving down by semitone and one up, with a resulting directed voice-leading interval sum of zero.
3. *Modality*: With the exception of the B♭-major chord in m. 3, the "Swam" progression is modally homogeneous, a showcase of intensified minor chromaticism and its capacity to connote shadowy, nocturnal states. This modal uniformity has a secondary effect of ensuring that all but two of the transformations (**PLR** and **L**) involve binary transformations, a feature that is closely related to the way the cue is able to project linear parsimony.
4. *Sequential Design*: "Swam" quickly settles into a repetitive harmonic pattern: a [–P4, +m3] sequence for the last four chords, enabled by the repetition of the cell **RP•RL**. In fact, in terms of transformational operators, the pattern stretches back a bit further—note the –P4 motion embedded within the indirect but comparable move from Gm to Dm. Compressing those together, we have (Gm⇨Dm)⇨(Fm⇨Cm)⇨(E♭m⇨B♭m), a sequence with three iterations. (An intrepid reader might find mapping this progression out in the Tonnetz useful (see "Tonal Space," below), as the [+P4, –m3] pattern is more readily apparent when visualized.)

BATMAN: MASK OF THE PHANTASM

Most pieces do not lend themselves in such an effortless manner to neo-Riemannian analysis as Richter's cue from *Waltz with Bashir*. For a more complex case study, we may turn to the "Caped Crusader." The gothic and at times campy Batman franchise has inspired many composers to turn to expressive chromaticism. An astoundingly thoroughgoing pantriadic passage may be found in Shirley Walker's score to *Batman: Mask of the Phantasm* (1993, 36:30, ▶).[42] Figure 3.5 provides a transcription of the cue "Birth of Batman," heard when Bruce Wayne commits to his vigilante alter ego and dons his iconic cowl for the first time. The excerpt falls into two thematic subsections, first (mm. 1–8) a statement of the family tragedy theme, and second (mm. 9–18) a definitive rendition of Walker's Batman leitmotif. Both are heavily chromatic, though in differing senses. The tragedy theme is resolutely nonfunctional and noncentric, its appoggiaturas and semitonal voice leading reminiscent of some of the more agonized music from

Figure 3.5 Walker, *Batman: Mask of the Phantasm,* "Birth of Batman."

Parsifal. The Batman motif, by contrast, uses triadic transformations to articulate a B♭-minor tonic, a key whose control over the theme persists until the last few measures, which dissolve back into tonal ambiguity.

Part of the difficulty in analyzing this passage is that it employs two different harmonic subidioms in succession—truly unmoored pantriadicism followed by chromatically enriched diatonic tonality. This difference in style might be partially accounted by providing an additional layer of annotations to the second theme (Roman numerals, for example). Yet the question of how to describe the progressions *transformationally* remains. For instance, despite using chromatic chords relative to the key of B♭ (♭v and VI), m. 12 has a clear half-cadential character, almost like a distorted iv⇨V progression. The harmonic logic is temporarily steered by diatonic expectations rather than transformational ones, and thus a different kind of description, $\mathbf{T_2P}$, from that of its surroundings—though this expectation also does not entirely communicate the latent functional implications of the move, either. The issue of whether such mergers of functional and transformational thinking are coherent (or contradictory) is one that has puzzled many theorists, and it will be broached more thoroughly in the final chapter. Two more pressing issues arise from this excerpt, however: non-triadic harmonies and multiple interpretations of the same harmonic transformation.

Although its chief harmonic building block is the consonant triad, Walker's tragedy theme is peppered with seventh chords and dissonant sonorities, none of which lend themselves to simple neo-Riemannian labels. Some, such as the appoggiatura chord that opens m. 7, are clear embellishments of more basic underlying triadic harmonies and may be reduced out. Others, however, are essential to the theme's tonal makeup. Measures 4 through 6 exhibit more dissonant sonorities than they do consonant triads, yet it would be odd to break off a neo-Riemannian analysis for this short span, only to resume once simple triads have begun to dominate the texture once again. A dramatic shift in methodology should be occasioned by a substantial change in the tone and structure of the music, a change that is simply not the case here.

The way around this impasse is to recognize whatever triadic background structures are present in these measures and convey their activity by using fuzzy transformations. The **~PRP** that ferries D♯m to C7/B♭ in m. 4 does not perfectly describe the behavior of every pitch involved in the transformation: the pitch-class B♭ is effectively cancelled out by the final **P** operation to account for the new C5, even though B♭3 persists in the bass. Yet on its own, **PRP** describes the essentially *triadic* behavior of the top three voices, which moves D♯m smoothly to CM. The following **~PRP** transformation, also fuzzy, effectively undoes its predecessor by returning to D♯m (enharmonically E♭m). But observe the retention, like before, of a "leftover" note, in this case C5, making the overall chord a C7♭5. Subsequent fuzzy transformations in this excerpt operate in a comparable fashion: pick out an underlying triadic progression, even if it requires waiting for accented dissonances to pass or reducing out non-chord tones where they occur.

A second challenge posed by "Birth of Batman" involves the assignment of transformations. Many of the intertriadic motions in this passage can be described in more than one way. This is not a defect of the methodology—far from it, descriptive multiplicity is among NRT's greatest assets. However, when it comes to making a first analytical pass at a passage, it can be frustrating to have to choose between alternatives, especially where context does not definitively support one option over the other. Already, the first transformation in the excerpt, for instance, raises this issue. Why not label this F♯m⇨B♭M with the specific unary operator for such motions: **H**exatonic Pole? There are, I believe, good reasons for analyzing it as a **PLP** compound instead of **H**. Performing **P**, **L**, and **P** on the upper chord produces the specific inversion and configuration of the upper portion of the chord. More importantly, the progression does not *sound* particularly atomic or unary at this stage: it is the beginning of a lengthy span of discursive pantriadicism, not a one-off absolute progression that asks to be taken on its own terms.

Compare this hexatonic relation to the alternation between A♭M and E♭m at the theme's conclusion. With rhythm stripped down to whole notes and the memory of B♭'s tonicity fading, this chordal oscillation really does sound justified, in Kurth's words, by its "sonic appeal as such." Hence, the use of the unary **F**ar Fifth transformation. This unary label can be contrasted with another instance of that same triadic motion in the middle of m. 7. Because the Em⇨BM progression is embedded in a more flowing and ongoing kind of pantriadicism, the shift is analyzed in a dependent way, as **LRP**. Similar lines of reasoning exist behind every other transformational label in the analysis of Walker's cue. On a few occasions when these differing construals are possible and noteworthy, alternative transformations are provided, wrapped inside parentheses. When one conducts a neo-Riemannian analysis, many such choices come down to matters of consistency and personal analytical priorities. Good transformational analysis proceeds neither arbitrarily nor by rote, but rather it involves a constant back and forth between contesting interpretive possibilities. As will become especially clear in the next chapter's section on contextuality, much of this methodology's explanatory power derives from the fact that it can offer different perspectives on the same musical event.

Tonal Space

Thus far, our analyses have been conveyed primarily through a combination of prose description and annotated musical notation. However, a different approach to representing neo-Riemannian findings, one more in keeping with the theory's concern for motion and symmetry, is available: the tonal-space diagram. Tonal space refers to any representation of harmony as occupying an abstract visual domain, and it usually involves a means of indicating distance and connectedness between harmonic "locations."[43] Tonal spaces can represent musical pathways, help calculate distances, and aid in discovering musical patterns. Insofar as they model how listeners comprehend harmonic relationships, tonal spaces are *conceptual spaces*; they may therefore reflect underlying neural or cognitive structures, though this function is not a requirement.[44] Indeed, tonal spaces can be used for a number of analytical purposes, and some of these will suggest different competing visual representations; no single space can ever model every noteworthy aspect of a piece of music. Transformation theorists have at their disposal a number of well-developed devices and strategies to render these conceptual spaces graphically, two of which—the Tonnetz and the transformation network—I will introduce presently.

When one is dealing with pitch relationships, the twin factors of distance and connectedness often imply a particular geometry in which processes such as chord progressions or modulations can be shown to play out. The most familiar of these geometries involve only one or two spatial dimensions. (Some theorists, notably Dmitri Tymoczko, have found uses for spaces with four or even more dimensions.) The circle of fifths exists along a single linear dimension, while the traditional musical staff, with its twin axes of pitch height and chronology, is a two-dimensional space. The geometrical properties of a space are determined by the presence or absence of certain musical equivalencies. For example, octave equivalence constrains the extent of the circle of fifths to a familiar clockface with twelve tonal "hours." But octave equivalence does *not* constrain the musical staff, which could go on forever in either direction (provided an arbitrarily huge number of ledger lines). Likewise, enharmonic equivalence, which holds that differently spelled notes like F♯ and G♭ are representatives of the same sonic entity, is assumed for the circle of fifths, as well as most atonal pitch spaces. Without it—and relatedly the equivalence of equal temperament (ET)—tonal spaces will sprawl out into infinity (Harrison 2002).

Figure 3.6 presents an important space to neo-Riemannian theorists: the *Tonnetz* (tonal network). This graph, which has its origins in eighteenth- and nineteenth-century central European music theory, depicts relationships between consonant triads, and it does so with no assumption of tonal hierarchy or chordal weighting.[45] Each point where lines meet (vertex) represents a named pitch class. These pitches are arrayed along three axes that correspond to different interval cycles. The horizontal axis adheres to an ic5 (perfect fourth/fifth) cycle; the northwest to southeast diagonal to an ic3 (minor third) cycle; and the northeast to southwest diagonal to an ic4 (major third) cycle. The small triangles formed by any three nearby pitches represent consonant triads. Right-side-up triangles are major triads, upside-down ones minor. While not a perfect gauge of interchordal distances, the Tonnetz can be used as an informal way of judging how close or distant two triads are, provided that the criterion of distance is transformational word length (e.g., how many **L**s, **P**s, and **R**s it takes to transform chord-1 into chord-2).[46]

The overall shape of the Tonnetz depends on whether enharmonic equivalence and equal temperament is assumed or not. If enharmonic equivalence and ET are ignored, the grid will stretch on forever in every direction, with note spellings taking on arbitrarily large numbers of accidentals. If instead enharmonic equivalence and ET are accepted, then the space wraps around itself into the finite

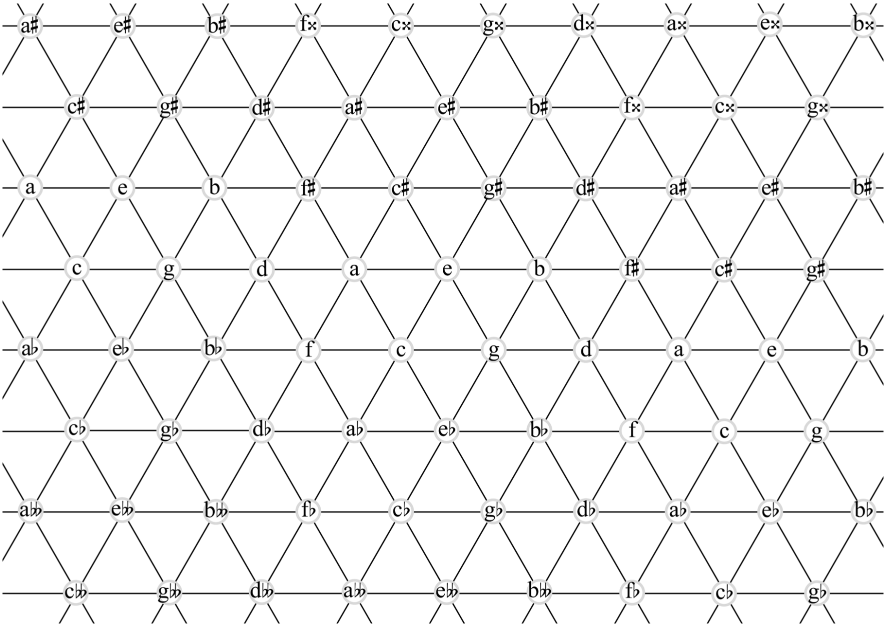


Figure 3.6 Tonnetz, infinite version.

shape of a torus—akin to the surface of a doughnut, geometrically speaking. The version of the grid in Figure 3.6 does *not* assume enharmonic equivalence for two reasons: (1) for the benefit of those not yet familiar with pc notation; and (2) in order to highlight a sense of directionality we often intuitively attribute to tonal space, where "sharpward" corresponds to ascending, brightening motions, and "flatward" corresponds to descending, darker shifts. For all subsequent renderings of the Tonnetz, I employ an enharmonically equivalent version, which is better suited to representing pantriadic chromaticism, where pitch-name distinctions lose the relevance they possessed in functional tonality.

A happy consequence of the Tonnetz being formed by intersecting fifth and third cycles is that adjacent triads are related according to the basic neo-Riemannian operations. This organization helps visualize, among other things, common-tone retention, inversion about stable pitches or intervals, and distance according to **PLR**-type displacements. Figure 3.7 provides two views of the neighborhood surrounding a single C-major triad. The first graph shows C major at the center of a collection of twelve closely related triads, while the second shows that same region as the product of a number of transformations from our neo-Riemannian inventory. Reflecting a triad upon its horizontal axis is equivalent to a **P** operation—note how the two pitches that form its fifth are retained. Moving a triad one triangle to the left or right corresponds to either an **L** or an **R** transformation, depending on the mode of the initial chord.

A number of familiar interval cycles are embedded within the Tonnetz's geometry. Figure 3.8 highlights the ic3, ic4, and ic5 cycles that emerge around a central C-major triad. Iterating **P** and **R** creates the eight-step octatonic cycle along the northeast to southwest diagonal alleyway. Similarly, **P** and **L** generate the six-step

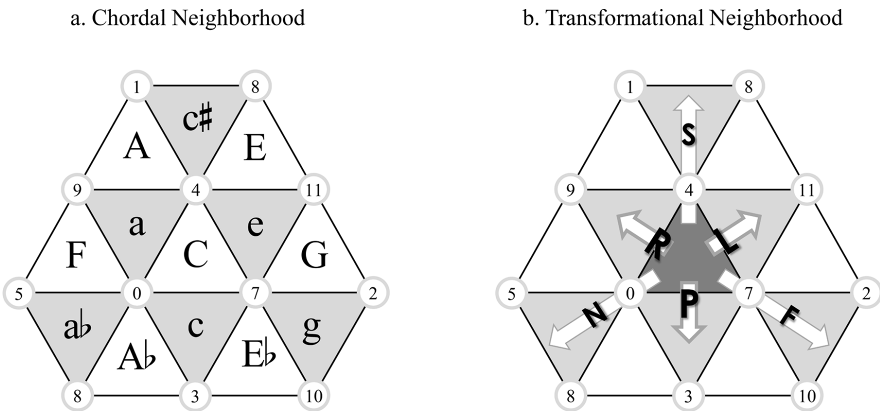


Figure 3.7 *Tonnetz* space around C major: (a) chordal neighborhood; (b) transformational neighborhood.

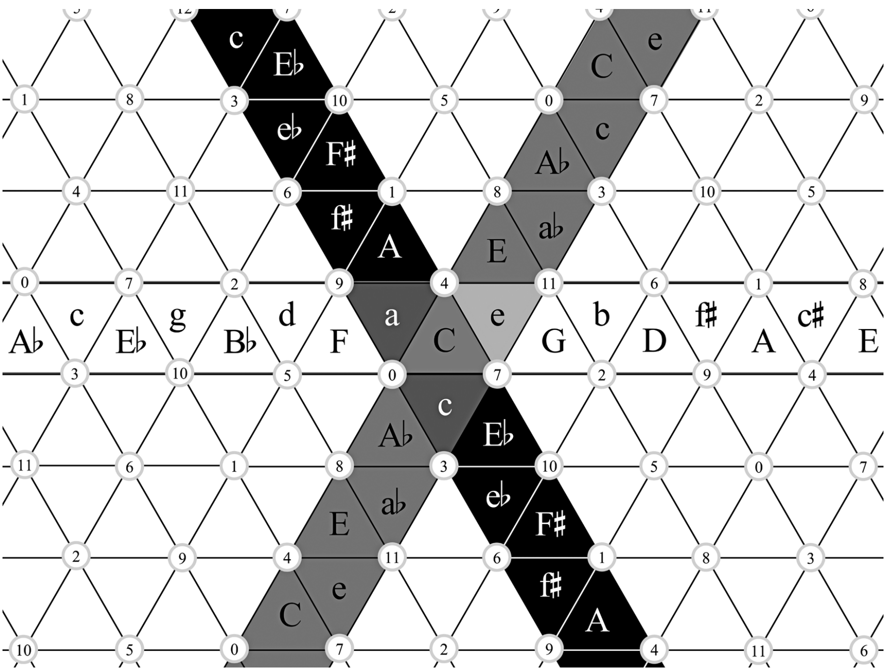


Figure 3.8 *Tonnetz* embedded cycles.

hexatonic cycle along the opposite diagonal. Meanwhile, a chain of repeated **L**s and **R**s produces the twelve-step circle of perfect fifths along the horizontal axis. This last cycle has a convenient upshot: all six consonant triads that belong to any one diatonic scale will be grouped contiguously and horizontally parallel with one another (Cohn 2011, 2012: 164–194). Both diatonic passages and cyclical processes therefore leap out of the Tonnetz when one grows to recognize the slivers and alleys they occupy. The presence of these emergent cycles and regions also serves to illustrate the geometrical redundancy of the enharmonically equivalent Tonnetz; note, for example, how the same C-major triad appears several times in the hexatonic diagonal of Figure 3.8. Short of representing this space differently—toroidally, for example, a representation that is confusing when viewed on the printed page—such repetitions are bound to happen. Redundancy might pose a slight graphical inconvenience, but it can also be a way to emphasize different contextual perspectives on seemingly identical triads. Just because two C-major triads share the same frequencies in ET does not mean they must occupy the same local spot in tonal space, as we will see.

THE DA VINCI CODE

One way in which the Tonnetz can aid film music analysis is by revealing the connections between passages with related but outwardly dissimilar musical material. Movie franchises provide some golden opportunities to track such musical connections. Hans Zimmer's music for the "Da Vinci Code" series, which includes *The Da Vinci Code* (2006), *Angels and Demons* (2009), and *Inferno* (2016), offers one such laboratory for inspecting franchise-spanning tonal transformations. The main theme for all three movies is based on a four-chord harmonic module that supports a simple, arching melody. Figure 3.9 offers a melodic reduction of the thematic cell as it appears in the climactic cue of *The Da Vinci Code*, "Chevaliers de Sangreal." At this stage, the chord succession is diatonic and, indeed, a purely white-note affair. However, the long duration of each triad and the absence of dominant-powered cadences grant the succession a nonfunctional, noncentric quality. Zimmer's theme is crafted to sound vaguely modal, rather than traditionally tonal—as befits of the ecclesiastical, esoteric subject matter of the film.

Over the course of the three *Da Vinci Code* movies, this module is subjected to a range of tonal transformations. Figure 3.10 provides a reduction and neo-Riemannian analysis of six such variants (▶). A few large-scale changes are clearly visible from this overview. Most apparent is the tendency toward

Figure 3.9 Zimmer, *Da Vinci Code*, "Chevaliers de Sangreal Theme."

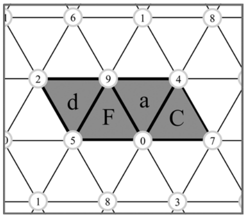
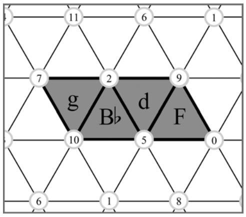
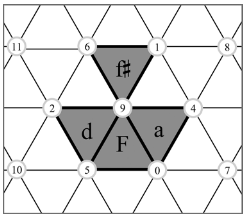
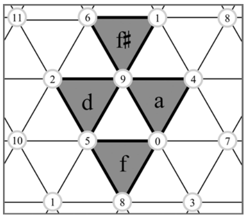
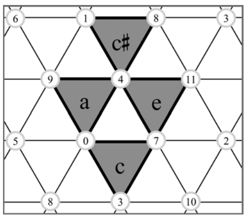
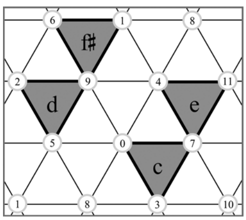
Figure 3.10 Zimmer, *Da Vinci Code*, "Chevaliers Theme" harmonic variants.

increased chromaticism, as evident, for instance, with the replacement of the diatonic **R** transformation with much darker chromatic progressions in the last four examples. However, a number of other patterns are not immediately obvious in the diagram, because of the variable transposition levels and triadic orderings of the six iterations. Thankfully, the Tonnetz can help neutralize these confounding factors.

Table 3.4 shows how each of the six variants of the *Da Vinci* theme fits into the Tonnetz. The diatonicity of the first and second variants is plainly evident in the horizontal and contiguous orientation of each four chord module. The second variant, which is a standard continuation of the main theme and also heard in "Chevaliers de Sangreal," is effected by a simple $\mathbf{T_5}$ transformation of the original cell, shifting the whole module one diatonic "slot" to the left. The third variant, on the other hand, appears in its complete form *only* on the *Da Vinci Code* soundtrack album, not in the film itself. (A partial version does occur at 1:39:50.) And while this unused material cannot inform a typical moviegoer's listening experience, it can help in understanding subsequent harmonic transformations. The progression, Dm⇨F♯m⇨FM⇨Am, contains three out of four of the same chords as the original. Yet the use of **PL** instead of the typical **R** dramatically changes the transformational "shape" of the module, which is no longer confined to the horizontal (i.e., diatonic) plane. The introduction of this chromatic third relation anticipates the more pervasive hexatonic orientation of subsequent thematic transformations.

The fourth and fifth variants, each powered by hexatonic compounds, share the same shape in the Tonnetz—something that may not be obvious in music

Table 3.4 **Zimmer, *Da Vinci Code*, "Chevaliers" theme variants in the *Tonnetz***

Film and Cue	*Progression*
a. Basic Module	
b. Transposed Module	
c. Partially Chromaticized Module	
d. Fully Chromaticized Module	
e. Fully Chromaticized, Reordered, and Transposed Module	
f. Fully Chromaticized, Reordered, Transposed, and Deconstructed Module	

notation, given their differing pitch content, ordering, and interior transformations (**RL** and **SP**, respectively). Note how, while a diatonic spine is still intact in both (Dm⇔Am and Am⇔Em), the overall degree of chordal connectedness is reduced, with triads now only sharing corners, not edges. The final variant, which accompanies a tense conversation in the midst of a swat-team operation in *Angels and Demons*, is most distantly related to the initial diatonic module. Here, only the D-minor starting triad and slow chordal texture remain as vestiges of the "Chevaliers" theme. However, the Tonnetz representation makes plain how it is descended from the original model by way of the progressive transformations of earlier variants, from which it clearly owes its double **PL** motions. Unlike every other modification of the model, the *Angels and Demons* progression is no longer fully connected on the Tonnetz. The first and second halves of the module share no edges or corners and are separated by a wide spatial gulf. This separation breeds a sense of tonal alienation, chiefly the product of the unprecedentedly complex **SLRP** compound—an appropriately dire-sounding tritonal motion that figuratively "cracks open" the already chromaticized "Chevaliers" motif.

Useful though the Tonnetz is for representing tonal pathways and spaces, it is sometimes advantageous to construct spaces bound by a less rigid geometry. **Transformational networks** have been as important to neo-Riemannians as prefabricated chessboards like the Tonnetz and related grids.[47] A transformational network requires two elements: nodes and arrows. Nodes represent harmonic objects and may be filled with specific triads or, in more open-ended cases, left empty. Arrows power the network and provide a description of relevant connections between triadic nodes. Arrows may be bidirectional, which helps convey oscillating progressions and reversible transformations like the unary NROs. Alternatively, one-sided arrows can capture directionality and chronology, while also being able to describe non-reversible transformations.

The number of nodes, the distances between them, and their spatial configuration is up to the analyst. Transformation networks normally do not make commitments about tonicity, but in cases in which a key center is obvious, the tonic can be indicated with a doubly encircled node (following Rings 2011b). Node/arrow systems can be as simple as a pair of triadic nodes and a single arrow, or as complex and spatially byzantine as one can imagine. Transformation networks are ad hoc in a positive sense: while they lose some of the orderliness of the Tonnetz, their ability to capture the peculiarities of a specific piece can more than justify any loss in geometrical generalizability.

A transformation network for the *Da Vinci Code* theme is shown in Figure 3.11. This network models every possible inter-triadic motion between the triads Dm, Am, FM, and CM as a neo-Riemannian transformation, including some pathways, such as Am⇔FM (**L**) and Dm⇔CM (**RLR**) not taken in any of the variations already cited. While not as systematically constructed as a Tonnetz diagram would be, the network nevertheless does capture aspects of relative distance and

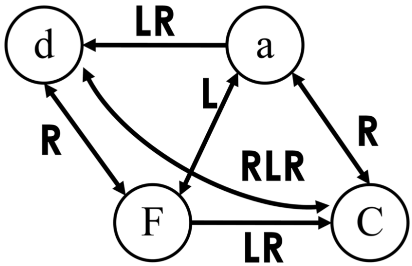


Figure 3.11 Zimmer, *Da Vinci Code*, "Chevaliers Theme," general network.

relatedness through its shape; note, for instance, that arrows for unary transformations are shorter than those for compounds.

Zimmer's work on the *Da Vinci* franchise provides many more examples of passages whose harmonic activity can be described by this network. For example, the first film includes a recurring (1:10:58, 1:53:18) progression [Am⇨CM⇨Dm⇨FM] that, while bearing a different chordal order and dissimilar melody from the main theme, fits snugly into the generative transformational network. The same can be said of less motivic moments, such as a cadence at the end (2:27:20) of the first film, (Dm⇨CM⇨FM⇨CM⇨Dm⇨Am⇨FM), or a progression twenty-three chords long during the climax of *Angels and Demons* (1:47:30), composed exclusively from these four triads in various orders (albeit decorated with occasional nonfunctional sevenths). That all these examples use literally the same chords as the main theme makes their transformational correspondence readily apparent, as all ultimately emerge out of the pseudo-modal, pseudo-minimalist idiom Zimmer employs throughout the series. Even so, the same network in Figure 3.11 can capture related music that uses different transpositional or modal configurations equally well; a tonally generalized "meta-network" for Zimmer's harmonic predilections in this franchise would simply need to empty its nodes of specific triads.

SCOTT OF THE ANTARCTIC

For a demonstration of the usefulness of spatial visualization in the analysis of extremely discursive pantriadicism, let us inspect a cue from Ralph Vaughan Williams's score to *Scott of the Antarctic* (1948). Although it sits outside the New Hollywood mainstream that has occupied us for most of this chapter, Vaughan Williams's music for this film proved highly influential to later American composers like Goldsmith, Shore, and Williams, who drew inspiration from its alien progressions and unearthly textures in their soundtracks for major science-fiction and fantasy movies. Yet the movie's music is also of substantial independent interest for the purposes of neo-Riemannian analysis.

The film, which depicts Sir Robert Scott's ill-destined expedition to the South Pole, is largely forgotten today, but Vaughan Williams's score enjoyed a second life in the concert hall, with large portions being adapted in his Seventh Symphony, *Sinfonia antartica* (1952).[48] The score and symphony both showcase a heavily chromatic main theme, whose twisting modulations seem to represent Scott's trudging progress across the frozen wastes of Antarctica. The theme's definitive statement comes in the cue "Scott Climbs the Glacier," written for a dialogue-free sequence (58:47, ▶) in which the explorer and his team slowly ascend an icy peak. Figure 3.12 provides a reduction with neo-Riemannian annotations.

The sprawling theme, which is thirty measures long (without repeats) falls into six subphrases, rendered as separate staves in the analysis. Vaughan Williams begins and ends by placing emphasis on G major, though this is not a "key" in any traditional sense. The overall tonal idiom is discursive pantriadicism, with a fixation on chromatic step and third progressions, at the near total exclusion of diatonic-fifth relations. There are many transformationally noteworthy aspects of Vaughan Williams's music—and more still for the thematic transformations it undergoes over the course of the film and symphony—but I will concentrate just on a handful of details especially germane to tonal space analysis.

Figure 3.12 Vaughan Williams, *Scott of the Antarctic*, "Scott Climbs the Glacier."

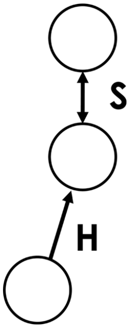


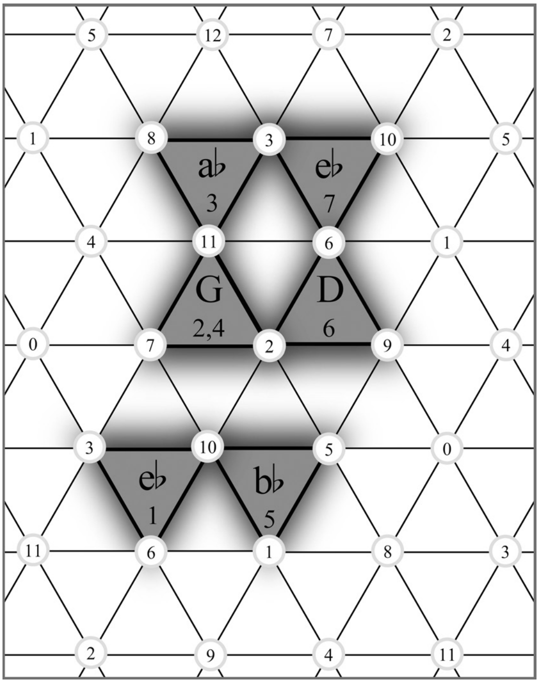
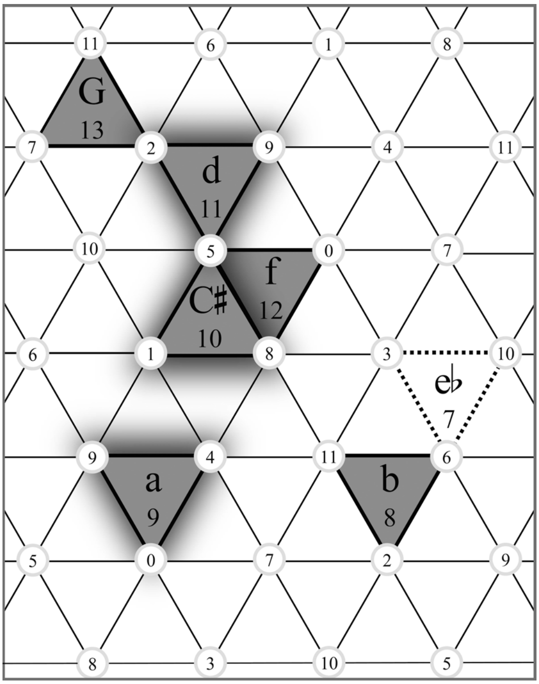
Figure 3.13 Vaughan Williams, *Scott of the Antarctic*, harmonic motif network.

The first four measures set the stage for the rest of the theme in several respects. The melody's ascent from E♭4 to C5—a near whole-tone hexachord—establishes the stepwise motion that will mark the cue from beginning to end. The harmonic progression that undergirds it, E♭m⇨GM⇨A♭m⇨GM, is tailored to nullify any diatonic expectations surrounding its lightly implied "tonic" of G. These first four chords set up what will become an important harmonic motif throughout the cue, represented with a transformational network in Figure 3.13. (The reasons for the unusual vertical orientation will be made clear shortly.) This little network has three triadic nodes, connected by a unidirectional **H**exatonic pole relation (as in E♭m⇨GM) and a bidirectional **S**lide relation (as in GM⇔A♭m). The three-pronged progression occurs, in some guise, five times over the course of the theme, though not every instance is as aurally obvious as the one in mm. 1–4. For seeing how the **H**/**S** transformational pairing arises, it is best to refer to the Tonnetz, where modified or concealed iterations of the cell leap out.

Table 3.5 provides a Tonnetz representation of the whole theme, split into six stages that correspond to its subphrases. In addition to housing the name of the triad, each triadic node includes an Arabic numeral that indicates at which stage of the journey the triad occurs. (Ideally, the graph would be animated in real time; these ordinal numbers are a compromise, given the limitations of the printed page.) Using this information, one can trace the theme's chronological progress from beginning to end. The motivic **H**/**S** cell is indicated by a dark halo surrounding triadic triangles, which now can be seen as the origin of the oddly skewed shape of the three-chord network in Figure 3.13.

Following its introduction in the first four measures, **H**/**S** cell is repeated in an easily recognizable form within mm. 5–7. For the most part, this is a simple $\mathbf{T}_7$ transposition of the cue's opening. But it is not a perfect transposition, as the head motif is cut short, landing on an E♭-minor triad that does not return to its **S**-partner, DM. Observe that the E♭m in m. 7 occupies a *different* spot on the Tonnetz than the one that initiates the whole theme. Despite the appearance of symmetry, there is a good case for not treating these spots as representatives of

Table 3.5 **Vaughan Williams, *Scott of the Antarctic*, "Scott Climbs the Glacier" in the *Tonnetz***

Measures	*Progression*
a. mm. 1–7	
b. mm. 8–13	

(continued)

Table 3.5 **Continued**

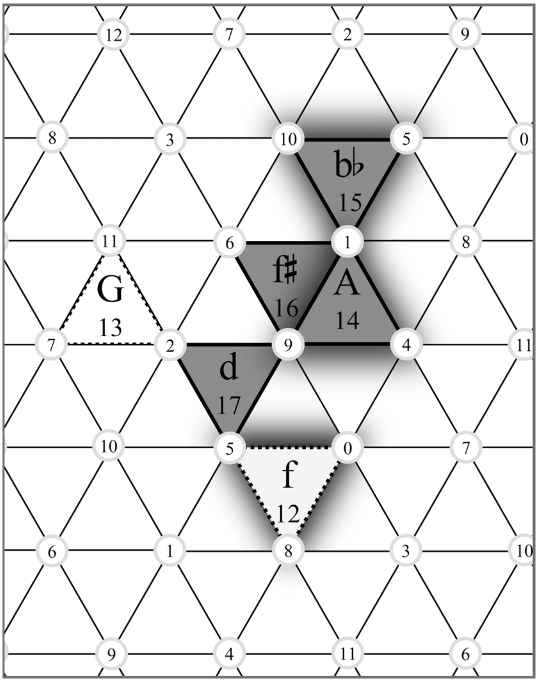
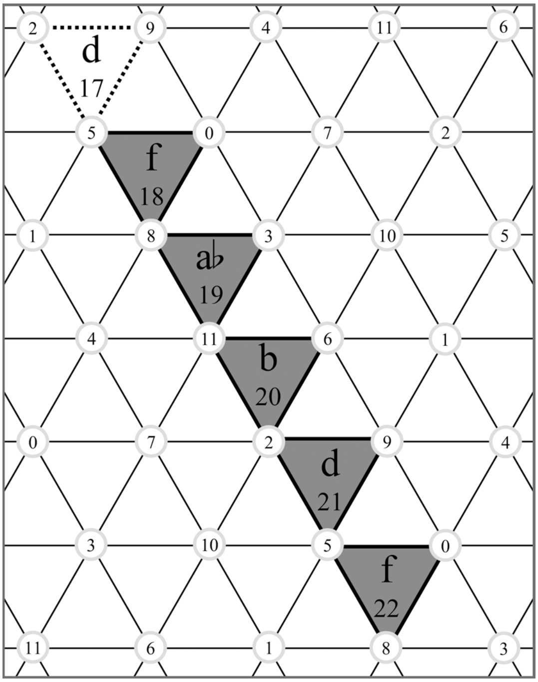
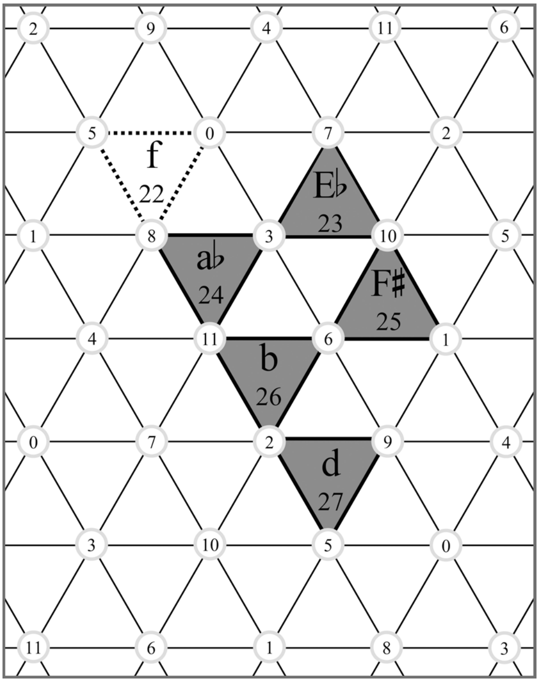
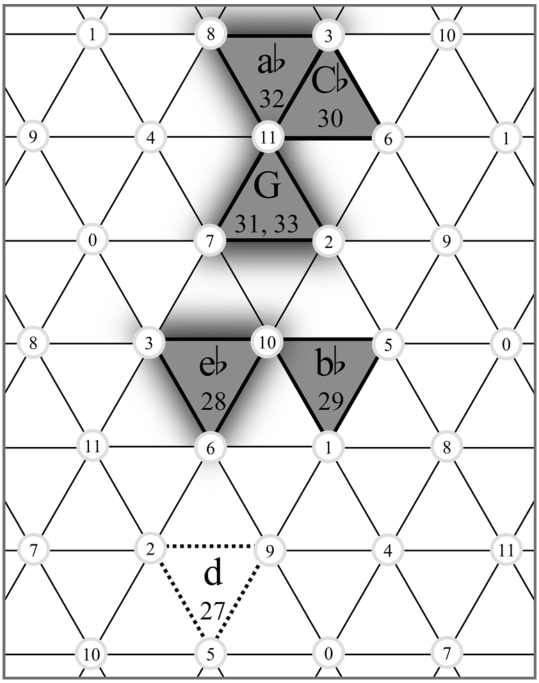
Measures	***Progression***
c. mm. 14–17	
d. mm. 18–21	

Table 3.5 **Continued**

Measures	*Progression*
e. mm. 22–24	
f. mm. 25–30	

the same harmonic object. E♭$_{m.1}$ and E♭$_{m.7}$ serve starkly different harmonic roles within their respective phrases and harmonic modules. The "function" of the initial E♭m is taken over by B♭m in the parallel phrase, while the concluding E♭m acts comparably to the A♭m of the previous phrase. One of the benefits of transformational analysis is that it allows us to make fine-grained distinctions about shifting a tonal intention like this one, without getting hung up on extraneous matters of enharmonic-identity or recurrence.

The next iteration of the **H/S** cell occurs in the second phrase (mm. 9–11) through the progression Am⇨C♯M⇨Dm. Here again the module is clipped at its conclusion, and is further distanced from its original model by being shifted over one measure within its phrasal unit; A minor occurs on the second of four measures instead of the first, and the following two triads are similarly displaced. The transition into the theme's subsequent phrase hosts the fourth appearance of the **H/S** cell, though here the **H** progression is obscured by the repeated interjections of an intervening sonority. Fm progresses to its **H**-partner, AM, but with an interloper, GM, sitting between the two and acting as a passing chord. This relationship, effectively invisible in Figure 3.12, is suddenly obvious when we consult the Tonnetz.

The theme builds to a massive climax, with a twofold ascent up an octatonic ladder (mm. 18–21, 22–34) that mimics the strenuous push of Scott and his men over the unforgiving polar terrain. Vaughan Williams's cue culminates with a fortissimo breakthrough onto GM at m. 27. The final **H**/**S** cell, which occurs between mm. 25 and 28, ties the theme together by recalling the opening's specific E♭m⇨GM⇔A♭m progression. Yet it is also a return informed by the sorts of transformational modifications the rest of the theme has undergone. The once unary hexatonic progression is again mediated by interstitial material, now *two* passing chords—an inverted D♭ and C♭7—which further thicken the space between E♭m and GM. (In the symphonic revision of this cue, this polar gap is further obscured by a series of lengthy new interpolations.) Yet, with the sight of the glacier's peak in view, we do return at last to well-trodden territory: a ringing repetition of the **S** progression, Vaughan Williams's harmonic emblem of the unfathomable mystery of the Antarctic landscape.

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Having reached the halfway point in this book, it is worth briefly taking a step back and asking what exactly it means to closely study film music. Arguably, going to the movies turns everyone into a music analyst. The facility with which even an inexperienced cinemagoer can make sense of the busiest of soundtracks is astonishing. Within milliseconds of striking the ear, film audio is broken down and reassembled into meaningful constituents, from simple frequencies to rich timbres to discrete instrumental choirs. We entrain rhythms and metrical hierarchies, form and confirm hypotheses about key, and draw predictions about how themes will proceed based on what we have heard before. What emerges is an independent and coherent stream of musical commentary, one we intuitively understand as coming from a different narrational space than other forms of cinematic audio like sound effects and dialogue. The presence of a moving image makes this perceptual feat even more impressive. We evaluate character psychology according to underscore, activate generic expectations in relation to style topics, and draw inferences about what will happen in the narrative based on what the score is foreshadowing. That for many filmgoers all of this mental activity happens unconsciously, without disrupting immersion, does not diminish just how complex the music analytical tasks in perceiving screen media are. Small wonder then that so much film music is governed by convention and cliché. Any shortcut to audience intelligibility, any method for lifting the cognitive load imposed by the soundtrack, stands to ensure more accessible, semiotically optimized musical storytelling.

This implicit form of music analysis might seem rather starkly opposed to the more active, score-based form of analysis I have advocated for. Close textual reading can reveal many treasures, including hidden patterns and connections never before grasped by listener or even composer. But it is a mistake to think that music analysis must be confined only to recondite matters, its only pleasures stemming from what Carolyn Abbate (2004: 524) dubs the "cryptographic sublime."

In introducing the tools and concerns of neo-Riemannian theory, I hope this chapter has provided a way of articulating some aspects of film music structure and meaning that our unconscious minds are already registering, that we as filmgoers already, in a deep if unexamined sense, "know." My goal has always been to provide readers with a pathway to more active, engaged filmgoing. Far from violently taking one out of the movie, knowing a **S**lide-progression or an octatonic cycle when one hears it can provide a frisson of recognition and rush of understanding that only deepens appreciation. It is with this possibility for a more profound—indeed more *musical*—way of engaging film in mind that we move on to the next chapter, where close analysis takes center stage.