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Triadic Transformations in the Music of César Franck: Analysis of Piano Solo *Prélude, Aria et Final*

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Abstract

The Neo-Riemannian theory is not only suitable for analyzing music with the ambiguity of harmonic functions in later Romanticism but also finds relevance between chords in the 20th century focused on the atonal music analysis. This paper employs the Neo-Riemannian theory to the last piano solo by César Franck based on the basic triadic transformations of P-relation, R-relation, and L-relation, as well as N-relation, H-relation, and S-relation, which are of integrated relations of transformations. At the same time, the symmetry and distance relationships of the triads can also be intuitively seen in the tonnetz model, which reflects Franck's tonality and personalized creation of using triads. Importantly, this analysis provides a theoretical basis for a comprehensive understanding of Franck.

네오리만 이론은 후기 낭만주의에서 화성적 기능이 모호한 음악을 분석하는데 적용될 뿐만 아니라 20세기에 무조성 음악의 화음 구조 분석에서도 광범위하게 응용된다. 본 논문은 네오리만 이론을 활용하여 P-관계, R-관계, L-관계와 함께 이러한 관계들의 합성적인 관계인 N-관계, H-관계, S-관계를 이해하고, 프랑크의 마지막 피아노 독주곡 속에 나타난 관계성을 분석한다. 또한 톤네츠 모델에서도 3화음의 대칭성과 거리 관계를 직관적으로 볼 수 있어 프랑크의 작품에서 3화음 관계를 볼 때 전통적 기능이 아닌 독창적인 작곡가의 창작적 의도를 밝힐 수 있고 더 나아가 전면적으로 프랑크 음악을 이해하기 위해 일정하고 논리적인 이론적 근거를 제공한다.

Keywords

César Franck, Prélude Aria et Final, Neo-Riemannian, Romanticism, Music Analysis

Introduction

In 20th-century Western music analysis, set theory and many theories sprung up. The Neo-Riemannian Theory originated in the 1980s as formulated by David Lewin (1933-2003).[1] The Neo-Riemannian theory arose in response to analytical problems posed by chromatic music that is triadic but not altogether tonally unified. Specifically, such characteristics are primarily identified with the music of Wagner (1813-1883), Liszt (1811-1886), and later composers but are also represented by some passages from Mozart (1756-1791), Schubert (1797-1828), and other pre-1850 composers.[2] Richard Cohn mentioned six concepts of Neo-Riemannian theory: triadic transformations, common tone maximization, frugal voice leading parallelism, mirror or "dual" inversion, enharmonic equivalence, and tonal relation.[3] The triadic transformations stand as the core of the Neo-Riemannian theory. The Neo-Riemannian theory originated from Hugo Riemann's (1849-1919) harmony theory, which deviated from the function of harmony and became an important theory for analyzing triad relationships since the 19th century.

In the 1980s, David Lewin first proposed the Neo-Riemannian Theory in his paper. Subsequently, Richard Cohn, John Clough (1930-2003), Brian Hyer, and Jack Douthett expanded upon this theory. The development of the Neo-Riemannian theory freed itself from the functional harmony of tonality and became a crucial analytical tool for music creation and analysis since late Romanticism.

This study first explains the basic concepts of the Neo-Riemannian theory. Building upon this foundation, it then delves into the application of triadic transformations in piano solo *Prélude, Aria et Final*. At present, there are few studies that apply Neo-Riemannian triadic transformations to analyze Franck's compositions. Therefore, this paper attempts to apply the theory of triad transformation to analyze a complete composition and provide a theoretical basis for a comprehensive understanding of Franck, which will be of reference significance to the analysis of his later compositions.

Basic Relations in the Neo-Riemannian Theory

The Neo-Riemannian theory is not only suitable for analyzing music with vague functions in the later stages of Romanticism but also has a wide range of applications in the 20th century's minimalist music with a focus on triad structures, as well as atonal music analysis. Scholars studying the Neo-Riemannian theory often use many geometric shapes of pitch relationships to articulate the interrelationships between triads. Figure 1 is a rendering of the Tonnetz.

Pitches in the Tonnetz are connected by lines if they are separated by a minor third, major third, or perfect fifth. Horizontal tones share a pure fifth-degree relationship. Diagonals of minor 3rds run from lower-left to upper-right, while diagonals of major 3rds run from upper-left to lower-right.

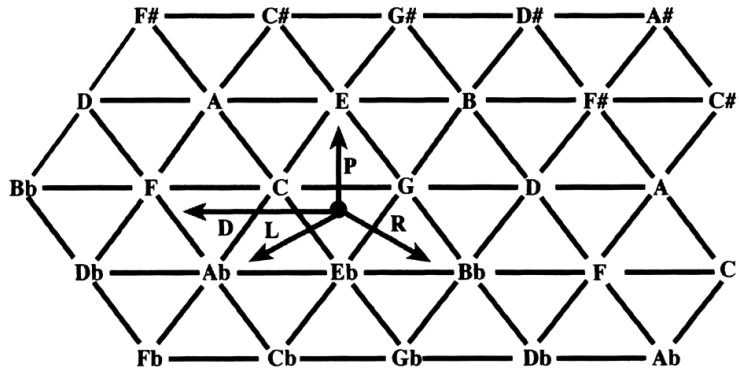


Figure 1. A Rendering of the Tonnetz[4]

The main features of the Neo-Riemannian theory of triadic transformations are generally considered to be contextual inversion, voice-leading parsimony, and common-tone maximization. The three conversion modes (P-relation, L-relation, and R-relation) reflect each other between the converted triads. The transition between major triad and minor triad can result in two common notes in these modes. Whenever a motion between two triads involves the retention of two common tones, the single 'moving' voice proceeds by a semitone in L and P or a whole step in R.[5] Table 1 illustrates three types of triadic transformations.

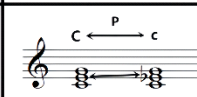
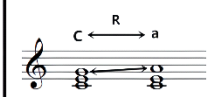
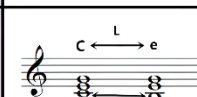
Name	Description	Contextual Inversion	Parsimonious Voice Leading	Example
P(Parallel)	Major and minor triad share the same root.	Invert around the shared perfect fifth.	One voice moves by 1 semitone.	
R(Relative)	The root of a Major triad becomes the third of a minor triad.	Invert around the shared major third.	One voice moves by 2 semitones.	
L(Leittonweschel)	The third of a major triad becomes the root of a minor triad.	Invert around the shared minor third.	One voice moves by 1 semitone.	

Table 1. Triadic Transformations[6]

Parallel forms a transition between major and minor triads by moving the semitone of the original third note through two triads; Relative converts a major triad into a minor triad by raising the fifth note of the major triad by a whole tone; Leittonwesel converts the root of a major triad into a minor triad by lowering it by the semitone.

Integrated Relations in the Neo-Riemannian Theory

Cohn refers to these triadic transformations as PLR families[7]. By applying the three triadic transformations of P-relation, R-relation, and L-relation, connections can be established between major and minor triads. On the basis of the Neo-Riemannian theory of triadic transformations, secondary operations can be constructed by combining these basic operations. To put it more specifically, these secondary operations include N-relation, S-relation, and H-relation. Table 2 illustrates three types of integrated relations.

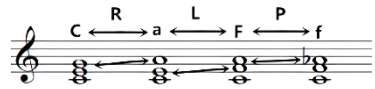
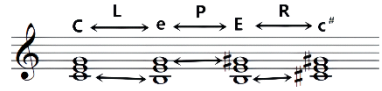
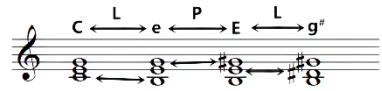
Name	Combining Form	Example
N(Nebenverwandt)	RLP	
S(SLIDE)	LPR	
H(Hexatonic poles)	LPL	

Table 2. Integrated Relations

N-relation (Nebenverwandt) involves converting the root note of a major triad or the fifth note of a minor triad as a common note. Cohn defined this triadic transformation as a Nebenverwandt conversion,[8] which can be achieved through RLP transformation. S-relation (SLIDE) converts the third note of a major and minor triad into a common tone. Lewin defines this triadic transformation as a SLIDE conversion,[9] which can be achieved through LPR transformation. H-relation (Hexagonal poles)[10] is a conversion of two triads in opposite positions of the hexagonal poles, which comes with no common tone between them. This conversion mode can also be obtained through LPL transformation.

In Neo-Riemannian theory, there is no traditional harmonic function, such as in the C major triad and F major triad. While traditionally considered tonic and sub-dominant in harmonic analysis, the C major triad and F major triad have a RL relationship. Similarly, the C major triad and G major triad are identified as tonic and dominant chords in traditional harmony, which showcases an LR relationship. The Neo-Riemannian theory abandons traditional harmony relationships and is more relevant in analyzing the compositions of 19th-century Romantic composers in theory. This paper attempts to analyze Franck's *Prélude, Aria et Final* by the triadic transformations theory.

The Application of Triadic Transformations in *Prélude, Aria et Final*

Piano solo *Prélude, Aria et Final* is the last piano solo composition of César Franck (1822-1890). This composition by Franck began writing in the summer of 1886 and was completed in the summer of 1887. It was premiered by Léontine Bordes-Pène at the French National Music Association on May 12, 1888. The form of "Prélude" is a sonata form that omits the secondary thematic recapitulation. The form of "Aria" is a ternary form with its repeated variations. The form of "Final" is a sonata form, with a speed of Allegro molto ed agitato.

L-relation in *Prélude, Aria et Final*

In "Prélude," the complete L-relation appears four times. The first instance is in measures 1-3, where the triadic transformations are between the E major triad and the $g^{\#}$ minor triad. Figure 2 is the measures 1-3 of "Prélude." The second occurrence is in measures 13-15, and the motion path of the triad is exactly the same as the first occurrence.

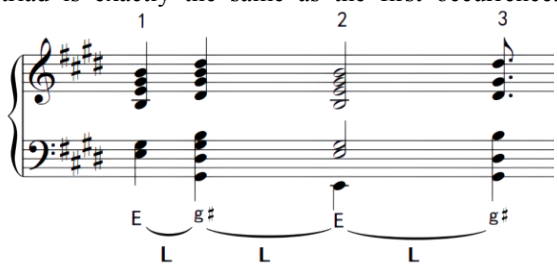


Figure 2. "Prélude," mm 1-3

The third occurrence is in measures 69-73, and the triadic transformations are between the $c^{\#}$ minor triad and A major triad. Figure 3 is the measures 69-73 of "Prélude."

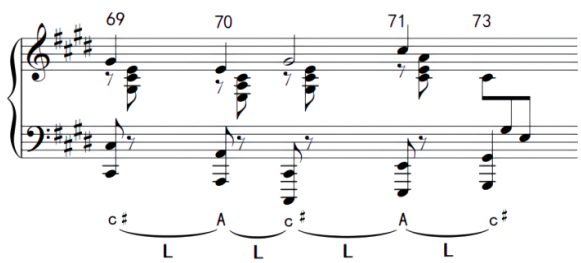


Figure 3. "Prélude," mm 69-73

When it comes to the fourth occurrence, it is in measures 147-149, and the triadic transformations are between the e^{b} minor triad and the C^{b} major triad. Figure 4 is the measures 147-149 of "Prélude."

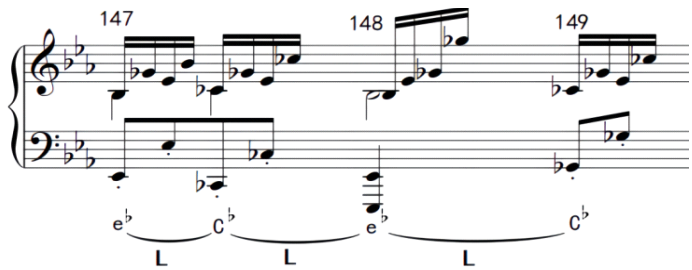


Figure 4. "Prélude," mm 147-149

As for "Final," the complete L-relation appears once in measures 239-245. Specifically, the triadic transformations are between the $c^{\#}$ minor triad and the A major triad. Figure 5 presents measures 239-245 of "Final."

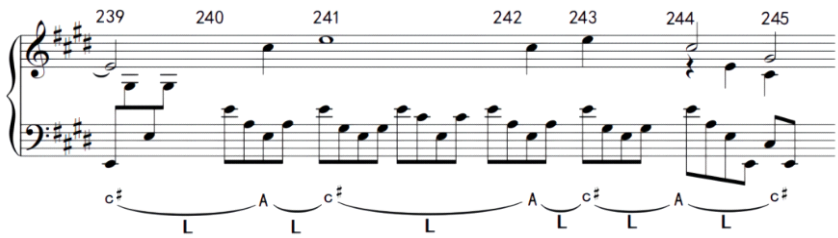


Figure 5. "Final," mm 239-245

The triadic transformations of these L-relations can be represented by the Tonnetz model. Figure 6 depicts the LR-cycle[11] Tonnetz of *Prélude, Aria et Final*.

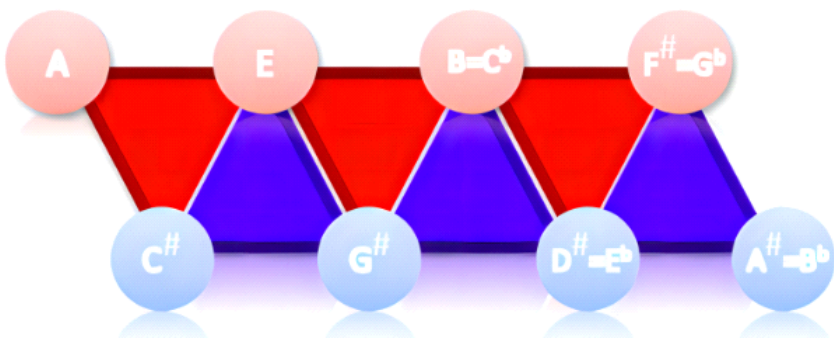


Figure 6. *Prélude, Aria et Final*, LR-cycle Tonnetz

This tonnetz model illustrates that the horizontal triads reflect the tonal relations by an LR-cycle, just like A-$c^{\#}$-E-$g^{\#}$-C^{b}-e^{b}. Tonnetz, based on the relationships of major third, minor third, and pure fifth, is perfectly suitable for showcasing the process of pitch variation, which also provides a clear depiction of the triadic conversion paths within the three structural parts. During this cycle, the tradic transformations gradually change the tonality to distant relationships.

R-relation in *Prélude, Aria et Final*

In this composition, the R-relation appears the most frequently. In "Aria," the complete R-relation appears once in measures 17-33, where the triadic transformations are between the A^{b} major triad and the f minor triad. Figure 7 presents the measures 17-33 of "Aria."

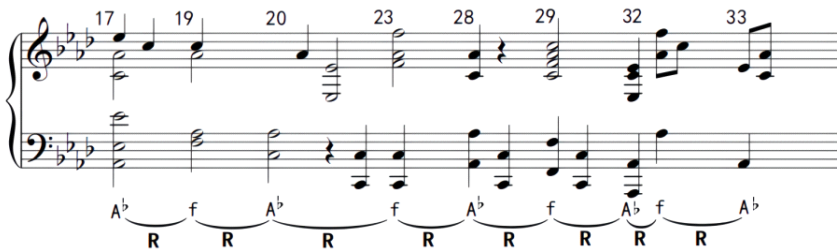


Figure 7. "Aria," mm 17-33

The complete R-relation has appeared seven times in "Final." The first occurrence is in measures 47-51, which features triadic transformations between the D major triad and the b minor triad. Figure 8 is the measures 47-51 of "Final."

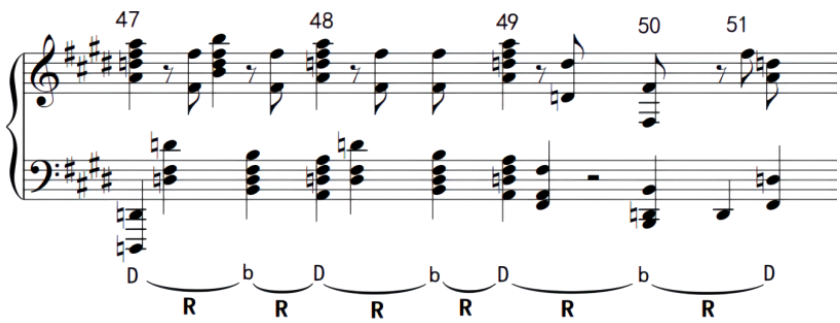


Figure 8. "Final," mm 47-51

Another R-relation occurs in measures 57-66, where the triadic transformations are between the A^{b} major triad and the f minor triad. Figure 9 is the measures 57-66 of "Final."

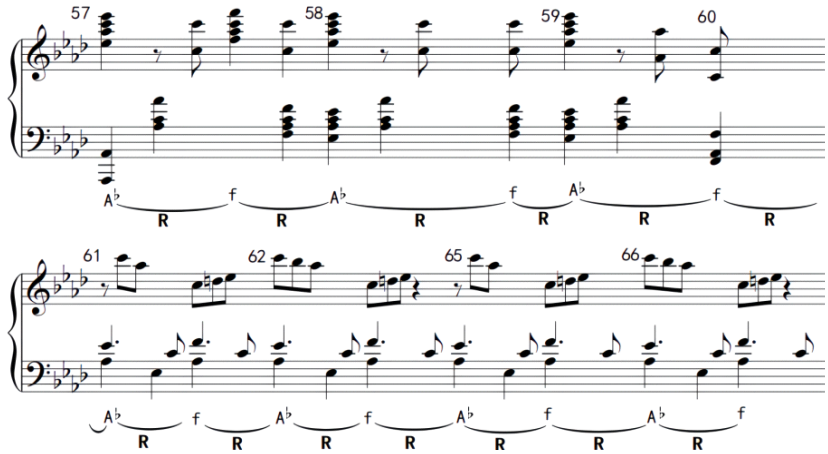


Figure 9. “Final,” mm 57–66

Thirdly, the R-relation is present in measures 69-70, and the triadic transformations are between the E major triad and the c$^{\#}$ minor triad. Figure 10 is the measures 69-70 of “Final.”

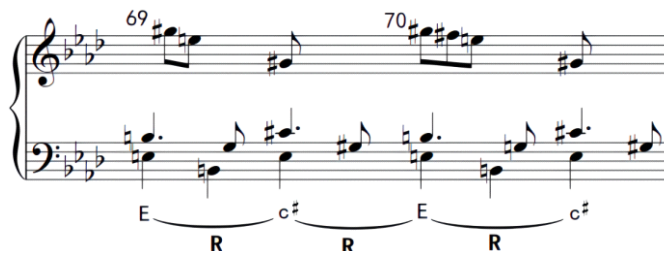


Figure 10. “Final,” mm 69–70

The modes for the fourth and fifth times are the same as those for the second and third times. The fourth triadic transformation is between the E major triad and the c$^{\#}$ minor triad, while the fifth involves the C major triad and a minor triad.

The sixth occurrence takes place in measures 208-212, and the triadic transformations are between the B major triad and the g$^{\#}$ minor triad. Figure 11 is the measures 208-212 of “Final.”

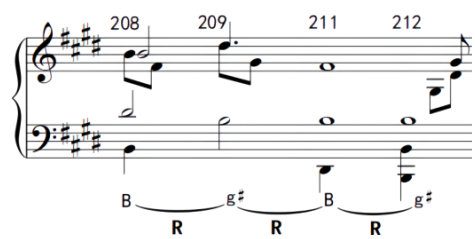


Figure 11. “Final,” mm 208–212

Lastly, the R-relation is in measures 249-251, and the triadic transformations are between the E major triad and the $c^{\#}$ minor triad. Figure 12 is the measures 249-251 of "Final."

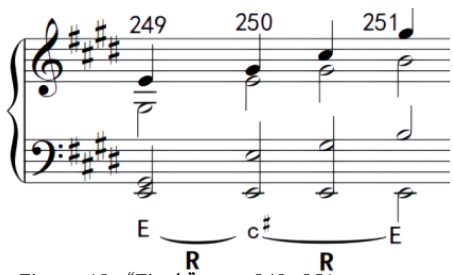


Figure 12. "Final," mm 249-251

The triadic transformations of these R-relations can be represented by the Tonnetz model. Figure 13 is the LP-cycle[12] Tonnetz of *Prélude, Aria et Final*.

The composition features a wide range of R-relation. This Tonnetz is obtained through f-A^{b}-a-C-$c^{\#}$-E. This process can be seen as consisting of R-relation and S-relation, while the RS=R(LPR)=(RLP)R=PL.[13] PL and LP are retrograde-related pairs,[14] so it is also an LP cycle. Going into detail, some of these R-relations represent the repetition of harmony, while others represent the continuation of the melody. The R-relation better reflects the tonal relations among the six concepts mentioned by Cohn. Therefore, R-relation is the most widely used and also promotes the continuity of melody.

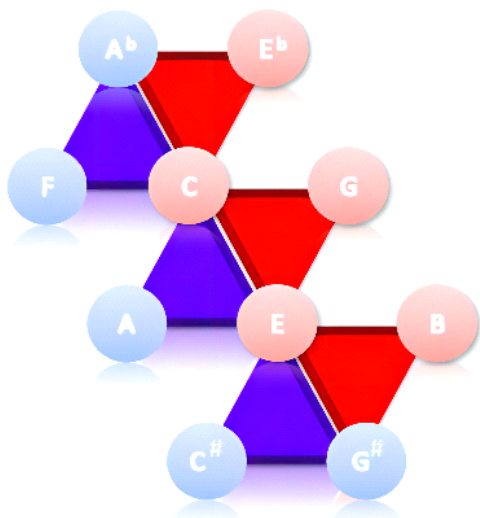


Figure 13. *Prélude, Aria et Final*, LP-cycle Tonnetz

P-relation in *Prélude, Aria et Final*

Compared with the R-relation and L-relation, the P-relation appears relatively few times in this composition, respectively in "Prélude"'s measures 122-123, the triadic transformations are between the e minor triad and the E major triad. In addition to measures 124-125, the triadic transformations are between the $G^{\#}$ major triad and the $g^{\#}$ minor triad. Figure 14 is the measures 122-123, 124-125 of "Prélude."

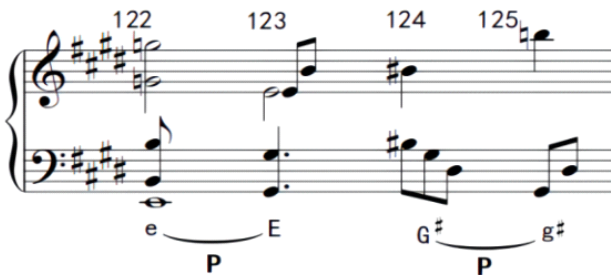


Figure 14. "Prélude," mm 122-123, mm 124-125

In "Aria"'s measures 67-72, the triadic transformations are between the a^{b} minor triad and the A^{b} major triad. When it comes to measures 78-80, the triadic transformations are between the e^{b} minor triad and the E^{b} major triad. And in measure 85, the triadic transformations are between the D^{b} major triad and the d^{b} minor triad. Figure 15 is the measures 67-72, 78-80, and 85 of "Aria."

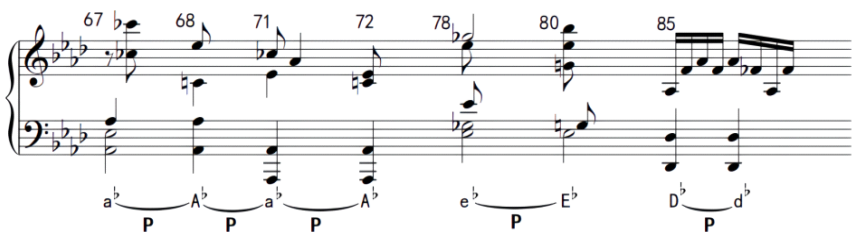


Figure 15. "Aria," mm 67-72, mm 78-80, and mm 85

The triadic transformation of these P-relations can be represented by the Tonnetz model. Figure 16 illustrates the LR-cycle Tonnetz of *Prélude, Aria et Final*.

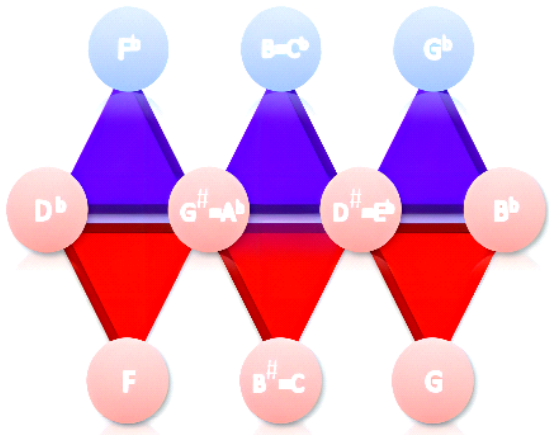


Figure 16. *Prélude, Aria et Final*, LR-cycle Tonnetz

This Tonnetz is obtained through D^{b}-d^{b}-A^{b}-a^{b}-E^{b}-e^{b}. This process can be seen as consisting of P-relation and N-relation, while the PN=P(RLP) =LR.[15] The LR-cycle Tonnetz model indicates that the process of converting triads gradually changes the tonality to distant tonality, which is based on the common tone maximization and voice leading parallelism.

N-relation in *Prélude, Aria et Final*

N-relation (RLP) is used in this composition; single S-relation(LPR) and H-relation(LPL) are not present. The N-relations occur eight times in this composition. Specifically, in "Prélude"'s measures 10-11, the triadic transformations are between the E major triad and the a minor triad. As for measure 38, the triadic transformations are between the A major triad and the d minor triad. Moreover, in measures 134-135, the triadic transformations are between the b minor triad and the $F^{\#}$ major triad. Considering measure 144, the triadic transformations are between the B^{b} major triad and the e^{b} minor triad. Besides, in measure 168, the triadic transformations are between the E major triad and the a minor triad. Figure 17 illustrates the content of measures 10-11, 38, 134-135, 144, and 168 of "Prélude."

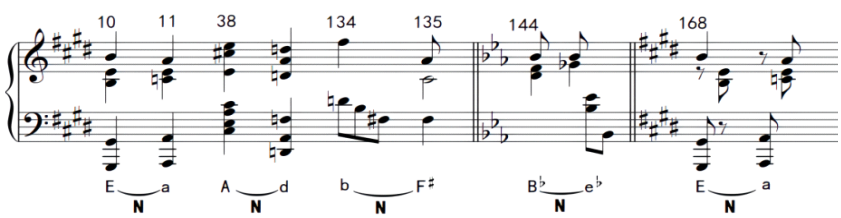


Figure 17. "Prélude," mm 10-11, mm 38, mm134-135, mm144, and mm168

In “Final”’s measures 51-52, the triadic transformations are between the D major triad and the g minor triad. In measures 53-55, the triadic transformations are between the a minor triad and the E major triad. And in measures 153-154, the triadic transformations are between the C major triad and the f minor triad. Figure 18 is the measures 51-52, 53-55, and 153-154 of “Final.”

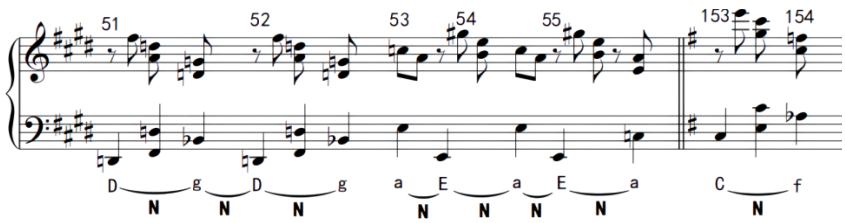


Figure 18. “Final.” mm 51–52, mm 53–55, and mm 153–154

The triadic transformations of these N-relations can be represented by the tonnetz model. Figure 19 illustrates the LP-cycle Tonnetz of *Prélude, Aria et Final*.

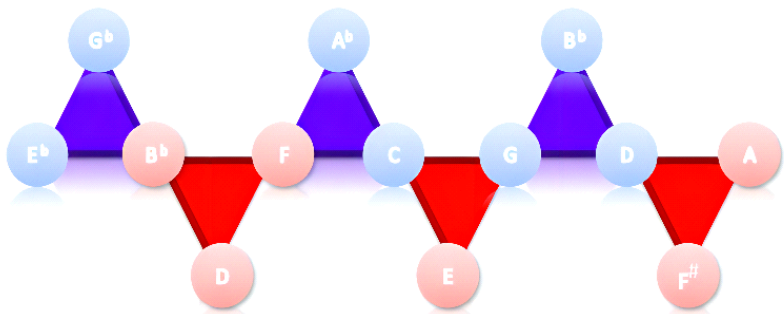


Figure 19. *Prélude, Aria et Final*, LP-cycle Tonnetz

This Tonnetz is obtained through e^{b}-B^{b}-f-C-g-D. In this process, it can be seen as consisting of N－relation and LRP, while the N(LRP)=(RLP)(LRP)=LP,[16] so it is also an LP-cycle.

The triads of each N-relation maintain a common tone. The horizontal triads reflect the relationship between tonality, while each triad of N-relation makes the relationship between tonality become increasingly distant, and the tension between triads increases, creating a sharp contrast in the music.

Conclusion

This paper is based on the common tone maximization and voice leading parsimony in the Neo-Riemannian triadic transformations theory. The study aims to explain the transformations of the P-relation, R-relation, and L-relation. Going into details, P-relation forms a transition between major and minor triads by moving the semitone of the original third note through two triads; R-relation converts a major triad into a minor triad by raising the fifth note of the major triad by the whole tone; L-relation converts the root of a major triad into a minor triad by lowering it by the semitone.

On the basis of P-relation, R-relation, and L-relation triadic transformations, secondary operations can be constructed by combining these basic operations. These secondary operations include: (i) N-relation(RLP) - converts the root note of a major triad or the fifth notes of a minor triad as a common note; (ii) S-relation(LPR) - converts the third note of a major and minor triad as a common tone; and (iii) H-relation(LPL) is a conversion of two triads in opposite positions of the hexagonal poles, with no common tone between them.

In this composition, the triadic transformations of R-relation are used more frequently than L-relation and P-relation. Two cycles were also discovered: LR-cycle and LP-cycle. Tonnetz models are established for each relationship. In the tonnetz model, the major and minor triads are symmetrically gathered together. At the same time, the symmetry and distance relationships of the triads can also be intuitively seen in the tonnetz model, which reflects Franck's tonality and personalized use of triads. Among these three triadic transformations, the conversion of L-relation and P-relation only requires moving a semitone, while R-relation requires moving a whole tone. Therefore, from the perspective of voice-leading parallelism, L-relation, and P-relation transformations can better reflect the linear movement of harmony than R-relation transformations. Despite this, the multiple occurrences of R-relation reflect that Franck is not limited to the linear movement of harmony connections but frequently used R-relation triadic transformations.

In the combination of triadic transformations, the N-relation appears the most frequently. N-relation is achieved by maintaining one common tone while the other two voices move by two semitones. The first step in the N-relation process involves the use of R-relation for triad conversion. However, what should be noticed is that R-relation only comes into play during the third step of S-relation, and R-relation does not appear in H-relation. Such a phenomenon explains the reasons for the multiple appearances of N-relation and reflects the characteristics of chromatic harmony during the Romantic period.

The application of the Neo-Riemannian theory to analyze Franck's piano solo *Prélude, Aria et Final* reflects the characteristics of harmonic use in Franck's later compositions. In the Neo-Riemannian theory, there is

no traditional harmonic function. The logic of chord symmetry is derived from the third-degree relationship between pitches. More importantly, it provides a pivotal theoretical basis for studying Franck's later music creation and analysis in his later work. The Neo-Riemannian theory can be applied to the analysis of both tonal music and atonal music. In the analysis of the composition, it is possible to determine the connection between each chord and whether the appearance of each chord is logical, which boasts certain research significance. It also contributes to a deeper understanding of the analytical methods of the Neo-Riemannian theory.

Notes

1. David Lewin, “A Formal Theory of Generalized Tonal Functions,” *Journal of Music Theory*, vol. 26, no. 1 (Spring 1982): 23-60.

2. Richard Cohn, “Introduction to Neo-Riemannian Theory: A Survey and a Historical Perspective,” *Journal of Music Theory*, vol. 42, no. 2 (Autumn 1998): 167-168.

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4. Richard Cohn, “Introduction to Neo-Riemannian Theory: A Survey and a Historical Perspective,” *Journal of Music Theory*, vol. 42, no. 2 (Autumn 1998): 174.

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6. Joseph N. Straus, *Introduction to Post-tonal Theory* (Pearson Education, Inc, 1990), 161.

7. Richard Cohn, “Neo-Riemannian Operations, Parsimonious Trichords, and Their ‘Tonnetz’ Representations,” *Journal of Music Theory,* vol. 41, no. 1 (Spring 1997): 2.

8. Richard Cohn, “Weitzmann’s Regions, My Cycles, and Douthett’s Dancing Cubes,” *Music Theory Spectrum,* vol. 22, no. 1 (Spring 2000): 98.

9. David Lewin, *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987), 178.

10. Richard Cohn, “Uncanny Resemblances: Tonal Signification in the Freudian Age,” *Journal of the American Musicological Society,* vol. 57, no. 2 (2004): 285-323.

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13. Brian Hyer, “Reimag(in)ing Riemann,” *Journal of Music Theory*, vol. 39, no. 1 (Spring 1995): 121.

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15. Brian Hyer, “Reimag(in)ing Riemann,” *Journal of Music Theory*, vol. 39, no. 1 (Spring 1995): 121.

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