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Exploring the Limits of Neo-Riemannian Theory

ABSTRACT

Background

This paper aims to review and to present improvements for the triadic networks explored in 2003 Steven Scott Baker's thesis called *Neo Riemannian Transformations and Prolongational Structures in Wagner's Parsifal*. The improvements appear as a possibility to include the four common-practice triad types — major, minor, diminished and augmented — into a single transformation network.

The Interval Invariance concept (Figure 1) is one of the main assumptions of a more orthodox Neo-Riemannian theory which indexes the P, L and R transformations in Brian Hyer's *Tonnetz*.

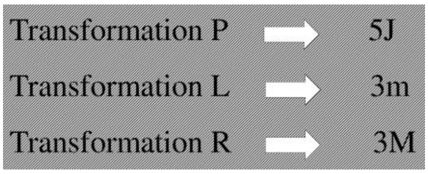

Fig. 1. Interval Invariance upon P, L and R transformations.

On the other hand, the Displacement Class concept introduced by Steven Baker allowed the creation of the '*R' (*Fuzzy R*) and the '-L' transformations that transcends Hyer's P, L, R as well as the P_1, P_2, L_1 and L_2 transformations from Douthett and Steinbach's *Tower Torus* (Douthett and Steinbach 1998, 250). The '*R' and '-L' transformations along the Neo-Riemannian P and L belong to Displacement Class 'DC1' which is a class of transformations that operates with the displacement of one semitone between components of chords during the process of transformation. The R transformation belongs to 'DC2'. The '*R' function transforms the C into a C+ or a Cm into a B+. The '-L' transforms a C into a C♯dim or a Cm into a Cdim. The following chart (Figure 2) illustrates these possibilities.

DC1 and DC2		Invariant Interval	Transformation
G E C → G E B		3m	L
G E C → G E C#	G Eb C → Gb Eb C	3m	-L
G E C → A E C		3M	R
G E C → G# E C	G Eb C → G Eb B	3M	*R

Fig. 2. Interval Invariance upon DC1 Displacement Class.

The incorporation of the '-L' transformation led to Baker's innovative *Octatonic Propeller Graph* (Baker 2003, 50), a model that combines three of Douthett and Steinbach's *Octacycles* with one of their *Hexacycles*, making possible the insertion of one diminished triad between each propeller blade. It is important to notice that each of the three blades represent one *OctaCycle* and share a common 'hub' in the center which is one of 'PL' cycles from Douthett & Steinbach's *HexaCycles*.

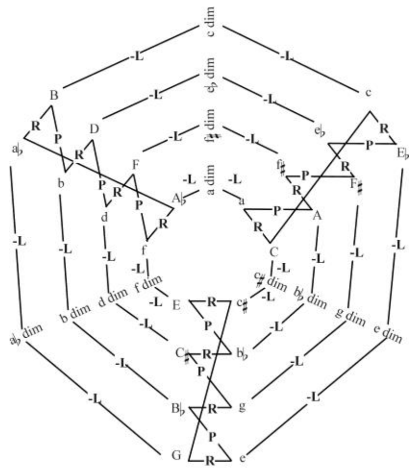

Fig. 3. Baker's Octatonic Propeller Graph with blades connected by '-L' transformation.

As can be deduced from Figure 3, the combination of '-L' and '*R' operations produces two discrete triads from a single major or minor triad: a C triad can be transformed into a C+ or C♯dim and a Cm triad can be converted into a B+ or a Cdim. These features are incorporated in the next improved cobweb-like model based on the 'P', 'R', '-L', and '*R' functions (Figure 4) that describes the interaction between the four common-practice triads.

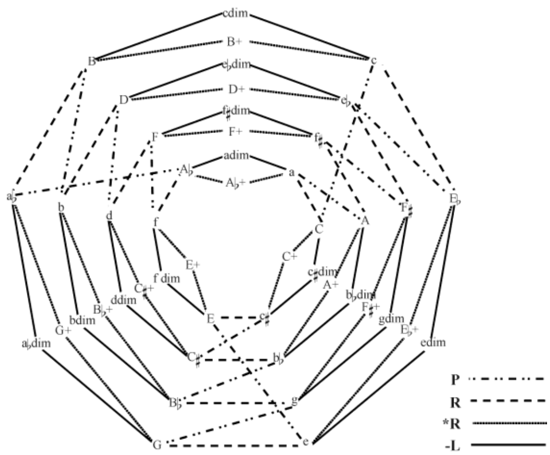

Fig. 4. Transformation network based on 'P', 'R', '-L' and '*R' transformations.

The previous model is fully descriptive for transformations involving the four common-practice triads mentioned. However it is not efficient when considering symmetry aspects between groups of triads. That is because of the presence of the

'R' transformation which comprises the displacement of two semitones while 'P', '-L' and '*R' transformations encompass displacements of a single semitone. One possible solution is to manipulate the network by inserting an augmented triad between the triads subject to the 'R' transformation (dashed lines). The following graph (Figure 5) displays the result of this strategy and takes into account only the Displacement Class DC1 (one semitone) between triad components.

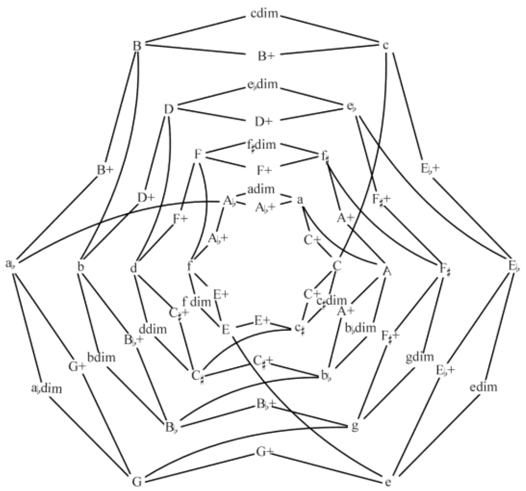

Fig. 5. Transformation network based on Displacement Class DC1.

Aims and Repertoire Studied

We can consider the previous network as an improvement on Steven Scott Baker's triadic models. One major difference, besides the inclusion of the four common-practice triads, is the possibility to deal with symmetry issues that could explain the relations between groups of triads in a specific musical context, for example.

These last two networks were developed during our doctorate and were directly related to Heitor Villa-Lobos modernist repertoire, in an attempt to explain certain unorthodox triadic relationships.

Implications

By dealing with symmetry issues, it is possible to relate triads that are fairly apart from each other, including those that have no common tones between them or even a minimal aspect of similarity. We collected a small sample referring to a sequence of triads (A♭m, G♭m, E♭ and D♭) extracted from Heitor Villa-Lobos's *The Little Cotton Bear* (*O Ursozinho de Algodão*), a 1921 piano piece from the cycle *Baby's Family No. 2 (Prole do Bebê No. 2)*. The following graph (Figure 6) illustrates the symmetry possibility.

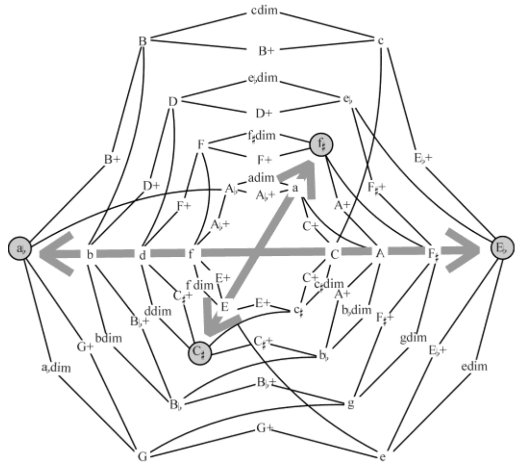

Fig. 6. Symmetry relations between groups of triads in Heitor Villa-Lobos's piece.

We notice the balance between the four highlighted triads due the equal number of steps necessary to transform one into each other. The possibility to include all three-note and four-note common practice chords into a wider network is already on demand.

Keywords

Neo-Riemannian Theory, Triadic Transformations, Symmetry, Heitor Villa-Lobos.

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