Remapping Riemann: Applying the Tonnetz to Church Modes

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Texas Society for Music Theory 2023

Abstract

When studying church modes, students are given two options. Modes are either taught as a major or minor scale with scale degree inflections, or they are taught as rotations of the major scale starting on different scale steps.While these are tried and true methods in music theory, they under-emphasize the connections between modes, key signatures, and pitch space.

The Eddy Theory adapts the tonnetz for visualizing pitch space for modes. By utilizing aspects from Neo-Riemannian theory and tonnetz, this new pedagogical approach emphasizes physically moving along an axis with visual aids to enforce connections.

Further Implications

My research can be used as a pedagogical tool in advanced music theory settings. It offers a new approach to studying and realizing modal transformations, and offers a new perspective to both students and teachers.

This research can also serve as a catalyst for new research pertaining to modal transformations in pitch space, which has exclusively been used to in the area of chordal transformation, i.e. Neo-Riemannian theory.

The Eddy Theory

The Eddy Theory utilizes a tonnetz to show transformations between modes and key signatures. The circle of fifths is displayed in a linear fashion on a tonnetz, with the major keys occupying upside down triangles and minor keys occupying rightside up triangles. Triangles on the tonnetz can be flipped to show the transformations of modes and their respective key signature. For example, an upside down triangle flipped to the right shows a Lydian transformation, and a rightside up triangle flipped to the left shows a Phrygian transformation. (See Figure 1 for all transformations.)

When taken a step further, triangles can be flipped multiple times to showcase an interesting classification of scales. When upside down triangles are continuously flipped to the left, a pattern emerges. Likewise, upside down triangles continuously flipped to the right displays a similar pattern. Continuous transformations will eventually require a leading-tone exchange (LTE). For instance, continuous transformations to the left will require a leading-tone exchange when the key of G ♭ is reached when starting on C. The transformation from D ♭ to G ♭ requires a LTE to account for C moving down to C ♭ . Continuous transformation to the right require a LTE when the key of D Major is reached; C moves up to C♯. (Figure 2)

The scale degrees above each of the keys represents the scale degrees of the C Major scale, showing a real, as opposed to a diatonic, cycle of fifths.

Transformations must occur in similar modes. For instance, Lydian and Mixolydian are major modes, so they can transform only via one move. Phrygian and Dorian are minor modes, also transforming via one move. The Locrian mode is exceptional as a diminished scale, requiring two transformations instead of one. The Ionian and Aeolian are absent because they require no transformations.

The Interactive Eddy Tonnetz (Figure 3) is modeled after a traditional tonnetz. The triangles are filled in with keys instead of being outlined by triads.

Figure 1: Transformations

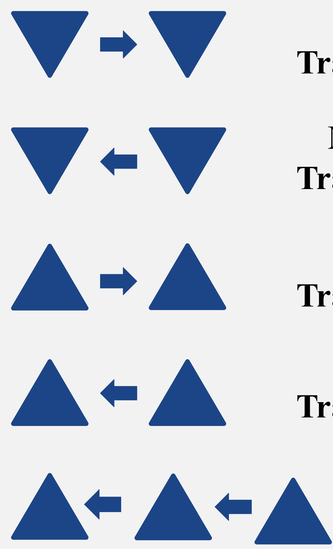
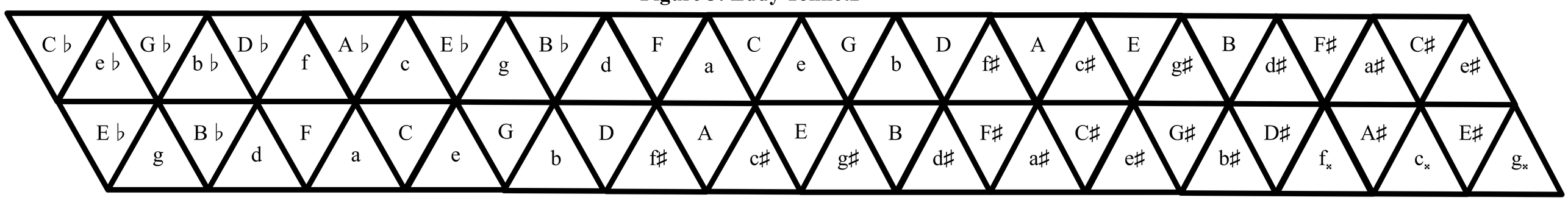


Figure 2: Major Key Transformations

								4	7	3	6	2	5	1
1	5	2	6	3	7	4	1	5	2	6	3	7	4	1
C ♭	G ♭	D ♭	A ♭	E ♭	B ♭	F	C	G	D	A	E	B	F♯	C♯
Ionian	Lydian Shift	Locrian	Phrygian	Aeolian	Dorian	Mixolydian	Ionian	Lydian	Locrian Shift	Phrygian	Aeolian	Dorian	Mixolydian	Ionian

Figure 3: Eddy Tonnetz



Acknowledgements

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This project was completed under the studies of Dr. Jennifer Beavers, Associate Professor of Music Theory at UTSA.

This project was completed in part with my participation in the NISD ISM Program under the direction of Tiffany Sweitzer.

Special thanks to NISD Fine Arts and James Miculka for funding this project.