

THE HARMONIC ANALYSIS OF GIULIO BRICCIALDI SELECTED FLUTE WORKS: EXPLORING THE NEO-RIEMANNIAN THEORY BASED VIA COMPUTATIONAL AIDED ANALYSIS

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ABSTRACT In the exploration of employing the Neo-Riemannian-based analysis towards 19th century flute music, I profoundly examine six flute works by an Italian composer who was established as a performer, and composer, Giulio Briccialdi (1818-1881). Born in Terni, Italy, he accomplished to write several virtuosic works for flute in the nineteenth-century era. His renowned flute repertoire ‘*Il Carnevale dzzzi Venezia*’ has been widely performed nonetheless, it is surprising that his musical works, especially on the flute, have not yet been extensively examined. I aim to depict and identify a harmony representation implemented from the computer-aided analysis based on the Neo-Riemannian analysis called *Hexachord.org* and *ChordComplexViz*. The implementation of the spreadsheets in this article intends to retrieve musical information and provide a measurement to disclose the analysis of its musical elements of harmonic analysis that offers an extended attribute to the flute works in the 19th-century music era from these selected works of Briccialdi. I choose these selected repertoires: *Ballabile Op. 15*, *Concerto Op. 65*, *Il Vento Op. 112*, *Il Carnevale di Venezia Op. 78*, *Le Carezze Op. 79*, and *Solo Brillante Op. 80* due to the reason that these musical works selected remained ‘untouched’.

Keywords: Flute, Neo-Riemannian, Giulio Briccialdi.

INTRODUCTION

During the nineteenth century era, the piano and other musical-instruments had tremendous expansion in their physical modification, and the flute too was in line with significant constructive evolution (Wye, 2017). This was due to industrial and technological advances strikes of the era. Apart from composing and performing, Giulio Briccialdi was directly named in correspondingly to involve in the Bb thumb invention on the flute (Gian-Luca Petrucci, 2001) for

the modern flute system. However, this article intent to explore and analyze his flute works because of insubstantial acquaintances with the flute music's in contrast to other eminent nineteenth-century composers and their works during the era.

THE COMPUTER-AIDED ANALYSIS

While conventional music analysis has been implemented in most musical works of the nineteenth century, the vital of expanding the terminology of music analysis via computer-aided analysis is in the great needs. Several developments on harmonic theory expanded in the era, the Austro-German harmonic theory profoundly connexion with Vogler and Weber (for scale-degree theory), Sechter and Mayrberger (for fundamental-bass theory) as well as Riemann for his function theory (Bernstein, 2008). The emergence of Riemannian theory analysis ascended towards nineteenth-century music as a result of its triadic but is not fully unifying tonally identified in most of the pre-1850 composers (Cohn, 1998). Although there was attempt to offer a substitute method to clarify the extended tonality and the compositions, formalizing the structural representative with the aims in creating a pedagogical and theoretical body of texts to explain the musical form of Riemann theory analysis (Bittencourt, 2013a) and features the analytical methodology of tonality and harmonic language of the nineteenth century music in a graph form (Bittencourt, 2013b), the method of Riemann theory analysis has evolved currently and embedded into several applications on the computer system for the case of Tonnetz in represent a support space of neo-Riemannian transformation (Cohn, 2012); (Bergomi et al., 2016) and (Nardelli, 2020). The growth of Riemann theory for instance, and the appliance on the computer-aided analysis system (Andreatta & Bigo, 2016), at this point of view, will be the case to discuss and applied in this article. Nonetheless, the available spreadsheets based on these Riemann musical theory analysis has broadened the methods of analysing music in conveying the notations into a data. The 'picturesque' in topology structures in these analyses enriched the dimensional diagram of the chord space (Tymoczko, 2020). Thus, enable to display neoteric entries to the Nineteenth-century music, especially for the flute compositions.

Further on this, the representation of musical structures and processes in *simplicial chord spaces* (L. Bigo, & D. Ghisi, 2013) has provided an environment called *Hexachord.org* and *Chord Complex Viz*, two software that dedicated to computer-aided music analysis. These two environments allow the study to examine the selected compositions in producing a visualization of the harmony in represented of a *chord-based simplicial complex* to represent a musical object compactly (Bigo et al., 2013). Therefore, a similar sub-complexes in their pitch-class set complexes can be found in musical sequences of the same genre (Bigo & Andreatta, 2019). Pitch-class distribution also constitutes an efficient tool for studying centrality in a musical sequence as, ‘a particular note is felt to be more prominent, important, or stable than others’, (Tymoczko, 2010). Thus, the Chord Complex Viz spreadsheet used in this article facilitate to retrieve musical information and elements on *filtration of pcs-complexes* based on the Riemannian Tonnetz analysis facilitates the study with the purposes in describing the musical elements with the effort to focus on the ‘centricity’ and characteristics of the piece.

METHODOLOGY

In realizing to portray the data, I transcribed these selected repertoires via Sibelius software. Then, the melody was removed (only the piano part left) before the files were exported into midi files in order to concentrate on producing the harmony representation (rather than the melody). By placing the midi files into these two environments, it generates detail of the pitch to be displayed in an accurate musical information while accelerating the process in analyzing the music through Neo-Riemannian theory analysis.

Figure 1.1. to Figure 1.6 are selected cumulative ‘Superlevel complexes in the filtration’ derived from the website called *ChordComplex.viz* while Figure 4.1 to Figure 4.6 is the data analysis (in graph form) generated from the *Hexachord.org* software. The selected music was interpreted and compared by using the Filtration features that differed to the value of its pitch-class sets based on the harmonic analysis. The slicing illustration process allowing researcher to apply filtration on a pcs-complex to keep only pitch-class sets that sound the most frequent appearance (Bigo & Andreatta, 2019)we can evaluate

for how long some combinations of pitch-classes sound simultaneously and then filter the piece according to the most relevant ones. This filtration process is performed by considering the superlevel sets of the function that computes the cumulative duration of pitch-class sets during the piece. Experiments show that musical sequences in the same style can exhibit similar sub-complexes in the filtration of their pitch-class set complexes. Filtered pitch-class set complexes also provide original informations on the use of the tonality and on the notion of centrality within a piece.”,”author”:[{“dropping-particle”:””,”family”:”Bigo”,”given”:”Louis”,”non-dropping-particle”:””,”parse-names”:false,”suffix”:”””}, {“dropping-particle”:””,”family”:”Andreatta”,”given”:”Moreno”,”non-dropping-particle”:””,”parse-names”:false,”suffix”:”””}],”container-title”:”Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics on the selected piece consequently results the composer’s style, centrality and distinctive in the selected repertoires.

FINDINGS AND DISCUSSIONS

Figure 1.1 to 1.6 displaying the accumulated pitch charts of the six selected flute repertoires by Giulio Briccialdi in the setting of superlevel complexes in the filtration on *Chord Complex Viz*. The filtration process and its cumulative process initiates once the first pitch appears. It represents the horizontal layout (from left to right) through several filtration levels in the following ‘yellow arrow’ on the below charts. The summary of each ‘Super level complexes in the filtration’ can be acquired at Table 1.

Figure 1.1 Superlevel complexes in the filtration of *Ballabile Op. 15*

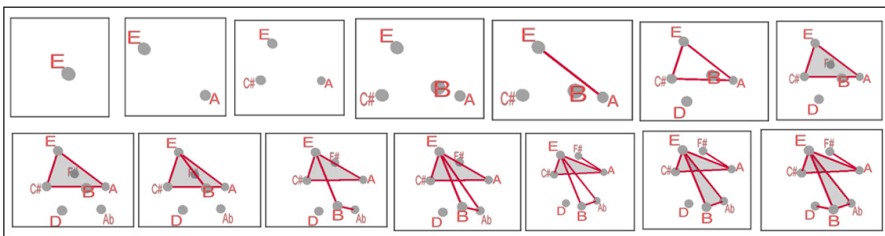


Figure 1.2 Superlevel complexes in the filtration *Concerto Op. 65*

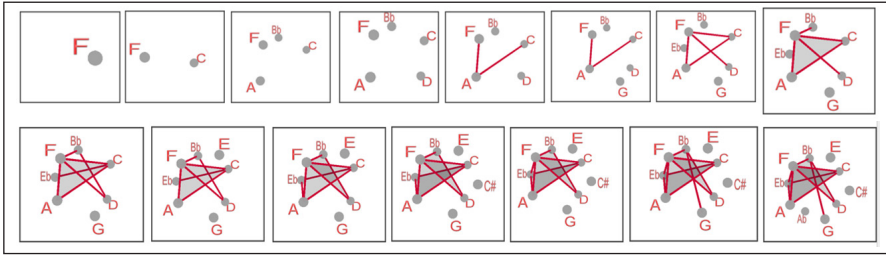


Figure 1.3 Superlevel complexes in the filtration *Il Carnevale di Venezia*

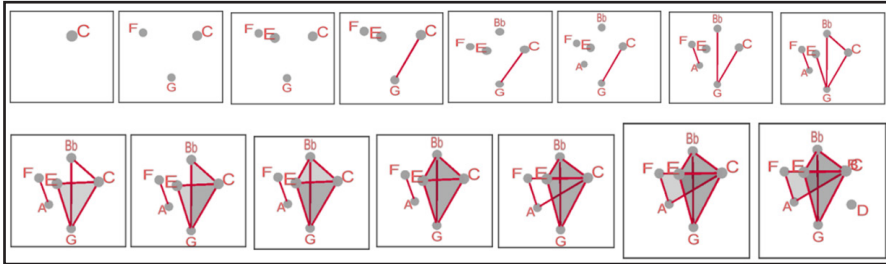


Figure 1.4 Superlevel complexes in the filtration *Il Vento Op. 112*

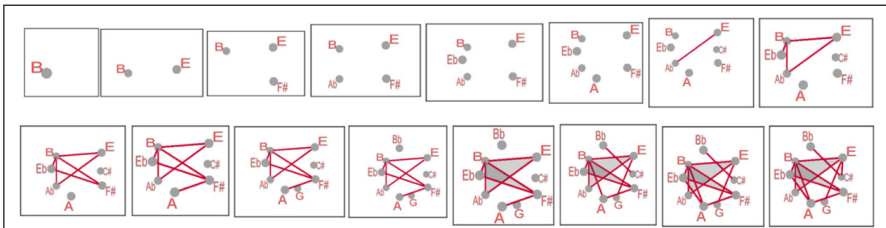


Figure 1.5 Superlevel complexes in the filtration *Le Carezze Op. 79*

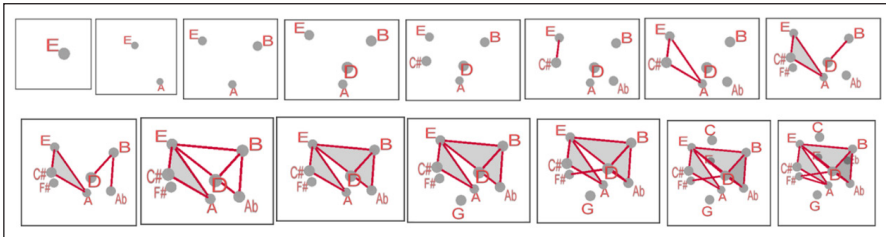


Figure 1.6 Superlevel complexes in the filtration *Solo Brillante* Op. 80

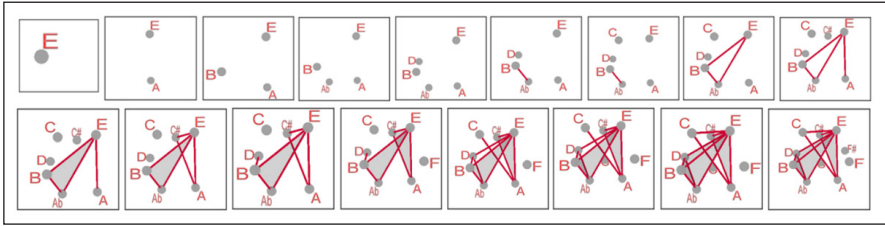
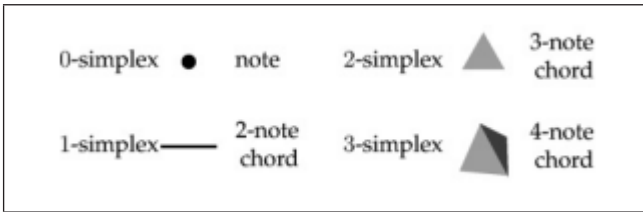


Table 1 portray the establishment and provides insight of this study to manifest another underlying tonality of intervals on a collection of the pitch-class sets cumulatively. It consists of four division in displaying the pieces into set of i) Single pitch set 0 Simplex cumulative (1-note /single pitch) ii) Differences of level between the first-two cumulative of 0-Simplex iii) Differences of level between the first-two cumulative of 2-simplex (3-note chord/triad) and iv) Differences of level The first cumulative of 3-simplex (4-note chord/triad). This can be comprehended by observing Figure 2 as 0-simplex represent a single pitch class, a 1-simplex represents a 2-note chord (or interval), a 2-simplex represents a 3-note chord (or triad) and a 3-simplex represents a 4-notes chord (L. Bigo, D. Ghisi, 2013).

Figure 2 The Representation notes and chords with simplices



The Single pitch set 0-Simplex cumulative (1-note /single pitch) column obviously indicated several pitches appeared derived from each of the repertoires and among these selected repertoires, *Il Vento* disclosed the highest collection of the pitch set with six (6) pitches {B, E, Fx, Ay, Ey, A} compared to other. However, these six selected repertoires have shown a similarity at the ‘Differences of level between the two first cumulative 0-Simplex’ column as *Ballabile* Op. 15, *Le Carezze* Op. 79 and *Solo Brillante* Op. 80 signifies the same pitch centricity on {E} and {A} while *Concerto* Op. 65 and *Il Carnevale*

di Venezia Op. 78 indicated a reflection in signifying the same notion of its pitch prevalent on {C} and {F}. On the other hand, *Il Vento* displayed its prevalent pitch on a distinct pitch set of {B} and {E} to compare with. The coloured sections in blue and yellow indicated the repertoires owned similar *centricity* towards the Differences of level between the first-two cumulative of 0-Simplex section. Similar to these, the First cumulative of 3-simplex' - (4-note chord/triad) had also portraying a resemblance in those pieces, *Ballabile* Op. 15, *Le Carezze* Op. 79 and *Solo Brillante* Op. 80 are correlated to the pitch-class set of {E, A \sharp /G \flat , B, D}. Contrary, differences of level between the first-two cumulative 2-simplex (3-note chord/triad) colour apparently are outlined in a diversity detail of each repertoire where *Le Carezze* was noticed to appear the only one pitch class set of {A, C \sharp , E} at 2-simplex (3-note chord/triad) compared to other pieces. Taken from the prevalence collection of the pitches, this study therefore allows to assess the association of the pitch on the intervals.

Table 1 The most prevalent pitch-class set over the remaining pitch-class set

	Single pitch set 0-Simplex cumulative (1-note /single pitch)	Differences of level between the two first cumulative 0-Simplex	Differences of level between the two first cumulative 2-simplex (3-note chord/ triad)	Differences of level The first cumulative 3-simplex (4-note chord/ triad)
<i>Ballabile</i> Op. 15	{E}, {A}, {C \sharp }, {B}	{E}, {A}	{A, C \sharp , E}, {E, Ab, B}	{E, Ab/G \sharp , B, D}
<i>Concerto</i> Op. 65	{F}, {C}, {A}, {B \flat }	{F}, {C}	{F, A, C}, {A, C, Eb}	{F, A, C, Eb}
<i>Il Carnevale Di Venezia</i> Op. 78	{C}, {F}, {G}, {E}	{C}, {F}	{C, E, G}, {E, G, B \flat }	{C, E, G, B \flat }
Figure 1.4 <i>Il Vento</i> Op. 112	{B}, {E}, {F \sharp }, {Ab}, {Eb}, {A}	{B}, {E}	{E, Ab, B}, {B, Eb, F \sharp }	{B, Eb/ D \sharp , F \sharp , A}
Figure 1.5 <i>Le Carezze</i> Op. 79	{E}, {A}, {B}, {D}, {C \sharp }	{E}, {A}	{A, C \sharp , E}	{E, Ab/G \sharp , B, D}
Figure 1.6 <i>Solo Brillante</i> Op. 80	{E}, {A}, {B}, {Ab}, {D}	{E}, {A}	{E, Ab, B}, {A, C \sharp , E}	{E, Ab/G \sharp , B, D}

Next, Table 2 depicts the intervals surface and the correlation between the pieces (from the first pitch to next one). It illustrates the use of Intervals on Perfect 4th and Perfect 5th in all of the selected repertoires dominantly. While the flute works of Concerto Op. 65 and *Il Carnevale di Venezia* shared a similar Interval, the others reported to exhibit various Intervals involved in Diminished 4th, Major 6th, Diminished 7th, and Minor 7th. The similarity on typologies of the chords and tables of intervals may give abundance of information about the composer (Jan La Rue, 2001) of course, in the form of ambiguities that impose difficult tasks upon those who attempt to explain the movement and shape of music. To cope with ambivalent effects produced by changing relationships among musical elements, analysis must occasionally create artificial situations in which the moving art-form is 'frozen' so that we can study each moment by itself. Some of the meaning is certainly lost in this immobilization—frozen fruits can never equal the flavor of freshly-picked produce—and other analytical procedures may also seem to violate the basic principles of art by reducing subjective feelings to objective quantities. Yet, although analysis can never replace nor rival feeling, it can enhance our perception of a composer's richness of imagination, his complexity (or utter simplicity). The three earliest pieces *Ballabile* op. 15, *Concerto op. 65* and *Il Carnevale di Venezia* op. 78 were still built in a clear and diatonic harmonies reflecting the classicism era. While that, the three works that consisted of the minor and diminished seventh chord - *Le Carezze*, *Solo Brillante* and *Il Vento* indicated the expanded attribute of the Nineteenth century music as the composer established in his compositions. With the dissonant harmonies found in these works, the melody also carried in extensive dissonant phrases (see Figure 3) of *Andante con moto* in *Il Vento*. The effects that Briccialdi attempted to express in this section may be comprehended as to form 'a numinous landscape' of sound space. This type of melody fully emerged on the flute works in the 20th century music era such as *Syrinx* (Debussy, 1913) and *Ballade* (Martin, 1939) has uncovered the effects of using certain pitches collectively rather than a lyrical melodic lines. Another metronomic melody in *Il Vento* can be located at *Allegro moderato* and *Allegro vivace* sections which comprises of repetitive motive on similar notations based on the chord progression (see Figure 3.1 and 3.2). The metronomic melody here manifested on the composer's brilliant techniques in playing the flute despite his creativity on composing the lengthy dissonant phrases. Farther from the chord analysis,

the melody structure obviously exhibits the units of chromaticism, dissonant in harmonies and melody with increasing delayed resolution, larger performing forces in wider register and dynamics range established in. Besides that, these two environments have assisted to expose the first layer of the prevalence pitch set out of these repertoires, it has also represented and clearly clarified the chord spaces materialized. Furthermore, the second layer of the analysis via the environment allowing to present the connection between repertoires. Subsequent study for flute instrument may examined and discourse over the flute works by several composers in the era. The future studies may draw on the development of the flute not only to portray the massive evolvement on its structure (Reisenweaver, 2011) but also the impact towards the flute music and examine the composers idea in shaping the music thru the revolution of the flute construction in the nineteenth century. The hypothesis of the study thus defines the flute composer's distinctive and their features in presenting the idea, imagination (Jan La Rue, 2001) of course, in the form of ambiguities that impose difficult tasks upon those who attempt to explain the movement and shape of music. To cope with ambivalent effects produced by changing relationships among musical elements, analysis must occasionally create artificial situations in which the moving art-form is "frozen" so that we can study each moment by itself. Some of the meaning is certainly lost in this immobilization—frozen fruits can never equal the flavor of freshly-picked produce—and other analytical procedures may also seem to violate the basic principles of art by reducing subjective feelings to objective quantities. Yet, although analysis can never replace nor rival feeling, it can enhance our perception of a composer's richness of imagination, his complexity (or utter simplicity, and the reflection of the era in flute music.

Table 2 The Interval surfaces based from the Single pitch set 0-Simplex cumulations

Title	Single pitch set 0-Simplex cumulative	The Intervals Between Single pitch set 0-Simplex cumulative
1. <i>Ballabile</i> Op. 15	[{E}, {A}, {Cx }, {B}]	(E – A) Perfect 4 th (E - Cx) Major 6 th (E – B) Perfect 5 th
2. <i>Concerto</i> Op. 65	[{F}, {C}, {A}, {Bb}]	(F – C) Perfect 5 th (F – A) Major 3 rd (F – By) Perfect 4 th
3. <i>Il Carnevale Di Venezia</i> Op. 78	[{C}, {F}, {G}, {E}]	(C – F) Perfect 4 th (C – G) Perfect 5 th (C – E) Major 3 rd
4. <i>Il Vento</i> Op. 112	[{B}, {E}, {Fx }, {Ay }, {Ey }, {A}]	(B – E) Perfect 4 th (B – Fx) Perfect 5 th (B – Ab) Diminished 7 th (B – A) Minor 7 th
5. <i>Le Carezze</i> Op. 79	{E}, {A}, {B}, {D}, {Cx }	(E – A) Perfect 4 th (E – B) Perfect 5 th (E – D) Minor 7 th (E – Cx) Major 6 th
6. <i>Solo Brillante</i> Op. 80	{E}, {A}, {B}, {Ay }, {D}	(E – A) Perfect 4 th (E – B) Perfect 5 th (E – Ay) Diminished 4 th (E – D) Minor 7 th

Figure 3 The extensive melody phrase at *Andante con moto* movement in *Il Vento*

Andante con moto.

Figure 3.1 Repetitive motive appears on the metronomic melody at *Allegro moderato*

Allegro moderato.

Figure 3.2 Repetitive motive appears on the metronomic melody at *Allegro vivace*



The other environment, *Hexachord.org* (Andreatta & Bigo, 2016) deployed in this article on the other hand, enable to generate histograms of the 2-compactness of all 3-pitch class set in the twelve T/I complexes of dimension 2 each of the selected flute work. Figure 4.1 to 4.6 illustrate the histograms patterns on the Average compliance of the twelve complexes built from three-note chord on the selected repertoires reported at Figure 3.1 to 3.6. These histogram charts were generated from the *Hexachord.org* with the propose on examining the high compactness of the trajectory in certain complex as it will mark as a characteristic of the pieces. Here, each complex, the compactness of the trajectory of the selected pieces (in black) compared to the Average 2-compactness of the set of all 3-pitch class set in the twelve T/I complex of dimension 2, in grey colour (see Bigo 2016, pg. 72). Most compactness space for each repertoire noticed here are in the K[3,4,5], K[3,3,6], K[2,4,6] and K[2,3,7]. The selected compositions showed the high compactness of the trajectory in K[3,4,5] are resulted from the strong use of major and minor chords in tonal music. Some similarities between these histograms seem to represent common practice of the composer on these works. The compactness of K[3,4,5] are including the major chord, major seventh chord and dominant seventh chord. This compactness indicates that the compositions has strongly built in a major chord, major seventh and

dominant seventh chord. This can be verified through the histogram provided. The second highest marked in $K[3,3,6]$ on the other hand can be found in *Il Vento*, *Le Carezze* and *Solo Brillante*. Total of five repertoires illustrated the same shape of histogram pattern at $K[2,3,7]$ and $K[2,4,6]$ except for *Le Carezze* while only three pieces appeared to have a $K[4,4,4]$ in *Il Vento*, *Concerto Op. 65*, *Le Carezze* and *Solo Brillante*. *Ballabile* indicated the only repertoire verified in possessing the $K[1,1,10]$.

Figure 4 The 2-compactness of the set of all 3-pitch class set in the twelve T/I complex of dimension 2 in the selection flute works (in black) compared to the average (in grey).

Comparing spaces regarding the selected pieces.

Figure 4.1 *Ballabile* Op. 15

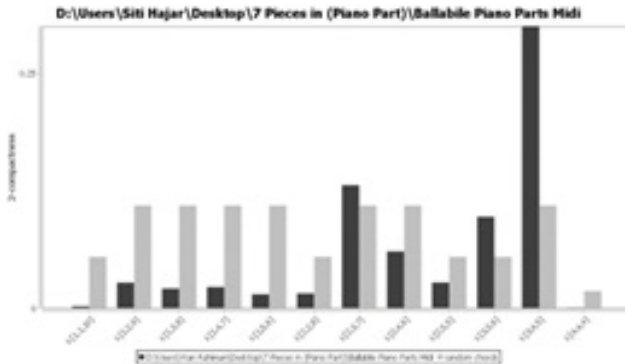


Figure 4.2 *Concerto Op. 65*

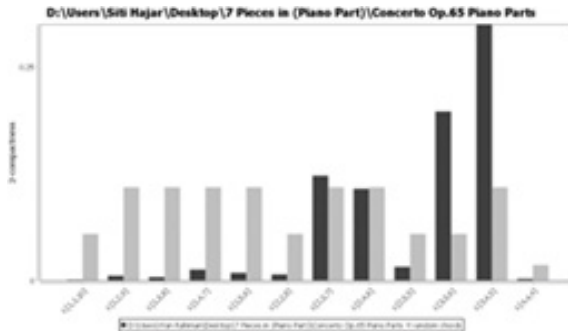


Figure 4.3 *Il Carnevale Di Venezia Op. 78*

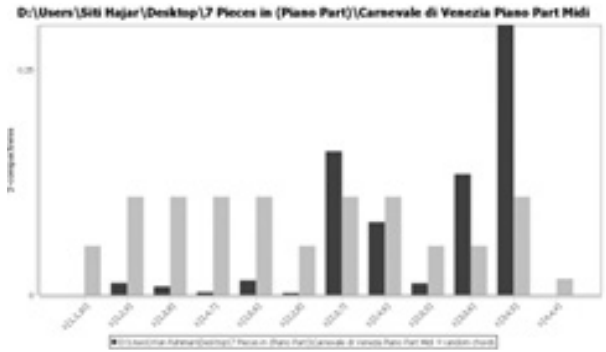


Figure 4.4 *Il Vento Op. 112*

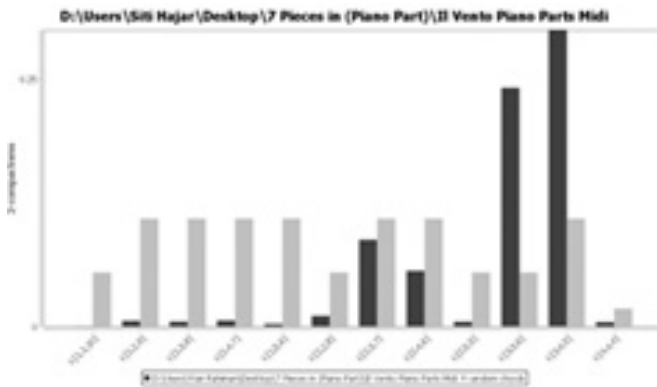


Figure 4.5 *Le Carezze Op. 79*

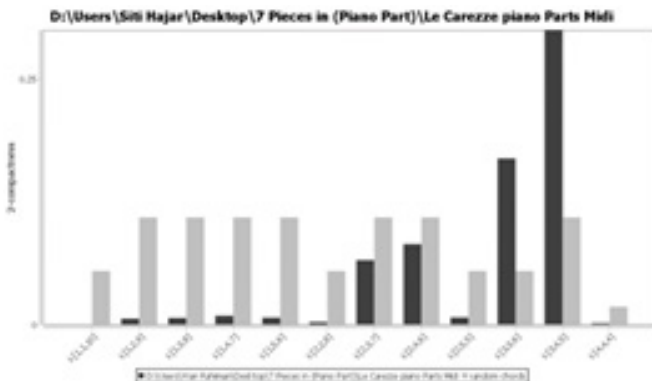


Figure 4.6 *Solo Brillante Op. 80*



The histogram represents a certainty of the evolvement in Briccialdi's music. The compactness on Bach's *BWV 328*, Debussy's *Voiles* and Schoenberg's *Parodie* (Andreatta & Bigo, 2016) are referred in this study to conclude that there is a reflection of the Bach's era with the *Il Carnevale di Venezia Op. 78*. Both pieces revealed to have excluded K1 (1,1,10) and K1 (4,4,4) in the T/I complex of dimension while the other repertoires presented to be included. The reflections of composer from previous works by the western composer may be found in Razali, CSMM. & Salleh, M. (2020) where the combinations of eastern and western element were found. Both explore the possibilities, intentionally or unintentionally, of combining contrasting influences of Asian traditional music idiom with Western traditional and contemporary musical styles.

Figure 5 A diagram adapted from Bigo (2015) in ‘*Topological Structures in Computer-Aided Music Analysis*’

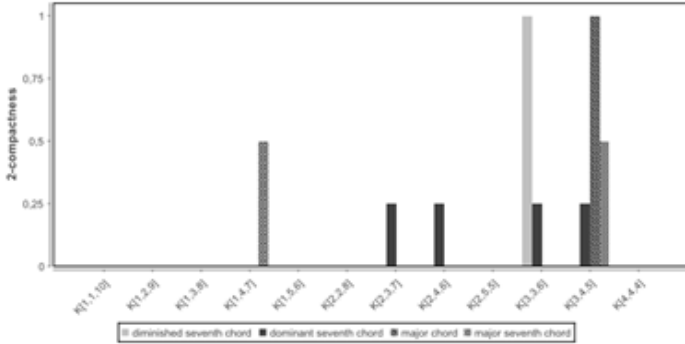


Figure 5 explain a diagram on the 2-compactness of four types of chords normally used in tonal chord. The dominant-seventh chord equality and its harmonic diversity presented in K(2,3,7), K(2,4,6), K(3,3,6) and K(3,4,5) while the diminished seventh chord is represented only at K(3,3,6). Among the six selected repertoires, *Il Vento* Op. 112 indicated the highest in representing the diminished seventh chord at K(3,3,6). While that, K(1,4,7) which also represented the major seventh chord show at peak in the *Concerto* Op. 65 compared to the other. By comparing from the other works implied from Bach, Debussy, and Schoenberg, the sequential of these selected pieces following the year thus can be predicted. Four of these repertoires were reported to be produced in the middle of his life journey as a composer while *Il Carnevale Di Venezia* (earlier life) and *Il Vento* towards the later life of the composer. Although *Ballabile* was written originally in Op. 15 (following the Opus number, the piece is in early sequence compared to the other selected piece). This study exposes that the work essentially was written in the middle of the composer life while the renowned flute work, the *Il Carnevale di Venezia* Op. 80 was the earliest among those selected flute works. As the compliance in the twelve complexes built from three-note chords in *Ballabile* Op. 15, *Concerto for Flute and Piano* Op. 65, *Solo Brillante* Op. 80 and *Le Carezze* Op. 79 were determined to have a parallel non-symmetrical unimodal, these works indicate that the correlation between the pieces are highly closer by the period of time. These repertoires have a reflection upon the composer’s creation during the middle life rather the *Il Vento* Op. 112 remained to establish versatile elements in the composition to be in a later of his life.

CONCLUSION

In conclusion, the harmonic analysis on the flutes work of Giulio Briccialdi are one of the flute repertoires collections in nineteenth-century music that emerged in the rise of virtuosity era. As a result, these selected flute compositions signified that Giulio Briccialdi ‘centricity’ results by locating the pitch at Table 1 from ‘The most prevalent pitch-class set’ over the remaining pitch-class set. It can be concluded that details from the six-repertoire selected portray 5 pitches {C, E, F, A and B} were chosen dominantly from the available of 12 pitches in music notation {C, C/Db, D, D#/Eb, E, F, F#/Gb, G, G#/Ab, A, A#/Bb, B}. The 5 pitches of note {C, E, F, A and B} resulted from the observation at Table 1 in the column ‘Differences of Level between the two first cumulation 0-simplex’. Three of the works, *Ballabile* Op. 15, *Le Carezze* Op. 79 and *Solo Brillante* Op. 80 share similarities with the cumulative between the two-first 0-simplex of pitch {E and A}. Further to this, *Concerto* Op. 65 and *Il Carnevale di Venezia* on the other hand, correlated in the pitch of {C and F}. While others portray the similarities on the pitch cumulation, *Il Vento* Op. 112 has significantly exhibited a distinctiveness in the pitch {B and E}. The uniqueness of the repertoire has disclosed the differences in the pitch cumulative among the selected repertoires coupled with the complexity and breath-taking melody comprising in varying articulation and intricate ornamentation of the melody found in the repertoire. The method of analysing in six selected music repertoires via the selected computational-aided music analysis has therefore contribute a topological data analysis on the flute music while the auxiliary apparatus enriched information in analysing in Briccialdi’s flute compositions. The findings allow researchers in observing subjects to a different perspective in analysing music rather than the progression, harmony and form resulted from the conventional music analysis. In fact, it reveals, the most important idiosyncratic of Giulio Briccialdi attributes towards the pitch selection, the chord spaces built besides portraying the evident on the utilization of chords with their associations among other works but also may produce neoteric data in comparison to the other composer’s work. Furthermore, music analysis provides the perceptions of composer’s richness of imagination, complexity, and the approach of organizing and presenting his skills (Jan La Rue, 2001) of course, in the form of ambiguities that impose difficult tasks upon those who attempt to explain the movement and

shape of music. To cope with am- bivalent effects produced by changing relationships among musical elements, analysis must occasionally create artiBcial situations in which the moving art-form is ÒfrozenÓ so that we can study each moment by itself. Some of the meaning is certainly lost in this immobilizationÑ frozen fruits can never equal the flavor of freshly-picked produceÑand other analytical procedures may also seem to violate the basic princi\u0002ples of art by reducing subjective feelings to objective quantities. Yet, although analysis can never replace nor rival feeling, it can enhance our perception of a composerÕs richness of imagination, his complexity (or utter simplicity thus the article enable further expands of multifaceted flute research focusing in the Nineteenth century music composers for flute such as Carl Reinecke (1824-1910), Theobald Boehm (1794-1881), Philippe Gaubert (1879-1941) and Franois Borne (1840-1920). Although the scope of this study currently based on western flute music and composer of the nineteenth century era, the method of music analysis in utilizing topological data analysis are also effective to the Korean traditional music that performed in the palace (Tran et al., 2021)the pitch of each note is encrypted and the length is visualized directly in a matrix form in Jeongganbo. We use topological data analysis (TDA. The benefits of computer-aided analysis allowing it to convey the musical forms into data representation and symbolism that is believed to broaden the interpretation and stylistic of the music as well as the composerÕs individuality. The flute music in the era has remarkably growth especially in the virtuosic style however the expanded research on it found inadequate. Furthermore, the accessible of the environments provide has provide a rapid outcome on musical analysis not only for the specific era, but also for the music composition in the subsequently era that may be explored widely in the ethnic music and its musical instruments (Dainal, 2020). The analysis of music may expand to explore further not only based on the western culture music thus impacts the Malaysia heritage especially on the Iban music and cultural artefacts (Kiyai @ Keai, G. & Tugang, N., 2020). The computer-aided music analysis (CAMA) then will release new data form of cultural music in analysis.

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