TENSION AND RELAXATION (DO NOT) EXIST IN DODECAPHONIC MUSIC OF WEBERN

Observing tension in music is generally a very sensitive research field. Authors like Wallace Berry and Joseph Swain believe that this is a principle which is the most fundamental aspect of music experience through its history, no matter which music language or compositional system it is.

Starting from such general assumptions that it is possible to determine the parameters which affect the feeling of tension and relaxation in dodecaphonic music as well, the possibility of recording the closures that are the basis for the structural delineation of the sections and the determination of phrases and sentences in the musical flow is imposed. The system surely exists, the only question is whether we are able to perceive it in a new, dodecaphonic music flow? Is it possible in a dodecaphonically organized work to find dissonant and consonant harmonies, and thus demonstrate the elements of tension and resolution, or do some other musical components have the primacy in organizing and establishing hierarchical levels in the definition of closures in dodecaphonic music? Relying on the writings of authors who have dealt with this or similar theme (Babbitt 1949, Forte 1973, Lerdahl 1989, Boss 1994, Rothgeb 1997, Farbood 2006, Granot and Eithan 2011, Zatkalik 2016), this work will illustrate the systematization and ranking of closures at the hierarchical level at which they operate in the examples of Webern’s dodecaphonic music (op. 20, op. 21, op. 22, op. 24, op. 27, op. 28 i op. 30).

Also, this work deals at a certain extent with the terminology of the cadence-closure. The parameters that are most important for the construction of the closures in Webern’s dodecaphony works are determined, and terminology is proposed: perfect closure – closure – semiclosure. The application of these ideas was demonstrated in the third movement of Webern’s String Quartet op. 28.
1. Introduction

Observing tension in music is generally a very sensitive research field. In tonal music there is a broad consensus among numerous authors about what constitutes musical tension. An analytic theory that has largely dealt with musical tension in the tonal system is the Schenkerian analysis, developed at the beginning of the 20th century; and it had a great deal of influence on the cognitive theory developed by Fred Lerdahl and Ray Jackendoff named *Generative Theory of Tonal Music*. Lerdahl and Jackendoff list very complex formulas for calculating tension in tonal music (based on the observation of melody, harmony, rhythm and meter), which we will not explain in detail on this occasion (Lerdahl and Jackendoff 1983).

In atonal conditions, things are somewhat more complex. The perception of tension in the absence of significant tonal characteristics is imprinted with acculturation as patterns based on which we observe musical flow are much more difficult. In this case, the importance of secondary music components should not be underestimated. When there is no tonal center, important music events are chosen based on our intuition of tension and relaxation that depend on different characteristics. Thus, Lerdahl states that in atonal conditions of great importance is the prominence of a particular event, which depends on: the similarity of sections on the distance, extreme registers, the closures of the larger sections, motif importance, longer note duration, texture, noticeable timbre and dynamic changes (Lerdahl, 1989: 74). It is clear that, in the absence of functional harmonic connections, the processes that emphasize certain musical events are accentuated. In addition to Lerdahl numerous authors have also insisted on this: Milton Babbitt (1949), Alen Forte (1955), Jack Boss (1994), John Rothgeb (1997). Everyone agrees that if tonal heights are not able to activate a certain tonal hierarchy, the listener turns to: rhythmic accents and longer notes, prominent registry, striking color, metric accents, recognizable beginnings and ends of motifs and phrases. The exact way of acting of these factors depends to a large extent on the context itself, because it is possible that the same procedures have different effects in different contexts; or, conversely, that different procedures lead to similar or same effect within a musical flow (Zatkalik 2016: 162).

In support of all this, there are also numerous recent researches on the topic of perception of tension in music. Mornaread M. Farbood published in his doctoral
dissertation the results of the research on the topic of musical tension model on the examples from the music of Bach, Vivaldi, Beethoven, Brahms and Schöenberg, but he also took demographic data on listeners (over 3000 respondents from 108 countries) as a relevant parameter. He studied the influence of musical components such as tempo, dynamics, pitch, tone, rhythm and harmony changes in such a way that he played music segments from different music epochs to listeners from different countries and cultural backgrounds. As a result, he received information about what is important for people to feel the musical tension. This is above all the height of the tone, then the dynamics and harmony, while the change in the rhythm and the color of the tone is almost negligible for the feeling of tension (Farbood 2006). Studies by Roni Granot and Zohar Eitan from Izrael, who researched the importance of musical elements such as dynamics, invoice and agogics in the sense of musical tension in atonal conditions, also stand out. They concluded that the interaction of several different musical components leads to a greater effect of musical tension (Granot and Eithan 2011).

2. Tension and relaxation (do not) exist in dodecaphonic music

Unfortunately, we have not yet received an answer as to whether we could contemplate on similar concepts of tension and relaxation in dodecaphonic conditions. Here we benefit from the thoughts of many important analysts who believe that this principle is omnipresent in music in general. We point out Joseph Swain, who believes that musical flow inevitably brings with it tension changes (Swain 1997: 28). He is joined by Wallace Berry with the assertion that the neighboring music events that exhibit change within any parameter and at any rate result in a functionally-expressive effect, i.e. by changing the intensity (Berry 1987: 9). So, generally speaking, no matter which style epoch it is, we can conclude that, as long as there is a musical flow, we will also have a sense of movement, i.e. the feeling of tension and relaxation as the most basic way to experience music. Any change in the musical flow results in an increase or decrease in the tension, and it can be realized by any musical parameter.

Although there is no detailed study that would provide us with answers to which musical components and in which correlations they cause a greater or lesser degree of tension in dodecaphonic conditions, we cannot ignore the attempts of au-
thors who have made efforts to contribute to this issue. Reginald Smith Brindle gives the setting of musical components that, in dodecaphonic conditions, affect the effect of tension or relaxation.

Table 1. Effects of tension and relaxation in dodecaphonic conditions (Brindle 1966: 110)

<table>
<thead>
<tr>
<th>tension</th>
<th>relaxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>rapid movement</td>
<td>tranquil movement</td>
</tr>
<tr>
<td>increasing impetus</td>
<td>declining impetus</td>
</tr>
<tr>
<td>strong metrical puls</td>
<td>weak metrical puls</td>
</tr>
<tr>
<td>irregular rhythms, well defined</td>
<td>flowing or &quot;vague&quot; rhythms</td>
</tr>
<tr>
<td>maximum height or depth</td>
<td>avoidance of extreme registars</td>
</tr>
<tr>
<td>strong melodic intervals</td>
<td>weaker melodic intervals</td>
</tr>
<tr>
<td>virile dynamics and strong contrasts</td>
<td>less dynamic contrast</td>
</tr>
<tr>
<td>staccato phrasing</td>
<td>legato phrasing</td>
</tr>
<tr>
<td>maximum volume</td>
<td>quite dynamics</td>
</tr>
<tr>
<td>contrasting silence</td>
<td>non-contrasting silence</td>
</tr>
</tbody>
</table>

These are primarily rhythmic parameters, such as feelings of speed, rhythmic and metric pulsation, and (ir)regularity of rhythmic figures. As can be seen from the given table, the lesser rhythmic values and metro-rhythmic irregularities affect the feeling of tension, while on the contrary, slower rhythm and more correct figures influence the sense of relaxation in the musical flow. Brindle also points out the registry as an important element that affects the feeling of tension, citing an example that a major ninth brings a higher degree of tension than a great second, precisely for register reasons and melody breaks. Other factors, such as dynamics, articulation, texture, color tone and interval relationships, when it comes to melody and in relation to sound, they are present as parameters that affect the feeling of tension and relaxation, but of minor importance (Brindle 1966: 110). Unfortunately, Brindle seems to have come to this list quite randomly, without any theoretical or empirical research, completely ignoring the fact that the same procedures can have different effects in different contexts and vice versa.

On the other hand, if we try to consider the harmonic characteristics of dodecaphonic music, we conclude that the dodecaphonic row has a constructive role, but it cannot construct functional tension and relaxation within the harmony like
in tonal music. The listener can hardly hear local structures, because it is difficult to learn what are dodecaphonic structures of chords and their sequences, when we know that each composition is based in its own sequence and contains its own sound material (Packalen 2005: 102). Thus, a listener in dodecaphonic conditions more easily observes larger structural segments (phrases and sections) and non-structural elements such as a change in dynamics, texture and tempo.

Starting from such assumptions that it is possible to determine the parameters which affect the feeling of tension and relaxation in dodecaphonic music, the possibility of recording the closures that are the basis for the structural delineation of the sections and the determination of phrases and sentences in the musical flow is imposed.

3. The specifics of closures in Webern’s dodecaphony, based on tension and relaxation

The question of the closures constantly emerges as one of the basic elements of the musical form, no matter which musical language the composer uses. Numerous authors (Tuttle 1957, MacDonald 2008, Bailey 2003, Boss 2014) give examples of dodecaphonic music closures, often creating analogy with tonal cadences, or completely opposite, completely negating the possibility of redefining tonal cadence in new, dodecaphonic conditions; but without explanation whether

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There are also numerous theoretical and empirical researches which dealt with the possibilities of aurally recording segments of the sequence (trichords, hexacords and similar), which would open the way to the prominent and less prominent harmonies and tones in terms of tonal centers (Krumhansl and Shepard 1979, Krumhansl and Kessler 1982, Krumhansl, Sandell and Sereant 1987), as well as the possibilities of recognizing the variants of the sequence (O, R, I, RI) and the segments of the series exhibited inverse or retrograde (Dowling 1972, DeLannoy 1972, Balch 1981, Krumhansl, Sandell and Sereant 1987). All research has always been carried out on two groups of listeners, musically educated and untrained listeners. The results of the research are very positive, as they indicate a high percentage of success in perceiving the listed characteristics in dodecaphonic music (66 – 82%), with professional musicians being able to perceive all expected musical components to a greater extent than musically uneducated listeners.

However, it should be kept in mind that the research was done on the examples of Schoenberg’s dodecaphony, which differs greatly from the principle of Webern’s dodecaphony. In Schoenberg’s works there are frequent tonal analogies (occurrence of chords built of third and fourth/fifth jump in bass at the moment of the occurrence of the boundary, the possibility of using the axis system in the recording of sound centers like in Bartok’s works...), while on the other hand in there are no tonal analogies that would lead to the allocation of a tone center or specific accompaniment, because Webern is characterised by punctualism, and in certain segments by complete serialization of the music flow.
these are individual cases in which tonal analogies have been recorded or if there are some other aspects of organization of closures.  

In the absence of harmonic functional connections, it seems that primacy in the construction of closures and formal processes, has been taken over by procedures that highlight certain musical events – rhythm, accents, prominent register, conspicuous color, metric emphasis, texture, dynamics; and tension is especially highlighted by dynamics, tempo and register (Zatkalik 2016: 162). It should be borne in mind that the mentioned elements of delimitation within the dodeca-phonmic music do not function independently in the construction of closures, but more often there is cooperation of several parameters in creating a stronger closure. Crystal Peebles in her doctoral dissertation titled *The Role of Segmentation and Expectation in the Perception of Closure*, defended in 2011 at the Florida State University, sums up the opinions of many authors regarding the possibilities of defining closures and their hierarchy. Guided by the knowledge that the strength of the closure feeling depends on how many different parameters are involved, Peebles gives examples from different epochs, from classicism to the twentieth century. On the example of Webern’s *Song op. 12 no. 1* for voice and piano, we see the application of her ideas.

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2 In the literature referring to post-tonal music, we often find connection with tonal terminology, although it is not the most appropriate. Cadence is a wide-ranging school term that varies from author to author. According to the author Ann Blombach, cadence is any musical element or combination of several elements, including silence, which leads to relative relaxation or deadlock, ending in music (Blombach 1987: 231). Similarly, Blombach and Joel Lester state that the interruption of rhythmic continuity and deadlock in the music flow also represent a kind of cadence (Lester 1982: 50-53). Wider definitions of the cadence introduce terminological dilemmas and are not the most adequate. A cadence is a flexible concept with a multitude of phenomena, but as a term it should primarily be associated with functional forms of cadence in tonal conditions. By limiting the concept of cadence in this way, we are encouraged to be more precise in determining occurrences that look similar, but differ in different contexts. In the book *The Musical Form or Meaning in Music* Berislav Popović proposes the term *boundary* instead of *cadence* in terms of a certain general term that can encompass the most diverse means based on which its contents are realized (Popović 1998: 166-229). Thus, in this paper, the term *boundary* is used as a more acceptable determinant of a wider meaning than *cadence*. The boundary would also include tonal cadences, but also all other aspects of the organization of endings such as Renaissance clauses, as well as post-tonal endings in the form of caesura, liquidation of material, highlighting various music components, such as texture or dynamics.

Table 2. The closures in Webern’s *Song op. 12 No. 1* for Voice and Piano

<table>
<thead>
<tr>
<th></th>
<th>1-3</th>
<th>4-7</th>
<th>8-11</th>
<th>the end</th>
</tr>
</thead>
<tbody>
<tr>
<td>fermata</td>
<td>pause</td>
<td>rit.</td>
<td>PPP</td>
<td>fermata</td>
</tr>
<tr>
<td>pause</td>
<td>comma in the text</td>
<td>pp pause</td>
<td>bigger notes</td>
<td>consonant chord/interval</td>
</tr>
<tr>
<td>dinamysm</td>
<td>half cadence</td>
<td>cadence</td>
<td>the strongest cadence</td>
<td></td>
</tr>
</tbody>
</table>

It is evident from the given table that primacy in the concept of the feeling of closure have certain kinds of musical flow interruption, which are realized by means of breaks, fermata or longer note value, and agogic signs such as ritardando. Since it is a vocal-instrumental work, text has a great role, and Peebles also mentions the punctuation marks in the text, such as a comma and a dot as elements that contribute to a sense of completion. There is also a change of the dynamic mark in the closures, which contributes to the greater impression of the musical flow interruption. What remains incomplete is definitely the harmony component, and the impression that research lacks systematics. Peebles states that the final closure contains the consonance intervals of major sixth and perfect fourth, but without any insight into which consonances were in the previous closures.

Similar arguments are also found in the discussions of the authors Rosemary A. Snow (1977) and Robert Hallis (2004) who spoke of “points of resolution” and psychological perception of tension and resolution in the construction of closures in Webern’s works. They singled out the impact of dynamics, texture and repetition marks (as a structural element) as being primarily important for the construction of closures. However, they did not at any time give an overview of the frequency of components involved in the construction of closures, nor is there any division or ranking of types of closures. It should also be borne in mind that the listed authors were concerned with the construction of the closures in Webern’s early atonal works, but when comparing their research with the obtained results in this paper, we come to a similar conclusion: dodecaphony did not bring new construction of closures compared to the boundaries in earlier
atonal works, and same/similar musical parameters remain in force during the construction of closures.

What can be recorded as an aspect of music closures in the analysis of instrumental dodecaphonic works by Webern, is the existence of certain resting places where musical flow stops, which is most often expressed by longer note values or breaks and caesuras, then by changing texture and agogics (common ritardandos at the ends of phrases and sections), and by changing dynamics. The articulation, melodic, and prominent registers do not have a greater significance in organizing the closures in the dodecaphonic works of Webern, since he distributes these parameters punctualystic, serialistics and very expressively throughout the musical flow. Playing with the registers and tone colors is constant and does not represent a specific procedure that would at some point help in delimiting phrases and sections.

**Table 3.** Frequency of the occurrence of certain musical parameters in the construction of closures in dodecaphonic instrumental works of Anton Webern

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>End of row or section of the form</td>
<td>100</td>
</tr>
<tr>
<td>Agogics</td>
<td>46</td>
</tr>
<tr>
<td>Texture</td>
<td>39</td>
</tr>
<tr>
<td>Pause or Caesura</td>
<td>38</td>
</tr>
<tr>
<td>Dynamics</td>
<td>38</td>
</tr>
<tr>
<td>Palindrome Form</td>
<td>14</td>
</tr>
<tr>
<td>Articulation</td>
<td>9</td>
</tr>
<tr>
<td>Metrics</td>
<td>9</td>
</tr>
<tr>
<td>Prominent Registry</td>
<td>9</td>
</tr>
<tr>
<td>Tempo</td>
<td>7</td>
</tr>
</tbody>
</table>
The visualization of the frequency of the music components shown at the time of closure does not speak enough about what kind of closure we should expect in the instrumental dodecaphonic works of Webern. Are there any particular relationships between the listed music components and which are the most common relationships?

**Figure 1.** Visualization of the relations between the musical parameters involved in the construction of closures

The ratio between the parameters in percent is given, expressed in terms of the total number of recorded closures in Webern’s instrumental dodecaphonic works (op. 20, op. 21, op. 22, op. 24, op. 27, op. 28 and op. 30). By analyzing combina-

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4 The segmentation of the music forms, listed in the works of Anton Webern, was taken from Kathryn Bailey (Bailey 1991, 1996).
tions, there are some more detailed conclusions about the “types” of the closures. The primary role clearly remains structural (the end of the sequence, and thus the completion of a particular section or sub-section within the form), as well as its relationship with agogics, pause or caesura and dynamics. A fairly frequent combination is also the link of agogic signs such as ritardando and dynamics. Other shown relationships are of lesser importance because their frequency is significantly smaller.

That is why we can summarize everything mentioned and divide the closures. There are five parameters that are most significant for the construction of closures, which are: the end of the dodecaphonic row, pause or caesura, texture, dynamics and agogics.

Closures containing all of the above parameters could be considered as stable closures as counterparts to authentic cadences in the tonal system. If, besides these parameters, additional parameters such as articulation, metric or prominent register would be included in the construction of the closures, such a kind of closure would be labeled as the strongest closure, as its strength would be further enhanced by the action of a larger number of parameters, and such a closure would receive the title of the perfect closure. Closures built from three or fewer listed parameters would make a permeable type of closure or half-closure. Proposed terminological definitions and shades in the closure strength, the perfect closure – closure – half-closure, are similar to the types of cadences in the tonal system. We give an example of the closures and their classification by strength in the case of Webern’s String Quartet op. 28, third movement.

Table 4. Visualization of the closure type in the third movement of Webern’s String Quartet op. 28
The third movement of Webern’s *String Quartet* op. 28 is a three-part song a b a. Part a in both occasions consists of two similar eight-bars, while part b brings fugato. There is also a certain symmetry in the exposure of dodecaphonic row and links with eight-bars from part a. Thus, in the first eight-bar, we have the relation of the basic sequence versus the transposition of the tritone as a counterpart of tonal relationships tonic-dominant, while the other eight-bar brings a reversed sequence, tritone distant, and then the basic sequence (counterpart of dominant-tonic) in inversion.

### 4. Further implications

Returning to the previous table, we can clearly see that there are common differences between the closures at the ends of eight-bar, which remind of cadence relations in tonal conditions. If we acknowledge the existence of closures and the possibility of their hierarchy being stronger and weaker, and based on the possibility of recording tension and relaxation in dodecaphonic conditions, does this open the door to the debate on syntactic determinants in dodecaphonic instrumental music of Webern?

As we have described the two eight-bar segments from the beginning of the third movement of Webern’s *String Quartet* op. 28, it seems that all reminds of fragments of earlier tonal syntactic determinants, and that the minimum of similarity and minimum difference between the two described eight-bars can be considered as a condition of their integration into the period. We open the door to the possibilities of revising classical syntax parameters in new dodecaphonic conditions, and with new, dodecaphonic characteristics.

### References:


Tenzija i razrješenje (ne) postoje u dodekafonskoj Webernovoj glazbi

Sažetak

Postojanje tenzije u glazbi općenito je veoma osjetljivo istraživačko polje. Autori poput Wallacea Berryja i Josepha Swaina vjeruju da je to princip koji predstavlja najosnovniji vid doživljaja glazbe kroz njezinu povijest, bez obzira na to koji je glazbeni jezik ili kompozicijski sustav u pitanju.

Polazeći od pretpostavki da je moguće odrediti parametre koji utječu na osjećaj tenzije i razrješenja i u dodekafonskoj glazbi, nameće se i mogućnost evidentiranja granica koje su osnova za strukturna razgraničenja odsjeka i određenja fraza u glazbenome toku. Sustav sigurno postoji, samo je pitanje jesmo li sposobni percipirati ga u novome, dodekafonskome glazbenom toku? Je li moguće u dodekafonskome djelu pronaći disonantna i konsonatna suzvučja i tako prikazati elemente tenzije i razrješenja ili neke druge glazbene komponente imaju prednost u organiziranju i uspostavljanju hijerarhijskih nivoa pri definiranju granica? Oslanjajući se na napise autora koji su se bavili tom ili sličnom temom (Babbitt 1949, Forte 1973, Lerdahl 1989, Boss 1994, Rothgeb 1997, Farbood 2006, Granot i Eithan 2011, Zatkalik 2016), ovaj će rad na primjerima Webernove dodekafonske glazbe (op. 20, op. 21, op. 22, op. 24, op. 27, op. 28 i op. 30) prikazati mogućnosti sistematizacije i rangiranja granica na hijerarhijskom nivou na kojemu djeluju, a na temeljima mogućnosti određenja tenzije i razrješenja u dodekafonskim uvjetima.

Ovaj se rad u određenoj mjeri bavi i terminološkim odrednicama kadenca – granica. Izdvojeni su parametri koji su najvažniji za konstrukciju granica u Webernovim dodekafonskim djelima te je predložena podjela granica i terminološke odrednice: savršena granica – granica – polugranica. Rad donosi i prikaz primjene predloženih odrednica u okviru trećega stavka Webernova Gudačkog kvarteta op. 28.

Keywords: dodecaphony, closure, Webern, String quartet op. 28
Ključne riječi: dodekafonija, granica, Webern, Gudački kvartet op. 28.