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Original Research Article

A Comparative Study of Square Structures in Children's Poems and Musical Periods from a Symmetrical Point of View, the Intersection and Superiority of the Metric Sequence*

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Problem statement: Researchers describe periodic musical structures as square antecedent-consequent, which forms a large part of musical works. In such structures, longer pauses exist at the end of the antecedent and consequent. Shorter pauses also exist in the middle of the antecedent and consequent. The formal attitude of binary, ternary, and periods from Kuregian's perspective (metric sequence) and other sound group research all illustrate the metric's encirclement in melodic structures. The poetic structures also follow the principles of musical metric progression.

Research objectives: This essay aims to find a mechanism to describe the rhythmic circular structure of children's poems and then test the theory obtained in a statistical community. In previous studies, researchers have examined the rhythm and prosody of children's poetry as external musical factors, and there are also models for folk poetry and prosody. However, applying the metric function to folk poems, primarily based on listening aesthetics, has yet to be done.

Research method: This research method is quantitative-qualitative. The first step uses a qualitative method based on library sources to describe fundamental theories. In the second quantitative phase step, 20 participants participated in a listening test.

Conclusion: Children's poem structure can be defined based on the principles of metric progression. The results for 90% of the audience illuminate that listeners prefer square division patterns and find them more natural. For this reason, most folk poems follow antecedent and consequent periodic types.

Keywords: *Children's rhythm, Metric Sequence, Caesura, Period.*

Introduction

The square antecedent-consequent structures exist in numerous musical works rooted in logogenic melodies (melodies inspired by poems). This finding means that verbal structures also work for music. For example, a sentence in language ends with a falling tone, similar to a musical cadence. Laboratory research on users also shows that the intersection of musical phrases follows the same linguistic structure. The essays will discuss this issue further.

Children's poems and, in general, folk poems, as well as pre-Islamic poems, are the subject of severe debates among researchers. Some consider them prosodic, and others consider them syllabic or numerical. In their analysis, other researchers also describe them as freestyle, with prosodic poems applying liberties (poetic options). In folk

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poems, deviation from classical prose does exist because the poets were unfamiliar with the prose's classical structure. Unlike the classical examples, sometimes, by investigating a folk poem, we realize that they have several meter changes. For instance, a folk poem may change the meter in each verse. Thus, some researchers find the prosodic rules ineffective for most poems. However, they invent other methods to analyze such poems. It is worth noting that music phrasing rules can adapt to poetry. For instance, a caesura or pause in poetry after a long syllable is similar to the caesura at the end of a long-duration note in music. Also, at the end of some sections, there is a caesura for a certain period. For example, in Bahr Raml-e-Mothmman, there is a symmetry principle between the first and second stanzas: Faelaton, Faelaton, Faelaton/ Faelaton, Faelaton, Faelaton. This claim is beyond the influence of words on poetry and poetry on words and the connection between poetry and music. In other words, folk poems, as well as Persian prosody and phrasing in them, are related to square structures in form.

Research Background

Discovering the fundamental and widely used common structures between poetry and music can be beneficial in designing the subject of composition and form courses because it is easier for a beginner artist to connect with natural structures. Besides, new tools will appear in the analysis of folk poetry by learning more about natural and conventional structures.

Regarding classical poems, researchers have been searching less for comparative alternative methods for prosody. Even many researchers in literature have justified pre-Islamic poems or folk poems in line with classical prose, in which the poet has more freedom (Vahidian Kamiyar, 1978). On the opposite point of Vahidian Kamiyar, Khanleri, and Tabari, the folk poetry meters are different from those of prosody, and they point to the concept of reliance in poems to justify the variation in meters. In fact, from this point of view, accenting some words makes the poem rhythmic, and the concept of accent explains deviations from classical prose on this basis (Khanleri, 1948; Tabari, 1980). Due to classical prose limitations, some researchers use innovative methods to describe folk, children's, and pre-Islamic poems.

Tabibzadeh rejects the previous theories about the folk poems' prosody and works based on pauses in his innovative method (Tabibzadeh, 2003). Fatemi's theory also aims to eliminate the deficiency related to classical prose in folk poetry readings. He accepts Vahidian Kamiyar's theory about prosody, but he uses Constantin Brillo's theory to modify "children's rhythms" in Iranian folk (and children's) poems. In Brailo's theory, binary divisions are dominant, and ternary divisions exist less often, but Fatemi considers ternary divisions to be more valid in the case of Iranian children's rhythms (Fatemi, 2003). On the other hand, Azadefar classifies the theories "Fundamentals of Melody Creation in Composition and Melody Structure in Iranian Classical Music" based on laboratory research and Lerdhal's theories (Azadefar, 2015, 2016). However, previous research has yet to investigate the compatibility between the theories of folk poetry and the periods' phrasing.

Research Question

The fundamental question of this research is as follows: How much is the adaptation of the widely used structures of children's poetry with the fundamental form structures in music? Moreover, how does the audience consider the metric progression in the poems to be natural? The research assumed that the fundamental structures of metric progression in music also apply to poetry.

Research Methodology

This research contains two qualitative and quantitative phases. In the first phase, this article classifies the formation of phrases qualitatively by referring to library sources from the perspective of music form analysis. Then, it compares the obtained

results with the existing theories about folk and prosaic poems. The research survey examined some rhythmic samples of poetry using quantitative methods on 20 musicians and non-musicians. Finally, the results are analyzed to see how much the theory anticipates listeners' test results. Undeniably, the study scope should be broader to generalize the theories, but due to the limitations of the COVID- 19 pandemic and the conditions of experimenting, testing more people was not possible.

• Metric divisions in phrasing and factors causing pauses (Caesuras) in music

- Metric progression and square structure

One of the most influential theories about classical and romantic forms is Kurgeian's theory, which brings various homophonic forms into the lied category. In homophonic music based on dance rhythms, Kuregian put binary, ternary, and period forms in the lead category in which metric sequence determines form borders. In this theory, each bar is a metric of the previous bar. The second two bars are also the metric response of the first two measures. Similarly, the first four bars are the metric response of the second four bars. This progression, called metric sequence, can continue. The progression disappears from the 16th bar.

Nonetheless, thematic and harmonic factors can result in periodic structures (Kuregian, 2017). Such structures based on 2n are called square structures. Fig. 1 shows this building. Because listeners perceive square structures very quickly, Kuregian justifies other periodic structures as deviation from square structures. For example, one of the types of 10-bar structures is 2+4+4, with a complementary

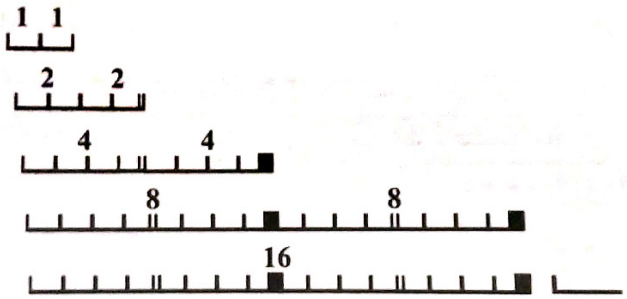


Fig. 1. Metric Sequence. Source: Kuregian, 2017.

Plagal cadence at the end. She also evaluates another 10-bar structure according to the motive and the harmonic structure as {(1+4)+(1+4)}. This approach exists in other formal schools (Spasobin, 2010).

Many music scholars also define square constructions based on the similarity of sentences (parallel periods). For example, Spasobin considers conventional periods a square with a repeating structure in aba1b1, where each letter represents a phrase (2bars). Table 1 shows Spasobin's divisions, and Fig. 2 is an example of a period with a square and standard structure.

Notably, this metric approach has yet to be applied throughout history. For example, in the case of Renaissance vocal music and some minimal music types, following the melody's metrical structures do not exist. Many motets of the last 50 years of the Renaissance or Tinnabuli music from Arvo Part do not have such formal metric structures. However, most melodies can adapt to antecedent and consequent metric sequences.

The musical formulations of the poem's rhythm are also compatible with the square structures. Fatemi classifies folk and children's poems in Table 2 in the book "Rhythm for Children in Iran." Table 2 shows that, firstly, square structures are dominant, and secondly, antecedent and consequent can be established to form structures. Fatemi describes the rhythmic structure of most children's poems as ternary and says that the binary rhythmic forms are an exception. In this theory, pauses can be expected at the end of the fourth pattern.

Tabibzadeh rejects the precocity of folk poetry, and instead of using prosaic elements, he presents another description based on the number of syllables and pauses. He introduces the pause factor in the poem's rhythm and marks | for the short pause and a more extended break || taking into account that Each syllable is marked with a _ sign, and he analyzes folk poems. For example, he puts "Atal Mattel Tulle Mattel" in _ _| _ _ || _ _ _ _Category. However, Tabibzadeh does not specify the accented syllables and their quality in this method. The

Table 1. Eighth- bar periods in classical music. Source: Spasobin, 2010.

	First Phrase		Second Phrase	
Common Square Structures of Periods	a	b	a1	b1
	a	b	a1	c
	a	a1	a2	a3
	a	a1	a2	b
	a	a1	b	b1
	a	b	b1	b2
	a	b	c	a1
	a	b	c	d

researcher has found formulas for the meter of folk poems without considering the tension and accent of each syllable. According to Tabibzadeh's research, two-line structures are the most common folk poem (Tabibzadeh, 2003). Fig. 3 illustrates one of his models, in which the antecedent-consequent structure is dominant.

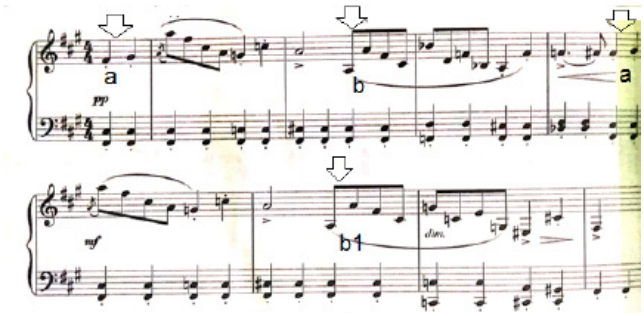


Fig. 2. A period ab a1b1 form. Source: Spasbin, 2010.

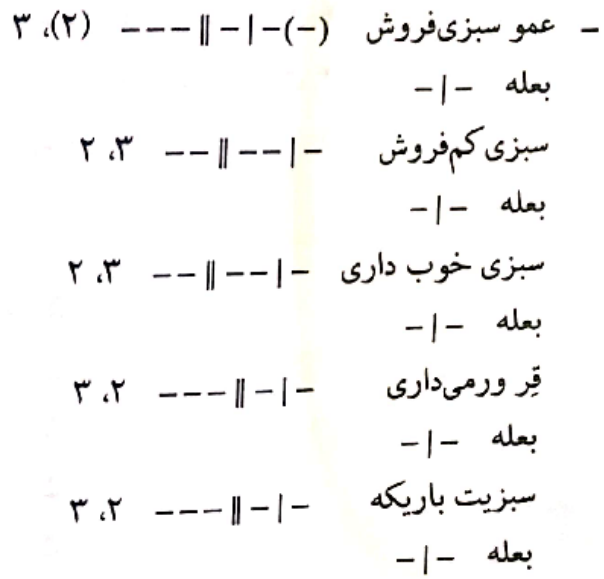


Fig. 3. Tabibzadeh's Model. Source: Tabibzadeh, 2003.

The examples discussed by Fatemi and Tabibzadeh, following antecedent and consequent structures with equal rows, show that square metric structures are far beyond Western music. Without one being affected by the other, patterns are adapted and compatible. Many structures may be universal and present in most cultures, so most listeners find them more natural.

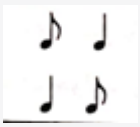
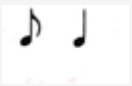
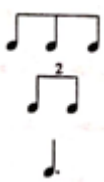
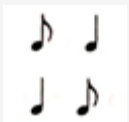
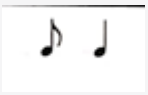
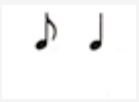
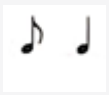
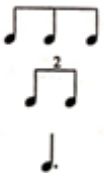
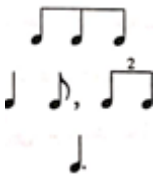
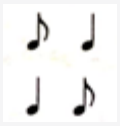
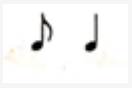
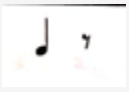
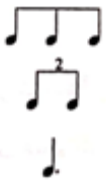
- Factors causing pause or caesura

A caesura is a period separating musical parts from each other. This phenomenon can have a visual appearance, such as rest, or it can have no symptoms. Also, the intensity of separation among structures can be different (Spasobin, 2010). The amount of a pause between the sections can be different. For example, there is a longer pause between the two more significant parts, A and B, in the compound ternary form than between the two sentences inside A. Also, some signs separate the parts more decisively; for example, a strong contrast of tempo with a change of tonality creates a longer pause.

Some authors consider some of the following factors to cause termination, but these definitions can be equivalent to pauses in larger structures. Larger structures emerge from aggregating tiny structures with terminations, pauses, and terminations, equivalent to this article. The following are the most critical factors that cause pause or caesura (or interior termination).

A) Long duration notes: Short duration notes that end with a long duration note create a feeling of ending in the long duration note (Narmour, 1992).

Table 2. Rhythmic patterns of folk poems according to Fatemi. Source: Fatemi, 2003.

	First Group	Second Group	Third Group	Fourth Group
Model No.1				
Variations		 divided rows		
Model No. 2				
Variations				
Model No.3				
Variations		 divided rows		

As a result, woodwind players may breathe at this point. In Iranian classical music, the phrase often ends according to the long-duration note. After a few short notes ending with a long note, there is a feeling of termination, so separation occurs.

b) Rest: The rest factor may occur after a long note or at the end of a phrase. In most sources, the visual representation of pause is rest. Rest can come between phrases, two sentences, two motifs, and even two sections, and they can be separated (Narmour, 1992; Spasobin, 2010).

c) Similarity: According to Spasobin, Kuregian, and Lerdhal, similarity is the factor that separates the structures. Spasobin believes that similarity separates and difference unites. For this reason, Spasobin, in the division of periods, considers periods with repetitive structures (parallel periods) to have a pause at the end of the first phrase (Spasobin, 2010; Kuregian, 2017).

d) Strong contrast: Spasobin considers the strong contrast as a separating factor that results in caesuras (Spasobin, 2010).

e) Metric Sequence: As previously mentioned in the Kuregian discussion, there is a break and separation point at the end of two-bar, four-bar, eight-bar, and sixteen-bar structures. Of course, According to Narmour, the arrival of the note on the metrical emphasis creates a sense of termination (Kuregian, 2017; Narmour, 1992).

f) Resolving a dissonance to the consonance (tension

to release): If the piece's central factor is consonant or stable (such as a stable chord or a central note), the unstable to stable resolution can create a sense of termination and lead to caesura. Of course, dissonance and consonance may differ in different styles, genres, and cultures. For example, in the common practice era, the resolution of the dominant seventh chord to the tonic can be seen as an example of this issue. However, the central factor in neo-tonal or even jazz music can be a dissonant chord. In such cases, there are other models for cadence. Cadence formulas such as the Ball-e-Kabutar or Nava cadential pattern in Iranian classical music also have a non-harmonic cadence function.

g) Sequence of a short skipping or step-wise motion after a long skipping: the sequence of three notes where the first and second have a long skipping motion and the second and third have a minor motion terminates the phrase (Azadefar, 2015; Narmour, 1992). A longer skipping means creating tension, and resolving a long skipping motion to a shorter one is like an association of tension to release and creates a sense of ending.

All these factors can work simultaneously, or one can work to weaken each other. The factors related to the rhythm and tension of the notes, i.e., the cases of a to e, can also be used in poetry. Table 3 shows the adaptation of some factors that cause pauses in music and poetry. However, in other cases, it is more challenging to describe the poem due to being involved with harmony or melody.

The previous section demonstrated that the final pause or caesura is more common at the end of the metric sequence. For this reason, folk and children's poems are often two lines, and the duration of two lines (and not necessarily the number of syllables) is equal. There is also a more significant gap between the lines. Besides, there is a smaller gap at the end of the pillars. The studies justify the metric sequence of musical periods as similar to poems. In this way, the audience of a poem, by listening to the rhythm, will be able to recognize the pauses or caesura correctly and find some types more natural.

• Experimental phase: Describing samples based on the metric sequence and natural patterns

- Purpose of the test

This experiment aims to investigate the content of square structures (type of antecedent and consequent) and the optimal location of breaks according to the abovementioned theories.

- Statistics and tested samples

The scope of this experiment consists of 20 men and women in the age range of 16-35. To consider the diversity of the population, musicians and non-musicians were randomly selected. The test was conducted on four audio samples designed using Sibelius software. In the sample test, no accent or emphasis exists in the software. Besides, audio samples and explanations were not provided to the audience, so the results would be unaffected.

The first example is the structure of Faulon, Faoulon, Fauol, Faulon, Faoulon, and Fauol, in

Table 3. Adaptation of the structures that create pause or caesura in poetry and music Causes of Caesuras. Source: Author.

	Caesura or Pause Elements Comparison	
	Poetry	Music
Pause Factors	A Longer Syllable	A Longer Duration
	Changing the Poetic Meter	Rest
	Repetition of a Poetic Element or Set of Elements in the First and Second stanza	Structural Similarity (Repetition of Phrase, Motif)
	Changing the Poetic Element,	Using a Completely Different Theme, Strong Contrast (thematic, dynamic, texture)
	Proportion of the Two-by-Two Proportionality Metric of the Elements	Metric Sequence

which the pause was made at the end of the third verb.

This example follows the expected structures in the metric sequence (Fig. 4).

The second structure is the same as the previous one, but by disrupting the pause by placing the Caesura factor in the second pillar, which questions the prediction of theories (Fig. 5).

In the third example of Fig. 6, the following rhythmic structure of the four-part structure is Mustafalan Mustafalan/Mustafalan Mustafalan.

The fourth example of Fig. 7 also has the same structure, but the pause place differs from metric sequence prediction.

The design of audio samples is such that the first and third patterns are the patterns according to metric progression. The second pattern is entirely far from the expectation, and with a breath or intersection different from the theory, the fourth pattern adjusts the pause's size in a more-than-expected way. The following questions were sent to the audience along with the audio sample:

Please choose the correct answer based on the audio samples. (If you do not have a preference, specify your answer)

a) Which of the first and second examples do you find natural? b) In which one of the first and second cases is breathing or pausing more natural? c) Which one do you prefer more natural between the third and fourth samples?

d) Taking a breath or taking a break in which one of the third and fourth cases is more natural?

e) Which of the first to fourth cases do you prefer?

- Summary and data analysis results

After collecting the data, the answers to the questions and the response percentage were done as follows:

a) 90% of the audience chose sample A, which shows that the intersected structures are based on periodic structure and metric sequence theories. With the repeated construction, the preceding case is the majority. However, there are exceptions in some cases.

b) 17 listeners, i.e., 85% of the audience, found the first example to have a more suitable pause than the second example.

c) 60% of the listeners considered the third sample and 40% reported the fourth sample suitable. This shows that listeners accept a departure from the metric cycle or stroke in long rhythmic cycles. The difference between the third and fourth samples was not in the position of intersection but in the amount of breathing.

d) The answer to this question was the same as the third question.

e) 95% of listeners prefer the first sample over other samples; in the next step, they accept the third and fourth samples. There was no significant difference in the preferences of the third and fourth samples.

Summarizing the findings, it is clear that the metric sequences, intersection, and breathing seem more

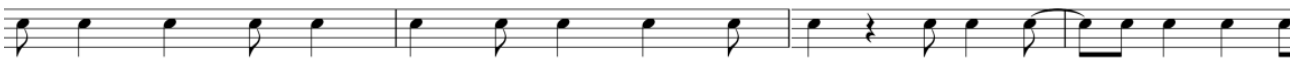


Fig. 4. Example No.1. Source: Author.

Fig. 5. The Example No.2. Source: Author.

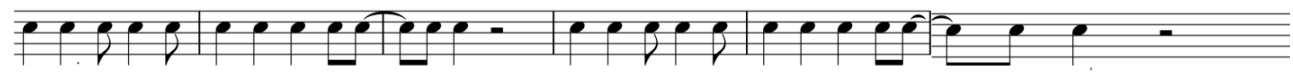


Fig. 6. Example No.3. Source: Author.

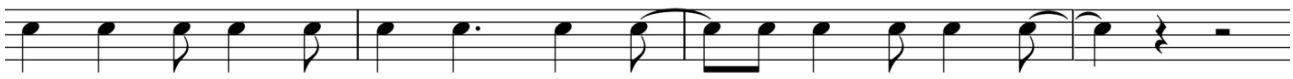


Fig. 7. Example No.4. Source: Author.

natural for 90% of the listeners. Also, crossing the middle of the rhythmic round and following the antecedent-consequent structures is a natural desire. However, contrary to expectations, regardless of music education, there is no significant difference between musicians and non-musicians. There is no 100% result in any structure. For this reason, one should be careful when generalizing the results to the whole.

Conclusion

The fundamental question of this research was as follows: How much is the adaptation of the widely used structures of children's poetry with the fundamental structures of form in music? How much do the audiences consider the metric sequence in the poems to be natural? The research assumed that the fundamental structures of metric sequence in music also apply to poetry.

The first part of the research illustrated that the metric sequences in music and poetry create pauses or caesuras. By comparing the concepts of formal and poems in the writings of Fatemi and Tabibzadeh, we can consider the position of pauses in music to be consistent with poetry. To show the acceptability of the patterns of crossing poems based on the principle of metric sequence, an experiment was conducted on 20 musicians and non-musicians. This test highlights abovementioned theories about periodic structure are in agreement with the audiences' answers. The survey results in four samples show that 90% of the audience find the pattern according to the metric sequence more natural and the intersection based on it is better. In the case of other patterns, increasing or decreasing the pause does not significantly affect the audience's preference. Future research can focus on other rhythmic and analytical patterns and test them on the audience to find reliable descriptive structures.

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