Proposing a *Makâm* Model Based on Melodic Nuclei

Examples from the *Hüseynî* and *Uşşâk* Families: *Hüseynî*, *Gülizâr*, *Muhayyer*, *Uşşâk*, *Bayâti*, *Nevâ*, and *Gerdâniye*

Ertuğrul Bayraktarkatal and Cenk Güray

INTRODUCTION AND SCOPE: THE CONCEPT OF MAKÂM

Makâm structures are the main tool for producing melodies in the musics of Anatolia, West Asia, Central Asia, the Middle East, the Eastern Mediterranean and the Balkan region. Makâm-based music developed based on theories that can be traced back to Ancient Mesopotamia and Ancient Greece. Historically, the concept of makâm has been defined in various ways. Until the fifteenth century, scale-based definitions that proposed melodic intervals as the main building blocks of makâm structures were more common. After the fifteenth century, the definitions moved toward a more melody-oriented route to take frets[1] as the building blocks of the typical melodic structures that were classified as makâm. Defining key points such as the important frets, and the melodic route between these frets etc., that produced the makâm-based melodies became more important than merely discussing the sound material that shapes the makâm structures. In this paper, a new melody-oriented model is put forward to describe makâm, aiming to construct theory through practice.

ORIGINALITY AND THE ORGANIZATION OF THE PAPER

[2] The unique model discussed in this article aims to describe makâm structures by defining the typical melodies derived from a melodic model—called melodic nuclei—that enable us to perceive a specific makâm in an audial way. These typical melodies are defined through assigning specialized functions to the important sounds/frets within the given makâm structure. This paper will begin with a literature review detailing the history of melody-oriented approaches in defining makâm structures, before discussing the original or novel aspects put forward in this study, such as the functionalities of the special pitches engaged

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1. The term "fret" refers to specific pitches played on a fretted instrument.

with the proposed melodic nuclei model and the underlying philosophy.

LITERATURE SURVEY

THE MEANING OF THE WORD MAKÂM

[3] The word makâm derives from the Arabic word *maqam*. The word makâm (maqam) points to various meanings such as "to step on" or "the place for sitting" (Kanar 2012); "the place to stand or to rest" (Devellioğlu 1986); "position, location, residence, halting place" (Nişanyan 2019); and "site," "region" (Kubbealtı 2019). The word *mukâm* seem to have related meanings to the word makâm (Kanar 2012). As a result, we can deduce that the word makâm could be translated aslike "the residence" or "the place for standing or resting."

MAKÂM AS A MUSICAL CONCEPT

[4] In music theory, the idea of makâm has received widespread attention; many works concentrating on the conceptualization of the makâm have therefore been developed. The late-17th and 18th-century theorist, composer and performer Kantemiroğlu (1673–1723) from Ottoman Istanbul defines the term makâm as follows:

> A specific makâm is one that identifies itself as the makâm of its central pitch[2][3] based on the melodic movements it experiences and thus undoubtedly differentiates itself from other makâm structures (2001, 40-41).

This definition concentrates on a central pitch, focusing on the uniqueness and the specificity of the melodic movement around that pitch.

[5] Abdülbâki Nasır Dede, one of the important theorists of the 18th century—referred to as the summit period of the Ottoman music tradition by many researchers (Güray 2017, 91)—

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2. The term *pitch* corresponds to a frequency interval in which the audial effect of the central frequency of the *pitch* is conserved. It should be remembered that the concept pitch used throughout this paper will refer to the median value of an interval of frequencies representing the same audial effect in mâkam music. We should add that these pitches address to frets and to fictitious frets in the fretless instruments too, which turns the intonation quality in performance a much more complicated issue.
3. As a musical term it has the meaning of axis or center.

gives the following definition regarding the origin of makâm within the pages of his manuscript named *Tedkîk ü Tahkîk*:

> [According to the reports of the ancient theorists] Makâm—-as soon as it can be heard with all of its original components—is a melodic line or structure that shows a specific integrity and identity, whose components will neither be divided into smaller pieces to produce another specific structure nor be transformed to completely resemble a previously known makâm type (Başer 2013, 107; 2006, 35).

This definition also underlines the uniqueness and the specificity of the makâm-based melody.

[6] In his dictionary named Musiki Istılâhatı Kazım Uz (1873-1943) emphasizes the idea of a pre-specified makâm melody related to a specific rule-base:

> A standard melody performed with respect to some specific rules within a certain zone of consecutive musical pitches4 (1964, 43).

[7] Ekrem Karadeniz (1904-1981) defines makâm as follows:

> Makâm is a melodic flavor in Turkish Music that is composed of musical sentences formed within a scale based on consonant intervals and pitches, having specific rules governing its melodic movements (2013, 64).

Here, Karadeniz highlights the concept of "musical sentences with specific characters" and its links with the word "flavor," referring to a specific taste or discrepancy. Such definitions featuring specific melodic movements around certain pitches are not limited to Ottoman-Turkish scholars.

[8] Powers defines makâm as "interrelated melodic entities" or "melodic types," based on its similarities to the concept of the Indian raga (1989, 42). According to him, "these melodic types are consciously used as norms for improvisation or composition" (Powers 1989, 42). He then refers to Idelson, who had defined makâm structures as the combination of "melodic motives" in the first edition of his work on Jewish music (1992 [1929], 84). He then interprets the effect of makâm in Turkish, Persian, and Indian improvisational music cultures, stating

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4. This refers to pre-defined melodies that are performed in a restricted part of a specific scale.

that such abstract melodic types are represented strongly in improvised performance (1989, 50). Powers invokes the concepts of "abstract melodic type" or "motive" when defining the key points of a makâm. Furthermore, he underlines the resemblance of the concept of 'Turco-Arabic' makâm (used in combination with the term awazat in the music theory of the Late Medieval Islam Period) to Uzbek-Tadjik makâm and Iranian *dastgâh*, given that they are all made up of smaller entities such as *jins* , *shuba* , and *gusheh* "that are independent individuals in their own right, with proper names of their own," noting the name-based specification of these indicated "melodic types/entities" that build up a makâm-based melody (1989, 44, 48–51). Hiromi Lorani Sakata further deepens the discussion by indicating that Afghan people identify and classify some specific melodic types on account of their resemblances with some folk songs with which they are familiar (1989, 172).

[9] In his paper entitled "Eight Musical Meanings of the Makâm Concept," Gültekin Oransay indicates the meaning spectrum of makâm as including "pitch, stereotyped melody or melodic path-in its widespread usage for classical style in Turkish Music" (1990, 58); in the dictionary by Kâzım Uz—which is transcribed and edited by himself—the author explains makâm as being a "melodic movement [seyir] within a particular scale [aşıt] or a number of scales" (1964, 42-43).

[10] In 1969, in his Ph.D. Thesis, Owen Wright makes an interesting remark, referring to theorist Qutb al-Din Şirazi (b.1311), that the distinguishability of a makâm is possible by defining a number of "prominent notes (pitches)" as the elements of a "modal nucleus" (1969, 66):

> But, as Qutb al-Din makes apparent, the feature of prominence alone is not sufficient to distinguish them from other modes, especially when their range is extended beyond the original nucleus of four or five notes (Wright 1969, 283).

[11] Similarly, in 1973, Nettl and Riddle indirectly defined the melodic characteristic of a makâm-based melody while analyzing the improvisational taksim performances by Jihad Racy; they observed the strong impact of specific melodic or motivic units in creating improvised melodies:

> And we also did not address ourselves to the origins of specific melodic or motivic units, as, for example, the degree to which some of them were learned and memorized

by Racy, others are variations of known motifs, and yet others were actually improvised by him. The extent to which the material is truly "improvised" is a question we do not attempt to assess. It may be of interest to point out that Racy himself, after seeing some analytical data, indicated surprise to the degree to which his performances followed certain patterns (Nettl and Riddle 1973, 13).

[12] Similarly, Karl Signell certifies that the essence of a makâm can be identified by very short patterns which were named as 'stereotyped motives" (1986, 125). He adds that:

> The creation of these uncanny motives, with their appropriate and powerful abilities to communicate the essence of a makâm is so impressive that Yaşar5 dubs them "miniature compositions" (Signell 1986, 139).

[13] Cinuçen Tanrıkorur explains the concept of makâm as:

> A rule-base originating through the use of musical scales formed being based on certain intervals not in an arbitrary way, but according to stereotyped melodic movements [seyir] instead (2006, 140).

These rules of melodic movements which cannot be changed by any composer are the main sources giving personality, taste and smell to makâm structures (Tanrikorur 2015, 129). He also emphasizes the fact that a makâm can be identified only by a short melody—without the need of referring to a scale—by saying that:

> As you may guess, there is no need to define a scale for understanding whether a melody composed of 4–5 pitches belongs to Sabâ makâm or not (2014, 28).

[14] Yalçın Tura tells us about the concept of makâm in a similar way using a quotation to Bülent Aksoy:

> Makâm structures are adorned with some key notes/pitches. The gathering of these pitches creates patterns specific to a makâm. Playing a few notes of a makâm at the correct intervals gives an impression about the melodies of that makâm to the listener. Four, five or even three notes are enough for this. These guiding melodies are in fact

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5. Necdet Yaşar was a well-known tanbur performer (1930–2017).

characteristic or stereotyped melodic patterns. In fact, the "makâm itself" has a stereotyped characteristic (2016, 116).

[15] While Yalçın Tura (1997) discusses the melodic fragments or melodic modules, he draws the attention to a modular structure that can be composed of melodic fragments with two, three or four notes.

[16] Cem Behar contributes to the discussion by asserting that:

> [...] a makâm-based melody does not act as a 'press' for the composers and performers that have internalized these structures. Just the opposite, every makâm represents an open creative area or an ever-advancing horizon for those who can use it. [...] The makâm is identified and its personality is made up by the movement route of the melodic line [seyir], the specific pitch hierarchy utilized as a result of this movement and small melodic fragments (B/G) (Behar 1987, 66–67).

[17] Kemal İlerici claims that "in our tradition the way a scale is processed is called makâm" (İlerici 1981, 2). Although İlerici defined makâm structures as being based on scales, he also discussed and analyzed the special melodic patterns regarding these makâm structures during his courses.

[18] Bayraktarkatal explains the makâm as follows:

> Makâm can indicate itself in only a small characteristic interval or in a tiny melodic nucleus. Various melodic lines can be produced by making frequent modulations." [...] Makâm is a melodic braiding. This braiding is designed according to the hierarchical structure within the scale of pitches used by the makâm (1997).

[19] On the other hand, Bayraktarkatal and Okan Murat Öztürk (2012), and Okan Murat Öztürk himself (2014) discuss the concept in a more detailed way, touching also on the concept of melodic nucleus:

> A makâm starts within a melodic zone which includes the pitch symbolizing the beginning of this makâm. This melodic zone enrolls functions of melodic tension and melodic resolution to the pitches placed within its borders. The melody developed based on these functions also leads to relations specific to a melodic

nucleus symbolizing the beginning of the makâm. […] the main requirements of a makâm melody include having an opening line that reflects the identity of the makâm and the inclusion of the makâm-specific melodic codes within this opening line (2012, 41).

THE CONTRIBUTION OF THIS PAPER TO THEORIES OF MAKÂM

[20] In related literature, there has always been a need to define the concept of makâm as a melodic formula requiring the utilization of stereotypical or characteristic motives developed over a specialized organization of sound and a defined pitch group. The critical questions to be asked and, it is hoped, answered in this paper should be as follows: What makes specific organizations of sound special? What kind of a melodic formulas makes the melodic products of this sound organization unique and therefore differentiable from other kinds of similar organizations? Is it possible to define a series of analytical components such as the special pitch functionalities to describe these formulas in an analytical way?

[21] This paper aims to discuss the analytical and structural details of such a melodic model, analyzing the unique melodic characteristics of makâm structures through the lens of melodic nuclei. A melodic nucleus of a makâm can be described as a melodic function that generates the stereotypical melodic motives for a specific makâm by assigning special functions to selected pitches within the sound cluster of that makâm. In addition, the paper plans to give the technical and functional details of these melodic nuclei and the structural preferences of the implicated pitch functions through an examination of many melodic examples. We believe such an approach will unify in a practical way the theoretical bases and justifications of the patterns called melodic nuclei with performance practice and education. Indeed, such a theory based on the functions of stereotyped melodies with a self-identity for forming the makâms not only considers a theoretical justification but also requires a philosophical justification regarding the cultural and perceptional roots of makâm-based music. Thus, the literature discussing the factors that make the makâm based music production and the resulting melodic nuclei culturally determined (and thus perceivable by the related culture) should also be covered.

LITERATURE SURVEY B: A MUSICAL PATTERN WITH SELF-IDENTITY

[22] As seen in the definitions cited in the previous sections, the idea of specific melodic patterns6 plays a major role in the traditional identification and re-envisioning of a makâm structure. This pattern also turns the makâm into a differentiable sound structure that can be perceived by an audial capacity using embedded knowledge of the makâm:

> A pattern is a structure that contains a minimum amount of self-specific knowledge and that is continuously being re-constructed (Kurzweil 2018).

[23] Within the makâm context, "pattern" refers to the melodic nucleus or melodic pattern7 that arises from hierarchy-based movements of pitches within a specific pitch zone or pitch group, containing a self-specific knowledge and experiencing a continuous re-construction process. Each melodic nucleus represents its difference in the simplest way possible. In the melodic nuclei that determine the makâm structures, there are carefully supervised melodic constraints. Each melodic nucleus presents a melodic movement that is built upon an open-ended tension-resolution relation within these specific constraints that will be discussed in detail in the following parts. The time-dependence and partly random structure of this open-ended relation—which can choose its path within the learned constraints based on a pitch hierarchy—naturally coincides with a stochastic production process (Borovkov 2013, 350). The most important feature of the pitch groups that produce the melodic nuclei is the eidos or self-identity generated through an inner melodic movement. The eidos/self-identity and the specific sound8 of a makâm evolve through the pitches, the functions of the pitches, the characteristics of the intervals between these pitches, and the structural utilization of the pitch (pitch) group. This eidos/self-identity can also be envisioned as the source of re-interpretation (or revival) of the concept of makâm that makes it culturally specific, as exemplified in the case of an İranian dastgah by Hammarlund (2004, 42). The differentiable sound/self-identity/pattern specific to any makâm can be considered a code. We can recognize a makâm by mapping it onto similar melodic patterns that we have experienced in an audial way before. The practical process for learning a makâm is conducted in a

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6. Pattern: Model, template, theme.
7. The terms of melodic pattern, melodic nucleus can replace each other.
8. Sound: To transfer a specific sound, to give a timber effect.

traditional, memory-based way depending on the music culture of the community in which it is learned.

[24] In our opinion, the uniqueness of a makâm will depend on specific characteristics included in the structural components of characteristic melodic lines. Further, this specific structural component should have an audial effect that will allow the listener a unique experience of it. These two main themes make a makâm structure a very flexible and productive agent for creating a sonic work of art through shaping a sound material into a unique, aesthetically pleasing structure—just like building a sentence through the material of words to assign a semantic structure to it, as stated by Wittgenstein (Bar-Elli 2006, 1).

[25] This structure, which can also be identified as a pattern, clearly resembles the formula of a musical or melodic pattern. During her discussion of improvisation in Iranian classical music, Nooshin pointed out a grammar-semantic-oriented issue by remarking on the entrance of concepts such as devices, strategies, rules, techniques, and musical grammar into the system of creating "makâm-based melodies" (2003, 252). The melodic pattern—instead of words—has been developed by a series of combinations of separate melodic blocks that are finally unified in unique musical expressions. This musical expression is matched with a pattern defined previously in our mind, which is semantically designed to give specific sensations based on various unique melodic formulas produced in a specific cultural habitat. In fact, these melodic formulas that find their real meaning in cultural context—similar to semantics in language—are called makâms or makâm structures. Moreover, the unification of melodic nuclei can eventually be identified as an algorithm designed to produce new melodies reflecting this formula. Thus, in traditional music, melodies based on more than one melodic nucleus can often be observed. In fact, the tradition itself has a close and strong relationship with the structure of the traditional work/object of art. According to many theories about art, the human mind can perceive an object as a work of art not as arising from a sensation of the soul, but from analytically based structural characteristics that can be perceived by physical sensations. This perception can be specific to the cultural context in which the work of art is produced. According to Moritz Geiger, a work of art can only be perceived because of its structural characteristics, which reflect the value and the specification through which it uniquely appears (Geiger 2019, 31). Gadamer defines this cultural context, in which these structural characteristics inspired through the cultural

symbols have been continuously re-envisioned as objects of art, as the tradition itself (Gadamer 2017, 88). Parallel to this view, in their book called "Palestinian Arab Music-A Maqam Tradition in Practice," Cohen and Katz define the concept of makâm structured by means of functions like "scale, the central notes, nuclei of notes like tetrachords and trichords and melody types" (2003, 19-20) as an important modal framework with a strong cultural background:

> Every musical culture is based on certain schemata, learned and natural, that distinguish it from others and every schema represents a principle of organization that may be realized in a piece in various ways. The schemata make it possible for us to predict the continuation of a musical progression; they take shape in the brains of people from that culture; serve as points of reference for the listener; may relate both to rules of composition and to rules of performance; and reflect the aesthetic ideal of music culture (2003, 19).

[26] This process is equally likely in what is called "the remembrance and the re-envision of the old" by Gadamer (Gadamer 2017, 89). Therefore, in our opinion, in Turkey and in many of the neighboring geographical areas (Jurgen Elsner 2016, iii-vii), the structural idea lying beneath the dynamic generation and transmission of music through the use of traditional melodic formulas should be sought in the concept of makâm and in the melodic nucleus acting as its core. Therefore, the methodology in this paper not only tries to bring a theoretical solution for expressing makâm structures, but also searches for cultural traces of makâm as an expressive agent for traditional cultures.

THE ORGANIZATION OF THE PAPER

[27] After the previous discussion about the music-theoretical, cultural, and philosophical background for illuminating the perception of this paper regarding the concept of melodic nuclei; the text will now discuss the formula for developing this pattern, which will be detailed within the functionality behind the melodic nuclei using examples gathered through practical makâm-based music heritage.

METHODOLOGY—THE CONCEPT OF MELODIC NUCLEI: PROPOSING A NEW MODEL FOR UNDERSTANDING, ANALYZING AND CLASSIFYING MAKÂM STRUCTURES

[28] As noted above, the makâm structure is not essentially a constant scale of pitches, but is a melodic movement. Nevertheless, considering the makâm solely as a melodic progression may both prevent the observation of the specific characters of the makâm structures and, more critically, may efface their self-identities in remarking on the differences between different makâm types. In our opinion, the most efficient way to understand the construction of a makâm-based melody is to comprehend the melodic nuclei that carry the specific melodic characteristics and the specific sound of the makâm.

[29] A melodic nucleus is composed of a pitch group of three or four pitches organized around a central pitch/axis, and is always developed on an integrated pair of balanced and unbalanced rests that arises out of a tension-resolution relationship. When such a relation is encountered, it is quite certain that the melodic nucleus alone can reveal the makâm structure.

[30] The complete structure of a makâm-based melody is developed by a modular intersection of different melodic nuclei. Both the continuously reproducible nature of a specific melodic nucleus and the modular character that leads to an infinite number of possibilities for the intersection of the different melodic nuclei make it possible to create various melodic compounds presenting different sounds and timbral effects.

[31] When our ears detect a melody, what are the criteria that direct us to classify it under a certain makâm structure? Usually, such a classification scheme has much to do with the technique of grouping, which collects things obeying certain rules under a specific heading (Güray et.al. 2003). In our case, this heading is a specific makâm, and the rules indicate the melodic characteristics that make this and similar structures unique. According to Bayraktarkatal, a melodic nucleus and the relational characteristics that are built around this nucleus should be the factor that differentiates a certain makâm from another one:

> A makâm is certainly defined by a melodic nucleus and wherever this nucleus appears we observe the color of this makâm there. The melodic nuclei possess a characteristic syntax and whenever this syntax is broken, the makâm loses its identity and turns into another makâm (Bayraktarkatal 2018).

[31] So here we end up with a model in the shape of a melodic nucleus that possesses a particular syntax that makes the makâm structure it belongs to differentiable from other makâm structures. This nucleus, whose timbral effect can be observed within an interval of frequencies, has a melodic center corresponding to a pitch. The other neighboring pitches have other musical functions and produce certain melodic characteristics engaged with this center. Moreover, a simple melody that sounds like a specific makâm should be composed by using these characteristic relations lying in the rule-base of the makâm kept in the collective memory and somehow symbolizing its self-identity. In the theoretical manuscripts of the early Ottoman period, this central pitch—from which the makâm emerges—is called *serâgaz* (polar pitch) (Güray 2017, 76–77). A complete melody may be formed under one nucleus or with a combination of a series of nuclei, which makes makâm music a modular system.
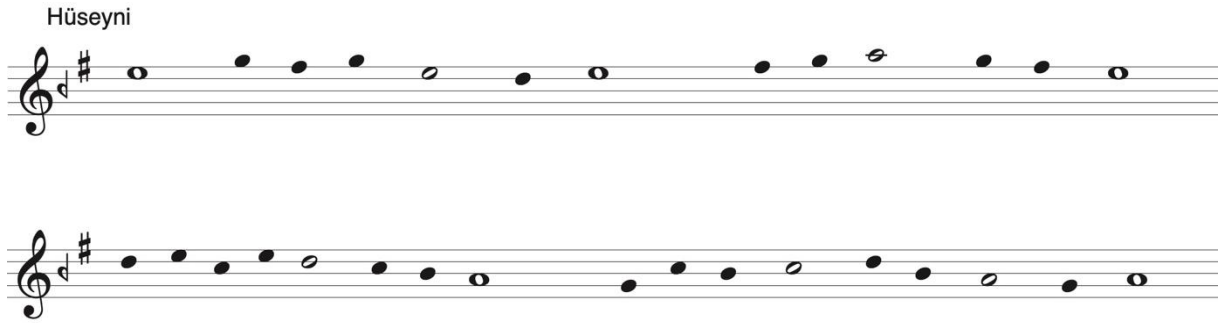
Figure 1: The examples of Melodic Nuclei for Hüseynî Makâm (See footnote 10 for the details of the pitch organization).

[32] In Figure 1, the combination of two melodic nuclei can be observed as forming the structure of hüseynî makâm. As may be seen, the first melodic nucleus starts with hüseynî (E) as a serâgaz (polar) pitch; the first melodic contour evolved on this nucleus takes this pitch as its center. This melodic contour is then supplemented with a contour evolving on a second melodic nucleus centered on dügah (A); thus, the melody produced by the hüseynî makâm comes to the stage as a combination of the melodic contours developed on two different melodic nuclei.

[33] Therefore, it can be easily argued that what constructs a specific makâm is not a scale or an intervallic structure, but a combination of characteristic melody building structures arising through the unification of a number of melodic nuclei and creating melodies within a hierarchy taking the central pitches of these nuclei and the specific pitch group around this center in their base. Now let us discuss the functions of the pitches in a melodic nucleus.

DISCUSSING THE COMPONENTS OF MELODIC NUCLEI[9]

[34] As was discussed earlier, the melody production system of a melodic nucleus can clearly resemble an algorithm designed to execute a previously defined musical pattern to create similar sonic products that act as melodies based on certain makâm structures.

[35] The pattern or melodic nuclei behind a specific makâm structure can be identified from four main components, known as the central identifier (M) pitches, co-identifier[10] pitches (T), reinforcing pitches (P), and ornamental pitches (S).[11] These four characteristic pitches within the pitch cluster of the specific makâm and the way they relate to each other construct the musical relation that creates a specific auditory experience for a unique makâm through the execution of its related melodic nucleus. This musical relation usually arises from the tension-resolution relation between two of these pitches (central identifier and co-identifier), with the supportive effect of a third pitch called the reinforcing pitch, and finally resulting with the introduction of an ornamental pitch coordinating the melodic variations. Now let us discuss these pitch functions in more detail.

[36] A pitch that will be named "central identifier pitch"[12] is subsequently placed in the axes of a melodic nucleus. A balanced rest is developed on this pitch and the surrounding three or four pitches move subject to it. The self-specific melodies occurring through the pitch group

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9. The pitch scale/system that we will be used throughout the paper—the notations corresponding to these pitches and the traditional pitch names asserted to these pitches (with the necessary abbreviations)—are given in the figure below. These pitches were actively used in theory and performance after the fifteenth century, and still constructs the main framework for today's theory and practice (Güray 2017, 90).


10. The term common identifier is used in a similar meaning and to identify the structures with a similar function in computer science too (Talburt 2011).

11. These pitches are expressed with their abbreviations transferred from Turkish synonyms: M for *merkez* (central identifier), T for *tanımlayıcı* (co-identifier), P for *pekiştirici* (reinforcing), and S for *süsleyici* (ornamental).

12. Central Pitch/Kutb (Pole): (M).
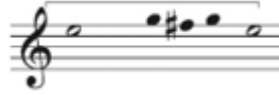
Figure 2: Central Identifier and Co-Identifier Pitches.
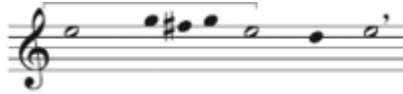
Figure 3: The Effect of Reinforcing Pitch.

around this central identifier pitch assertively identify the makâm. The central identifier pitch defines the center that initiates the melody specific for a makâm, and the name of the makâm is usually acquired from this pitch.

[37] The co-identifier pitch functions as the unifying pitch that helps to identify the makâm-based melody in coordination with the central identifier pitch by creating a melodic tension-resolution with it.13 In fact, the central identifier and the co-identifier pitches construct a pitch pair relying on the tension-resolution relation in between. Thus, the characteristic of this pitch usually includes creating a feeling of unbalanced rest engaged with the effect of the central identifier pitch. Without feeling the integrative effect between the central identifier and the co-identifier pitches, it is not possible to identify the given makâm.

[38] An example for the pair of central identifier (E) and co-identifier (G) pitches for hüseynî makâm can be observed in figure 2. It can be easily seen that the tension in gerdâniye (G) is resolved in hüseynî (E).

[39] The reinforcing pitch can be identified as a pitch to support and strengthen the feeling of the balanced rest aroused by the central identifier pitch. Finally, the ornamental pitch establishes the melodic transitions, connections and variations between central identifier, co-identifier and reinforcing pitches. Note how the rest in central identifier pitch hüseynî (E) is supported by the reinforcing pitch nevâ (D) in figure 3 and how the ornamental pitch eviç (F#) produces new melodic variations between gerdâniye (G) and hüseynî (E) in figure 4.

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13. The function of this pitch can be imagined by examining the strands of a DNA where the structure of one strand determines the other. (Khanacademy 2020)

Figure 4: New Variations by the Ornamental Pitch.

[40] If the makâm is built up in the correct structure, it may be certified that the sonic identity of the makâm can be preserved even if there are minor changes in the frequencies of the related frets. Thus, as soon as the makâm structures are developed in a correct way, these specific characteristics make this makâm recognizable even when alternative pitches replace the traditional pitches. Karl Signell makes a similar comment, implying that a correct construction of these structures (referred as melodic nuclei in this paper) can lead the listener to a correct identification of the makâm even when the melody is played on a well-tempered keyboard. Signell calls these characteristic, recognizable melodies "sterotyped motives" (1986, 125). A specific makâm can be identified when the pitch frequencies of the group do not surpass the borders of the specific pitch intervals making up the makâm,[14] and the structure of the melodic nucleus of the makâm is thus protected.

[41] Now, the related functions attributed to these specific pitches for each melodic nucleus will be exemplified concentrating on how these melodic nuclei and the related pitch functions can be deduced from musical examples and literature knowledge gathered from two important families of makâm structures of Turkish music, namely *hüseynî* and *uşşak*. The examples will demonstrate how different melodic nuclei are utilized to form larger makâm-based melodies through the unification of various melodic nuclei in a modular way and how these melodic nuclei can be extracted from different musical examples to examine the theoretical background of this musical formation.

DISCUSSING HÜSEYNÎ AS A MODEL TO CLASSIFY AND UNDERSTAND MAKÂM STRUCTURES

[42] In the theory books of the fifteenth century, the *hüseynî* makâm—one of the oldest makâm structures of Anatolian music—was expressed in a series of definitions reflecting a

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14. Otherwise, the makâm can be transformed to another similar one. These frequency borders for the characteristic pitches that help to differentiate between two makâm structures can be named as the *threshold of transformation*.

wide variety of expressions. For example, Hızır Bin Abdullah defines this makâm with the following phrase that points to a melodic contour, starting with *dügâh* (A), the melody rising to *segâh* (B♮), *çargâh* (C), *nevâ* (D) and finally reaching to the central identifier pitch *hüseynî* (E) from which the makâm emerges:

> *Dugâh heman, segâh heman, çargâh heman, yekgâh pençgâh evi, dugâh hüseynî evi serâgaz, segâh hisâr evi, yekgâh gerdâniye evi, dugâh muhayyer evi* (Güray 2017, 76).

[43] The pitch hüseynî is emphasized here as being the central identifier pitch of the melodic contour with the use of the phrase "serâgaz,"[15] meaning that the melody emerging from this pitch is the main melody giving the color of the makâm; the phrase 'serâgaz' may identify the central pitch through which the starting melodic contour is produced. Therefore, we can label this pitch as the central identifier pitch. Seydi, who produced his work around 1504, gave a very flexible and practical definition of the hüseynî makâm:

> Var ol şeşgah evinin bir kılın ur (Rest at şeşgah [hüseynî] pitch a while)
> Karar et dügâhun hanesinde (Come and take the final rest at dügâh) (Güray 2017, 77).

[44] This definition also definitely directs the melodic contour to hüseynî (E) and identifies the final rest at dügâh (A). Therefore, it can be said that the central identifier pitch (M) of the melodic nucleus defining the hüseynî makâm is the hüseynî (E) pitch through which the makâm evolves. From the results of the analysis made of many melodies on hüseynî makâm, it can be asserted that the pitch pair defining the hüseynî makâm is composed of the hüseynî (E) pitch hosting a balanced rest and the gerdâniye pitch hosting an unbalanced rest arising through its tension-resolution16 relationship with the hüseynî (E) pitch, as shown in the example of the melodic nucleus given in figure 5.

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15. Origins from the Persian word *âgaz* referring to the start of a speech or a melody, 'ser' completes this word adding the meaning 'main' to it. So *serâgaz* means the main source of the melody. (Kubbealtı 2005).

16. The concepts of balanced and unbalanced rests were proposed by Koray Köse-a student of composition in Başkent University State Conservatory-in 2019 during the course in 'Modal-Makam Harmonics,' inspiring from his theory background in Mechanical Engineering.

Figure 5: The Nucleus and the Melodic Nucleus for Hüseynî (Hsy) Makâm.[17]

[45] In the above figure, the opening nucleus of hüseynî makâm was addressed by the rightmost figure symbolized by the word çekirdek—the Turkish synonym for the word nucleus. This figure shows the main melody-producing pitches that are irrevocable when constructing the makâm melody, whereas the functions of the pitches in the nucleus are placed to the left of this figure. The related melodic nucleus producing the stereotype melodies is shown by the leftmost figure symbolized by the abbreviation 'Eç' of the Turkish words Ezgi Çekirdeği meaning Melodic Nucleus. Each line segment above this melodic nucleus marks an alternative stereotypical melody based on the hüseynî makâm.

[46] As the gerdâniye (G) pitch identifies the basic melodic movement of the hüseynî makâm by being integrated by the hüseynî (E) pitch, it carries the characteristic of a co-identifier pitch (T). Without the integrative capability of this pitch, it would not be possible to differentiate the hüseynî makâm. Here eviç (F#) acts as an ornamental pitch (S) and is used as a media of transition, connection, and variation between the central identifier, co-identifier and the reinforcing pitches. The *nevâ* (D)[18] pitch is used for both ornamental and reinforcement functionalities, reinforcing, supporting and strengthening the feeling of balanced rest in the *hüseynî* (E) pitch.

[47] Therefore, the opening contour of *hüseynî* makâm can be identified (as in Figure 5) as constructing a melodic relation mainly between *hüseynî* (E) and *gerdâniye* (G). The beginning of the *hüseynî* makâm does not necessarily imply 'a melody starting with *hüseynî* pitch (E)', but instead it implies that the melody starts by taking *hüseynî* (E) in the center, and this

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17. All the examples representing the melodic nuclei aim to be as inclusive as possible; of course, many other different examples could be given too.

18. The pitch names are given with lower case letters, whereas the similar terms symbolizing the makâm structures are given starting with an upper-case letter.

-2	1	2	3
Nvâ D	Hsy E	Evc F#	Grd G
P/S	M	S	T

Figure 6: The Numeric Pattern for the Hüseynî Melodic Nucleus.

center usually realizes itself by establishing a relation with *gerdâniye* (G) (Figure 5). The *numeric pattern* for the *hüseynî* melodic nucleus is shown in Figure 6.

[48] Within the format of the numeric pattern, the number 1 is assigned to the central identifier pitch, whereas the number 2 is assigned to the neighboring pitches to the central identifier pitch. For the lower neighboring pitch, a minus sign (-) is added to the number and the higher neighboring pitch is enumerated with a plus (+) sign. As the nucleus is enlarged, the numbers are being increased in sequence both in negative and positive magnitudes regarding ascending or descending routes. In the case of hüseynî melodic nucleus, the number 1 is assigned to the hüseynî (E) pitch as the central-identifier, the number 3 is assigned to gerdâniye (G) as the co-identifier pitch, the number -2 is assigned to nevâ (D) as the reinforcing-ornamental pitch and finally number 2 is assigned to eviç (F#) as the ornamental pitch.

[49] The starting melodic contour is exemplified in composition "Bir Dilberdir Beni Yakan" by the eighteenth-century composer Tanburi Mustafa Çavuş (Music example 1), which presents the functions of the central identifier, co-identifier, reinforcing and ornamental pitches consecutively in the marked part and in many other cross-sections of the melodic example:

Music Example 1: "Bir Dilberdir Beni Yakan" (Repertoire of Turkish Radio of Television [TRT] 2019).

[50] The melody in music example 1 starts simply with a relation between *gerdâniye* (G) and *hüseynî* (E) that fits the definition very well and continues with a descending melodic line to '*çargâh*' (C), '*segâh*' (B♮) and '*dügâh*' (A). Then the melody experiences an ascending line that reaches '*hüseynî*' (E)' and '*nevâ*' (D)'. As '*gerdâniye*' reflects a feeling of unbalanced rest being engaged with the central identifier pitch '*hüseynî*' (E), it can be expressed as the co-identifier pitch. When the melodic line is analyzed carefully, *nevâ* (E) can be identified as the reinforcing pitch (Figure 5) as it is supporting the feeling of the balanced rest aroused through the central identifier pitch *hüseynî* (E). Similarly, *eviç* (F#), *çargâh* (C), and *acem* (F) in Music Example 1 seem to act as ornamental pitches for the beginning melodic nucleus of hüseynî makâm, by means of establishing the melodic transitions and connections between central identifier (*hüseynî*-E), co-identifier (*gerdâniye*-G), and reinforcing (*nevâ*-D) pitches.

DISCUSSING THE HÜSEYNÎ FAMILY: THE RELATIONS OF HÜSEYNÎ WITH GÜLIZÂR AND MUHAYYER

[51] As a summary, the typical melodic nuclei used to produce the melodies in *hüseynî* makâm constitute a *hüseynî*-based melodic nucleus to create the starting melody that shapes the differentiating and unique melodic line of the makâm. The most critical point in *hüseynî*

makâm lies in the tension/resolution between *hüseynî* (E) and *gerdâniye* (G) pitches. If the makâm-based melody arises from the *hüseynî* (E) pitch then the outcoming makâm is *hüseynî*. *Gülizâr* makâm uses the same pitch group with the *hüseynî* makâm. However, the *gülizâr* makâm differs from the *hüseynî* makâm by its melodic line arising from the *gerdâniye* (G) pitch. This makâm resolves to *hüseynî* (E) pitch after constructing an unbalanced rest on the *gerdâniye* pitch (G) (Figure 7).

[52] Therefore, the specific formula and name for this makâm, which is in fact similar to *hüseynî*, arises from the fact that the makâm evolves with a tensioned-unbalanced rest on *gerdâniye* pitch (G). This unbalanced rest based on a melodic tension gives a specific *sound* to this melodic production, which makes it differentiable from *hüseynî*; this relation is in the tradition named separately as *gülizâr*. All the roles of the active pitches for the *gülizâr* makâm are similar to the *hüseynî* makâm, the only exception being that, for this makâm *muhayyer* (A) is used both as an ornamental pitch and as a reinforcing pitch—just like the function of the *nevâ* pitch (D) in *hüseynî* makâm (Figure 5). *Gülizâr* makâm is a widespread melody-producing tool for Turkish folk music.

[53] The numeric pattern for the gülizâr melodic nucleus is shown in Figure 8.

[54] A passage from a folk song of Erzurum can be used as an example of gülizâr structure (music example 2), where the first tensioned rest is felt on gerdâniye (G) [1] and the second rest is observed in hüseynî (E) [2] (Music Example 2).

-2	1	2	3	4
Nvâ D	Hsy E	Evc F#	Grd G	Mhy A
P/S	M	S	T	P/S
"				

Figure 8: The Numeric Pattern for Gülizâr Melodic Nucleus.

Music example 2: "Erzurum Yıldızı" (İlerici 1981, 7).

[55] Thus, it can be said that the hüseynî and gülizâr makâm structures use identical melodic nuclei with similar functions for the pitches and what differentiates them is the direction in which the tension in gerdâniye (G) is resolved. If the tension is decisively uses gerdâniye (G) as a point of rest, then the melody should remain within the borders of the gülizâr makâm (Figure 7). Nevertheless, if this tension is directly resolved on hüseynî (E), then this melody remains in the group of hüseynî (Figure 5).

[56] In contrast, muhayyer makâm uses the first melodic nuclei around the center muhayyer (A);[19] this starting shape differentiates this makâm directly from the other two: gülizâr and hüseynî. This time the central identifier pitch (M) for the first nucleus is muhayyer (A), whereas the tiz çargâh (C) act as the co-identifier (T) pitch. In this nucleus gerdâniye (G) is the reinforcing pitch (P) and eviç (F#) is the ornamental pitch (S). The nucleus for this makâm composed of the fundamental pitches that are shaping the melodic structure is given as tiz çargâh (C) and muhayyer (A) in Figure 9.
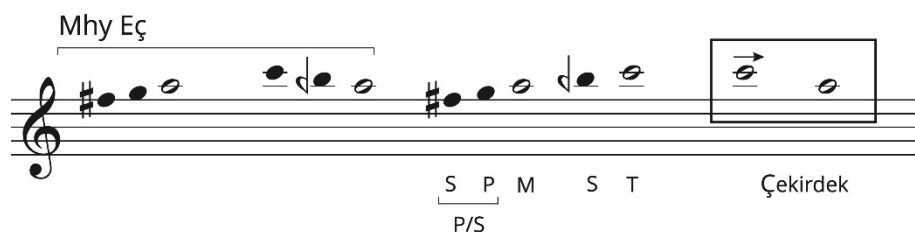
Figure 9: The Nucleus and the Melodic Nucleus for *Muhayyer* (Mhy) Makâm.

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19. This nucleus resembles the uşşâk nucleus that will be explained later in this text.

Yüksek Minarede Kandiller Yanar

Music Example 3: "Yüksek Minarede Kandiller Yanar"—A folk song from Elazığ (Repertükül 2020).

[57] The opening movement of a folk song from Yozgat (music example 3) can exemplify this makâm through the marked parts denoting the *muhayyer* melodic nuclei.

[58] *Muhayyer* progresses and finishes like the structure of *hüseynî.* What differentiates *muhayyer* from *hüseynî* and *gülizâr* is the central identifier pitch (*muhayyer*–A) and the related pitch organization around it. In fact, it can easily be detected that the *hüseynî-gülizâr* and *muhayyer* nuclei represent a remarkable analogy due to the similar functions of the pitches that create them. In this sense the central identifier pitch *hüseynî* (E), the co-identifier pitch *gerdâniye* (G), the reinforcing pitch *nevâ* (D) and the ornamental pitch *eviç* (F#) for the *hüseynî-gülizâr* nucleus (Figure 5, Figure 7), show a great functional similarity with the central identifier pitch *muhayyer* (A), the co-identifier pitch *tiz çargâh* (C), the reinforcing pitch *gerdâniye* (G) and the ornamental pitch *tiz segâh* (B♮) of the *muhayyer* nucleus (Figure 9). Of course, the two nuclei also seem similar with another analogy by which the melodic tension between *hüseynî* (E) and *gerdâniye* (G) pitches occurring in *hüseynî* and *gülizâr* makâm structures (Figure 5,7), take place between *muhayyer* (A) and *tiz çargâh* (C) pitches in *muhayyer* makâm (Figure 9). It is interesting that the nucleic centers also give the name of this makâm, as in the example of *hüseynî.* The numeric pattern for the muhayyer makâm is given in Figure 10.

$$
\begin{array}{ccccc}
-3 & -2 & \mathbf{1} & 2 & \mathbf{3} \\
\text{Evç F\#} & \text{Grd G} & \text{Mhy A} & \text{TSgh B}\natural & \text{TÇgh C} \\
\text{P/S} & \text{P/S} & \text{M} & \text{S} & \text{T}
\end{array}
$$

Figure 10: The Numeric Pattern for the *Muhayyer* Melodic Nucleus

THE MAIN CLASSIFICATION PARADIGM BETWEEN HÜSEYNÎ AND UŞŞÂK FAMILIES: HÜSEYNÎ AND NEVÂ PITCHES

[59] According to our point of view, the main paradigm lying beneath the choice of classifying the *hüseynî* and *uşşâk* families—two grand melody production systems of Anatolian music culture—separately, should be the change of the critical pitch functions of the related melodic nuclei from *hüseynî* (E) to *neva* (D) and *çargah* (C). The reason for differentiating this family from the family of *uşşâk* lies in the pitches of *çargah* and *nevâ*, which usually play the role of constructive pitches for the makâm structures of the uşşâk family, similar to the role played by the *hüseynî* pitch in the *hüseynî* makâm family. To understand the positions of nevâ and çargah pitches in such organizations, we should check the melodic nuclei making up these structures and the way they relate to the other pitches during the construction process. We will use two ancient makâm structures, namely *huzî* and *nevrûz*, to describe this situation:

[60] The first detailed description of huzî structure—possibly a makâm of the fifteenth century—can be found in the "Tedkîk ü Tahkîk" by Abdülbâki Nasır Dede, written in the eighteenth century:

> *Müzeyyen-i lazımi ile bile Rasta âgaze idüb, karargahı olan rast perdesine geldükte, Dügâh perdesi gösterüb dügâhta karar ider. (The melodic line starts at rast [G] which is its required pitch; after coming to rast it ends at dügâh [A]) (Kutluğ 2000, 203)*

[61] This simple description describes huzî as a structure starting with rast (G) and ending in the dügâh (A) pitch; in other words, this makâm is classified somewhere between rast- and dügâh- centered makâm structures, implying a possible passageway between these two families having neighboring drone tones. The description of Ekrem Karadeniz supports the previous definition by adding nevâ and çargâh pitches as the starting point of the makâm.

Melodic Example 4: *Huzî* melody from Sivas ("Kar Yağar Bardan Bardan") (Repertükül 2019).

According to Karadeniz this makâm travels to segâh (B♮) and dügâh (A) and comes to rast (G), rests there and returns to dügâh (A) and stops (1983, 99). So çargâh (C) and nevâ (D) pitches appear as the critical pitches for this structure; however, these pitches may make a very strong connection with rast (G) and the makâm finalizes on dügâh (A). In addition, Karadeniz states that some composers use this makâm without referring to the rast (G) pitch (Karadeniz 1983, 99). A dance tune from the Sivas region of Turkey fits this description quite successfully (melodic example 4-huzi melodic nuclei are marked): [62] Figure 11 shows the *huzî* nucleus, which we are calling *uşşak-huzî* because of the similarities of these two structures. This can also be identified as the ending nucleus-1signifies the first of three methods to create ending melodies for the *hüseynî* makâm (Figure 12ab); *dügâh* (A) acts as the central identifier pitch, *çargâh* (C) can be identified as the co-identifier pitch, and the inclusion of *rast* (G) in melodic example 4 can be identified as an effect that plays the role of the reinforcing pitch. Finally, *segâh* (B♮) functions as the ornamental pitch.

Figure 11: The Nucleus, the Melodic Nucleus and the Numeric Pattern for the Melodic Nucleus of Uşşâk-Huzî (Uşk-Hzi) Makâm (Ending Hüseynî Melodic Nucleus 1).

[63] It is very interesting that the beginning (Figure 5) and the first ending nucleus of hüseynî makâm (Figure 12ab) have a very close resemblance with each other in terms of the functions of the utilized pitches. In summary, it can easily be detected that the central identifier pitch of the beginning nucleus hüseynî (E) shows an analogy with dügâh (A)—the central identifier pitch of the ending nuclei. Similarly, all the identifier, reinforcing and ornamental pitches seem analogous with their counterparts in the corresponding nuclei. Just as gerdâniye (G) and çargâh (C) are analogous co-identifier pitches, nevâ (D) and rast (G) are analogous reinforcing pitches and eviç (fa#)-segâh (Bↄ) are analogous ornamental pitches. Therefore, the model of the opening hüseynî nucleus is identical to the model of the final hüseynî nucleus-1 (Figure 12ab), and thus we can assert that one of the generic versions of hüseynî makâm comprises two identical (albeit transposed) melodic nuclei, as shown in figure 12ab.

Figure 12 ab, ac, ad: The Beginning and the Ending Melodic Nuclei for *Hüseynî* Makâm.

[64] Similar ending nuclei can also be assumed for the *gülizâr* makâm (Figure 13):

Figure 13: The Opening and Final Melodic Nuclei for *Gülizâr* Makâm.

[65] Just like the position of *hüseynî* in the *hüseynî* family, *uşşâk* can be identified as the main makâm of the *uşşâk* family. The difference between *uşşâk* and *huzî* is mostly based on altering melodic directions around the same nucleus. The tensioned-unbalanced rest in *çargâh* pitch in *huzî* makâm resolves in *dügâh* pitch as a balanced rest, similar to the way that *gülizâr* uses *hüseynî* and *gerdâniye* in its melodic productions. In *uşşâk* makâm, the starting melody starts at *rast* (sometimes *ırâk* [F#]), goes to *dügâh*, rests at *çargâh*, sometimes goes to *nevâ*, and comes back to *dügâh* through the same group of pitches (Figure 14). The only difference between these two nuclei is that in the *huzî* nucleus the co-identifier is *çargâh* (C), whereas *in uşşâk* the co-identifier is *nevâ* (D). The central identifier pitch is *dügâh* (A) and the reinforcing pitch is *rast* (G) in both nuclei. The ornamentals are *segâh* (B♮) and çargâh (C) in *uşşâk* (also sometimes co-identifiers, especially in descending melodies), whereas it is *segâh* (B♮) and *nevâ* (D) in *huzî*.

[66] As can be observed from figures 11 and 14, it is mainly the melodic directions that demarcate *huzî* and *uşşâk* makâm structures that share the same melodic nucleus. The opening melodic function of *uşşâk* is exemplified in a very interesting traditional dance tune

Figure 14: The Nucleus, the Melodic Nucleus and the Numeric Pattern for the Melodic Nucleus of *Uşşâk* Makâm.[20]

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20. Uşşak melodic nucleus (Figure 10) is identical to muhayyer melodic nucleus (Figure 5) with a frequency difference on one octave.

Music Example 5: "Ayın Ortasında Bir Sarı Yıldız" (Repertükül 2019).

from Van named "Ayın Ortasında Bir Sarı Yıldız" from Van (Two consecutive *uşşak* melodic nuclei are marked in Music Example 5).

[67] Another *uşşâk* nucleus can be added on the *nevâ* pitch to the first *uşşâk* nucleus for a possible extension of *uşşâk* makâm. In this case, usually the expected *hisâr* pitch (E♭) is replaced by the *hüseynî* (E) pitch, which can be considered a characteristic of another ancient makâm called *nevrûz*.

[68] *Nevrûz* makâm, which builds an alternative way of creating an ending nucleus for *hüseynî* makâm (Figure 12ad), is a very old and basic tetrachord defined clearly by Safiyüddin Urmevi in the fourteenth century that identifies a very simple structure based on the sequence of four pitches starting with or 'arising from' (*âgaze*) *dügâh* (A) and continuing with *segâh* (B♭), *çargâh* (C), and *nevâ* (D) (Güray 2017, 68; Uygun 1996). Also, Ladikli Mehmed Çelebi of fifteenth century identifies two types of *nevrûz*: 'small (*sagir*)' and 'large (*kebir*),' where the small one (*Nevruz-u Asl-ı sagir*) begins from *nevâ* (D) and travels to *çargâh* (C), *segâh* (B♭) and *dügâh* (A), and the large one (*Nevruz-i Kebir*) begins from *hüseynî* to follow the same route (Tekin 1999, 158).

[69] In Kantemiroğlu's work "İlm-i Edvar-ı Musiki," the description of *nevrûz* makâm is given as below, signifying an extension on the pitch nevâ by the use of the pitch *hisâr* (E♭), which replaces *hüseynî* (E) in the generic scale:

> *Nevrûz (BAYÂTİ) segâh kopup çargâh nevâ ile hisârı gösterüb bade nevâ ile çargâhı gösterüb, hisâr nimi gösterüb, bade yine nevâ çargâh ile segâhı gösterüb dügâh perdesinde karar ider* (It starts with *segâh* [B♭], goes to *çargâh* (C), *nevâ* (D) and *hisâr*, goes again to *nevâ*, *çargâh* and *hisâr* and comes to end at *dügâh* through *nevâ*, *çargâh* and *segâh*) (2001, 389).

[70] As seen, the critical points in this description include the *nevâ* pitch being in the center of the starting nucleus, having *çargâh* and *hisâr* in its structure; and ending with a second nucleus centered on *dügâh*, resting on the pitch *segâh*. Therefore, it is possible to observe that *nevrûz* makâm can also act as a complementary structure to increase and enlarge several nuclei to build up larger structures.

[71] Yakup Fikret Kutluğ also points out that *nevrûz* evolves into *uşşâk* by replacing *hisâr* (E♮) with *hüseynî* (E) (2000, 168), confirming that this replacement can be considered an explainable transformation based on musical practices. This assessment also proves the idea that *uşşâk* makâm is formed by the combination of two *uşşâk* nuclei.

[72] A folk song from Sivas can be given as an example of this organization, which builds a small contour on *nevâ* (D) using *hüseynî* (E) (instead of *hisâr* (E♮)) and builds a second ending contour on *dügâh* (A). (In Music Example 6, the first and the last two *nevruz* melodic nuclei are marked). As can be observed through this example, a makâm-based melody can occur through the unification of repetitions of the same melodic nucleus.

Music Example 6: A Dance Tune from Sivas – An example of *Nevrûz* Makâm (Repertükül 2020)

[73] It can be observed that *huzî* and *nevrûz* seem to act as complementary parts that build up the lower nuclei of the melodies, which started from the nucleus built around the *hüseynî* pitch in the *hüseynî* makâm family. Both *huzî* and *nevrûz* are used to bring a melody created in *hüseynî* nuclei to *dügâh* (A), which is the drone tone of the *hüseynî* makâm (Figure 12). The *nevrûz* and *huzî* structures are also among the main components of many important makâm structures other than *hüseynî*.

[74] A makâm structure that is very close to *uşşâk* is *bayâti* (Figure 15). Bayâti is formed by the combination of two *uşşâk* nuclei; just like *uşşâk* makâm, but this time with the distinctive starting melodic line of this structure arising from *nevâ* (D) and moving to *dügâh* (A) in the opposite direction from *uşşâk*. Regarding the finishing nucleus, the only difference between the functions of the pitches is their opposite melodic directions.

[75] The extension of *bayâti* makâm is established by placing another *uşşâk* nuclei on the *nevâ* pitch (D); it differs slightly from a standard *uşşâk* nucleus by concentrating on *acem* (F), and reaching *nevâ* (D) using the *bayâti* pitch ([E♭]) [21] (This may also be a melodic contour arising from the *huzi* nucleus structure, transposed to *neva* pitch, by resolving the tension of *acem* (F) on *neva* (D)). The ending of *bayâti* is the same as *uşşâk* makâm, although—as emphasized by Kutluğ—because the *bayâti* makâm rarely uses pitches lower than *dügâh* (A), the usage of the *rast* (G) pitch in *bayâti* makâm is not as common as in *uşşâk* makâm (Kutluğ 2000, 191–194).

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21. A slightly flattened version of E♭-A pitch between the *nevâ* pitch (D) and *hisâr* (E♭). In the ending part of the makâm as an exception, it usually uses *hüseynî* pitch instead of *bayâti*.

Figure 15: The Nucleus, the Melodic Nucleus and the Numeric Pattern of *Bayâti* (Byt) Makâm

[76] The final nuclei of *uşşâk* and *bayâti* are very close to each other because they both use a *hûzi-* or *nevruz*-type nucleus for complementary action, as seen in Figure 16. However, the bayâti version of the final nucleus is made slightly different by the possible inclusion of the pitches *acem* (F) and *hüseynî*, which emphasize the neva pitch as a second possible center. This nucleus, called *uşşak- bayâti* (Uşk-Byt), is the second alternative for the finishing melodic lines in *hüseynî* makâm (Figure 12ac).

Figure 16: The Nucleus, the Melodic Nucleus (Ending) and the Numeric Pattern for the Melodic Nucleus (Ending) of *Uşşâk–Bayâti* Makâm

Music Example 7: *Bayâti Peşrev* (TRT Repertoire 2020).

[77] It should be mentioned that the makâm structures have likely undergone some changes during different periods. Such a change can be detected in the *uşşâk* nuclei on the *nevâ* fret taking part in the construction of *bayâti* makâm. In this nucleus, although the structural functions of the pitches are preserved, it is apparent that the *bayâti* (E♭) pitch has been replaced by the *hüseynî* pitch—a change that does not prevent the continuation of the *uşşâk* timbral effect. Such replacements between frets in this pair of pitches (*hisâr-bayâti* [E♭][22] and *hüseynî* [E]), denoting a change in the pitch group of the nucleus, were also reported by Yakup Fikret Kutluğ during his comparative comments about makâm structures such as *uşşâk* and *nevruz* (2001, 168, 390).

[78] An example from a *peşrev* by Artaki Candan (1885-1948) serves to demonstrate this makâm. (In Music Example 7, the *bayati* melodic nucleus for the starting part [yellow] and the nevruz melodic nucleus for the ending part [blue] are marked).

[79] Another important makâm structure that takes nevâ (D) as a central identifier pitch is *nevâ*. The definition of *nevâ* makâm can be first observed in the manuscript by Hızır bin Abdullah that summarizes the pitch sequence of the makâm:

> *Dügâh* (A), *segâh* (B♭), *çargâh* (C), *nevâ* (D), *hüseynî* (E), *eviç* (F#), *gerdâniye* (G), *muhayyer* (A) (Kutluğ 2000, 174).

[80] A more detailed description of the makâm is given by Kantemiroğlu of 18th century:

> *Dügâh perdesinden hareket idüb nevâ perdesinde kendini gösterdikten sonra dâimi tam perdelerle gezinmek suretiyle tiz hüseynîye çıkup kalın sesli nevâya yani yegâha dek*

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22. The *bayâti* pitch is slightly lower in frequency than the *hisar* pitch (Güray 2017, 100).

inilebilir ve gelip dügâh perdesinde karar verir. (Moves from *dügâh* (A) to *nevâ* (D) and gives the color of the makâm at *nevâ* (D), then using the whole pitches the makâm can move to *tiz hüseynî* (E-one octave higher) in the higher octave and to *yegâh* (D) in the lower octave) (Kutluğ 2000, 174).

[81] Neither of these definitions indicate a specific *nevâ* nucleus, which gives the audible *sound* characteristic of this makâm. This nucleus is especially identified within the contour between *nevâ* and *muhayyer* (D and A), as shown in Figure 17. In this nucleus, *nevâ* (D) acts as the central identifier pitch, *gerdâniye* is the co-identifier pitch (also sometimes ornamental pitch); *çargâh* is the reinforcing pitch, and *hüseynî* and *eviç* (sometimes co-identifier) are the ornamental pitches. While considering *nevâ*, it can be observed that a new nucleus is formed on the *nevâ* (D) pitch. We call this nucleus—which replaces the *eviç* (F#) pitch that is used in the ascending contour with *acem* (F) in the descending one and reinforced by the *çargâh* pitch—the "*nevâ* melodic nucleus" (Figure 13). The ending contour of the makâm is again very similar to *uşşâk* (Figure 18):

Figure 17: The Nucleus, the Melodic Nucleus and the Numeric Pattern for the Melodic Nucleus of *Nevâ* Makâm.
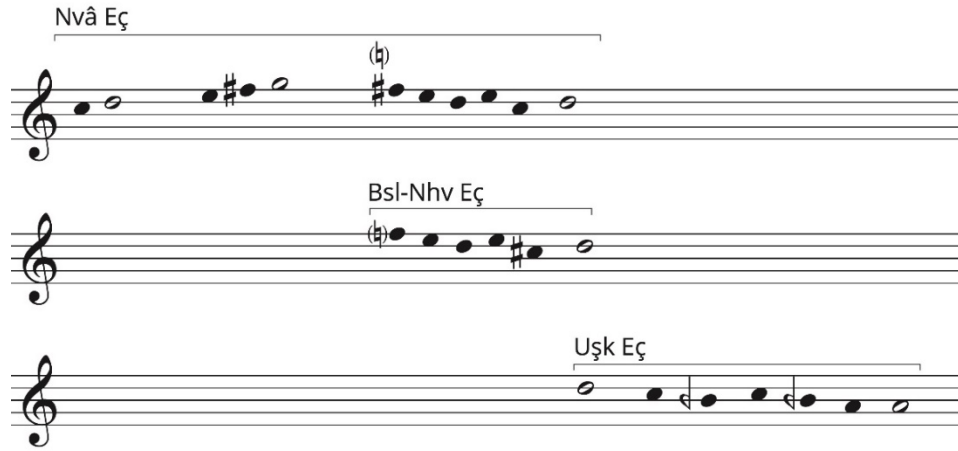
Figure 18a, b, c: Opening and Final Melodic Nuclei of Nevâ Makâm.[23]

[82] The peşrev of Beyazıt the Second (1447—1512) is an example of nevâ makâm. (In Music Example 8, the neva melodic nucleus for the starting part [yellow] and the uşşak melodic nucleus for the ending part [blue] are marked).

[83] Tahir makâm exmplifies the modular structure of Anatolian makâm types. It is formed by the combination of a *muhayyer* (*uşşâk*) nucleus on a *muhayyer* (A) pitch, a *nevâ* nucleus on a *nevâ* pitch (D), and an *uşşâk* nucleus on a *dügâh* (A) pitch. Therefore, *tahir* makâm stands right at the centre of the *hüseynî* and *uşşâk* families, having *muhayyer*, *nevâ*, and *uşşâk* components in its body with very close similarities in nuclei structures that include the defining characteristics of these makâm types (Figure 19).

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23. The makâm can use a melodic nucleus called buselik-nihavend for the beginning or the improvement parts which is out of the scope of this paper (Figure 14b).

Music Example 8: Nevâ Peşrev (Repertoire of TRT 2020).

Figure 19: The Melodic Nuclei Constructing the *Tahir* Makâm.

[84] Hızır Ağa and Yakup Fikret Kutluğ give descriptions similar to the above one regarding *tahir* makâm. Hızır Ağa of the eighteenth century describes this makâm as follows:

> *Tahir oldur ki eviç ve gerdâniye ve muhayyer gösterip ve tiz çargâhta tamam perdelerle nevâya inip, nevâdan gerdâniye gösterip ve dönüp perde perde inüp dügâhta karar ide.* (Tahir starts by *eviç* (F#), *gerdâniye* (G) and *muhayyer* (A) pitches, comes from *tiz çargâh* (C) to *nevâ* (D) using whole pitches (C-B♮-A-G-F#-E-D), travels to *gerdâniye* (G) through *nevâ* (D), ends at *dügâh* (A) by touching on previously inferred pitches) (Kutluğ 2000, 348).

[85] Kutluğ indicates a kind of *uşşâk* ending for this makâm, which matches our definition above (2000, 349). Kutluğ also points out that the uşşâk ending can be replaced by a *bayâti* ending for *tahir* makâm, especially if the ending melodic contour does not make use of the *rast* (G) pitch as an effect to reinforce the *drone tone/ending pitch*. Further, Kutluğ claims—referring to Karadeniz—that a *bayâti* type ending even using the *hisâr* (E♮) pitch will match with a variation of *tahir* makâm called *Baba Tahir* (Kutluğ 2000, 348).

Music example 9: An Example of Tahir Makâm-Allı Turnam (Repertükül 2020).

[86] A folk song from Keskin named "Allı Turnam" can be given as an example of tahir makâm. (In Music Example 9, the starting part with the *muhayyer* melodic nucleus [yellow], the development part with the *neva* melodic nucleus [red], and the ending part with the *uşşak* melodic nucleus [blue] are marked). This is an example constructed with the unification of three different melodic nuclei.

[87] *Gerdâniye* can be expressed as a similar makâm to *tahir*, in the sense that it develops with a *bayâti* structure (similar to *nevâ*) and ends with *uşşâk*, just like *tahir*. However, at start, the *gerdâniye* structure uses the melodic nucleus of rast (one of the oldest melodic structures of Anatolian makâm types) (Figure 20) transposed to the *gerdâniye* (G) pitch, which is one octave higher than the *rast* pitch (G). In this nucleus, *rast* (G) is the central identifier pitch, and *ırâk* (F#) is the reinforcing pitch.

Rast Ezgi Çekirdeği

-4	-3	-2	1	2	3
Ygh D	HsyAşr E	Irk F#	Rst G	Dgh A	Sgh B♮
S	S	P/T	M	T/S	T/S

Figure 20: The Melodic Nucleus (Beginning) and the Numeric Pattern for the Melodic Nucleus (Beginning) of *Rast* Makâm.[24]

[88] In the fifteenth-century in the manuscript of Kırşehirli Nizameddin, *Gerdâniye* makâm was defined as being developed by the combination of hüseynî and rast during (Güray 2017, 83-84):

> *Bu dahi tizinden kopar karar ider, serâgaze evvel gerdâniye rast, segâh evi hisâr, dügâh evi hüseynî, yegâh evi pençgâh, çargâh heman, segâh heman, dügâh heman, nerme giden bunlardır*. (It starts from the high frequencies, the melodic contour arises from *gerdâniye* (G), goes to *eviç* (F#), *hüseynî* (E), *nevâ* (D), *çargâh* (C), *segâh* (B♮) and *dügâh* (A) and the ones going towards the lower direction than *rast* (G) such as *rast* (G) and *ırâk* (F#)).

[89] Here, *rast* (G) and even *ırâk* (F#) act as reinforcing pitches for the drone tone, which is *dügâh* (A). Kantemiroğlu gives a very similar definition to Nizameddin, adding that "if this makâm would end at *rast*, it could be the same as a *rast* makâm starting with *gerdâniye* which is the octave of *rast*" (Kutluğ 2000, 352). Nasır Dede also defines the makâm in a parallel way:

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24. Makâm structures can alternatively be classified in two main groups basing on the characteristic of having an identical beginning/central (*âgaz)* and ending (drone) pitches or not. The beginning/central pitch and the ending pitch (drone tone) of the *rast* makam is identical (*rast*-G pitch), whereas the beginning/central pitch (*hüseynî*-E) is different from the ending pitch (*dügâh*-A) in *Hüseynî* makam.

Perde-i gerdâniyeden Rast agâze idüp, Uşşâk karar ider. (It produces a *rast* melodic contour starting from *gerdâniye* but ends as *uşşâk*) (Kutluğ 2000, 352).

[90] The central identifier pitch for the beginning nucleus of the makâm is also the center of the development melodic nucleus, which is *gerdaniye* (G) (Figure 21). Then the central identifier frets move to first *neva* (D) and to *dügah* (A)—the centers of the development and the finishing nuclei. *Gerdâniye* also may seem to sound similar to *gülizâr* makâm, but in fact they are very different in sound—in the sense that *gülizâr* develops from the *hüseynî* family, whereas *gerdâniye* arises through the *uşşâk* family[25] with an additional effect from the *rast* melodic nucleus at its beginning that is identical to the starting melodic nucleus of *gerdâniye* makâm (only transposed to a higher octave) (Figure 21).

[91] It can be seen that the *gerdâniye* makâm comprises the combination of three nuclei: namely *rast*, *nevâ-bayâti* (interchangeable), and *uşşâk*. This definition and structure are
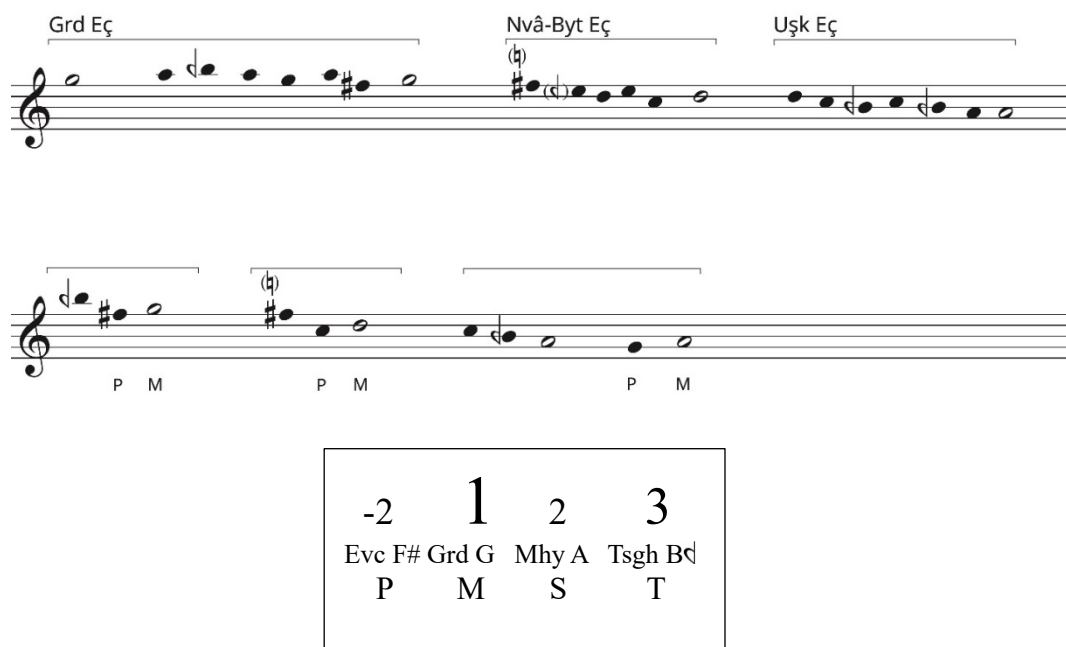
Figure 21: The Melodic Nuclei Constructing the *Gerdâniye* Makâm and the Numeric Pattern for the Melodic Nucleus of *Gerdâniye* Makâm.

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25. For the reason that this makâm gives importance to nevâ pitch using *nevâ* (D) based *bayâti* and *uşşak* nuclei, which makes it possible to classify *gerdâniye* under the *uşşâk* family. Whereas the other topic for classification should be *hüseynî* family for the makâm structures taking the *hüseynî* pitch as their axis.

Music example 10: Gerdâniye Peşrev[26] (Repertoire of TRT, 2020).

completely in accordance with the definitions of the theorists who lived between the fifteenth and nineteenth centuries. Therefore, it can be argued that there are very strong initiatives to classify *gerdâniye* under the *uşşâk* family and even under the *rast* family, due to the melodic contours of this makâm using *nevâ* as a central identifier pitch, due to the effect of *uşşâk* makâm at the ending contour of *gerdâniye*, and due to the effect of *rast* in the starting contour.

[92] An example of *gerdâniye* can be seen in a *peşrev* by Suphi Ezgi (1890–1962). (In Music Example 10, the *gerdaniye* nucleus is marked for the starting part [yellow], two *neva* melodic nuclei are marked for the development part [red], and the *uşşak* melodic nucleus is marked for the ending part [blue]; the remaining parts are the auxiliary parts connecting different melodic nuclei by an abstract descending of ascending line not reflecting a center-oriented circular melodic movement to create a melodic nucleus).

<div align="center">

CONCLUSIONS

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[93] This study concentrates on an original model defining the makâm concept and related makâm structures. The premise of the paper is that the specific melodic characteristic of a makâm are generated from a unique melodic nucleus composed of a pitch group of three of four pitches, and that the complete structure of a makâm is developed by a modular meshing of various melodic nuclei emerging through functional interactions between the pitches in these specific pitch groups. The functions of the pitches in the melodic nuclei constitute the main means of differentiating the makâm structures. In this paper we focused on explaining

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26. Rare changes between *eviç* (F#) and *acem* (F) pitches can be detected during the performance opposing the notation.

the functions of these pitches within a melodic nucleus in a unique and original way. Every melodic nucleus is a structure that possesses a specific melodic characteristic arising through a unique pitch group. This unique pitch group and the specific melodic pattern evolving from it reflect a characteristic timbral effect identifying the makâm audibly. The makâm structures having a common or similar timbral effect can be classified under the same category regarding a family of makâms.

[94] Therefore, we can assert that the specific melodic pattern produced by a melodic nucleus both gives the unique melodic characteristic and the differentiable sound characteristic of a makâm. Moreover, we consider that it would not be possible to define a melodic nucleus identifying a makâm by abstracting it from characteristic melodic patterns (by solely defining it based on a scale, a tetrachord or a pentachord etc.) sourced through the specific character of its melodic nucleus. Such an analytical approach based on typical melodies created by melodic nuclei directly aims to explain the production system behind the musical tradition; it effectively opens the way of connecting 'improvisational performance' or even 'traditional composition' with the theory.

[95] The approach in this paper, putting forward musical practice, will help to improve an educational model both promoting richness in improvisation and increasing compatibility between practice and theory. Such a model will also be of potential to help music students, composers, and performers to improve their productions in makâm-based music. The possible problem of cooperation with the scale-based theories of neighboring territories and the need for the definition or classification of the partial melodic contours that could not be directly matched with a specific melodic nucleus may be regarded as the disadvantages of this method.

[96] The idea of defining a makâm in this paper, beginning with the previously mentioned nuclei, reflecting the tiniest difference in these nuclei in the denomination process, and constructing greater melodic contours by the unification of these small melodic patterns, also serves as an argument for a detailed, consistent, and integrated structure shaping Anatolian music by aiming to reach the whole from the meaning of the tiniest component. Therefore, the makâm concept can be described as a system based on classical aesthetics, and this phenomenon can be identified as the formative and the transmitting agent of the tradition.

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