



434

The Interrelation Between Human Being and Their Built Environment in The Early Bronze Age of Bademağacı Höyük, Turkey

A. IRAZ ALPAY,

MIDDLE EAST TECHNICAL UNIVERSITY, ANKARA, TURKEY

ABSTRACT

The urbanization of the Early Bronze Age of Anatolia involved the widespread emergence of a radial settlement layout characterized by agglutinated megarons facing a courtyard. Previous studies focused on the cultural and architectural typologies of these settlements over time and their distributions. Only a few, particularly on Seyitömer and Demircihöyük, aimed to address the relation of this settlement pattern with the social structures that altered during the EBA. This study aims to understand the role that buildings played in the manifestation of the social system in the EBA of Bademağacı Höyük, in Burdur, Turkey. To address the issue, an integrative approach combining space syntax with artifact distribution and archaeoastronomical analysis is developed to investigate the social system, identify different social classes, if ever existed, and understand whether celestial phenomena influenced the configuration of space.

The results reveal four distinct building types differing based on their locations and plans and suggest social stratification with a social leadership like authority. Results also lead to the conclusion that buildings played a functional role in establishing and maintaining a general sense of community and social norms by demanding cohesiveness and promoting cooperative interdependence. Bademağacı differs from Demircihöyük and Seyitömer in terms of different configurations and use of space and represents the transformation process between the egalitarian appearance of the material culture and complex societies where elites legitimized their power over the surplus. In this respect, Bademağacı gives some new insight into the relation of this settlement pattern with the social systems of the EBA of Anatolia.



KEYWORDS

The Early Bronze Age, Bademağacı, Space Syntax, the human-built environment, the social system

1. INTRODUCTION

Spatial analysis has long been used in archaeological research and provided significant insight into location-oriented actions at varying scales. In this respect, Space Syntax brings forth a conceptual framework accompanied by a set of analytical methods, which produce visual and numeric outcomes that enable a comparative investigation to interpret the spatial configuration of the built environment based on a series of postulates (Hillier and Hanson 1984; Hillier, Hanson and Peponis, 1987; Hillier 2007). The burgeoning point of its development is to find a way to generate such a spatial organization that can be combined to form more complex structures that works coherently while representing a specific notion or ideology (Hillier and Hanson, 1984). The primary postulates are that social structures are inherently spatial and the spatial configurations have social reasoning (Hillier and Hanson, 1984, pp.95-97), and they influence the behavior of the people living within them (Hillier, 2007, pp.19-30). The aim, in broad outline, is to understand the underlying social logic behind this particular configuration. It is often applied to studies investigating the relationship between society and various space forms, ranging from buildings to landscapes.

Highly symbolic beliefs and rituals of the Neolithic formed through the relationship between the living's houses and their deceased, which served to create placed-bound identities and memories (Mazurowski and Jamous, 2000; Özkaya and San, 2007; Rosenberg and Redding, 2000; Stordeur and Abbes, 2002; Notroff, Dietrich and Schmidh, 2016; Baird, Fairbairn and Martin, 2017; Hodder and Cessford, 2004; Kuijt, 2001; Özbaşaran, 2012), altered into a new form mediated by portable objects during the Early Bronze Age (Yıldırım and Steadman, 2021; Erdoğan, 2009; Lehner and Yener, 2014). The transition from buildings to portable objects that embodied symbolic expression inherently changed the human-built environment relationship. In this context, with a pre-planned settlement layout, Bademağacı Höyük stands out as an intriguing case to study for understanding the extent of this change and the social system of the EBA of Anatolia.

This study seeks insight into the role that the built environment played in the manifestation of the social system within the context of social institutions in the Early Bronze Age society of Bademağacı Höyük. To address the issue, an integrative approach combining space syntax with artifact distribution and archaeoastronomical analysis is developed to investigate the social system, identify different social classes, if ever existed, and understand whether celestial phenomena influenced the configuration of space within the site border.

2. BADEMAĞACI HÖYÜK

Bademağacı Höyük is a mound type site located in the southern border of the Lake District region of Burdur, in Turkey. The settlement encompasses an area of 1.59 ha and has an altitude of 7 m above the plain level, 9 m above the bedrock. The site was excavated annually from 1993 to 2010. By the end of the excavation project, almost %65 of the total surface of the mound had been excavated (Duru and Umurtak, 2019, p.8).

The earliest occupation phase is the Early Neolithic Period, dated to 7030 - 6710 cal.B.C., and continued until the Late Neolithic Period (Duru and Umurtak, 2019, pp.8-9). The Chalcolithic and the Early Bronze Age I periods were presented solely by small finds and ceramic remains. The EBA II settlement was established around 2800 B.C. on fire debris, which ended the Neolithic phase (Duru, 1997, p.152), and occupied without interruption for about four centuries (Duru, 2000, p.205; Umurtak and Çongur, 2021, pp.4-6) that created approximately 4.5-5m habitation debris (Duru and Umurtak 2015, p. 75).

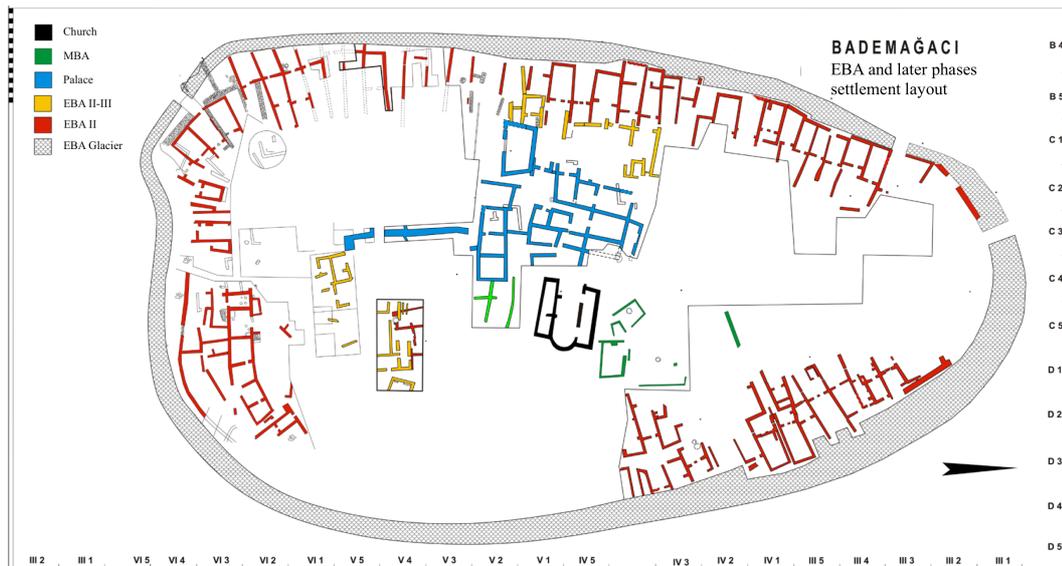


Figure 1: Bademağacı the Early Bronze Age settlement plan, after Duru and Umurtak (2011, p.31)

The settlement was surrounded by a 3-8 m wide stone pavement running along the mound slope. The randomly placed varying size of stones gives the impression that the aim was not to flatten the surface or protection of the village, rather to build a barrier against the spate (Duru, 2000, p 200-201). In the north, three village entrances were uncovered. The location of the village entrances appear to have been changed during the pavement repairs; one of them (KG3) had been used during the early phases of the site and was covered with stone pavement during the later phases (Duru and Umurtak, 2006, pp.639-646). According to excavators, agglutinated buildings created wall-like protection preventing the entrance into the village (Duru and Umurtak, 2016, p.76).



The EBA buildings were primarily constructed side by side, perpendicular to the stone pavement along the eastern and western sides of the site, around the Neolithic remains found in the middle of the mound according to a plan suggesting the existence of a powerful authority (Duru and Umurtak, 2002, pp.561–562; 2005, pp.437-440; 2007, pp.187-191; 2008a, pp.255-260). The northern section was left empty, possibly as a place to keep animals. The agglutinated buildings often had various wall thicknesses indicating different construction or repairment times for each. According to excavation results, the buildings that were used for a long time underwent repairs many times while maintaining their construction plan (Duru and Umurtak, 2010a, pp.438-445; 2010b, pp.20-21). The building entrances were facing the mound centre. During the EBA II-2, additional ante walls were built towards the centre at both sides of the building (Duru and Umurtak, 2005, pp.437-440).

There is no information on the wall construction technique, use of wood and the construction of a roof. Only the floor of the one house was identified during the two-decade-long excavations. For this reason, the information about the floors is also limited. There were no portable objects or immovable property that indicates inner installation in these megalithic buildings.

In terms of their complex architectural plan, two distinct building constructions were uncovered: one in the centre and the other in the south section. These two building complexes have a different architectural plans. The Multiple-Room Building 1, found in the center of the mound, consisted of 17 rooms, which were possibly connected (Duru and Umurtak, 2008a, pp.255-260). Excavators suggested an additional 10 more rooms that extended beneath the church construction (Duru and Umurtak, 2015, p.76). According to excavators, the building was used as a residence of the most powerful families of the village while being an administrative building (Duru and Umurtak 2008b, pp.17-19; 2011, p.11). The Multi-Room Building 2, found in the south, is composed of a line of rectangular rooms built side by side (Duru and Umurtak, 2009, pp.261-268).

The stone-circles are another architectural elements noteworthy. The total number of stone circles or their places that were uncovered during the excavations is unknown. One of them was identified as a storage facility. Another, however, was identified as a grave marker and beneath it, a pithos was uncovered within a skeleton carefully placed E-W direction. A total of 30 pithoi graves were found either in the streets, empty spaces or beneath the house floor. Unfortunately, only four of them were represented on the maps. Consequently, the association of these stone-circle architectural elements with burials is not clear. The pithos graves are well-known burial traditions of the EBA Anatolia. Some EBA sites where pithoi burials were uncovered include Demircihöyük-Sarıket (Seeher, 1992; Massa, 2014), Gavur Evi Tepesi (Vandam et al., 2013) and Karataş-Semayük (Wheeler, 1973; Angel, 1976). It appears to have been a preference for the direction of pithoi toward the east and southeast, respectively.



3. THEORY

Despite its widespread use in various disciplines, due to the fragmented nature of data, Space Syntax has, thereby, theoretical, methodological and epistemological limits when it is applied to an archaeological study while filling the lacuna of the need for a method to investigate the relationship between social systems and spatial organizations. Critics share a common concern that the complexity of social systems is underestimated. Because data is reduced to a graphical form and most of the attention is given to accessibility, the analysis does not take account of architectural characteristics and inner installation of the place or artifacts placed in it that could embody symbolic expressions with a specific meaning in a social context that might vary culturally (Leach, 1978; Hodder and Hutson, 2003 pp.47-49; Parker Pearson and Richards, 2005; Bafna, 2003; Fisher, 2009; Osborne, 2012; Montello, 2007). Graphical representation also fails to acknowledge such connectivity provided through visual, auditory and olfactory features of the place (Osman and Suliman, 1994; Fisher, 2009) as well as the function of place that might change over time (Leach, 1978; Foster, 1989; Shapiro, 1997; Fladd, 2017). Yet, the main challenge is the applicability of the analysis that depends on a well-identified architectural plan, which is rarely the case in archaeology (Cutting, 2003; Foster, 1989; Fisher, 2009). The presence of an upper floor or a roof-top entrance makes applying the analysis even more complicated.

Nevertheless, the method is highly flexible and open to modification. Combining with other theoretical approaches helps strengthen the theoretical frame of studies (e.g. Rapoport, 1990; Blanton, 1994; Hodder and Pels, 2010, pp. 163-186; Tringham, 1994; Clarke, 1977, pp.1-32; Dobres and Robb, 2000, pp.3-17). The physical characteristic of space and/or its function can be, indeed, included in calculation by assigning a new scoring system to each (Fisher, 2009) as well as in access graphics by employing a notation system (Fisher, 2009; Verhoeven, 1999, cited in Cutting 2003,p.18; Benech, 2007; Harrison, 2016; Fladd, 2017). The effectiveness of the technique in producing meaningful results, on the other hand, can be only ensured if and only if current data provide a minimum level of information to represent the configuration of space (Osman and Suliman, 1994; Cutting, 2003).

In this study, following Brück and Goodman (1999, p1-19), the issue is conceptualized from the environment-behavior perspective that recognizes a systematic interrelationship between the built environment and the patterns of human behavior. As argued by Thomas (1996), place refers to space that is perceived through human experience within the relation of one's body with the homogenous space of infinite extension that surrounds. In this respect, space syntax is used to meet the need for an analytical method. The limitations of the technique aim to be addressed initially by reducing the missing information and taking into account the nature of activities performed in each unit of space through the material representations of those activities. To associate space with a particular activity(ies), artifact distribution is investigated. As an essential indicator of the social system, the population of the village is also calculated.



Societies also conceived and ordered space in a similar way to how they perceived the sky (López, 2015, pp.341-352). The built environment was employed also as media for power, belief systems, ceremonial rituals, daily activities and symbolic expressions related to celestial objects (Iwaniszewski, 2005, pp.11-16; 2011, pp.30-37; Krupp, 2015, pp.67-91; McCluskey, 2008, p.264). The analysis questions any interest in celestial bodies and aims to understand ancient people's perception of the sky, the conceptualization of celestial knowledge and its material manifestation (Ruggles, 2005, p.19; 2011, p.1). The interest in celestial phenomena could be reflected through portable objects (e.g. Jegues-Wolkiewicz, 2012, pp.1-3,8-9), symbolic expressions (e.g. Jegues-Wolkiewicz, 2005, pp.43-62) as well as the architectural design of construction (e.g. Nadali and Polcaro, 2016, pp. 103-108), planning the city layout (e.g. Müller-Karpe, 2015, pp.83-92) or in some cases encompassing the natural features of the region such as trees, posts (e.g. Ridderstad 2009), rock alignment (e.g. Bhatnager and Livingston, 2005, p.17), caves (e.g. Roslund, Lindström and Andersson, 1999, pp.105-115) or mountain picks (e.g. Belmonte, 2015, pp.483-492). Analysis results offer a different perspective to understand the relationship between human being and their built environment. In the scope of this study, archaeoastronomical analysis is performed as a complementary segment of the built environment investigation to understand the function of buildings from a different perspective.

4. ANALYSIS AND RESULTS

4.1. Data Preparation

In the light of the published data including maps, settlement layout is digitalized in which some

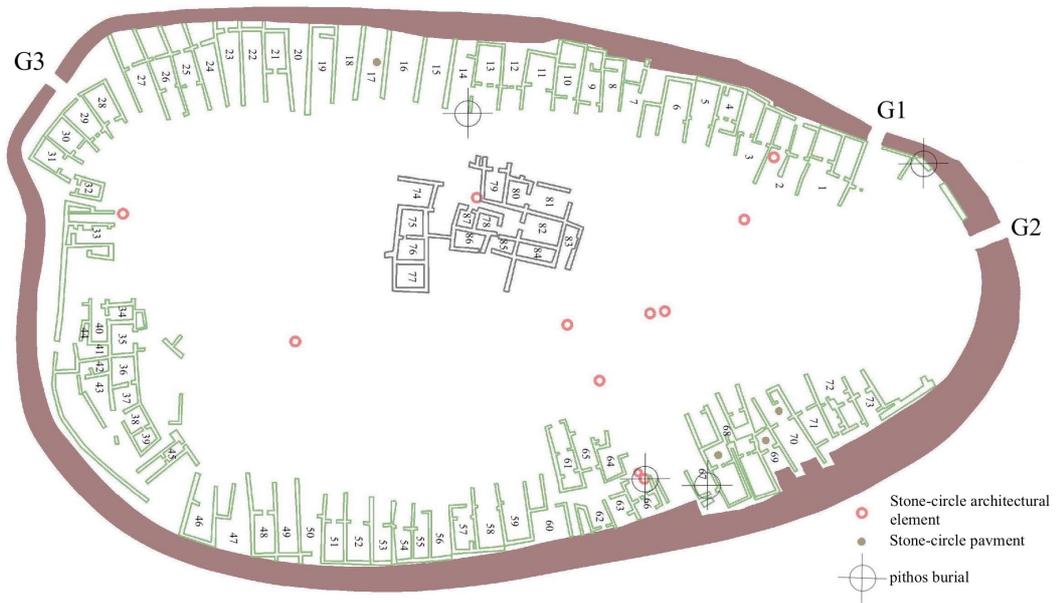


Figure 2: Bademağacı EBA II digitalized settlement plan

buildings, wall constructions and architectural elements, which were not dated to the EBA II phase, are removed. The unexcavated area in the site is then reconstructed based on the excavation reports by replicating the existing ones to create a relatively contemporaneous complete building layout of the EBA II village of Bademağacı Höyük.

4.2. Artifact Distribution

To determine the function of buildings, small finds, plant and animal remains, and ceramic assemblages are closely examined, as well as artifacts. Due to the poorly published data, artifacts and burials distributions over the site are only partially represented on the map. Nevertheless, some buildings and rooms are labelled as storage facilities even though the architectural traditions of the village give no clue to identify different building types in respect to their function. However, it is not possible to suggest a pattern for artifact assemblages or the locations of pithoi burials. The investigation of artifact distribution reveals that figurines, loom weights, seals and metal objects had been uncovered from all over the settlement. On the other hand, two animal figurines were found in the dwellings in the northern area.

4.3. Architecture

Based on their plan, their size and artifacts found within them, buildings are categorized into four groups: the Multi-Room Building (1), storage facilities, dwellings type 1 and dwellings type 2. The two building complexes differ in terms of their plan and their size suggesting they were used for different purposes. The Multi-Room Building 1 appears to have consisted of megalon-like

buildings and storage facility-like rooms. The Multi-Room Building 2 consisted of a single-type

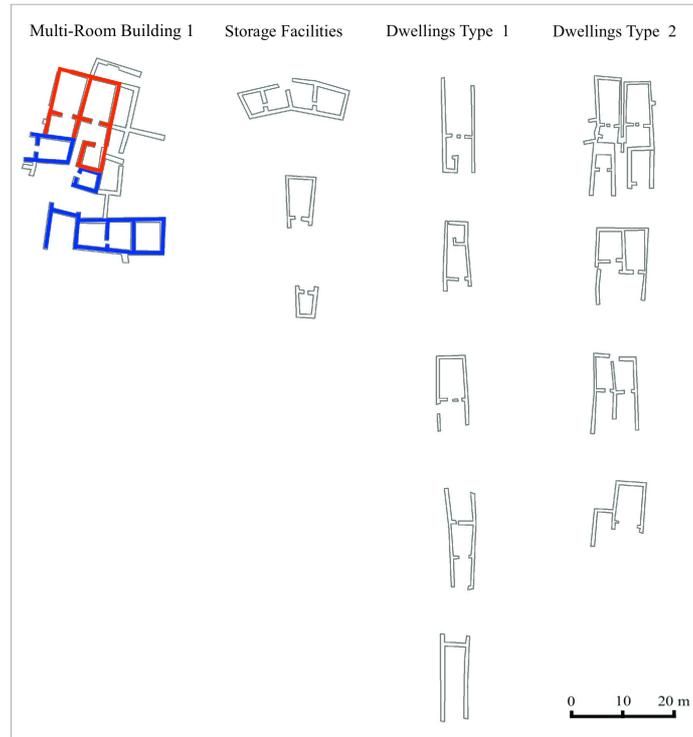


Figure 3: The building types categorized based on their plan and the artifact assemblages found within them

building constructed side by side in a row. Dwellings type 1 refers to buildings with rooms lined up in a row. Some buildings, however, were built as two cellae used as a single unit where they share a common open space within two ante walls and they are labelled as dwelling 2. One of the animal figurines was also found in Building 68 that is also labelled as dwelling type 2.

Excavators suggested that the northern section, where there is no architectural remains or even small finds found, was used to keep the animals. Animal and plant remains indicate that there were animal husbandry and harvesting. Thus, hunting plays a minor role in the subsistence of the village. According to the Ministry of Agriculture and Forestry of Turkey, the annual amount of fodder required for a bovine animal is calculated as 4.5 tons. 4.5 tons of fodder corresponds to approximately 7 tons of corn silage and 1.5 tons of hay. For this reason, at least 2.5 decares of irrigated or 5 decares of dry land per animal on which fodder can be produced are needed.

Therefore, one need additional space to keep this fodder at least for the amount needed during the winter. The temperature also affects the animals by causing heat stress. The lowest temperature of the Burdur regions is minus one point 7 degrees and highest is 29,4 degrees and the average temperature is around 22,4 degrees. This temperature range is in the limits not to be affected by heat stress. Nevertheless, during the winter animals may have needed to be kept in a closed place. In the light of this information, the dwellings type 2 is closed to the place where farming animals thought to be kept maybe belong to the households who were responsible for the farming animals and needed additional spaces.



Despite the existence of large jars and vessels, there was no recognizable places for pottery production, as well as the presence of a significant number of metal objects, there was no trace of metalworking either at the site. Lack of hearths in the dwellings, lack of ovens, and lack of any evidence of metalworking suggest that some activities, such as pottery-making and metalworking, were possibly carried out beyond the site boundary. While others, particularly cereal production, animal management and textile, were carried out in the village. The presence of some activities and the absence of others may also suggest that the site was occupied seasonally and other activities took place elsewhere.

The agglutinated dwellings with an entrance facing the centre of the mound create cohesiveness which causes group members to remain in the group based on the combined commitment of each household to the group. Cohesiveness, on the other hand, refers to both positive and negative effects on individuals in a group in which people interact sometimes cooperatively but sometimes competitively. A variety of factors whether people interact cooperatively or competitively. Reward structure shaped by the nature of the social interdependence among group members either leads to competitive or cooperative interdependence. Agglutinated buildings restrict the amount of space available while demanding a reciprocal concession and strong collaboration with neighbouring dwellings that increase cooperation. These strengthen the bonds among village inhabitants and create a general sense of community.

Relatively wide entrances and lack of threshold, which create a boundary between the interior and exterior, increase interaction and so communications. Cooperation is greater when communication is required. Except for the dwelling type II, sharing a similar size of a living room makes the concession easier and so reinforces the cooperation and results in greater concession and quick agreement.

The inner division of the dwellings into two rooms is more likely to have a functional meaning. The arrangement of the rooms creates a different degree of privacy. The lack of remains indicating inner division within the living room can be read as providing little privacy within the dwelling. Excavation results suggest that the back rooms were used as storage rooms. The presence of an individual storage room indicates the concept of ownership and personal values. Personal value is also an important factor influencing the behavior of individuals orienting towards either cooperation or competition. In this case, a similar size of dwellings also suggests cooperative interaction. Unfortunately, there is no information on how the interior of the buildings was used.

Estimation of population size and space syntax analysis (mentioned below) indicate that the population density is lower compared to Demircihöyük and Seyitömer. Therefore, it is aimed to visually display the ratio of built area and open space, and dwelling area and storage facilities. To

create graphics, the size of each building as the building itself, its living space (cella), and its storage space are measured.

Graphics elucidate similar ratios for the total dwelling area to commonly used storage facilities (discussed below) and the Multi-Room Building 1 area to its storage facilities. This similarity indicates a fair share of subsistence between the inhabitants and the people who lived in the Multi-Room Building 1. Furthermore, the average size of the megaron-like rooms (the Building 81,82 and 84) within the complex is 25,63 m² which is relatively similar to the average size of the dwelling type 1, 26,47 m². This indicates that there is no privilege given to the Multi-Room Building 1 in terms of room size and architectural planning.

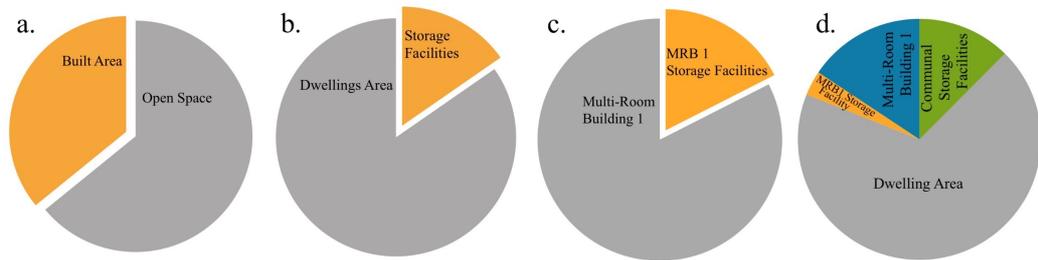


Figure 4: a. the ratio of built area to open space within the glacier in Bademağacı, b. the ratio of total dwelling area to the total area of communal storage facilities, c. the ratio of the Multi-Room Building 1 built area to the total area of its storage facility, d. the ratio of the Building complex, its storage facility, the total dwelling area and the communal storage facilities

Although the location of the Multi-Room Building 1 indicates strategic importance, possibly in terms of higher status among the other buildings, by taking into consideration of the architectural plan of the rooms in the Multi-Room building 1, the similar ratio of the building area and storage facilities, it is suggested that the higher status previously suggested for the households lived in the Multi-Room Building 1 is a social leadership like authority who focuses on the emotional and interpersonal aspects of social interaction, rather than task leadership like an authority who controls, direct and organize the society in carrying out a specific task. In another word, the households that lived in the Multi-Room Building 1 were ritual or moral leaders rather than a wealth-based elite.

Even though the living room size of the dwelling type 1 is almost double the size of type 2, the average size of the whole buildings of the dwelling type 1 and type 2 are the same. This indicates that there is no privilege given to the households of the dwelling type 2 in terms of building size, instead, the architectural plan differs. If we agree that the households that lived in the dwelling type 2 were livestock raising people, then this difference was possibly due to the functional need to obtain additional space for the animals, rather than symbolic to represent higher status.

4.4. Space Syntax Analysis

Unlike the villages developed organically, both the settlement layout with some degree of standardized architectural tradition and the excavation results suggest that the EBA II village of Bademağacı was established based on a plan in which decisions and actions were taken strategically in advance to achieve specific goals to meet the needs of society. This strategy requires putting things into proper order or a relationship based on the social norms and physical needs of that time. Therefore, although the settlement layout and the plans of the buildings are relatively simple compared to the previous studies applying space syntax to the complex building plans or urban layouts, the techniques are applied blindly in hopes of finding order in the configuration of space that might give insight into the social system of the village. Unfortunately, neither architectural remains nor excavation reports provide sufficient information for any modification in the analysis. Yet, the analyses not only facilitated the interpretation of the data by enlightening the crossroads at the key points, but they also revealed unpredictable outcomes.

A justified graph is created for different building types. For the dwellings and storage facilities, the graph is drawn from the entrance as approached from the village centre. However, for the Multi-Room Building 1, a graph is drawn for each cardinal direction since it had multiple entrances and not all rooms are connected.



Figure 5: The justified graphs created for different building types: from the village center for the dwellings and storage facilities, from the cardinal directions for the Multi-Room Building 1.



Space Syntax acknowledges two types of relationships: those between the inhabitants and those between inhabitants and foreigners. The glacier pierced by three passageways and the building's blind back walls appear to create a pervasive boundary providing limited interaction between the inhabitants and foreigners. According to excavators, this boundary served for protection from outside danger. However, the glacier has a gentle slope rather than a steep slope, and the entrance and there was no trace of additional architectural features for a closure of the gates. Moreover, with the shallow wall construction, the northern section of the site is vulnerable in terms of controlling the site's access. According to the connectivity graph, inside the settlement, on the contrary, the connectivity is high. The settlement plan is pedestrian-friendly, whether inhabitants or foreigners, and it provides easy access to the desired location. That contradicts the idea of limiting access for foreigners. Therefore, this boundary is more likely to serve as a barrier for space while creating a sense of community.

The visibility graph analysis also reveals that G2 has a greater degree of connectivity followed by G1 and G3, respectively. That means that G2 has a higher strategic value compared to the others. By taking into account the isovist graphs, connectivity graphs and step depth graphs all together, it seems more likely that G2 was the main gate into the village rather than G3 as excavators suggested.

The visibility graph points out that the space where the connectivity is highest, as coloured red in the graph, is the southwestern area in the village centre which corresponds right in front of the Multi-Room Building 2. This building complex, however, does not display a profile that matches with a standard village dwelling, instead, consists of two rows of rooms in small size placed back to back displaying a complex architectural plan where the most southern side was closed with a long wall. The bulla was found in one of the rooms, Building 38. Even though this building complex was placed in a location where its visibility is highest among the village, the convex graph analysis results clearly show that it has also the highest deepness. In other words, pedestrians whether inhabitants or foreigners, could see the building complex right away but they could not reach it easily. Therefore, it won't be a coincidence to find the bulla in a location where its deepness is highest. According to the mean depth graph, Building 42 has the highest score for mean depth.

Spatial step depth from each gate is created to observe whether the situation differ based on which gate was chosen to enter into the village. However, regardless of which gate was used to enter the village from, this Multi-Room Building 2 has the highest deepness even more than the Multi-Room Building 1, where authority lived according to excavators. Analysis results and artifacts found within this region emphasize the strategic importance of this building complex. The graphic also indicates that almost all buildings, except the Multi-Room Building 2, are relatively equally distant from the main room in the Multi-Room Building 1. On the other hand, the Multi-Room

Building 2 have a lower spatial connection with the buildings in the northeast and northwest sides as well as with the Multi-Room Building 1.

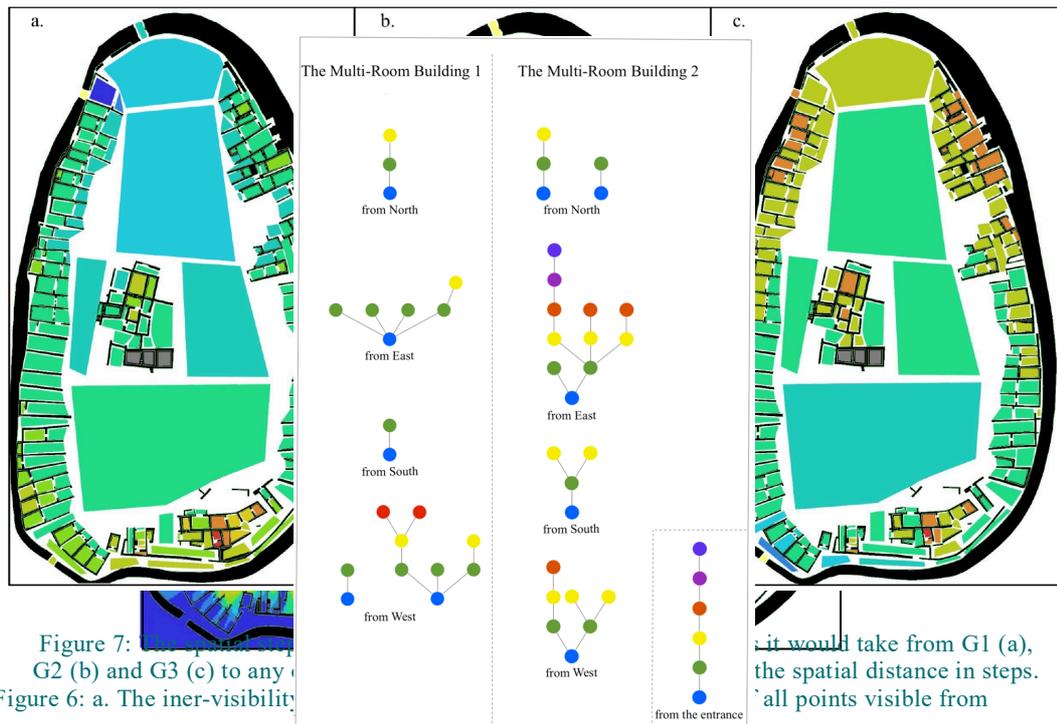


Figure 8: The justified graphs for the Multi-Room Building 1 and the Multi-Room Building 2 from the main cardinal directions

Even though the architectural plan of the Multi-Room Building 1 differs from the Multi-Room Building 2, it is worth comparing their structural connectivity. Therefore, a j-graph is created for the Multi-Room Building 2 as it was for the Multi-Room Building 1. The graphs elucidate no similarity between the buildings complexes but point out possible main entrance direction. Based on the structural routes of the rooms and the architectural plan that has been uncovered, the main entrance for the Multi-Room Building 1 is possibly from the west direction while the main entrance of the Multi-Room Building 2 is from the east.

Based on the space syntax analysis and archaeological remains, the Multi-Room Building 2 is likely to have served as storage facilities. These facilities, however, had no connection with the Multi-Room Building 1 or the buildings found on the northern side of the village. Its position with the highest connectivity in the village indicates that it was employed for communal storage facilities.

The Multi-Room Building1, as mentioned above, consists of megaron-like buildings and storage facility-like rooms. There are at least two, but possibly three megaron-like buildings found. The entrance of the storage rooms is either from outside or from inside. In the light of these



observations, I suggest multiple households, possibly relatives, lived in this building complex. The location of the building gave importance related to the status of its household. Based on the assumption that G2 was the main entrance into the village and the main entrance of the Multi-Room Building1 was from the west, one can conclude that the position of the building and architectural plan aimed not to have control over the village entrance but seek some degree of privacy. Additionally, the entrances of some storage rooms are from outside, and it suggests that this needed privacy may not be for the inhabitants but for the foreigners who could not reach easily to the main entrance when they enter the village from any gate.

4.5. Estimating Population Size

Even though it is desirable to apply different methods using different archaeological data, which can be compared with historical and ethnographical data to calculate the carrying capacity based on the ecological and cultural conditions of the village, only the architectural features provide a suitable proxy to estimate the population size. In this respect, the average living room size is calculated based on excavated buildings identified as dwellings. The average living room size is 26,47 m² with a standard deviation of 8,48 (Bessel's correction), and it provides suitable space for 5-7 people to live.

Although Umurtak and Duru proposed another 30 buildings in the unexcavated area, only 15 buildings can fit in it. They also assumed that all buildings were houses. Assuming 6-7 people living in each, a total number of 120 houses produced at least 700 people. However, the investigation of artifact distribution reveals that some buildings were used as storage facilities. Moreover, the number of buildings that fit in the unexcavated area is less than the number suggested by excavators. Excluding the storage facilities, a total of approximately 55 dwellings produces a population of 350 people based on a household of 5-7 individuals as an estimation using the average capacity of houses.

4.6. Archaeoastronomical Analysis

Archaeoastronomical analysis is performed to understand whether celestial objects influenced the configuration of space during the EBaII of Bademağacı. Architectural remains of the site were the foundation of the buildings that were hardly more than 30-40 cm tall. This condition is merely suitable for horizontal orientation analysis. In this respect, the architectural plan of the Multi-Room Building 1 gave no clear idea about the whole building plan as well as the main entrance into the building. Furthermore, the settlement design clearly shows buildings were not oriented to a certain direction, but rather to the village centre according to their positions within the settlement layout. Therefore, the analysis is applied only to the three village gates.

The azimuth is measured for each village gate based on their axis of passageways. Then, horizon profiles for each gate are generated by using a website (<http://www.heywhatsthat.com/>) where the



horizon height is measured to calculate the declination degree of each gate. The declination values are calculated based on the related horizon height and latitude. Declination values are essential when comparing results with other sites. The same declination values mean that buildings are oriented toward the same point in the sky regardless of their locations. It will be a key criterion for analyzing the patterns of orientations in settlements belonging to the same culture but located in different regions. Stellarium, which displays a realistic sky view based on the specific location, is used to determine whether the declinations of the gates match with a potential celestial object. However, analyses produce no meaningful result.

5. DISCUSSION

The application of techniques requires clear starting and finishing configurational features. The nature of archaeological data, on the other hand, is fragmented and results in theoretical, methodological and epistemological limitations. Although space syntax is flexible and open to modification, archaeological remains found in Bademağacı höyük preclude any alteration. In this study, the limitations aim to be addressed initially by reducing the missing information and taking into account the nature of activities performed in each unit of space through the material representations of those activities. The plans and positions of the uncovered buildings are employed to replicate buildings in the unexcavated area on the digitalized map. By doing it, the architectural traditions of the village during the EBA II is maintained, and a relatively reliable settlement layout, which reflects the spatial distribution of the buildings once in time, is generated. Artifact distributions are investigated to associate space with a particular activity. Unfortunately, publications do not provide all the information required to comprehend building sequences or locate findings and samples in their context. For the necessary information, the head of the excavation was contacted, but no result was obtained. Therefore, the accuracy of digitalized settlement layout and artifact distribution map should be treated with caution.

The artifact distribution map does not display exact locations of all artifacts but it does point out the boundaries within which they were uncovered and gives at least a general idea whenever a place and its location are investigated. The map elucidates that figurines, loom weights, seals and metal objects were uncovered from all over the settlement and suggests household-level production and consumption. Furthermore, when evaluated together with ceramic groups it gives no indications for identifying any buildings as privileged residences.

In the scope of space syntax analysis, axial line analyses, convex isovist analysis and convex spatial analyses are applied, justified graphs are constructed, and the numeric value table is created. The use of graphics to visualize calculations demonstrates that they are efficient for analyzing large amounts of data and straightforward displaying the ordered relationships between spaces. The numeric values of related analysis, on the other hand, are difficult to fathom at first glance. The simplicity of the settlement layout and the similarity of the building plans produce numerical data very close to each other. Thereby, inferring the numerical values becomes



challenging. The result of the space syntax analyses reveals that some identifications and definitions made by excavators need to be re-evaluated. It also enables interpretation of the finds from a holistic approach. Consequently, a more coherent narrative about the EBA II settlement of Bademağacı became possible.

The shift from the buildings to portable objects, that embodied symbolic expressions, inherently changed the human-built environment relationship, and in the EBA II village of Bademağacı, it took a new form. Based on the archaeological remains, the results reveal four distinct building types differing based on their locations and plans and suggest social stratification with a social leadership like authority. Results also lead to the conclusion that buildings played a functional role in establishing and maintaining a general sense of community and social norms by demanding cohesiveness and promoting cooperative interdependence.

Like Bağdemağacı, Demircihöyük and Seyitömer were also emerged on a mound based on a pre-planned model. It is worth emphasizing that a mound type site does impose neither a pre-planned settlement layout nor agglutinated dwellings since there are examples of otherwise such as the EBA II site of Küllüoba (Efe and Ay-Efe, 2007, p.265, Fig.6), Kanlıgeçit (Özdoğan, 2006, p.576, Res.1) and Titriş Höyük (Algaze and Matney, 2012, pp.993-999). The management of space and built environment on a mound differed from that on a plain (Bailey, 1999, pp.110-127; Steadman, 2000, pp. 164-199). Mounds served as spatial and temporal boundaries for the organization of the built environment and the activities. They have embodied the remains of previous generations. They have inherently symbolic, as well as expressive, meanings as monumental built environment. As a result, they conducted different forms of relationship between human beings and their built environment.

Table 1: Chronology table (based on Steadman and McMahon, 2011). White and black portioning is used for imprecise dating.

Date	Cultural Period	Bademağacı H.	Demircihöyük	Seyitömer H.
1500 B.C.	MBA			
2000 B.C.				
2300 B.C.	EBA III			
	EBA II			
2700 B.C.	EBA I			
3000 B.C.				
4250 B.C.	Late Chal.			

The round-shaped settlement formed by agglutinated house facing to a courtyard of Demircihöyük consisted of 26 buildings and the estimated population of the village was a maximum 130 people (Korfman, 1979,; 2011, p.214). The size of the settlement is 0,35 ha and compared to Bademağacı, the ratio of open space to the built area in the village is very low. The open space found in the



centre of the village was not suitable for public occasions due to the slope toward the centre, and the storage facilities and silos that were placed in the deepest part of the centre.

Although Korfmann (1983, p.222) claimed that there was a ruling power over the small farming communities of Eskişehir region that imposed the settlement layout upon the inhabitants of Demircihöyük village, the spatial arrangement of the site and communal storage facilities, according to Durgun (2012, pp.26-27), implies a decision-making strategy that was likely governed by the entire community. In Phase K1, only one building had three rooms and built by different construction techniques from the others. During the following phase K2, at least three buildings with these specific construction techniques were observed (Korfmann, 1979, p.193). The quantitative analysis of the burial context done by Massa (2014, pp.73-93) implies some degree of stratification in respect to the age classes. With the existence of distinctive buildings, Massa suggested some degree of a vertical hierarchy, possibly in terms of local leaders of the community who had regulated the daily life of the inhabitants of Demircihöyük. Each dwelling had its storage silo buried in front of them, and in the centre, there were storage facilities and silos (Korfmann, 2011, p.214). The distinctive houses were spatially ordered as like other dwellings and they were slightly larger, possibly either for more storage or for larger gathering area. In a matter of material manifestation, whatever the daily life rules were, it was likely that they were followed by the whole community including these exclusive individuals.

Despite the radial site layout that resembles the site of Bademağacı, Seyitömer had significantly different building layouts that had been formed based on the different construction techniques used and their function (Harrison, 2016). The dwellings of non-elite communities had houses that shared common spatial features, while workshops were located in clusters and used at a communal level to produce pottery for both local use and trade. The elite community, on the other hand, legitimized their power and social status through different architectural features in terms of location and building techniques and finally, the ritual community was located at the centre of the site (Harrison, 2016, pp.328-335). In this respect, the society of Seyitömer displays both vertical and horizontal hierarchy.

The site of Seyitömer occupies an area of 0,6 ha which is half the size of Bademağacı. Thus, unlike Bademağacı, Seyitömer did not have a wide-open space rather narrow streets surrounding the central building complex and a small open area in front of the Administrative Complex. In Seyitömer, due to the settlement layout, spatial ordering had two dimensions: one was created by the field of view and the other by the location. Based on the location, the privilege was given to the central building complex but its living quarters size is slightly smaller than other dwellings. Based on the field of view the privilege belongs to the Administrative Complex but its size is not dramatically larger compared to other dwellings. Size, in this respect, is not an indicator for pointing to the privileged ones but it still matters when the sizes of the central complex and the Administrative Complex are compared. The household of the Administrative Complex demanded

more space than the central complex. Like Demircihöyük and Bademağacı, in Seyitömer each building had its storage area but there were no communal storage facilities. Instead, the Administrative Complex had a group of storage facilities that were built behind it which provided control over the resources. There were most likely three different household-level roles, one defined for non-elite community, one for spiritual community and one for elite community.

In the site of Bademağacı, the spatial layout of the buildings displays two-ranked ordering building positions: the ones along the circle and the ones in the centre. Pithoi graves found in the settlement indicate some degree of exclusiveness given to individuals. Both architectural and burial traditions suggest that some individuals had different positions in society. Regardless of their rank, houses had their own storage rooms. The storage facility of the central buildings was fairly proportioned with the communal storage facilities. Like Demircihöyük, in Bademağacı whatever the daily life norms were, the entire community, including these exclusive individuals, followed them. In conclusion, Bademağacı differs from Demircihöyük and Seyitömer in terms of different configurations and use of space and represents the transformation process between the egalitarian appearance of the material culture and complex societies where elites legitimized their power over the surplus.

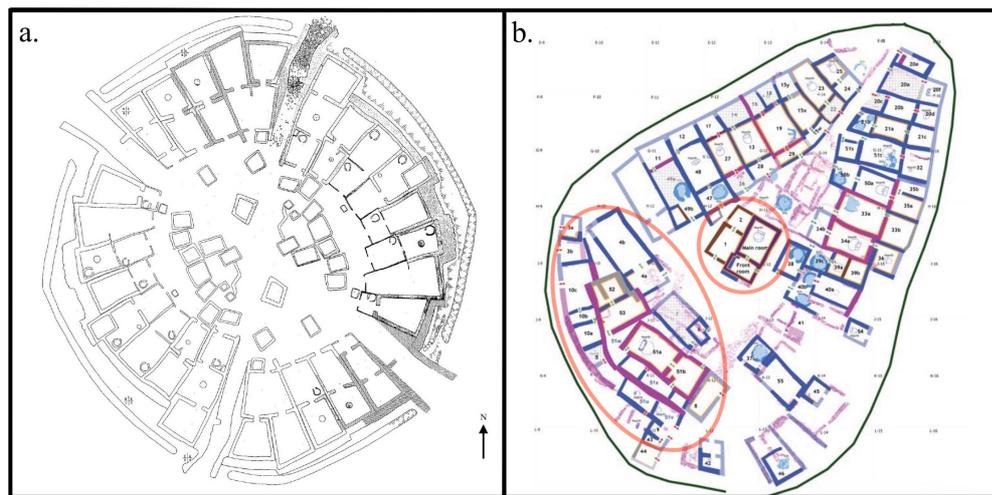


Figure 9: a. Demircihöyük reconstruction plan of Phase F1 and H, modified from Korfmann (1983, Fig.343) b. Seyitömer Höyük the EBA III Phase B settlement plan, red circle in the centre indicates the Central Megaron Complex, identified as sanctuary with two storage rooms and second circle indicates Palace Complex with storage rooms, modified from Harrison (2016, Fig.5.2)

6. CONCLUSION

In conclusion, the embodiment of symbolic expressions changed its form from the buildings to portable objects and consequently it altered the human-built environment relationship during the Early Bronze Age. Based on the archaeological remains, the results of analyses lead to the conclusion that each site had a unique structure of the social system in which the relationships



between the privileged ones and others varied. In broad outline, buildings were employed as a medium to spatially locate the privileged inhabitants in the village, while also serving a functional role in establishing and maintaining a general sense of community and social norms by demanding cohesiveness and promoting cooperative interdependence.

In the site of Bademağacı, buildings are categorized into four groups based on their plan and the artifact assemblages found within them: the Multi-Room Building (1); communal storage facilities; dwelling type 1; and dwelling type 2. Results suggest the presence of a social leadership like authority, in other words, ritual or moral leaders who focus on the emotional and interpersonal aspects of social interaction. The lack of hearths, ovens and any evidence of metalworking suggest that some activities, such as pottery-making and metalworking, were possibly carried out beyond the site boundary. While others, particularly cereal production, animal management and textile, were carried out in the village. The presence of some activities and the absence of others may also suggest that the site was occupied seasonally and other activities took place elsewhere. However, to support or refute the argument, further research is needed. If this was the case, calculating population, identifying the demography and determining the structure of the social system become even more complicated.

Acknowledgement

This study is part of doctoral thesis submitted to the Middle East Technical University. I offer my deepest gratitude to my supervisor Assoc. Prof. Dr. Evangelia Pişkin for her guidance and support. Without her encouragement and effort, the thesis would not have been completed. I also would like to express my very profound gratitude to my parents and my brother. Your love and supports give me wings to fly through my own way.

REFERENCES

- Algaze, G., & Matney, T. (2012) 'Titriş Höyük: The nature and context of third millennium BCE urbanism in the Upper Euphrates Basin' in Steadman, S. R., & McMahon, G. (Eds.) *The Oxford handbook of ancient Anatolia*. New York: Oxford University Press, pp.993-1011.
- Angel, J. L. (1976) 'Excavations in the Elmalı Area, Lycia, 1975. Appendix: Early Bronze Karataş people and their cemeteries', *American Journal of Archaeology*, pp.385-391.
- Bafna, S. (2003) 'Space syntax: A brief introduction to its logic and analytical techniques', *Environment and Behavior*, 35(1), pp.17-29.
- Bailey, D. W. (1999) 'What is a tell? Settlement in fifth millennium Bulgaria' in Bruck, M., & Goodman, M. (Eds) *Making places in the prehistoric world Themes in settlement archaeology*. London: UCL Press, pp.94-111.
- Baird, D., Fairbairn, A., & Martin, L. (2017) 'The animate house, the institutionalization of the household in Neolithic Central Anatolia', *World Archaeology*, 49(5), pp.753-776.
- Balton, R. (1982) 'Urban Beginnings: A view from Anthropological Archaeology', *Journal of Urban History*, 8(4), pp.427-446.



- Belmonte, J. A. (2015) 'Solar Alignments-Identified and Analysis' in Ruggle, C. L. N. (Ed.) *Handbook of Archaeoastronomy and Ethnoastronomy*. New York: Springer, pp.438-492.
- Benech, C. (2007) 'New approach to the study of city planning and domestic dwellings in the ancient Near East', *Archaeological Prospection*, 14(2), pp.87-103.
- Bhatnagar, A., & Livingston, W. C. (2005) *Fundamentals of solar astronomy* (Vol. 6). World Scientific.
- Blanton, R. E. (1994) *Houses and Households-A Comparative Study*. New York: Plenum Publishing Corporation.
- Brück, J., & Goodman, M. (Eds.) (1999) 'Introduction: themes for a critical archaeology of prehistoric settlement', *Making places in prehistoric world: themes in settlement archaeology*. London: UCL Press, pp.1-19.
- Clarke, D. L. (Eds.) (1977) 'Spatial information in archaeology', *Spatial Archaeology*. New York: Academic Press Inc, pp.1-32.
- Cutting, M. (2003) 'The use of spatial analysis to study prehistoric settlement architecture', *Oxford Journal of Archaeology*, 22(1), pp.1-21.
- Dobres, M. A. & Robb, J. (Eds.) (2000) 'Agency in archaeology: paradigm or platitude?', *Agency in Archaeology*. London: Routledge, pp.3-17.
- Durgun, P. (2012) *Social Organization in the Early Bronze Age Demircihöyük: A Re-evaluation*. Master Thesis. Koç University. İstanbul. Available at: <https://acikbilim.yok.gov.tr/handle/20.500.12812/169311> (Accessed: September 2018)
- Duru, R. (1997, April) 'Bademağacı Kazılar 1994 Yılı Çalışma Raporu', *BELLETEN*, LXI, 230, pp.149-181.
- Duru, R. (2000, April) 'Bademağacı Kazıları 1997 ve 1998 Yılları Çalışma Raporu', *BELLETEN*, LXIV, 239, pp.187-255.
- Duru, R., & Umurtak, G. (2002) 'Bademağacı 2000-2001 Çalışma Raporu', *BELLETEN*, LXVI, pp.561-562.
- Duru, R., & Umurtak, G. (2005) 'Bademağacı Kazıları 2004', 27. *Kazı Sonuçları Toplantısı*, Cilt II, pp.437-444.
- Duru, R., & Umurtak, G. (2006) 'Bademağacı Kazıları 2005', 28. *Kazı Sonuçları Toplantısı*, Cilt I, pp.639-646.
- Duru, R., & Umurtak, G. (2007) 'Bademağacı Kazıları 2006 Yılı Çalışmaları', 29. *Kazı Sonuçları Toplantısı*, Cilt II, pp.187-196.
- Duru, R., & Umurtak, G. (2008a) 'Bademağacı Kazıları 2007 Yılı Çalışmaları', 30. *Kazı Sonuçları Toplantısı*, Cilt I, pp.255-268.
- Duru, R., & Umurtak, G. (2008b) 'Bademağacı Kazıları 2007 Yılı Çalışmaları', *ANMED*, pp.14-19.
- Duru, R., & Umurtak, G. (2009) 'Bademağacı Kazıları 2008', 31. *Kazı Sonuçları Toplantısı*, Cilt III, pp.261-268.
- Duru, R., & Umurtak, G. (2010a) 'Bademağacı Kazıları 2009 Yılı Çalışmaları', 32. *Kazı Sonuçları Toplantısı*, Cilt I, pp.438-445.
- Duru, R., & Umurtak, G. (2010b) 'Bademağacı Kazıları 2009 Yılı Çalışmaları', *ANMED*, pp.19-25.
- Duru, R., & Umurtak, G. (2011) 'Bademağacı Kazıları 2010 Yılı Kazıları', *ANMED*, pp.7-15.
- Duru, R., & Umurtak, G. (2015) 'Torosların kuzey eteklerinde en erken yerleşik yaşamın izinde Bademağacı Höyüğü', *Antalya*, 27, pp.70-80.
- Duru, R., & Umurtak, G. (Eds.) (2019) *Bademağacı Höyüğü Kazıları I Neolithic ve Erken Kalkolitik Çağ Yerleşmeri*. İstanbul: Ege Yayınları.



- Efe, T., & Ay-Efe, D. Ş. (2007) 'The Külliöba excavations and the cultural/political development of western Anatolia before the second millennium bc' in Alparslan, M, Doğan-Alparslan, M, & Peker, H. (Eds.) *Festschrift in Honor of Belkıs Dinçol and Ali Dinçol VITA*. İstanbul: Ege Yayınları, pp.251-268.
- Erdoğu, B. (2009) 'Ritual symbolism in the early Chalcolithic Period of Central Anatolia', *Journal for Interdisciplinary Research on Religion and Science*, 5, pp.129-151.
- Fisher, K. D. (2009) 'Placing social interaction: An integrative approach to analyzing past built environments', *Journal of Anthropological Archaeology*, 28(4), pp.439-457.
- Fladd, S. G. (2017) 'Social syntax: An approach to spatial modification through the reworking of space syntax for archaeological applications', *Journal of Anthropological Archaeology*, 47, pp.127-138.
- Foster, S. M. (1989) 'Analysis of spatial patterns in buildings (access analysis) as an insight into social structure: examples from the Scottish Atlantic Iron Age', *Antiquity*, 63(238), pp.40-50.
- Harrison, L. K. (2016) *Living spaces: Urbanism as a social process at Seyitömer Höyük in Early Bronze Age Western Anatolia*. Doctoral dissertation. State University of New York at Buffalo. New York. Available at: <https://www.proquest.com/openview/c149b10b0fa050c28f1775e81c71fa7d/1?pq-origsite=gscholar&cbl=18750> (Accessed: September 2018)
- Hillier, B. (2007) *Space is the machine: a configuration theory of architecture*. Space Syntax. London: UCL.
- Hillier, B. & Hanson, J. (1984) *The Social Logic of Space*. Cambridge: Cambridge university Press.
- Hillier, B., Hanson, J. & Peponis, J. (1987) 'Syntactic analysis of settlements', *Environment and Planning B: Planning and design*, 3(2), pp.147-185.
- Hodder, I., & Cessford, C. (2004) 'Daily practice and social memory at Çatalhöyük', *American antiquity*, pp.17-40.
- Hodder, I., & Hutson, S. (2003) *Reading the past: current approaches to interpretation in archaeology*. 3rd edn. Cambridge: Cambridge University Press.
- Hodder, I., & Pels, P. (2010) 'History houses: a new interpretation of architectural elaboration at Çatalhöyük' in Hodder, I. (Ed.) *Religion in the emergence of civilization: Çatalhöyük as a case study*. Cambridge: Cambridge University Press, pp.163-186.
- Iwaniszewski, S. (2005) 'Astronomy in cultural landscape: new challenges for World heritage issue', *Cultural Landscapes in the 21st Century Forum UNESCO: University and Heritage 10th International seminar and Inter-Congress of the World Archaeological Congress*. April. pp.11-16.
- Iwaniszewski, S. (2011) 'The sky as a social field', *Proceedings of the International Astronomical Union*, 7(S278), pp.30-37. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/B9B1D25A545AD17BB5BB519EF0E0ADF3/S1743921311012440a.pdf/the-sky-as-a-social-field.pdf> (Accessed: November 2015)
- Jégues-Wolkiewicz, C. (2005) 'Aux racines de l'astronomie, ou l'ordre caché d'une oeuvre paléolithique', *Antiquités nationales*, (37), pp.43-62.
- Jégues-Wolkiewicz, C. (2012) 'Paleolithic techniques and tools used to calculate space and time, Part3', *Pleistocene Coalition News*, 4(I).
- Korfmann, M. (1979) 'Demircihöyük', *Anatolian Studies*, Vol.29, pp.192-194.
- Korfmann, M. (1983) *Demircihöyük. Die Ergebnisse der Ausgrabungen 1975-1978. Band I: Architektur, Stratigraphie und Befunde*. Mainz: Philipp von Zabern.
- Korfmann, M. (2011) 'Demircihöyük' in Kabul, N. (Ed.) *Tarih Öncesinden Demir Çağı'na Anadolu'nun Arkeoloji Atlası*. İstanbul: Doğan Burda Rizzoli Dergi Yayıncılık, pp.214-215.
- Krupp, E. C. (2015) 'Astronomy and Power' in Ruggle, C. L. N. (Ed.) *Handbook of Archaeoastronomy and Ethnoastronomy*. New York: Springer, pp.67-91.



- Kuijt, I. (2001) 'Place, death, and the transmission of social memory in early agricultural communities of the Near Eastern Pre-Pottery Neolithic', *Archaeological Papers of the American Anthropological Association*, 10(1), pp.80-90.
- Leach, E. (1978) 'Does space syntax really constitute the social' in Green, D., Haselgrove, C., & Spriggs, M. (Eds.) *Social organization and settlement: Contributions from Anthropology, Archaeology and Geography*. Oxford: BAR International Series (Supplementary) 47(i). British Archaeological Reports, pp.385-401.
- Lehner, J. W., & Yener, K. A. (2014) 'Organization and specialization of early mining and metal technologies in Anatolia' in Roberts, B. W., & Thornton, C. P. (Eds.) *Archaeometallurgy in Global Perspective*. New York: Springer, pp.529-557.
- Lopéz, A. M. (2015) 'Cultural Interpretation of Ethnographic Evidence Relating to Astronomy' in Ruggle, C. L. N. (Ed.) *Handbook of Archaeoastronomy and Ethnoastronomy*. New York: Springer, pp.341-352.
- Massa, M. (2014) 'Early Bronze Age burial customs on the central Anatolian plateau: a view from Demircihöyük-Sarıket', *Anatolian Studies*, 64, pp.73-93.
- Mazurkowski, R. F. , & Jamous, B. (2000) 'Tell Qaramel: excavations 2000', *Polish archaeology in the Mediterranean*, 12, pp.327-341.
- McCluskey, S. C. (2008) 'Nationalism and politics in the recovery of past astronomies', *Archaeologia Baltica*, 10, pp.263-267.
- Montello, D. R. (2007) 'The contribution of space syntax to a comprehensive theory of environmental psychology', Proceedings of the 6th International Space Syntax Symposium. İstanbul. Available at: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.509.3933&rep=rep1&type=pdf> (Accessed: September 2019)
- Müller-Karpe, A. (2015) 'Planning a sacred landscape. Examples from Sarissa and Hattusa' in D'Agostion, A., Orsi, V., & Torri, G. (Eds.) *Sacred Landscapes of Hittites and Luwians: Proceedings of the International Conference in honor of Franca Pecchioli Daddi Florence*, Vol.9. Firenze: Firenze University Press, pp.82-93.
- Nadali, D., & Polcaro, A. (2016) 'The sky from the High Terrace: Study on the Orientation of the Ziggurat in Ancient Mesopotamia', *Mediterranean Archaeology and Archaeometry*, 16(4), pp. 103-108.
- Nortoff, J., Dietrich, O., & Schmidt, K. (2016) 'Gathering of the dead?The early Neolithic sanctuaries of Göbekli Type, southeastern Turkey', in Boyd, M. J., Morley, I., & Renfrew, C. (Eds.) *Death rituals, social order and the archaeology of immortality in the ancient world: Death shall have no dominion*. Cambridge: Cambridge University Press, pp.65-81.
- Osborne, J. F. (2012) 'Communicating power in the Bīt-Ḫilāni palace', *Bulletin of the American Schools of Oriental Research*, 368(1), pp.29-66.
- Osman, K. M., & Suliman, M. (1994) 'The space syntax methodology: fits and misfits', *Architecture and Behaviour*, 10(2), pp.189-204.
- Özbaşaran, M. (2012) 'Aşıklı' in Başgelen, N., Özdoğan, M., & Kuniholm, P. (Eds.) *The Neolithic in turkey. New Excavations and New Research 3-Central Turkey*. İstanbul: Arkeoloji ve Sanat Yayınları.
- Özdoğan, M. (2006) *Yakın Doğu Kentleri ve Batı Anadolu'da Kentleşme Süreci. Hayat Erkanal'a Armağan. Kültürlerin Yansıması*. İstanbul: Homer Kitabevi.
- Özkaya, V., & San, O. (2007) 'Körtik Tepe. Bulgular ışığında kültürel doku üzerine ilk gözlemler', *Türkiye'de neolitik dönem*, pp.21-36.
- Rapoport, A. (1990) *The meaning of the built environment: A nonverbal communication approach*. Tucson: The University of Arizona Press.
- Parker Pearson, M., & Richards, C. (Eds.) (2005) *Architecture and order: approaches to social space*. Taylor & Francis e-Library.



- Ridderstad, M. (2009) 'Orientation of the northern gate of the Goseck Neolithic rondel'. Available at: <https://arxiv.org/abs/0910.0560> (Accessed: November 2015)
- Rosenberg, M., & Redding, R. W. (2002) 'Hallan Çemi and early village organization in eastern Anatolia' in Kuijt, I. (Ed.) *Life in Neolithic farming communities*. Boston: Springer, pp.39-62.
- Roslund, C., Lindström, J., & Andersson, P. (1999) 'Alignment in profusion and confusion' *Lund Archaeological Review*, 5, pp.105-115.
- Ruggles, C. L. (2005) *Ancient astronomy: an encyclopedia of cosmologies and myth*. Oxford: Abc-Clio.
- Seeher, J. (1992) 'Demircihöyük Nekropol Kazısı: 1991 Yılı Sonuçları', 24. *Kazı Sonuçları Toplantısı*, Cilt I, pp.365-379.
- Shapiro, J. (1997) 'Fingerprints in the landscape: Cultural evolution in the north Rio Grande', *Proceedings Volume II, Archaeology, Space Syntax First International Symposium*. London. 21. Available at: <https://www.spacesyntax.net/symposia-archive/SSS1/SpSx%201st%20Symposium%2097%20-2003%20pdf/1st%20Symposium%20Vol%20II%20pdf/3%20-%20Archaeology/21%20Shapiro%20300.pdf> (Accessed: October 2022)
- Steadman, S. R. (2000) 'Spatial patterning and social complexity on prehistoric Anatolian tell sites: models for mound', *Journal of anthropological archaeology*, 19(2), pp.164-199.
- Steadman, S.R., & McMahon, G. (Eds.) (2011) *The Oxford Handbook of Ancient Anatolia: (10,000-323BCE)*. New York: Oxford University Press.
- Stordeur, D., & Abbès, F. (2002) 'Du PPNA au PNB: mise en lumière d'une phase de transition à Jerf el Ahmar (Syrie)', *Bulletin de la Société préhistorique française*, pp.563-595.
- Thomas, J. (1996) *Time, Culture and Identity: An Interpretative Archaeology*. London, New York: Routledge.
- Tringham, R. (1994) 'Engendered places in prehistory', *Gender, Place and Culture: A Journal of Feminist Geography*, 1(2), pp.169-203.
- Umurtak, G., & Çongur, F. (2021) 'The Early Bronze Age II Settlement at Bademağacı Höyük: An Evaluation of the Pottery and Beak Spouted Jugs', *Olba*, 29(XXIX), pp. 1-24.
- Vandam, R., Kaptijn, E., Poblome, J., & Waelkens, M. (2013) 'The Bronze Age Cemetery of Gavur Evi Tepesi, Southwestern Turkey', *Anatolica*, 39, pp.241-259.
- Verhoeven, M. (1999) *An archaeological ethnography of a Neolithic community: space, place and social relations in the burnt village at Tell Sabi Abyad, Syria*. Nederland Historisch-Archaeologisch Instituut.
- Wheeler, T. S. (1973) *The Early Bronze Age Burial Customs of Karataş-Semayük*. Doctoral dissertation. Bryn Mawr College. Bryn Mawr. Available at: <https://repository.brynmawr.edu/dissertations/182/> (Accessed: June 2021)
- Yıldırım, B., & Steadman, S. R. (2021) 'Chalcolithic Religion and ritual on the Anatolian Plateau' in Steadman, S. R., & McMahon, G. (Eds.) *The Archaeology of Anatolia Volume IV: Recent Discoveries (2018-2020)*. Newcastle-upon-Tyne: Cambridge Scholars Press, pp.307-393.