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## Effect of Religion on the Type of Materials Used in Spiritual Architecture

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### ABSTRACT

“Spiritual or Traditionalist Approach” is concerned with recognition of symbols, meanings and concepts hidden as the result of architecture. “Pragmatic Approach” reviews the functional features of a building and believes that all parts of a building should be functional. This is while “Form-oriented Approach” is opposite to that approach and addresses aesthetical aspects more than function. In the present study, therefore, 37 religious and non-religious buildings in the Middle East were studied and compared in view of consumed materials in order to review the role of materials in establishment of physical proportions in spiritual architecture. For the purpose of this comparison, the materials used in each building were first specified and coded and then they were compared by inputting the codes into SPSS software and by using Kruskal Wallis nonparametric descriptive and inferential statistics. The results of study indicated that the calculated chi square was equal to 11.272 and that the difference observed in the type of consumed materials in each group of Islamic, Christian, Zoroastrian and non-religious buildings was a significant difference. In other words, the hypothesis indicating that religion affects the type of consumed materials in conceptual buildings is confirmed with a probability of 95%.

**Key words:** Spiritual architecture, skeletal proportions, self-sufficiency

### INTRODUCTION

Designing is associated with physical and spatial proportion in the spiritual architecture in the Middle East (focus placed on the material role). From the perspective of Islamic world, the world’s phenomena consist of the exterior and interior aspects of form and meaning. In the art and architecture field, a great focus is placed on esoteric aspects of works and artistic phenomena create a new look in the architecture designing which is called “meaning oriented”.

The meaning oriented approach in the architecture design has been applied to convey the hidden and known meanings which lies beyond the architecture body, also, the way that meaning oriented architect adopts from the meaning subject has a significant role in his meaning oriented perspective. In the meaning oriented architecture, researchers interpret the architecture based on personal analysis of approaches. Adherents to this view, the architecture of the body but it does

not see it as a manifestation of the mysterious meanings. Here, the object or work of art is a tool to convey spiritual messages and meaning. In the present research, the physical proportions have studied in order to achieve the goals.

William Morris show that “Architecture includes the whole physical environments that surrounded the human life and as long as the social and civilization life continues, the architecture necessity can’t be neglected. All the manmade environments are the result of selective solutions from the current options. The special option that is considered valid in the society represents the society culture. In fact, one way to culture evaluation is possible through looking the most common selections in the society. The selections in every culture results that in the formation of different buildings and locations (Rapoport, 2009). Architecture is a cultural and thus a domestic phenomenon.

From the Burckhardt (1986) view, “The ultimate goal of holy art doesn’t exist in reminding the feeling or effects

transformation but the holy art is a mystery, consequently is a simple, primary and main means which is free from any product. The mysterious world has the holy art in nature which preserves human soul from hideous and transient belongings (Memarian, 2008).

The traditional architecture has been the most perfect means for soul elevation of traditional human. Highest level of its flourish is found in the art masterpieces as mosque and house (Afhami and Zamane Soltani, 2012).

The different kinds of materials used in the buildings caused differences in the building which is explainable through egocentric meaning. Egocentric means that maker tries to construct the buildings with cheap materials. Introspection orientation was considered in building construction and the communication ways with external world; in such a way, the building was constructed in a way that all interior advantages had related association and as the result of specific geographical conditions of Iran reigns: Dry region, different winds, fluid sand, the introspective building was common (Pirniya, 1995).

The effects of space on building have been observed in other parts of world. For example, the Mosque of Ibn Tolon had been built by caliphs. Since Iran 'art was inspired by raw material or ripe brick in building and didn't use the Byzantine material that was stone. Instead of stone columns that was used by Shami and Western architects and most of them were the ruins of Roman buildings, the brick piers had applied in order to erect the building. Here, not only the technology of building was different, but also the aesthetic principles differed as well. However, the space image and space creation style are basically the same (Burckhardt, 1986).

In the Mutawakkel and Sarmara and Ibn Taval, in order to erect roof, the brick piers have been used instead of marble columns. Material used in the construction of mosque is common to both (Brick and stucco) and most significantly, the spiral form of minarets and its located position in mosque outside, was inspired by architectural design of Mutawakkil Mosque. However, the current minaret was replaced instead of main minaret in the eight century (Zarei, 2012).

In front of altar, a multi-story minaret, with a square base on which minarets are placed in the cylinder building with a spiral external suitcase; leads to the Mamluk clock tower (recently built). The minaret is reminiscent of Malviye minaret in Baghdad or Ziggurat in Mesopotamia.

The built Mosques was constructed by the Turkish leader who governed for Abasiyan during 1876, 1879 Ch which had a wild differences nationally and environmentally. The Mosque's root dates back to the erected building by caliphate in Mesopotamia; a place where the art conception didn't derive from byzance but Iran's building art which were raw or ripe abode or brick.

Instead of stone columns that were applied by Levant or western architects and most of the columns belonged to the

Roman ruins, the brick piers were used in order to erect the roofs in many pillars. Here, not only technically but also aesthetically, the principles are different. Although, the space image and space creation was basically the same in both cases (Burckhardt, 1986).

## MATERIALS AND METHODS

The present study is based on conducting a qualitative and quantitative research, in order to provide an answer for the following question: Is the religion has an effect on the types of used materials in the meaning oriented architecture? First, an example of Islamic, Christian, Zoroastrianism monuments and other non-religious monuments including 37 famous monuments that are collected from religious buildings of Muslims, Christians, Zoroastrians and some non-religious buildings, collections and materials used in their construction together with non-religious buildings, has been studied. In the next process, each of the materials received a code and as the numerical codes entered the SPSS phase. The difference among the used materials in each building were evaluated through nonparametric which is Kruskal-Wallis Test in order to identify whether that kinds of materials differs in different religions or not?

## RESULTS

The possible differences among religious building have been assessed and its comparison is done among different religions and non-religious buildings in the meaning oriented architecture. First, the kind of material is identified in the Table 1 and after encoding, the difference between the types of material in each of building type, have been studied with Kruskal-Wallis test is as follows.

Data source was obtained through observation checklist of five experts in this field (Memarian, 2008).

These table data indicates the type of materials used in each building. In order to provide an answer to the question; whether or not types of materials used in various religions are different, the nonparametric Kruskal-Wallis test is used as follows:

**Kruskal-Wallis test:** Kruskal Wallis (1952) test based on the maximum use of the material. So, in any type of building material has been determined based on the maximum rate.

According to the test results in Table 3, comparison of used materials in religious buildings for Muslims, Christians, Zoroastrians and other non-religious buildings, show that the chi-square ( $\chi^2$ ) calculated in 3 degrees of freedom equal to 272/11 which is compared with the index table, a significance level reduced to less than 0.5 and this indicates that the observed differences in the types of materials used in each group of Islamic monuments, Christianity, Zoroastrianism and non-religious, implies a significant difference. In other words,

Table 1: Materials used in the construction of religious buildings of Muslims, Christians, Zoroastrians and non-religious buildings

Religious buildings	Materials
<b>Muslim</b>	
Building the Kaaba, Mecca, Saudi Arabia	Stone
Mosque of Sultan Hassan, Cairo, Egypt	Stone, brick
Ibn Tulun Mosque, Cairo, Egypt	Stone, brick
Dome of the Rock, Palestine	Stone, wood, metal
Great Mosque (Umayyad Mosque), Damascus, Syria	Stone, marble, tile
Hagia Sophia, Istanbul, Turkey	Stone, brick
Blue Mosque (Sultan Ahmet Mosque), Istanbul, Turkey	Stone, brick
Suleymaniye Mosque, Istanbul, Turkey	Stone, brick
Shah Mosque, Isfahan, Iran	Brick, stone, tile
Jame Mosque of Yazd, Iran	Brick, stone, marble, tile
Sepahsalar Mosque, Tehran, Iran	Brick, stone, tile
Mosque in Natanz, Iran	Brick, stone, tile
Fahraj Mosque, Iran	Mud brick
Zavareh Mosque, Iran	Adobe, brick, chalk
Kerman Jame Mosque, Iran	Brick, stucco, stone and tile
Sheikh Lotf Allah Mosque, Isfahan, Iran	Brick, stone, tile
Rahim Khan Mosque, Isfahan, Iran	Brick, stucco, stone and tile
Hakim Mosque, Isfahan, Iran	Brick, stucco, stone and tile
Seyyed Mosque, Isfahan, Iran	Brick, stucco, stone and tile
Tarikhane Mosque, Damghan, Iran	Adobe, brick, chalk
<b>Christian</b>	
Surp Hripsime Church-Tabriz, Iran	Stone, clay, sand
Holy Rosary, Isfahan, Iran	Stucco, brick, adobe
Surp Sarkis Church-Lilava, Tabriz, Iran	Stone, stucco, brick, adobe
Surp Asdvadzadzin Church-Maralan, Tabriz, Iran	Wood, stone, brick, adobe
Surp Stepanos Church-Hakopjan, Julfa, Isfahan, Iran	Brick, brick, chalk, thatch
Surp Katarine Nunnery, Julfa, Isfahan, Iran	Wood, adobe, chalk, brick
Surp Sholakat Chapel, Tabriz, Iran	Stone, sand, lime, clay
<b>Zoroastrian</b>	
Helen Temple, Eastern Azarbaijan, Iran	Stone, clay
Azargoshasb Temple, Western Azerbaijan, Iran	Brick, mortar
Niasar Temple, Niasar, Kashan, Iran	Stone, mortar chalk
Espakhou Temple, North Khorasan, Iran	Rubble stone, mortar
Takhte Rostam Temple, Shahriar, Tehran, Iran	Brick, mortar
Darreh Shahr Temple, Darreh Shahr, Ilam, Iran	Cobblestone, chalk
<b>Non-religious</b>	
Shah Abbasi Caravanserais, Eastern Azerbaijan, Iran	Mortar, stone, brick, tile, lime
Khaje Malcolm Caravanserais, Maragheh, Tabriz, Iran	Stone, brick, brick, thatch, chalk, wood
Dokoohak Caravanserais, Shiraz, Iran	Stone, chalk, lime

Table 2: Rating given to each building based on the type of used materials

Building type	Abundance	Rating average
Islamic	57	46.25
Christian	27	64.85
Zoroastrian	12	66.00
Non-religious	15	69.10
Total	111	

Table 3: Nonparametric test, chi-square

Test	Materials type
Chi-square	11.272
df	3.00
Asymp. Sig.	0.01

Materials grouped by type of building

the hypothesis that the religion effects on the type of materials used in meaning oriented construction has 95% of being approved. Materials in each category of buildings are illustrated in the Table 4.

Table 4 was set based on the number of observations. For example, more mosques have been used in a variety of materials. In listed Churches Making used a variety of materials.

The Table 4 shows that in most of Islamic building composed of brick, stone, chalk, clay and cement whereas, the Zoroastrian buildings, were composed of, stone, chalk and mortar in the construction of religious buildings also, most materials such as brick, stone, clay, mud and wood were used in the Christian construction.

Materials such as stone, chalk and mortar were used in the construction of religious buildings in Zoroastrian. Also, the materials such as brick, stone, mud and partly wood were applied in the Christian building and usage of cement, sand and lime has been observed as the Table 1-4 illustrated, mostly, brick, stone, chalk, clay and partly, tiles were used in the Islamic building where as the Islamic Zoroastrian building was composed of stone, chalk and mortar. Also, materials as brick, stone, clay, mud and partly wood, also sand and lime were used in the Christian buildings.

In non-religious buildings as the inn, mostly composed of stone, brick, chalk and lime also partly of wood, tile, brick, cement and concrete are also observed.

Table 4: Matrices of type of material in every building

Materials	Frequency	Percentage	Type of building									
			Islamic		Christian		Zoroastrian		Non-religious		Total	
			Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Brick	Observed frequency	Percent of the building materials	16	28.1	5	18.5	1	8.3	2	13.3	24	21.6
Rock	Observed frequency	Percent of the building materials	17	29.8	4	14.8	5	41.7	3	20.0	29	26.1
Wood	Observed frequency	Percent of the building materials	1	1.8	2	7.4	0	0.0	1	6.7	4	3.6
Metal	Observed frequency	Percent of the building materials	1	1.8	0	0.0	0	0.0	0	0.0	1	0.9
Tile	Observed frequency	Percent of the building materials	9	15.8	0	0.0	0	0.0	1	6.7	10	9.0
Marble	Observed frequency	Percent of the building materials	2	3.5	0	0.0	0	0.0	0	0.0	2	1.8
Adobe	Observed frequency	Percent of the building materials	4	7.0	5	18.5	0	0.0	1	6.7	10	9.0
Clay	Observed frequency	Percent of the building materials	1	1.8	3	11.1	1	8.3	1	6.7	6	5.4
Chalk	Observed frequency	Percent of the building materials	6	10.5	4	14.8	3	25.0	2	13.3	15	13.5
Sand	Observed frequency	Percent of the building materials	0	0.0	1	7.4	0	0.0	0	0.0	1	1.8
Cement	Observed frequency	Percent of the building materials	0	0.0	1	3.7	0	0.0	1	6.7	2	1.8
Lime	Observed frequency	Percent of the building materials	0	0.0	1	3.7	0	0.0	2	13.3	3	2.7
Mortar	Observed frequency	Percent of the building materials	0	0.0	0	0.0	2	16.7	0	0.0	2	1.8
Lime and soil mortar	Observed frequency	Percent of the building materials	0	0.0	0	0.0	0	0.0	1	6.7	1	0.9
Total	Abundance	Materials percent of the building	57	100.0	27	100.0	12	100.0	15	100.0	111	100.0

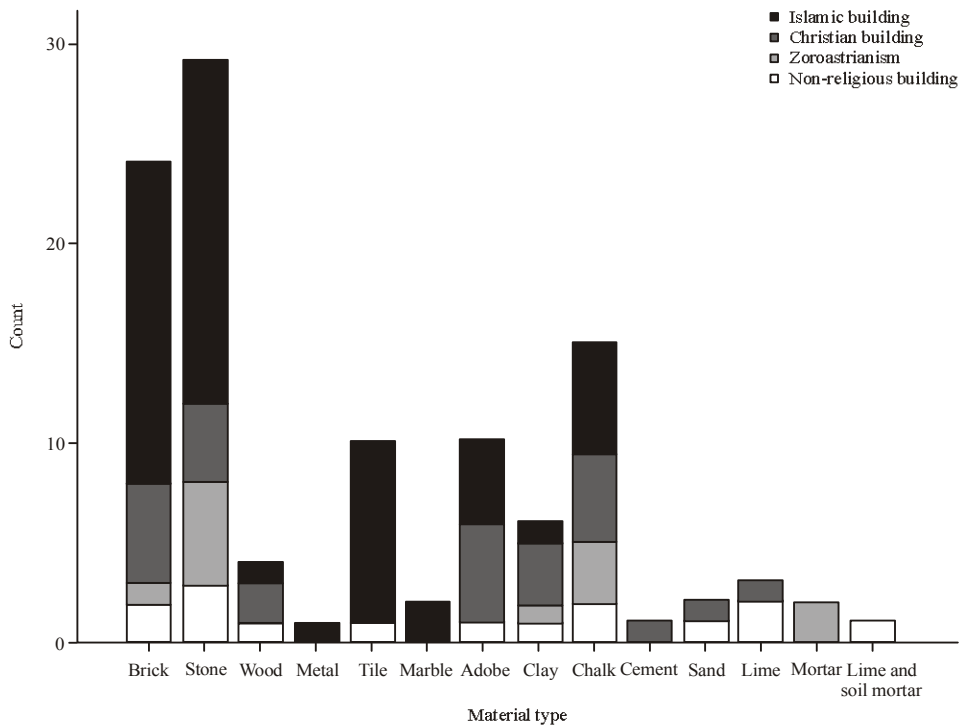


Fig. 1: Types of materials used in the construction of buildings

**DISCUSSION**

The material used in the building based on domestic priority and it indicates the importance of material type in the construction of the related building. For example, materials such as stone, brick are used in the Islamic buildings where as the Zoroastrian buildings mostly composed of stone. The usage of tile was observed in the Muslim building, the material that never used in the Christian building, Fig. 1 shows the difference in the material type in the construction of building:

Figure 1 is based on the average of the highest materials of all buildings drawn.

Here tile word is seven colored tiles that used in Islamic buildings and other buildings in Islamic regions.

In Fig. 1, evaluation of materials used in buildings and their priority shows the priority of each of the materials used in the building have been adjusted to local interests and reflect the importance of the type of building materials is regarded.

For example, in most of the Islamic buildings the used materials were stone and brick. While most of the buildings associated with Zoroastrianism, the use of stone was common in the building construction Also; lime was used in the buildings associated with Muslims. Why is lime never seen in the Christian buildings? The differences in the type of building

materials used in the religions of Islam, Christianity and Zoroastrianism, indicated some similarities as well as differences. The differences that may result from the initial vision in making, such building which caused the same materials to be used more than other types over the time. For example, building materials for Churches were the same as these, used for domestic buildings until the 4th century. Walls were of crude brick and roofs of palm trees covered with a layer of mud. When Christianity became the official religion in Egypt, Churches were built of stone with marble columns and wooden roofs such as those that we see now in Cairo. But this is not deniable that time and space phenomena partly influenced the type of used material. As the tiles usage was seen in the mosques' construction which was the result of Arab developed his communication with other culture and architecture. The significant and visible point lies in the difference of the type of materials used in the selective buildings.

In previous study has also been noted. For example, research showed regarding columns, they are considered the most valuable architectural remains in mosques and buildings. At the early stages of mosque architecture, columns had been built by using the trunks of palm trees. Then, the industry of construction materials flourished, when stone and mud were used to build columns. As a matter of fact, the Greek and Roman architectures inspired Muslim architects to use stones as construction materials for building columns (Saniei and Delavar, 2012).

The subject is somewhat influenced by geographical regions. For instance, In the Middle East the most used materials were clay and brick which has played a substantial role in the construction of different abodes, e.g., Ottoman governors were more concerned to build mosques like Alkhaski mosque, Ahmadiyya mosque (Medan) and Hayderkhanah mosque as well as Quran teaching schools (Tkaya) such as Albanndnaiji (Mandalawi) tkaya, Khalidiya tkaya and Sheikh Hassan Altayar etc. Hayderkhanah mosque was a distinctive building. Materials used in this building were wage, gypsum and marble (Al-Taie *et al.*, 2012).

From one hand, the role of religious instruction and the construction of religious buildings mustn't be neglected. According to the religious instructions, luxury and decoration must be avoided in the usage of materials and the materials which are available must be applied. In the Muslim religious instructions, it's prohibited to decorate the mosque like Jews and Christians places of worship. As the Nouri (1986) writes: The Holy Prophet (PBUH) said: Don't decorate the mosques in the way that Jews and Christians people do.

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