

VOLUME IV

RESEARCH AND TEACHING IN DESIGN AND MUSIC

INVESTIGAÇÃO E ENSINO
EM DESIGN E MÚSICA

INVESTIGACIÓN Y ENSEÑO EN
DISEÑO Y MÚSICA

CHAPTER II
ARTIGO 6

DOI: 10.53681/2024.103/14

**EVALUATION AND
ANALYSIS OF KNOWLEDGE
DEVELOPMENT IN THE FIELD OF
MICROARCHITECTURE-BASED
JEWELRY DESIGN:
AN APPROACH TO AESTHETICS**

ABSTRACT

The design and manufacture of jewelry is one of the oldest decorative and applied arts. This art, by using the creativity of designers in the design and construction sectors, produces valuable products and ultimately growth of individuals and economies of countries. This article focuses on the design and manufacturing of microarchitecture jewelry. Therefore, a review study was conducted in order to obtain basic information in published articles. In the review section, by searching the keywords Jewelry or Jewellery in the Scopus database, 4,330 articles were extracted and on the web of science, 5,260 articles were extracted. In the next step, by searching for the keywords Jewelry or Jewellery and Aesthetics 30 articles and by searching for the keywords Jewelry or Jewellery and Architecture 0 articles were extracted from the Scopus database. According to the obtained information, most of the authors pay attention to materials more than other cases in the design and manufacture of jewelry, and the number of articles in the field of jewelry which are specifically with a microarchitecture approach is very limited. In order to complete the data, a case study was conducted through a questionnaire, and according to the results, it can be concluded that the design of jewelry inspired by architectural features can greatly influence the introduction of the culture and art of a nation, and this style can also attract the attention of tourists and customers and promote the economic growth of the country.

KEYWORDS

Jewelry, aesthetics, microarchitecture, design

RESUMO

O design e fabrico de joias é uma das mais antigas artes decorativas e aplicadas. Esta arte, ao utilizar a criatividade dos designers nos sectores do design e da construção, produz produtos valiosos e, em última análise, o crescimento dos indivíduos e das economias dos países. Este artigo centra-se no design e fabricação de joias de microarquitetura. Assim sendo, foi realizado um estudo de revisão com o objetivo de obter informações básicas em artigos publicados. Na secção de revisão, através da pesquisa das palavras-chave Jewelry ou Jewellery na base de dados Scopus, foram extraídos 4.330 artigos e na web of science foram extraídos 5.260 artigos. Na etapa seguinte, através da pesquisa pelas palavras-chave Joalheria ou Joalheria e Estética, foram extraídos 30 artigos e pela pesquisa pelas palavras-chave Joalheria ou Joalheria e Arquitetura, foram extraídos 0 artigos da base de dados Scopus. De acordo com a informação obtida, a maioria dos autores dá mais atenção aos materiais do que outros casos no design e fabrico de joias, e o número de artigos na área da joalheria que abordam especificamente a microarquitetura é muito limitado. Para completar os dados foi realizado um estudo de caso através de um questionário e de acordo com os resultados pode-se concluir que o design de joias inspirado em características arquitetónicas pode influenciar muito a introdução da cultura e arte de uma nação, sendo que este estilo também pode atrair a atenção dos turistas e dos clientes e promover o crescimento económico do país.

PALAVRAS-CHAVE

Joalheria, estética, microarquitetura, design

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1. INTRODUCTION

Clothing and accessories that entered human life in the early ages with basic functions took on tasks such as sending messages and shaping social identity. In general, humans need to produce artistic elements in order to mark history and convey culture or identity in this way. Accordingly, traditional clothing and accessories, as a product of a culture, are one of the most important indicators of the lifestyle of societies (Aydm et al., 2013; Mena, 2022). The tendency to adorn oneself has been noticed since the beginning of human creation. Jewelry making has been an industry since the past, and after the 18th century it became a branch of art and found its place in the history of Contemporary Art. The shapes and materials used in making jewelry have transformed by the advancement of mankind in industry, technology and intellectual evolution. Classic jewelry, which precious metals and stones were used in them, gave way to more modern and unlimited jewelry, in which any type of material can be used (PhD Map_JJR, nd & Maghsoodi et al., 2016).

In the Stone Age, stone and bone were commonly used to make jewelry. After metal was discovered, the production of these types of arrays continued alongside the production of metal arrays. The jewelries which have been discovered since the beginning of the Metal Age include: spindle-shaped or quadrilateral bone pins in cross sections, bone pendants or in snail and tubular forms of copper, and later, necklaces made of beads, the most common of which were multi-colored and single-grained. Cylindrical ones in white, gray and black colors became common. Gradually, the use of colored stones in the construction of metal arrays became popular. With more knowledge of tools and materials, various engravings and carvings on ornamental stones were also added to jewelry design patterns (Raei, 2013). In this era, every material including stone, wood, bone, metals and precious minerals, was used to make jewelry (Chavashbashi, 2013).

Certainly, every country has its own record regarding the design and making jewelry. Iran, due to its old history and its rich metallic nature, can claim to be an ancient civilization and oldest history of metallurgy. The very valuable and expensive artworks that today adorn the prestigious domestic and foreign museums and private collections of famous collectors all over the world reflect the fact that Iranian gold and jewelry makers in various historical periods, both before Islam and after, have had an extraordinary skill in making precious ornaments and jewelry (Seighali, 2013).

Now, manufacturers of luxury products, especially high-quality jewelry and clothing, adhere to values such as environmental and cultural considerations in order to connect with consumers. This is how producers can improve their identity and quality by pursuing sustainable development and considering consumers' awareness of social and environmental issues (Lerma, 2018).

Aesthetics in jewelry design are among the basic needs and refers to the visual, sensory and experimental appeal of a product. Typically, aesthetic designs evoke positive emotions in users and can promote user interaction with the product and strengthen the sense of connection with the designed product (Moraes et al., 2017). Humans use information obtained from different methods (senses) to understand products. Even when people are exposed to single-mediated stimuli (eg, seeing an image), it is not only the visual system that is directly stimulated, but also other senses (albeit indirectly) in the process (Gambera et al., 2019). In some ways, aesthetics can play an important role

in conveying product or brand identity, values, and visual communication. In the global jewelry industry, products are marketed that have high value both because of their material value and their symbolic and aesthetic meaning. Millions of people are employed in the global jewelry industry, and the entire economic prosperity of some countries depends on this business (Moraes et al., 2017). Based on this fact, paying attention to this industry and examination of ways to improve this industry, in addition to its spiritual, symbolic and aesthetic role, can also play a significant role in the development of the economy of countries. The purpose of this study is to examine jewelry with an impact of aesthetics and microarchitecture approach.

1.1. AESTHETICS

Life consists of shapes, forms, and objects which the initial and non-judgmental exposure to them causes a reaction and a level of excitement. Of course, if this effect is more profoundly able to communicate with the audience (user, customer...) the person will focus on it, otherwise he will pass it. This is a very sensitive stage for the designer (Taybi & Fardpur, 2012) because this process establishes harmony between the designer and the customer.

Beauty can affect people in many ways, it can be comforting, confusing, pleasing, engaging, inspiring, or terrifying (Scrotten, 2009). Aesthetics of Greek origin (Aisthanesthai) and means sensory perception (Soleimani & Mandgari, 2016). Although the concepts of beauty in the form of the word “Beauty” go back to Greek philosophy, the word “Aesthetic” was introduced by German Alexander Baumgarten in 1750 (Lothian, 1999). The basic concepts of aesthetic elements are considered the basis of the formation of the design from an artistic point of view. These concepts include: basic shapes, constructive forms, textures, colors, etc. which are gathered in the form of composition and form the foundation of visual and applied arts. Among these concepts, form carries a more prominent semantic burden in creating a design (Taybi & Fardpur, 2012).

The definition of the product’s aesthetics as an object component of an artifact is applicable not only to visual aesthetics but also a non-visual aesthetics. For example, Postrel refers to texture as non-visual elements in addition to color and form. In other words, both types of aesthetics of the product are objectified, because people define beauty as something that lies in an object, rather than exclusively the result of a positive feeling of the body. A positive (or negative) feeling is a kind of reflection of the human reaction to these product characteristics, and speaks to the degree to which a person believes that the product is aesthetically pleasing (Sauer & Sonderegger, 2022). In other words, beauty has two types of characteristics: external and visual characteristics that are perceived by the human senses and internal and invisible characteristics that are perceived by human thought and reason (Soleimani & Mandegari, 2016).

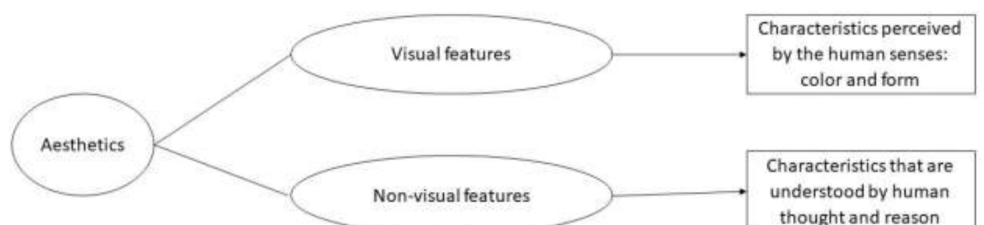


Fig. 1. Aesthetic features.

1.2. MICROARCHITECTURE

Many people are interested in the specific forms of their traditional architecture, and that's why architects turn to historical buildings to create forms and decorations. This interest in microarchitecture structure varies greatly by region and period (Lambourn, 2011). Also, among the motifs used in the design and manufacture of jewelry that enhance the visual value is the inspiration of architectural motifs. Many objects and designs from the late 13th century onwards show that the design theory used in small works is similar to that used for large structures (Bucher, 1976).

When it comes to architecture in goldsmithing, especially jewelry-making, microarchitecture is not a representation of a real architecture. Each piece should be considered as an architectural form, including architectural details, which form the basis of the goldsmith's work as a whole. The use of this element – the details or decorations in the architecture of a certain period – in jewelry making the researcher confronts some issues. The most difficult thing to solve is whether the model of a goldsmith's work in this case is architecture or perhaps both art-architecture and goldsmith – have adopted some particular decorative themes of a given time (wrześniak, 2019).

In general, the topic of microarchitecture in jewelry refers to complex and precise designs that imitate architectural elements on a smaller scale. This design approach involves creating pieces that resemble buildings, structures, or architectural motifs (part of a structure). These designs can be both modern and traditional, inspired by different architectural styles and eras, resulting in pieces that are not only aesthetically pleasing, but also tell a story or evoke a sense of heritage and culture. In the design with a microarchitecture approach, columns, arches can be inspired (for example, inspired by the sashes of Iranian palaces, domes or even famous architectural monuments such as the Eiffel Tower, the Taj Mahal or the Colosseum.) Microarchitecture in jewelry is a combination of art, design and industry that pushes the boundaries of traditional jewelry techniques. It enables creativity and innovation, enabling designers to transform architectural wonders into a wearable piece by adding value.

The design of jewelry with microarchitecture structure can be displayed in different models, for example, it is possible to fully display the desired building in the design and manufacture of jewelry. You can also get inspiration from parts of the architecture of the buildings to make jewelry.



Fig. 2. Making jewelry inspired by historical monuments. (Font: My Modern Met, 2021)



Fig. 3. Ring design inspired by the Orosi windows of Golestan Palace.
(Font: A'Design Award & Competition)

In some cases, artists use building's materials to make jewelry. For example, we can refer to the artwork of Sabine Pagan, called " VALS ROCK ". Vals is the name of a region in Switzerland where the stone is abundant and has been quarried since 1950 (A'Design Award & Competition, n.d.).



Fig. 4. VALS ROCK SERIES, 2016.
(Font: S.P. 2024)

2. METHODOLOGY

The study consists of two parts:

- The review
- Case study

In the review studies section, after initial search in Google Scholar and according to the title of the article, the keywords "jewelry", "jewellery", "aesthetics" and "microarchitecture" were first selected as keywords and library resources related to the keywords and title of the article were studied.

Next, due to the breadth, in the first step, in general, by searching the keywords Jewelry or Jewellery in the Scopus database, 4,330 articles and 5,260 articles were extracted from the Web of science. In the next step, by searching for the keywords Jewelry or Jewellery and Aesthetics from the Scopus database, 30 articles were extracted and by searching for the keywords Jewelry or Jewellery and Architecture, 0 articles were extracted from the Scopus database. By filtering and selecting articles that use Jewelry or jewellery keywords and published between 2016 and 2023,

1,878 articles were extracted from Scopus and 1,362 articles from web of science. Then, from the results obtained, the following were removed:

(1) duplicate articles. (2) articles with incomplete information such as keywords, journals, or authors' names (3) conference papers or articles published in Business Journals (4) books, book sections (5) articles that were not relevant to the topic

Bibexcel software has been used to analyze bibliometric data due to its high flexibility in data entry as well as compatibility with other databases such as Scopus and Web of science and visual tools such as Gephi or VOSviewer employed in the study. The density in VOSviewer software reflects the power of interaction between keywords.

3. RESULTS ANALYSIS

Data collection was done by two methods, the first part of data collection was carried out through the analysis of the findings from the questionnaire in the form of Google form. Respondents to the questionnaire included men (41.7%) and women (58.3%), some of whom had equal experience in jewelry design, and some of whom had no background in the field. According to the results of the questionnaire, the design of jewelry inspired by architectural features can greatly influence the identifying and spreading of the culture and art of a nation. And this style can also introduce the traditional architecture of a country, and if inspired by the architecture of traditional and modern buildings of countries, in the design of jewelry, it can also attract the attention of tourists and customers and help the economic growth of countries. In the second part, the bibliometric analysis method was used to perform the analysis. The reason for choosing this method is that it is easier and more reliable to analyze hundreds of articles compared to other methods. Bibliographic analysis can analyze relationships between articles, common citations, and keywords, so the results can provide comprehensive information. This method helps the reader to easily and clearly identify clusters of their research interests in the field.

Fig.5 shows articles published along with the keywords Jewelry or Jewellery in the web of science database from 2000. According to this chart, it can be noticed that the attention to jewelry and jewelry has increased in recent years than in previous years, and since 2000, the average number of articles published in this regard has increased (643.59%). The peak year for which the most articles were published was 2020 with 299 articles in Scopus and 326 articles in Web of science.

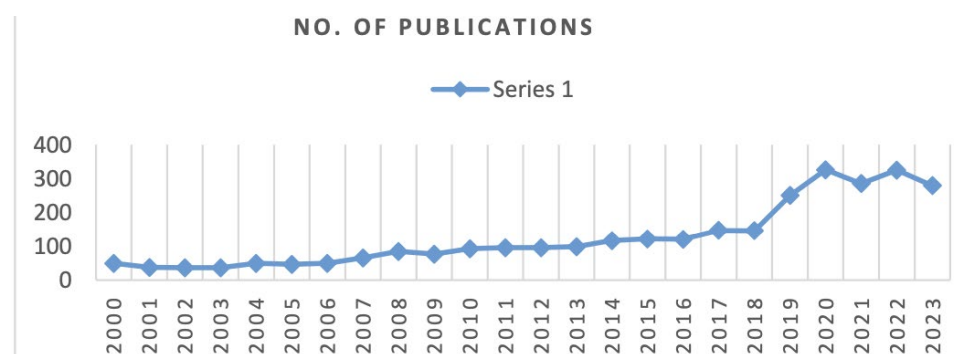


Fig. 5. Articles published since 2000 (web of science).

According to Fig. 6 the ten authors who published the most articles related to the keywords Jewelry or Jewellery are as follows:

Lu, T with 29 articles, Colomban, P 27 articles, Hatipoglu, M 26 articles, Guo, Q 26 articles, Liao, L 24 articles, Mei, Le 22 articles, Thyssen, J 21 articles, Li, Yan 19 articles, Shen, A H 19 articles and Chen, Q 16 articles.

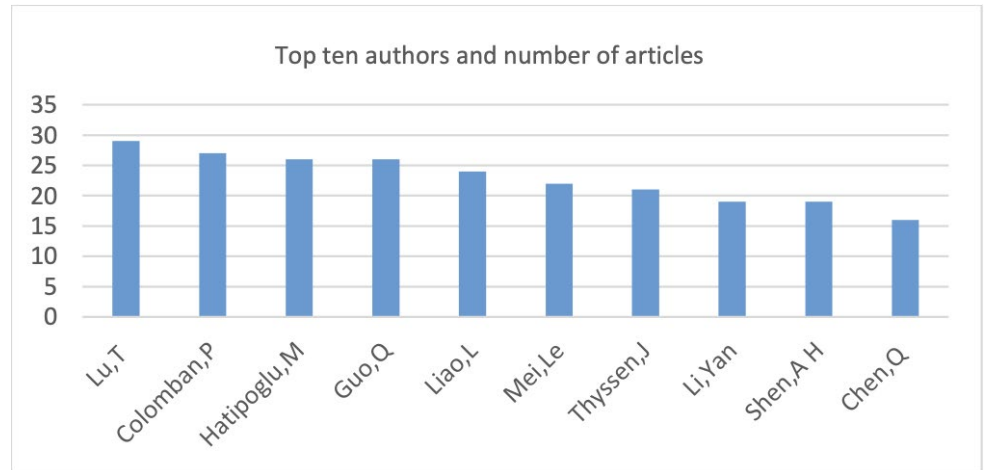


Fig. 6. Ten authors with the most articles published on the web of science.

Fig.7 shows the most geographical locations that, according to Web of science, published the most articles related to the keywords Jewelry or Jewellery. The United States of America and China published 587 and 479 articles, respectively. The UK and Russia also rank third and fourth respectively with 242 and 191 articles published. Accordingly, it can be concluded that the topic of jewelry and jewelry has become popular in the United States of America compared to other geographical positions.

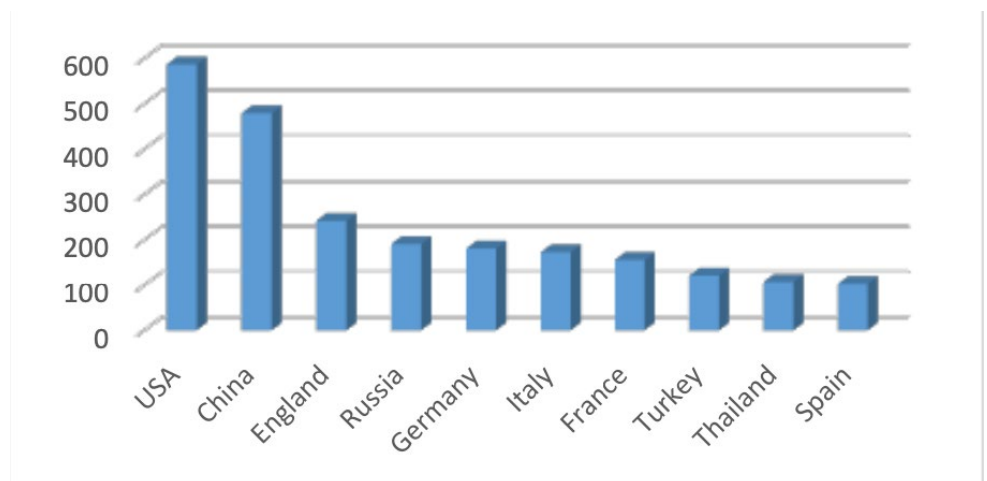


Fig. 7. Ten geographical locations and number of articles published.

In Fig.8, it shows the degree of relevance of keywords to Jewelry or jewellery keywords from articles. According to this image (Fig.8), we can see what keywords the authors use most and communicate them to each other. By viewing this image, it is possible to see what topics most authors choose in relation to jewelry. According to this image, the most relevant keywords in this cluster are "design", "gold" and "nickel". It can be argued that the attention of most writers in the field of jewelry is more on the design and materials used in its manufacture. Another feature of this image (Fig.8) is the connection of the key words with each other.

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HOW TO REFERENCE THIS ARTICLE

Naeini, H. & Samiei, S. (2024). Evaluation and analysis of Knowledge Development in the field of microarchitecture-based jewelry design: an approach to aesthetics. *In* Raposo D., Neves J., Silva R., Castilho, L.C. & Dias R. *Research and Teaching in Design and Music Vol. IV* (147-158). *Convergências Research Books Collection*. Editions IPCB. pp. <https://doi.org/0.53681/2024.103/14>

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In the same sense, in 2024 the book "Research and Teaching in Design and Music", Volume IV, is the result of short articles approved in *Double-blind peer review* and presented at the 9th EIMAD - Research Meeting in Music, Arts and Design.