

The Selection and Research of Materials Based on the Sculptural Thoughts and Emotions of Artistic Forms

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Abstract: Sculpture is a three-dimensional art that requires the use of certain materials for its support. The image of sculpture is based on material, one of the elements of the sculptural image, using carving, welding, moulding or casting on a variety of different materials to give the work a unique aesthetic meaning and convey the sculptor's thoughts and feelings. The various artistic forms of sculpture convey different ideas and feelings to people, and the viewer has different perceptions.

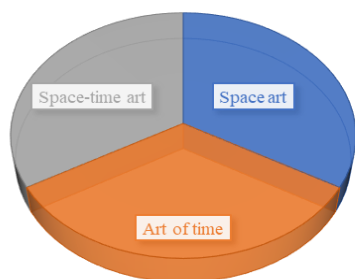
Keywords: Sculpture; Ideas And Feelings; Materials; Art Forms

1. INTRODUCTION

The formal ways of art can be divided into spatial art, temporal art and spatio-temporal art according to the form of existence, and the structure of art can be divided into visual effect art, auditory system art, visual art and imaginary art according to the way of perception. As shown in Figure 1. The sculpture must be made of certain material materials and must be made to occupy certain spatial coordinates in the immediate three-dimensional space of the visible static data art marker image. The choice and application of materials is one of the elements in the whole process of creating sculpture (Braga & Pinto, 2022). The brand image of a sculpture is based on chemicals and the material is one of the elements of the brand image that gives the work its different aesthetic qualities. Materials are a prerequisite for creating sculptures with chemicals, and the form and spirit of the work depends on them. The choice and use of materials has a direct impact on the form and development of the idea of the work. Choosing the right materials for your work will help you to express your subject matter. In a typical sculpture there are two main ways of using and expressing materials. One is the recognition of the elements of the material itself, such as clay, layering, principles and many other elements. Not only does this reflect the primary expression of the form, but also the material itself. In this case the material is active, concerned with itself, reflecting the object and producing a strong practical effect. On the other hand, the material is used as the element that gives form, and the social properties of the material itself are not the main concern, but only the aesthetics of the

design and the specifics of the mark. In this case, the material is used only to serve a purpose and has no influence on the work. The expression of sculpture is closely linked to the material. With the development of productivity levels and the release of ideologies, there are a great variety of materials that can be used to write sculpture (Borovaya et al., 2021). When writing sculpture, one must take care of the material itself, dialogue with it, experience and interact with it, presenting its characteristics to the sculpture so that the irreplaceable linguistic characteristics of the sculpture can be rediscovered and the thoughts and emotions of the creator can be felt.

**ART FORMS CLASSIFIED
ACCORDING TO THE FORM OF
EXISTENCE**



**CLASSIFICATION OF ART FORMS
ACCORDING TO THE WAY THEY
ARE PERCEIVED**

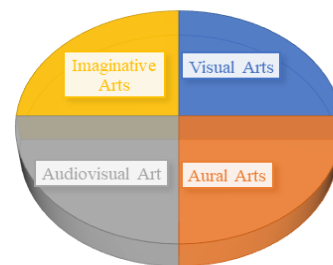


Figure 1: Form classification of art

2. SCULPTURE AND MATERIALS

2.1 Sculptural Materials

2.1.1 The development of sculptural materials

The evolution of materials has actually accompanied the development of mankind over time. As people learned to use tools, the definition of materials changed and evolved along with the level of productivity in society. As human civilisation marched on, so did sculptural materials (Brilli & Savin, 2019). Beginning with the firing of pottery from clay in primitive times, as production processes and quantities increased, more and more materials were used and man's ability to use tools increased considerably. Later, wood, stone, brass and, following industrialisation, various new composite materials were developed. The history of material development is shown in Figure 2. The real development of sculptural materials came at the end of the 19th century, with the emergence of new ideologies in the plastic arts that disrupted traditional modes of thinking and the realisation that the representation of the object was no longer the only criterion for evaluation. Radical masters of art continued to challenge the shackles of

tradition, and in their vision of the plastic arts there was no clear definition of the primary language of expression for materials, all materials could be transformed into the primary language of expression for sculpture in a given context. New technologies are constantly being used for the study and application of materials, and the development of materials has become multifaceted (Jue & Jue, 2021). The development of sculptural materials has increased the possibilities for creating sculptural plastic art, including new understandings and applications of traditional materials, the exploration of new materials, and creative practical activities involving new materials. The richness and diversity of materials used to make sculpture has made it easier for sculptors to express their creative sensibilities.

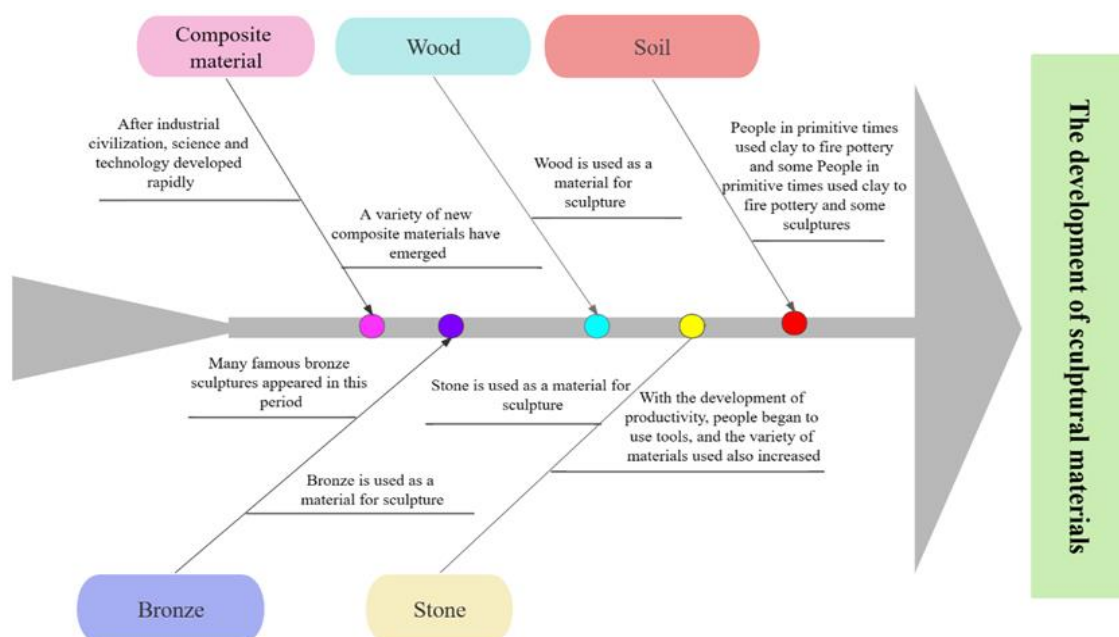


Figure 2: History of material development

2.1.2 Material and textural expression of sculptural materials

Materials refer to the textures and layers of materials that often give us an intuitive vision and experience, such as transparent and translucent glass, cool and bold metals, natural and ecological woods, and the strength and weight of plastics. The qualities of these materials often express the aesthetic textures required for each individual to perform their work, but these expressions can be directly related to our experience and judgement of the material. If we selectively ignore them, there is no real harmony between the material and the work, and the emotions and statements of the work are not properly expressed. Some literary artists choose sculptural materials in a way that violates their acceptable aesthetic value, but still demands more than the effective level of those materials, with the result

that they lose more than they gain. For example, if a modern, contemporary work is created but it is made of dense, dark materials, the characteristics of the chosen material are inconsistent with the aesthetic quality of the work and therefore incompatible with the modern, contemporary nature it is intended to convey (Kang & Kim, 2020). When the artist's creative intent and the language of expression are not in harmony, the artistic beauty and expressive power of the work is not evident.

There are several ways in which texture can be expressed. The first is inherent in the material, such as the grain of a tree, and many artists use this free-growing texture in their work in order to fully express the artistic beauty of the wood. The second occurs in the middle and later stages of creation. Many artists are unable to achieve the texture of the existing material and actively alter the material to create more texture in order to achieve the aesthetic expression of a masterpiece. These alterations produce much more texture than the natural texture. Examples include polishing rough stones, electrochemical etching of cold hard stones, firing of clay and the creation of various patterns by machine. These different artificial interventions enrich the form of the sculptural material and enhance the artistic beauty of the work. As shown in Figure 3.

The way the texture is expressed

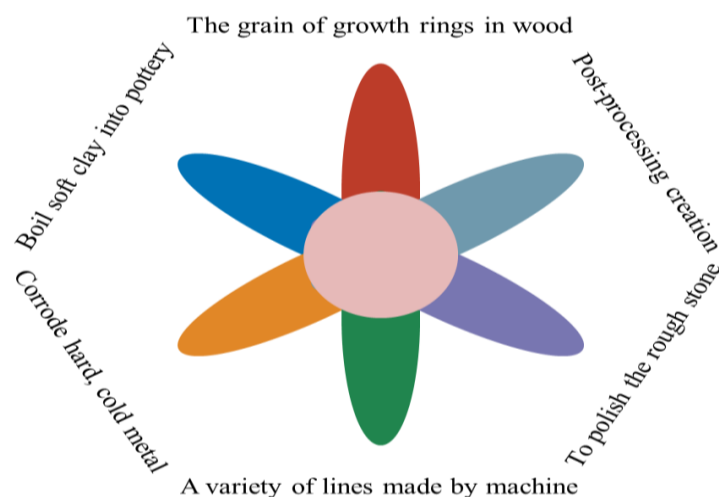


Figure 3: Representation of texture in sculpture

2.1.3 The artistic aesthetics of sculptural materials

The aesthetic value of the materials used in sculpture comes from a variety of sources, including the behaviour of the material, the nature of the texture and the perception of the material. The potential aesthetic value of a material must be sincerely explored and developed by those who use

it in order to discover deeper aesthetic properties beyond its physical characteristics. This is shown in Figure 4. For traditional materials, such as brass, which symbolises power and profit, or jade, which symbolises status and money, they have different aesthetic values, and there was once a consensus on these values (Kim & Yong, 2021). However, with the application of new technologies and the use of advanced processes, the physical properties of the materials have acquired a high degree of richness and colour, and the aesthetic values of the materials have been explored as never before, in terms of the use of common metallic materials that represent both industrial civilisation and modern technology and the future of innovation. Underpinned by new ideas and concepts, materials can be imbued with a sensual and specific aesthetic value, and when masters of art bring their own personality and excellence to the expression of the basic expressive language of writing, the organic chemistry of the work goes far beyond the way we perceive it, deepening the level of expression of the basic expressive language of materials as it relates to the personal emotions of the creator. For example, in Hashur's secondary work 'Garbage Man', made from discarded materials, these discarded materials, which are no longer of much use, are given new value and meaning by the creator's own ideas.

Sources of aesthetic value

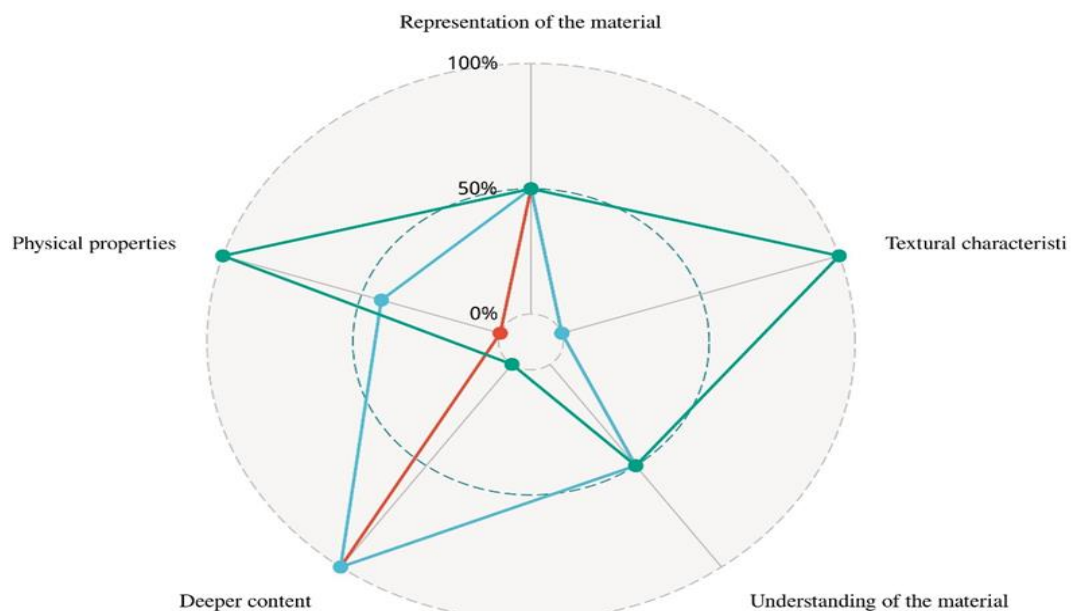


Figure 4: Sources of aesthetic value in sculpture

2.1.4 Innovation in sculptural materials

Rapid technological developments have led to significant increases in

productivity levels and the discovery and use of many new, even unsafe, materials. New artistic concepts, supported by the application of new technological means for the further processing of sculptural materials, have led to a greater trend in the application of materials, which has given great dynamism and impetus to breakthroughs in sculptural materials (Kim, 2020). The application of a number of high-tech tools in the art industry has allowed you to use an increasing number of materials that at first glance are not needed at all. Examples include composite materials, organic plastics and other new technical materials. New artistic concepts are taking shape and artists are increasingly experimenting with the incorporation of sound, light, electricity, chemical changes and other technological means into their sculptures to create more technical and diverse sculptures. This is shown in Figure 5. Making sculpture more artistic and pleasing to the eye.

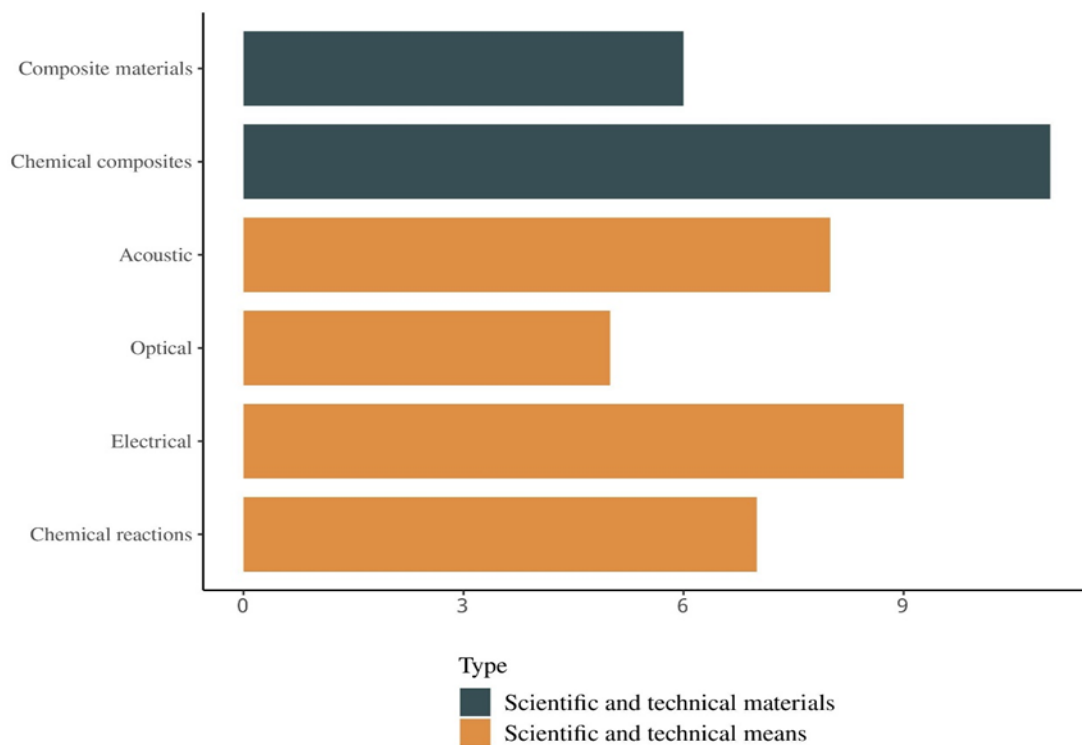


Figure 5: Innovative approaches to sculptural materials

2.2 The relationship between materials and sculpture

Materials are the material preconditions for artistic creation and are the mediating medium for transmitting the expressive power of the artistic language of sculpture. The choice of the right material plays an important role in expressing the cultural value of an artwork. Table 1 lists traditional and contemporary sculpture. In traditional cultures, where the artist is primarily committed to the perfect integration of artistic craftsmanship and

technique with the emotion of the work, materials are seen as purely organic and physical sculptural media, and the rich and varied aesthetic uses of the materials themselves are often overlooked (Knight et al., 2021). In contemporary art, public creation is increasingly dependent on the expression of the properties of the material, and the inherent aesthetic potential of the material is increasingly valued. In other words, the emotional expression of sculpture in contemporary art is increasingly dependent on the material. In the case of Cézanne's fountain, the perception of material has completely changed and the meaning of material in contemporary sculpture needs to be rethought and redefined.

Table 1: Traditional and contemporary sculptural works of art

Sculpture Categories	Name of work	Features
Traditional Sculpture	Terracotta figurines	Passing on a long cultural history from ancient times
	Zhuhai Fisherman's Daughter Statue	People miss history
Contemporary Sculpture	We travel together	Nature consciousness
	The Circle of Life	Rigid, heavy, ancient temperament and language The human body is ringed and linked at the beginning and end, full of movement

With the use of new materials, the number of sculptures has increased, the choice of materials has become more innovative and daring, and the approach to sculpture has undergone a certain intellectual liberation. Sculpture has evolved from a traditional monolithic approach to a modern diversity in which materials and sculpture are more closely linked. Sculptures made from materials with simple artistic solutions have become one of the most important means of expressing the artist's artistic ideas, and a new awareness has emerged that the value of the material is infinitely greater than the value of the work (Lee, 2021).

Although the material is very important, the material itself does not fully reflect the content of the sculpture; the artist must live and learn the idea and spirit of his creation as the primary means of expression. We should not presume that a pile of sand is a work of art; art is something that needs to be created and worked with in a rational and artistic way that brings out the spirit and meaning of the artist (McCarthy et al., 2020). After all, the material is a medium-textured particle through which the artist can express his or her artistic ideas. Tuffy Berger once said that the material itself is alive, not the spirit. It is as if the spirit of the content is the soul and the

material is the human body; a work of art can only be considered meaningful when the two are perfectly combined.

3. FACTORS INFLUENCING THE CHOICE OF MATERIALS FOR SCULPTURE

3.1 The choice of materials by the art creator

In the plastic arts, material is a necessary form of data visualisation. Having taken inspiration from an object, the artist transforms it into a new brand image through certain secondary creations, and material is the primary means of expressing this chemical image. Unlike traditional sculpture, where the use of materials is limited to the chemical medium, contemporary sculpture focuses more on the potential aesthetic value of the material and its openness to understanding and application (Ohseungjun & Chul, 2019). As an abstract sculptor, Craig is committed to the exploration of materials, and he understands how to use a variety of materials as a primary language of expression to achieve his preferred expressive effect. He is also adept at exploring the possibilities of materials and has an excellent ability to identify materials in literature. Even useless and cumbersome materials become full of life and vitality in his eyes.

When choosing materials for writing, the sculptor must select materials that are suitable for literary expression, which means that the aesthetic value of the materials must be consistent with the poetic meaning of the work. Of course, this does not preclude some artists from being creative and choosing 'metaphorical' forms of expression, using a material language that is consistent with the poetry of the work, which makes the choice of material even more important (Parfenov, 2020). The choice of materials and the use of their characteristics as the primary means of expression in a sculpture is a matter that must be carefully considered by the creator. The choice of materials depends on the artist's ability to understand and apply them.

The use of materials is related to the artist's thoughts and feelings; artists of different schools choose different materials according to their expressive needs, and the same materials can be interpreted in different ways depending on the view of the sculpture. With the theme of 'the most basic of human existence', the British artist Marco Quinn experimented with a variety of materials to test the boundaries of sculptural art. In his most famous work, *Self*, the artist created a sculpture of his own head based on a clot of blood taken from his own blood and frozen. This work requires

constant refrigeration and conveys life's dependence on new technologies and environments, as well as life's sensitivity to itself. American artist Jeffrey Koons is the most important pop artist since Violet Warhol. He knows how to transform everyday modern products - hoovers, basketball games, balloons - into beautiful sculptural artworks based on stainless steel sheets that test key concepts on a traditional aesthetic level. His work strives for perfection and visual impact, using different stainless steel materials to bring out the properties of the metal, such as shine and brightness, and polishing and plating to create beautiful and shiny works of art. In this way, he expresses, among other things, the endless impulses of our modern commodity society. Working in stainless steel, Geoffrey Smith was one of the leading post-war American sculptors, influenced by existentialist philosophy and focused on expressing his physical existence and psychological state in his work (Sharma et al., 2019). He wrote without preparing a manuscript in advance and did not sketch the final effect, but, like Pollock, he composed the consistency of the individual poses from a constant reflection.

Based on his own judgement and personal feelings, he welded various geometric shapes into animated, stylised sculptures in fibreglass. In the process, Smith polishes the surfaces of the sculptures, creating a rough texture that reveals the sculptor's personal touch and handling of the work. The result is a work with a significant material texture. Contemporary, British sculptor and conscious artist Gavin Tulk focuses on the small things in life to create works in bronze. Taking inspiration from everyday rubbish, Tulk participated in the Venice Biennale, where he created a sculpture that looks like a discarded plastic bag but is actually made of brass. What appears to be a discarded plastic bag is in fact a sculpture made of brass. Suggesting dominance, elegance and status, the brass is made from the cheapest of plastic bags, and the psychological fallout from the change in material reveals his profound reflection on the conspicuous consumption of society as a whole. The properties and characteristics of the new materials reflect the new era. Because many artists are able to use new materials as new inspiration, their works have a visual impact that is completely different from the traditional physical and psychological sensations.

When the haze in the city was getting worse, a Dutch artist used the basic principle of electrostatic attraction of dust to create a large electromagnetic field based on nanomaterials that absorbed the haze particles and then shrunk the collected haze particles to create a haze weather diamond ring

(Ko, 2022). The worst things always get better with a clever twist. The diamond ring made of hazy weather is very effective in communicating the creators' development philosophy of spreading environmental protection. As can be seen in Table 2, different sculptors have different preferred materials.

Table 2: Sculptors and materials

Sculptor	Materials	Creative characteristics
Jeff Koons	Transforming ordinary modern commodities into exquisite sculptural artworks through stainless steel	Challenging the traditional notion of aesthetic hierarchy, he pursues a pleasing visual effect that expresses the endless desires of the modern commodity society
David Smith	Expressing his physical presence and psychological presence in his work	The work is created through a continuous reaction of movements that polish the surface of the sculpture to create a rough texture
Gavin Tulk	A master of observing details in life and shaping them in bronze	The contrast in perception caused by the substitution of materials reflects the author's deeper reflection on consumerist society

3.2 The choice of materials by the art audience

Today, people's living standards have reached unprecedented heights and their aesthetic sensibilities are steadily improving. People's appreciation of sculpture is no longer limited to the level of 'beauty'; the harmony between sculpture and the natural and humanistic environment has also become increasingly important. The natural and human environment has a great influence on the cultural connotation, core content and thematic design of sculpture, as well as the expression of materials. Aspects of the influence of the natural and human environment on sculpture are shown in Figure 6. For example, in a kindergarten, children like to write sculptures in lighter, more colourful materials, and installing a cold-looking iron sculpture would not satisfy the demand for sculpture (Trizio et al., 2022).

It is therefore the people who have the greatest influence on sculpture. The raw materials for sculpture must not only conform to the new forms of public aesthetics, which are the most popular and visible to the audience in the plastic arts, but also to the characteristics of good use and convenience for the public, and finally, public art itself is characterised by its cultural and interactive nature.

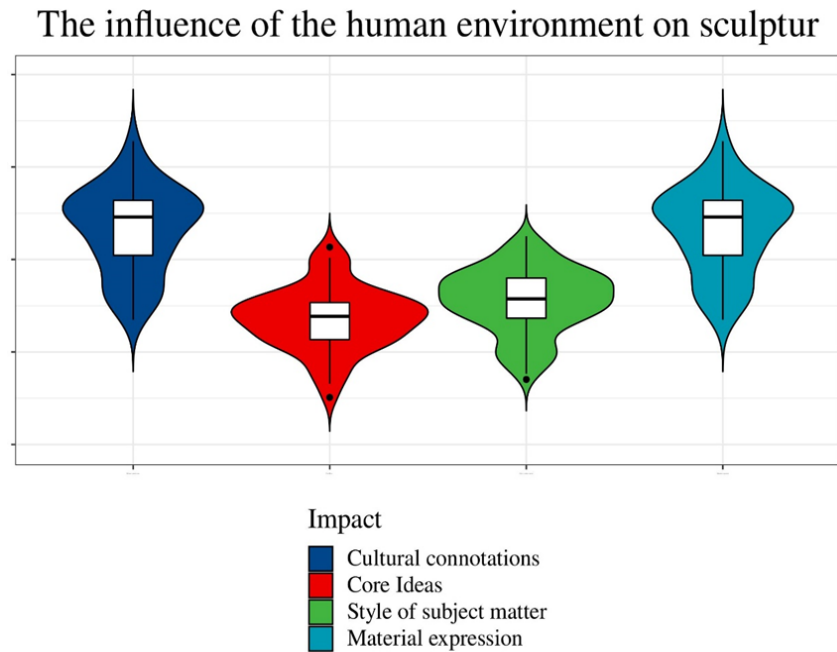


Figure 6: The influence of the natural and human environment on sculpture

New York's Millennium Park is a major cultural, arts and recreational district on the shores of Lake Michigan. The Outdoor Arts Centre, Cloud Gate and Crown Fountain have been known for the past thousand years as the gardens and ecological parks of the Big Apple. The Cloud Gate is a large public sculpture that leaves a lasting impression on the viewer. It is a sculpture made of stainless steel sheets with a polished surface, which have been highly polished and put together (Vermeij & Thomson, 2023). The entire sculpture, designed by the famous British artist Anis, resembles a giant silver bean with a spherical mirror body. Depending on the surroundings, one can see not only one's own reflection in the mirror, but also the view of the big city around the Eco Park. The skyscraper blocks form a breathtaking city skyline and a very large city skyline in the clouds. In the context of the display itself, based on surface mapping, Cloud Gate envelops the entire surrounding landscape in itself, invisibly complementing the mirror space and the alien space. Depending on the polar day and night, the seasons, and the time of day and orientation, Cloud Gate's oversized mirrored body always appears colourful and varied, providing great visual enjoyment to the viewer. Due to its curved structure, a 'gate-like' recess at the base of the sculpture provides an intriguing image of the mirror's internal structure at the back. This unique design is the most original single cloud door, a rare beauty for an interior artwork and has been described as one of the most successful and popular pieces of public art in New York. The stainless steel panels and the shape of the cloud door contrast with their surroundings, but this contrast is created in harmony. It

is definitely one of the successful works that combines sculpture and public space and makes full use of the aesthetic value of the material - the mirrored panels (Yisoon, 2020). It is a large sculpture, circular, with a full slope, which is also a sticker for the strength and plasticity of the material. Based on the characteristics of the material, Cloud Gate integrates the natural environment of the interior, both indoors and outdoors. The designer's central design concept makes this change profoundly practical and enables creation in terms of content identity and popularity.

3.3 Selection of materials for the environment

In this context, environment refers to all objects and conditions within the internal space in which the sculpture is located, including of course the entire and man-made environment. Differences in the environment of a site can affect the style, cultural heritage, size and choice of materials for a sculpture. We need to consider the full range of the environment, including landscape, topography and climate, so choosing materials for a sculpture is also a task (Yu, 2021). In complex environments, we need to be aware of the durability of the sculpture material, its resistance to corrosion and the changes caused by sunlight and weathering. We need to ensure that sculptures placed in the environment can be maintained over time without the natural elements altering the original meaning of the sculpture. Prolonged rainfall can change the shape and colour of a sculpture, or the climate of the sun can cause a sculpture to take on a different meaning from different angles over time. Table 3 provides some examples of how sculptural materials can be influenced by the environment. Materials are influenced by the environment in the following categories

3.3.1 The temperature and humidity of the environment

In outdoor public spaces, temperature is the first factor to be considered. High temperatures in the summer and very low temperatures in the winter can affect materials. Ambient humidity can also affect the expression of material properties. For example, metal materials are more likely to corrode and rust in a humid environment, many materials will mould in damp and cold conditions, and some materials will change their properties when humidity returns, causing sculptures to warp (Yeh et al., 2022). While we cannot rule out the possibility of a new wave of artists using temperature and ambient humidity specifically in their art installations, there is no obligation to consider temperature and ambient humidity-induced changes in materials together.

3.3.2 Climatic factors

UV light, frost and high winds are all likely to affect your sculpture. If the choice of materials is too arbitrary, it can spoil the poetry of the image and content, or lead to a waste of sculpture and resources.

3.3.3 The influence of species

Many materials, such as wood, plastic and some synthetic materials, can be consumed by insects, birds and other creatures. This process takes a long time, so several aspects should be considered when choosing materials to ensure the stability of public sculpture.

3.3.4 Vandalism

While some materials are durable, others are not. Clay is known to be very complex in composition and when fused with silt can easily leave stains on the surface of the material, some of which may be acid leach stains. This can have a detrimental effect on the appearance of the sculpture itself. It is important that the material is chosen so that it does not break easily, or that the structure is designed so that it is easy to clean.

Table 3: Courses Sculptural Materials and Environment

Materials	Affected Environment	Sculpture
Stone, Wood, Metal	Temperature and humidity	The "Lerooy" sculpture in France
Fragile Materials	UV light, frost, gale force winds	Welcome to the East Olympics Ice Sculpture
Wood, Rubber And Plastic	Insect, bird and other animal consumption	A wood carving of Qingming Shanghe River
Non-Stain Resistant Materials	Dusty components, rain and acidic corrosion stains	Outdoor Stone Sculptures

The Pavilion of Flowers is an example of how the environment can influence the choice of sculptural materials. The Pavilion of Flowers was created by the Planning Institute of the Nanjing Art Institute. The creative impetus for the work came from the design of potted flowers (plants) connected to the pavilion in the design department, giving it a new global poetic dimension. Using parametric design, the shape of the flowers can be instantly derived and digitally specified to create a temporary pavilion that visually supports the interior space and adds interest and hierarchy. A simple structural support point system using 272 hollow stainless steel round tubes as structurally precise connection points was created by electrofusion in various sizes, 703 stainless steel round tubes in total. The triangular grid formed by the structural management system was obtained

by computerised segmentation and refinement of the gallery surface, with the sides of the triangles made up of translucent PVC plastic sheets. When the artwork is exposed to sunlight or rain, the viewer has a very different visual experience at different times and from different angles (Young, 2022). The visual approach to artistic expression and the fairytale interior created by the dark shadows of skin and colour in the sunlight make it an iconic creative space for audiences of all ages on campus.

Using common packaging and construction materials, the creators of this work have captured the characteristics of a new material by applying a new style of material we have not heard much about but may have seen and used in the past, PVC, which is one of the most popular and most used high-tech generation materials. It has the advantages of being well coordinated, easy to shape, not easy to break, non-toxic, non-polluting and long storage time. This stretch film is in line with the artist's concept of writing "flowers". It allows for the flexible use of stainless steel tubes and stainless steel balls as structural support materials, gently defining the artist's 'formal' structure. The artist has also added a colour gradient to the translucent PVC material to create colourful projections as well as brilliant diffused light during the day when the sun is shining, and to create a beautiful atmosphere at night when the moonlight reflects on the track, creating a wonderful space for the public to receive and enjoy (Zhang & Yin, 2019). In addition, the PVC material is environmentally friendly, smooth and can be stored outdoors for long periods of time. The interactive space designed with this material blends in with the natural environment of the site, highlighting the artistic beauty and social thoughtfulness of the work as it should be.

4. CONCLUSION

The expressive power of sculpture is closely related to the materials used. With the development of productivity levels and the emancipation of mindsets, a wide variety of materials can be used to create sculpture. In creating sculpture, we must engage with the material itself, dialogue with it, experience and interact with its chemical composition, express its characteristics in sculpture and rediscover the irreplaceable linguistic expression of sculpture. For the cultural meanings brought by the material itself, it is important to avoid the direct use of symbolism and to complement the composition of the work's thematic ideas with its own original message, renewing the original true identity to achieve the

emergence of unexpected and authentic effects. When creating sculptures, one can experiment with different materials to evoke different associative content, but when it is clear what ideas and qualities the work is intended to convey, it is advantageous to choose the material that best suits the work so that the thoughts and emotions of the creator can be properly and accurately conveyed.

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