

Light and Shadow in Painting – Concerning the Expression of Shadows in Western Painting –

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Abstract. In realism paintings in Western art, as perspective drawing has developed, so has the artists' ability to create the illusion of space as they see it. One of the important techniques is the skill with which light and shadow are used to create the illusion of a three dimensional space on a two dimensional surface. In this representation of the space, if the light is not depicted on a picture plane, the three dimensionality of the objects will be weak. Then, my question is when the expression of shadow and shade is correctly performed, does it assure recognition of the depicted space? This study will take up Johannes Vermeer, who drew scenes of everyday life realistically, and consider his use of shadow and shade geometrically. I'd like to consider what kind of light and shadow he had in mind. As a conclusion, it can be said that his space was precise in terms of perspective; he depicted shade but not shadow precisely. That made his space lack unity, leaving his picture plane serene as if time had frozen in it. But if we suppose the world he wanted to express was not just a scene of daily life, but a story with a lesson to be learned, then without the precise depiction of shadow and shade, the viewer can tell the story is fiction.

Key Words: shadow and shade, Johannes Vermeer, realism, representation

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1. Introduction

The depiction of light and shadow is an important technique to represent illusory space in painting. Without light, nothing can be seen but with shadow and shade objects and the space surrounding them can be realistically defined.

Realism expressions try to describe objects truthfully. But in reality, even if the expression of shadow and shade is imprecise, people can recognize the object depicted. Even with only

contour lines, viewers try to figure out the shape of the space, the identity of the object or its mass. In order to represent realistically, there are techniques like, perspective drawing, shading, and chiaroscuro, which have been used in various ways, depending on the times and regions. In Eastern art, including Japan, the sense of shadow and shade is weak [1]. In Western art the periods before the Renaissance saw few expressions of shadow and shade. Shadow and shade started to appear on the picture plane after the invention of perspective drawing in the 15th century.

This paper takes up Johannes Vermeer, whose works are often described as “photo-like”. The author will consider one of his pictures and analyze it geometrically. What kind of characteristics does his picture plane have in terms of the expression of shadow and shade?

2. The Expression of Shadow and Shade

To place the light source and decide the quality, number or direction of the light and rays gives the depicted space reality, or unreality, in addition it sets the dynamity, quietness, mystery, or pleniness. In the West, there is a technique called *chiaroscuro*, which describes purely tonal monochrome paintings (such as Grisaille) relying for their effect only on gradations between brightness and darkness; as a result, the pictures placed on a wall look as if they were reliefs. De Piles, in his “Cours de Peinture (1708)”, defines it as ‘the art of advantageously distributing the lights and shades which ought to appear in a picture, as well for the repose and satisfaction of the eye, as for the effect of the whole together’ [2]. In the 15-6th century, Leonardo left a sketch of graded shadow and shade of a sphere. Until the mid 17th century, painters only expressed the light side of the object and the dark shade was used for the other side, but the shadows on the ground or on the wall were left unclear. That is, there wasn’t a clear intention to explain the relationship between objects and the unity of the space. In the 17th century, people started to think about geometrically logical shadow and shade. For example, Jean-François Nicéron drew a picture of an object casting its shadow on the ground, or Jean Debruil shows the shadows changing to angles of the rays [3]. About one century after perspective drawing had spread, the expression of shadow and shade was used to construct the wholeness of the picture plain.

It is Rembrandt who is famous as a master of chiaroscuro, or expressing light. In his works, the light and shadow with lamps and candles as their sources were depicted, making his picture planes dramatic. But his expression of the shadow and shade was not realistically precise; it makes us suspect the existence of light by the brightness and darkness. In his mind, he was not depicting shadow and shade, but light.

Also Gaspard MONGE insists to artists on the necessity of scientific consideration in his “Géométrie descriptive” (1811) [4].

3. On Johannes Vermeer

Johannes Vermeer was born in 1632 in Delft, Holland and stayed there throughout his life. He died in 1675. In 17th century Holland, an independent and unique art style was born as a result of the strictly regulated society in terms of politics, economy, religion and geography. Ordinary people bought small pictures, along with their everyday shopping at markets to put on their walls. Artists drew those small pictures to be sold as general merchandise. At the same time they commissioned works from the aristocracy. Contrary to Rembrandt who worked mostly in Amsterdam, Vermeer belonged to the Delft School. Among his contemporaries are:

Carel Fabritius, who deceived viewer's eyes by drawing as if the real objects existed, Hendrik van Vliet and Emanuel de Witte, who drew precise interiors of churches as if they were using perspective drawing, and Pieter de Hooch who drew scenes from everyday middle class life. Vermeer must have been influenced by these people.

There aren't many facts known about Vermeer's life. In his 43 years of life he left only 32 paintings (and 4 dubious ones), but only half of them have been able to be classified as to the order in which they were drawn.

Remaining are 2 landscapes, 5 portraits, 25 pictures of interiors and pictures with a story. Most of his works were described in detail depicting quiet scenes from everyday life as if time had frozen momentarily. As his interiors are so realistic, it is possible for me to reconstruct plans of the interiors of 14 of them [5].

4. "The Music Lesson"

4.1. The depicted space



Figure 1: Johannes Vermeer, "The Music Lesson (A Lady at the Virginal with a Gentleman)", c. 1662–1664, oil on canvas, 74 x 64.5 cm, The Royal Collection

"The Music Lesson" (Fig. 1) is said to have been drawn in the early 1660's, when Vermeer was on the verge of establishing his own style.

In the picture plane there are a woman and man standing facing a virginal placed in front of the wall. On the left, there are windows, and on the front side, there is a mirror reflecting

the woman's face and a picture hanging on the wall. In the foreground is a table covered with a carpet, and on it, there is a pitcher on a tray. Between the woman and the table lies a viola da gamba and a chair. On the floor, tiles placed at 45 degrees to the walls are making a pattern. The depth of the room seems to be emphasized by the pattern of the tiles, the windows and walls and the table. The room and objects in this picture often appear in his other pictures.

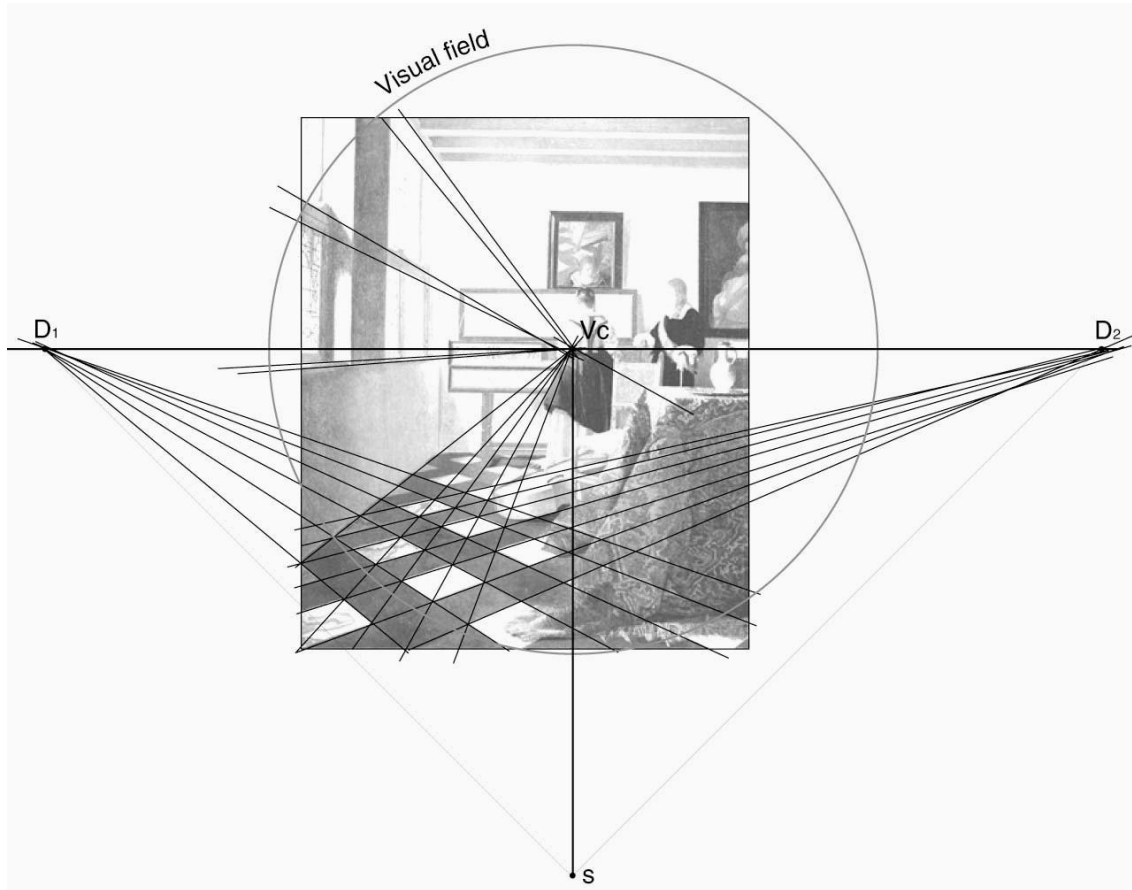


Figure 2: Analysis of the perspective drawing in “The Music Lesson”

As the picture looks like the artist followed one-point perspective projection, depth lines will be extended to converge at the woman's left elbow (Fig. 2). From that, the visual center (V_c) which is the vanishing point of depth lines, distance points (D_1 , D_2) and viewpoint (s) can be figured out and the plan and elevation of the interior can be drawn like the Fig. 3. As the distance of eye can be calculated from the size of the objects, it can be said that the painter was looking at the scene from the corner of the room facing the front wall. The image of the depicted objects is within the visual field, there are few distorted parts on the depicted space. The image is constructed according to the depth lines of the wall and the table which lead the viewer gently to the visual center; namely the two people. The precisely depicted space leads the viewer to see time as frozen, absorbing even the music from the virginal.

The rooms Vermeer depicted were shown by P.T.A. SWILLENs into 4-5 kinds according to the pattern of the tiles and the windows. In SWILLENs' viewpoint, each room was depicted precisely using perspective drawing, which was in fashion in those days [6].

P. STEADMAN reconstructed a model of the room according to the data from SWILLENs. He calculated the location of the painter from the figure depicted in the mirror on the front

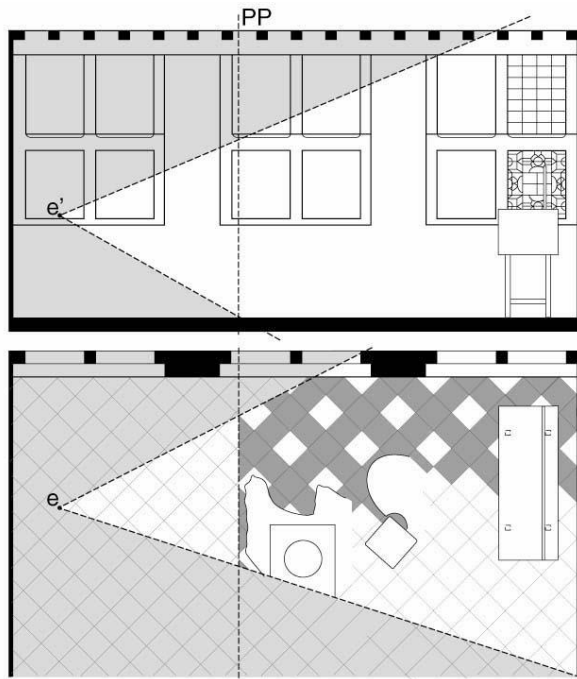


Figure 3: Plan and elevation in the room on “The Music Lesson”

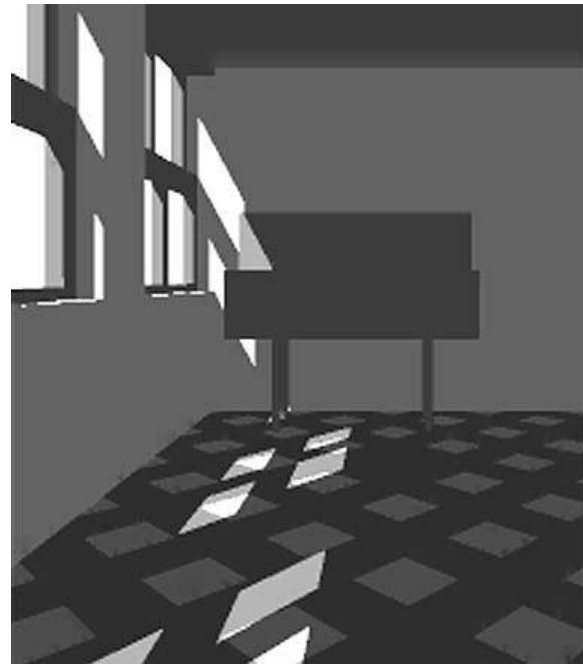


Figure 4: Representation of the shade and shadow in the room on “The Music Lesson” by 3D-CG (STRATA StudioProTM 2.5J)

wall. And then he took a photograph of the model room and suggested the use of camera obscura [7]. There are some other scholars who also insist that Vermeer transcribed the pictures taken by camera obscura instead of depicting space by drawing it geometrically. In any case, it is certain that he “depicted” the space precisely.

4.2. The depiction of shade and shadow

The scene lit up with pale rays gives a tranquil impression. There are few dark areas in the picture and it looks as if the soft rays shine in every corner of the room. The metal tray, the ceramic pitcher, and the soft carpet respond to the rays according to their material and texture. On the front wall near the window is depicted a dark shadow in the shape of a triangle. The shadow between the windows is darkish and the front part of the table is also painted in a dark color. In contrast to the above, the theme, that is the woman and the virginal, stand out clearly. At a glance, the shadow and shade in the picture look like very natural. But careful observation makes us wonder if the rays alone can light up the room this brightly. It is not likely, with only the rays coming from the windows on the left. For example, the floor near the left wall, which should not be lit up, is too bright. The shadows of the mirror’s frame cast on the front wall were double. The white blouse of the woman is shaded on her right side, which suggests light from another source.

The vanishing point of the rays shining through the window couldn’t be located because of the ambiguity of shadow. I therefore represented the shade and shadow in the interior by 3D computer graphics following his shadow, which is the one cast on the corner of the front wall. As Fig. 4 shows, if the direct rays come in through the windows, the shining windows will be reflected on the floor and the front wall. But in a real life setting, the shadow and shade or the tone of brightness are not as simple as the reconstruction shows because of the

following reasons; the shadow and shade in Vermeer do not seem to be created by these strong direct rays; the transparency of the glass at that time would have been lower; in a real life setting there should be various reflections.

In Vermeer's space no part suggests unnatural shading, but there's no unity in terms of light source. It means that he depicted light and shade but lacked the sense of shadow, thus, the shadow was not represented. It can be said that he depicted each object but not the space or the atmosphere as a whole.

5. Consideration

STEADMAN believes the space Vermeer often depicted was his studio. Above all "The Music Lesson" shows the scene that the artist's easel reflected by the mirror. If his model reconstructed by STEADMAN is right, there should be three sets of these windows. How much light could a room like this allow? The picture of his model does not allow us to be conclusive about the shadow and shade of the room and the figures in it cast by the rays .

On Vermeer's picture plane, there are various dots which we might call light drops. These drops seem to represent the shapes by the contrast of the color instead of drawing the contour. It is highly likely for him to have used the camera obscura. He must have been fascinated by the shining dots on the figures made by the captured light. On the other hand, he must have seen the precise works by Van Vliet and De Witte in Delft. The influence of Hans Vredeman de Vries is also suggested [8]. I assume that Vermeer determined the structure of the picture using camera obscura and then, made perspective drawing of the interior adding geometrical motifs. He may have been interested in the shining figure the camera obscura captured but not the space in it. Thus in "The Music Lesson" there appeared no shadow which showed the special relationship.

The genre pictures in 17th century Holland often reflect the everyday life of ordinary people. However, they are not only copies of life, they also depict life's lessons. In "The Music Lesson", it is said that the virginal, the symbol of sensuality of the woman, implies the subtle sparks of love between the two figures. Vermeer seems to be interested in telling a story, not merely describing a scene of everyday life.

6. Conclusion

"The Music Lesson" is constructed precisely in terms of perspective drawing. The structure and the contrast of darkness and brightness lead the viewer to the theme. But although the shapes are clearly drawn, the shadow and shade are not represented to show the scene precisely. In this sense the picture is not photo-like. On the other hand, the clear shapes enhance the reality of the picture plain. Vermeer seems to have arranged the structure to represent a moment in everyday life. However, it seems to me as if there were a glass wall separating the artist from the scene he was watching. The room, like a stage setting, allow nobody to enter. It is because he made a fictional world with less shadow than in reality. The realistic work of art does not mean a photo-like scene, which is cut out from the exact space and time. It conveys a message from the artist. The reality of the artist changes according to his or her message.

Even in modern times, painters may shade the objects on the table but often not shadow even when they express the distance between the objects. The shade clarifies shape and the

shadow describes the space and the atmosphere. But precise shadow makes the picture plain too explanatory. Paintings should create fictional space.

The realism in painting lies not in drawing like a photograph, but in the way the message from the artist is conveyed. It expresses the intention of the artist by adding or subtracting something on reality, which a photograph cannot do.

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