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## The Significance of Painting Appreciation in Learning for the Elderly

*La importancia de la apreciación de la pintura en el aprendizaje de las personas mayores*

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### **Abstract**

What is the educational significance of viewing paintings? In particular, what is its significance for the learning of elderly people? This paper attempts to answer these questions by means of experiments using brain activity measurements and questionnaire methods with young and the elderly students as subjects. The conclusions are: (1) Comparing the students, it cannot be said that the elderly students are necessarily inferior to young students. (2) In their impressions after viewing the paintings, the elderly students more accurately and richly expressed detailed techniques, composition and colour combinations, etc. (3) In their impressions after listening to the explanations, the young students were more likely to interpret the explanations as given, while the elderly students tried to construct their own impressions based on the explanations. It has pointed out that appreciation of paintings is suitable for learning in old age.

*Keywords:* Appreciation of Paintings, Learning through Lifelong, Brain Activity, Elderly.

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## Resumen

¿Cuál es el significado educativo de ver pinturas? En particular, ¿cuál es su significado para el aprendizaje de las personas mayores? Este artículo intenta responder a estas preguntas mediante experimentos que utilizan mediciones de la actividad cerebral y métodos de cuestionario con estudiantes jóvenes y mayores como sujetos. Las conclusiones son: (1) Comparando a los estudiantes, no se puede decir que los estudiantes mayores sean necesariamente inferiores a los estudiantes jóvenes. (2) En sus impresiones después de ver las pinturas, los estudiantes mayores expresaron con mayor precisión y riqueza las técnicas detalladas, las combinaciones de composición y color, etc. (3) En sus impresiones después de escuchar las explicaciones, los estudiantes jóvenes tenían más probabilidades de interpretar las explicaciones dadas, mientras que los estudiantes mayores trataban de construir sus propias impresiones basadas en las explicaciones. Ha señalado que la apreciación de las pinturas es adecuada para el aprendizaje en la vejez.

*Palabras clave:* Apreciación de Pinturas, Aprendizaje a lo Largo de la Vida, Actividad Cerebral, Adulto Mayor.

## Introduction

An aged society is one of the most important issues internationally. In Japan, it is estimated that by 2050, approximately 40% of the population will be elderly. Naturally, this causes several problems, including labor shortages, pension system maintenance, and financial issues. In response to an aged society, The Japanese government policy emphasizes participation in learning and in the labor of the elderly.

The development of social policy formulations in many countries has focused on improving happiness as a goal (Austin, 2016, pp.123-138). A. Sen criticizes such evaluations of psychological measures as important but 'indirect ends,' and insists that this is an argument that reverses "ends" and "means". He argues that it is important to expand people's capabilities to enable them to achieve their chosen goals (Sen, 1992)<sup>1</sup>. How does this capability relate to the appreciation of the painting?

Therefore, it is essential to discuss the purpose of education. Generally, in the world of education, emphasis is placed on improving intellectual and cognitive abilities, that is academic ability. In addition, the healing effects of art therapy and the role of arts in community development (Meade; Shaw, 2021) are discussed. Many objections and criticisms have been made to the finding that educational effects enhance spatial cognition and sensitivity. (Rittelmeyer, 2017, Jenkins, 2002). This is known as the "Mozart Effect" (Rauscher *et al.*, 1993). However, these educational researches lack empirical evidence and remain impressive and descriptive.

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<sup>1</sup> Mitsuru Takahashi (Takahashi, 2022) developed the content of Sen's capability approach to education. The analysis in this chapter expands on this and aims to elucidate the educational significance of painting appreciation for the elderly by comparing it with young people.

Neuroscience research cannot be ignored to elucidate the process of painting appreciation. For example, E.R. Kandel challenged to figure out what happens in the brain when we look at and think about painting. What does it mean to "understand" the intricacies of avant-garde art? He is trying to elucidate the mechanism of the human aesthetic experience as a molecular mechanism of neurotransmission (Kandel, 2012, 2016).

Neuroesthetics focuses on understanding the visual and emotional effects and mechanisms of artistic experiences based on neuroscience. Neuroaesthetics research argues that aesthetic experience is perceived through the interaction of three frontal lobe-centric systems: the emotional appraisal system, the semantic knowledge system, and the sensorimotor processing system (Chatterjee, Varianian, 2016, pp.174-177). However, in brain function mapping using fMRI, which is used as a method, it is possible to clarify which part of the brain is affected by a specific stimulus when viewing a painting, and what kind of stimulus it is. However, the elucidation of the meaning construction process of painting appreciation remains an issue.

Therefore, to overcome these problems and elucidate research issues, we will attempt to comprehensively understand aesthetic experiences based on the analysis of painting appreciation using brain activity measurement devices and questionnaire methods.

## Methods and procedures of the experiment

The subjects were university students, but as Open University students were also included, they ranged in age from their 20s to 80s. There were approximately 20 subjects in this study; however, to compare young and old students, four Open University students aged 70 years or over and five female university students in their 20s were included in the analysis.

Participants in the experiment viewed replicas of five famous paintings<sup>2</sup>, Raphael's "Madonna of the Goldfinch", Kandinsky's "Composition VII", Monet's "Waterlilies", Henri Rousseau's "Dream" and Picasso's "The Painter and Model", (that is, except Raphael, they were works from the transition from modern painting to contemporary painting in three different schools). Students looked at the painting in three ways. The first is the "solo type": Visit alone. The second is "dialogue type": Visitor talks with another visitor while looking at the paintings. Finally, like gallery talk, the "explanatory type": Visitors view the work while explaining and asking questions about it<sup>3,4</sup>.

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2 How we evaluate of an aesthetic experience depends on the context. For example, the brain activity differs between paintings in museum collections and inexpensive printed materials. In general, museum work activates brain activity. This suggests that contextual information can activate memory and modulate the visual pleasure levels. The use of replicas in this experiment did not have a significant effect.

3 This indicates how the learning spaces we create facilitate learning. In other words, this study attempts to answer the question of whether this leads to deeper learning. This suggests that the educator's role is to create a space for interactions between visitors and between visitors and curators (Damsa *et al.*, 2019).

4 Here, we show the relational character of the learning space that "the learning space is generated by interaction and interaction. (Gulson; Symes, 2007, p.17).

6. The Significance of Painting Appreciation in Learning for the Elderly

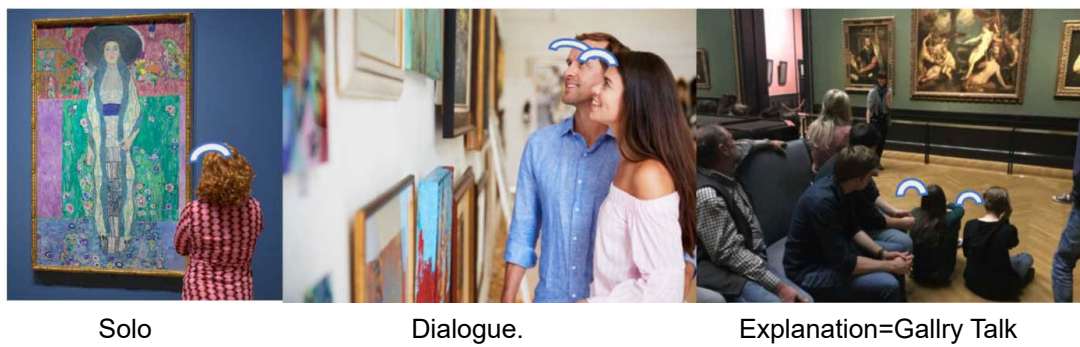
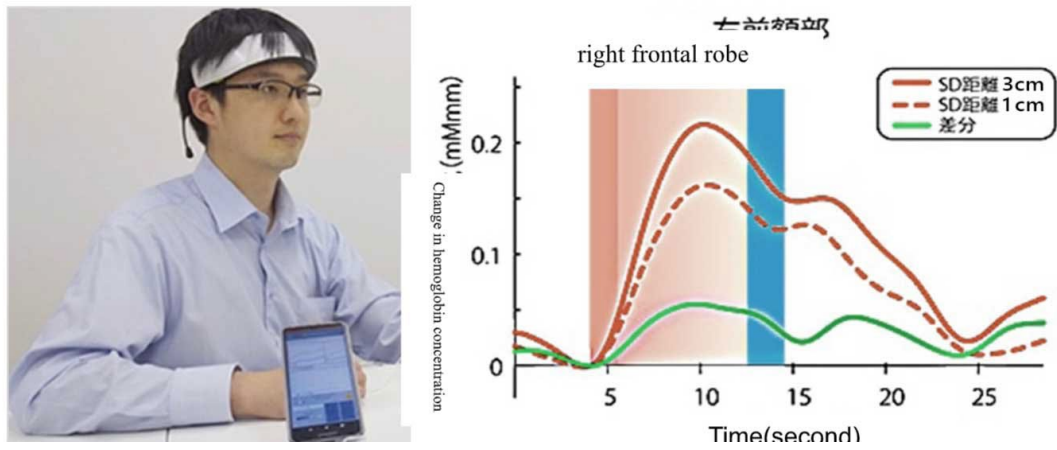


Figure 2. Appreciation Method

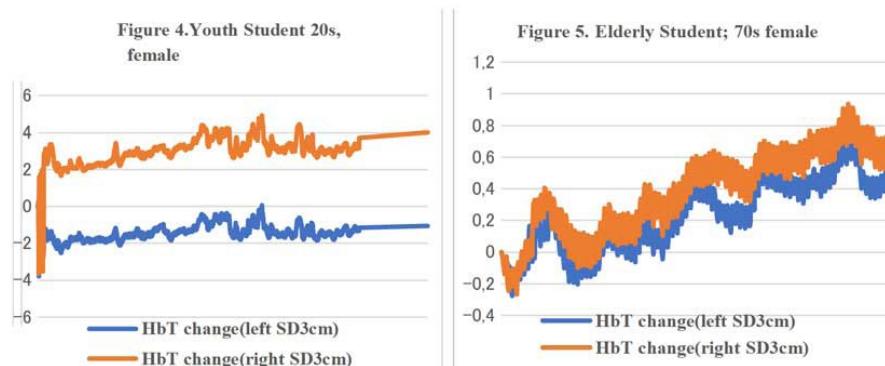
The subjects were asked to wear HOT-2000, a lightweight blood flow measurement device jointly developed by Hitachi Electric and Tohoku University, and watch paintings to capture the process of changes in brain activity. Simultaneously, based on the questionnaire, we attempted to analyze how participants viewed the work, what they felt, and what kind of meaning was constructed in the process of changes in brain activity. The viewing time was determined by the participants.

## A comparison between young and elderly students



Figure 3. Raphael's 'Madonna of the Goldfinch.' Figure 4. Monet's 'Waterlilies'  
Figure 5. Picasso's 'Painter and Model'

### (1)Appreciation of Raphael's "Madonna of the Goldfinch"



First, we will take Raphael's classical "Madonna of the Goldfinch." There are several paintings of 'Madonna and Child', but this is a famous work that shows the influence of Leonardo da Vinci's composition. It contains Raphael's blue colors and religious allegories alluding to Christ's fate.

Regarding the brain activity of the young students, there was a large difference in the function of the left and right frontal lobes when observed while listening to the commentary. Cognitive function was higher than language function.

A young student who viewed the painting solo stated that "The woman is only affectionate towards the child on the left and indifferent and cold towards the child on the right". This is a misunderstanding. After listening to the commentary, this false understanding did not arise. Another young female student commented on Joseph and Jesus' future destiny. She said, "I felt it was expressed through the book in Mary's hand and the bird in Joseph's hand". This understanding only follows the lines of "explanation" and does not express an

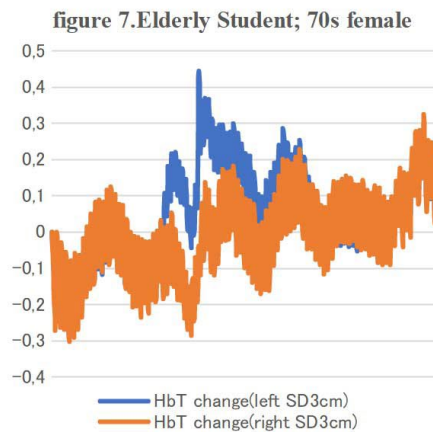
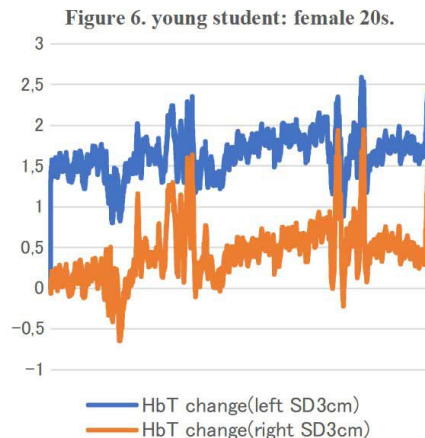
original opinion or understanding. In other words, is it not the expression simply tracing the understanding that is in line with the 'explanation' received at the time of appreciation? The 'explanations' in gallery talks sometimes run the risk of constraining the viewer's perception. This tendency is stronger was abstract paintings.

What about elderly students? According to the questionnaire, "I was impressed by the description of the Virgin and Child, the detailed description of the landscape, and the description of the Virgin and Child still smiling". Furthermore, "I thought that the Virgin's compassionate look over Joseph and Christ, and the innocent way Christ and Joseph hold hands in the mystery, expressed the Virgin, Joseph and Christ's love of parents and children and love of humanity." The participants focused on the details of the painting. In this way, elderly participants observed Raphael's depiction of his work and expressed their feelings.

Brain activity while viewing Raphael's painting gradually increased in both language and cognitive function. The results showed that the subjects tried to understand the paintings by observing them. As shown here, active attention and curiosity are important for learning (OECD, 2007).

Based on the analysis so far, it is said that there is a possibility of misunderstanding when appreciating solo or dialogue, but on the other hand, when listening to the "explanation" and appreciating it, there is a risk that the understanding will be restricted by the explanation. How can this double binding be resolved?

(2) Kandinsky's "Composition VII"



When Kandinsky first saw the Impressionist Monet's "Haystack" he was greatly surprised, and under the influence of that, he created his style. He realized that paintings can move people even if they were not indicated. This was the birth of abstract painting.

However, it is difficult to understand. Partly because of this, the results showed that the functions of the left and right frontal lobes changed while separated when listening to the commentary. This was true for both young and elderly subjects.



The young students noted Kandinsky's drawing process. "The variety of colors and shapes left an impression on me. He drew lines without stationery: It was interesting to see how the various colors and shapes were expressed as they were." Here too, she speaks as if she understood what she had received, by the contents of the 'explanation.'

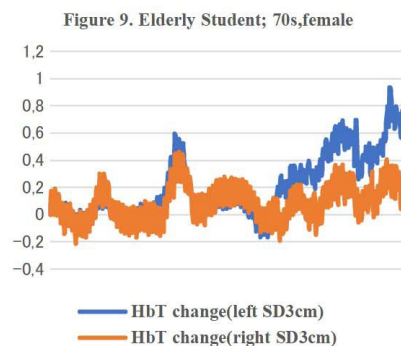
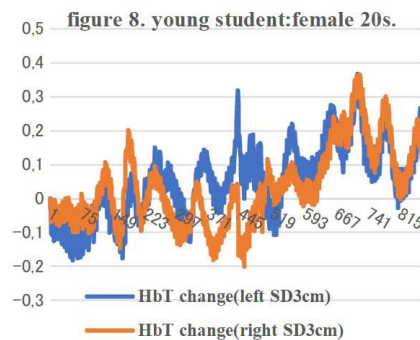
This is generally expressed as follows: As the painting style progresses, that is, as it shifts from figurative painting to abstract painting, it becomes necessary for the painter or an expert to explain it. As a result, the influence of top-down understanding has become increasingly important for aesthetic experiences (Leder, 491). Does this mean that listening to the 'explanation' is the main focus and that there is not much activity to try to understand? This may have caused functional separation of the left and right frontal lobes.

An elderly said, "I had the impression that the composition of the painting was not very clear. I think that The picture is, after all, a combination of straight lines and curves. He dared to use simple colors and compositions to clearly express the reform of the drawing style".

It is certainly difficult to understand what this painting attempts to convey. It is also his intention to exclude the subject in the first place. Although the subject does not clearly recognize that such a shift was intended, he recognizes the novelty of Kandinsky's technique as a turning point in the history of painting.

Factors such as color clarity, contrast, composition, size, and shape found in Kandinsky influence aesthetic preference. It has something in common with Nagasawa Rosetsu's attempt to emphasize the contrast of these elements seen in the Japanese painting "White Elephant and Black Cow." It draws out the fun of Kandinsky's painting.

### (3) Monet's "Water Lilies"



Monet's Waterlilies is a familiar work to the Japanese. The work was owned by 13 museums in Japan and strongly influenced by Japanese paintings (Ukiyo-e and Fusuma-e). It is composed of a composition that ignores the perspective that is fundamental to Western painting, and water lilies and willow trees are said to have been transplanted from Japan, making the work initially familiar to the Japanese as traditional Japanese painting.

Young students are more familiar with this work than with other paintings, and their left-and right-brain activities fluctuate synergistically. However, their understanding of the work is based on what they hear in the commentary, rather than what they create.

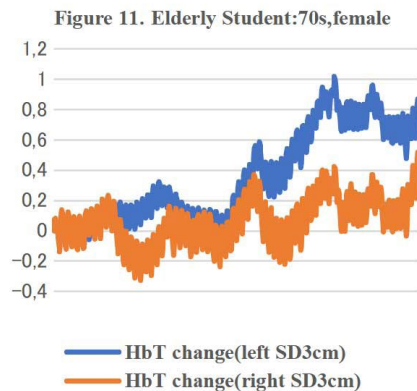
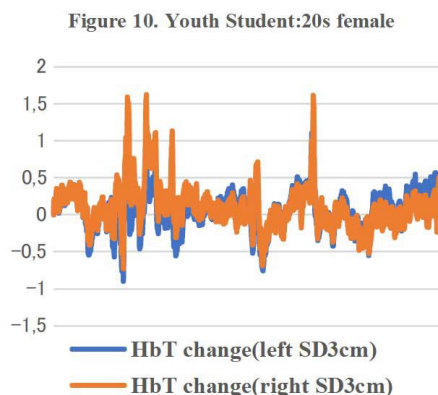
For example, the subject stated: “Monet used a lot of colors. The way they used so many colors to express the water lilies left me with a strong impression. I was surprised that the river part was drawn vertically and the flower part horizontally”. She knows that Japanese painting has an influence, but that it is not sufficient to capture the characteristics of Impressionist works.

An elderly student also commented, “I was moved by the vivid colors of the water lily floating on the surface of the water. In addition, delicately drawn willow branches are reflected on the surface of water overflow with flowers, leaves, and twigs. I was impressed by the way Monet led the painting into a world of temporary tranquility. Moreover, “I got the impression, with the colors that fill the entire canvas, Monet is trying to express the beauty of nature in his heart in this painting.”

It can be seen that young students were also impressed by Monet's technique, but the elderly expressed more of the emotions they received from the paintings and were trying to properly understand what Monet intended to express in this painting.

For paintings with relatively good knowledge, there is a tendency for the left and right functions to act synergistically and gradually, regardless of age, by viewing them while focusing on exterior beauty and composition.

### (3) Picasso's "Painter and Model"



The work was produced at a time and was influenced by Picasso's Cubism and the culture of African folk masks.

The brain activity of the young student fluctuates so that both frontal lobe areas overlap for the first time during the visit listening to the “commentary.” While listening to the commentary, they may try to make sense of the world that the Picasso paints.



Generally speaking, when looking at paintings, we tend to pay more attention to the faces of people than to landscapes, still lives, or artifacts. In particular, Picasso's seemingly simple compositions and designs are influenced by cubism, and the distorted faces painted using this technique activate the brain<sup>5</sup>.

A young subject commented, "It is an impressive painting with human faces, profiles, and eyes. The colors are calm, and the painting has a homely atmosphere". She added, "I thought it might represent a part of a person, with the face, eyes, and palette cut out from different angles." Thus, while referring to cubist color, composition, and technique, her understanding of the work was consistent with the knowledge provided by the experts.

In contrast, the elderly students also saw it as "an interesting way of looking at the paintings, trying to unravel what he was trying to say in the paintings". He saw it as "a technique that attempts to portray the depth and enjoyment of the painting at the same time, and to represent the painting as an enjoyable puzzle." Picasso's seemingly simple compositions and designs were influenced by Cubism, but here too it is important for learning to see them as "interesting". Regarding brain activity, we observed that the brain gradually became more active. The elderly have also become more active over time in the appreciation of this painting.

## Conclusion

From this discussion, several points can be made regarding the learning of the elderly. First, elderly subjects are not necessarily inferior to younger students. The brains of the elderly are becoming increasingly active. In other words, changes in brain activity indicate that subjects are trying to construct the meaning of their work. Thus, they may have been more active learners<sup>6</sup>.

In general, agility, power, comprehension, and memory gradually decline with age. However, even if the accumulation of fluid knowledge declines, it is said that the crystallized knowledge accumulated through life experience remains stable. In addition, rich insight, expressive power, comprehension, critical power, and creativity of the elderly increase or stabilize with age. In this sense, learning through painting appreciation is one way to enrich the abilities of elderly people.

Second, elderly students can express their impressions after viewing paintings more accurately and in detail, in terms of techniques, compositions, and color combinations. In particular, when it came to expressing their feelings, the elderly participants were more expressive.

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<sup>5</sup> Focusing on face is a social-cognitive function. This is generally considered a cognitive function forms the basis of a series of social interactions that perceive, interpret, and respond to the intentions, tendencies, and behaviors of others. Mental activity forms the basis of interpersonal relationships. Brain science highlights the connection between painting techniques and brain activity.

<sup>6</sup> In comparison with figurative paintings, abstract paintings are said to contain elements that activate brain activity. Thus, in terms of art history, the beginning of the 19th century marked a turning point from modern painting to contemporary painting. One attraction of new age techniques is the activation of brain activities.

Third, it is important to learn through the appreciation of paintings to create an understanding of the work. It is important to consider appreciation as a learning process for the construction of meaning and understanding. In their impressions after listening to the commentary, young students tended to interpret the work following the commentary, whereas elderly people attempted to construct their meanings based on the commentary. In other words, it is more important to create “one's understanding” than “correct understanding.”

Fourth, as already mentioned, gallery talk constrains visitor perception. Therefore, curators need to be mindful of appropriate and moderate interventions, and, as we have indicated, abstract paintings like those of Picasso may contain more brain-activating elements than figurative paintings. It is important to provide inspiration and other educational interventions to unlock this creativity<sup>7</sup>.

Elderly people do not have inferior comprehension, learning abilities, or semantic constructions. In this sense, learning through the appreciation of paintings can enrich the capabilities of elderly people.

We also summarize the implications of this research on museum education.

1. What is the correct method of observation and understanding? Should visitors understand art historians and experts? It should be emphasized that there has been a shift in the theoretical paradigm of museum education. Learning in museums is premised on the co-construction of knowledge and practice by learners themselves. In other words, we need a process of “negotiating” the meaning of given knowledge and practice, focusing on collective participation and transformative experience (ecological perspective). Educators are expected to play a role as facilitate learning, promote dialogue among visitors, and promote a free and creative understanding of work.

2. How can individual differences be incorporated in an analysis? In this study, the analysis was limited to female college students in their twenties, but the process of changes in brain activity differed depending on their sex and educational background. Furthermore, differences in age, frame of reference (cognitive framework), and pre-existing knowledge of paintings have a significant impact on brain activity and comprehension. Therefore, it is necessary to formulate a more appropriate research plan while controlling these factors.

3. In this study, we attempted to integrate brain science and social science, brain activity measurement, and questionnaires. In addition, it would be possible to approach a more appropriate analysis by recording the contents of the dialogue during the viewing process with video or the like, and proceeding with the analysis.

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<sup>7</sup> This is not to say that elderly people are better at art appreciation. The question is whether these resources can be converted into capabilities. This is Sen's conversion factor. The physical decline associated with aging makes mobility difficult and inhibits museum visits. This could also act as a factor. This point is pointed out by Takahashi (2022, pp. 85-87).

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