



American Journal of Multidisciplinary Research and Innovation (AJMRI)

ISSN: 2158-8155 (Online), 2832-4854 (Print)

VOLUME 3 ISSUE 4 (2024)



PUBLISHED BY: E-PALLI PUBLISHERS, DELAWARE, USA

The Synesthetic Language of Picasso: Exploring Emotions and Sensations in His Art

Koncha Pinos¹*

Article Information

Received: June 19, 2024**Accepted:** July 25, 2024**Published:** July 29, 2024

Keywords

Pablo Picasso, Synesthesia, Neuroaesthetics, Multidisciplinary, Cross-Modal Association, Art History Analysis

ABSTRACT

This review article adopts an interdisciplinary approach in analyzing Picasso's synesthetic experiences and a transformative glaze on his artwork. It integrates and analyses the methods from different disciplines through Art Historical Analysis. It explores Picasso's paintings in various phases and investigates possible synesthetic perception by observing patterns of colors, forms, and compositions. Neuroscientific Approaches are incorporated to explain how the sensory input of the receiver could have triggered a cross-modal effect in Picasso's work by exploring the concepts of synesthesia. Psychological interpretation explores the psychological theory of feeling and investigates how Picasso's feeling processes are associated with synesthetic feeling and his creative decision-making processes. This article includes a literature review that explains the purpose of positioning Picasso's synesthetic artwork in the broader context of synesthesia and the theories of art. Due to this kind of multidisciplinary approach adopted in work, the richness of Picasso's synesthetic imagination can be examined more profoundly, and the interactions between experience, feeling, or even mood of the artist with their art can be reconstructed in detail. In this context, synthesizing findings from the multi-disciplinary literature, this paper offers a novel insight into Picasso's synesthetic imagination and a holistic understanding of artistic innovation.

INTRODUCTION

Synesthesia is a true connection between two or more different sensitizing and cognitive operations in which the stimulation of one causes an automatic effect in the other. At times, various kinds of synesthesia occur in specific contexts, for instance, cochleotopic individuals who perceive colors and shapes in their mind's eye when listening to music (Adiletta & Thomas, 2020). This condition enables them to self-generate and experience music as if it is a visual art that combines two senses – auditory and visual – in a synchronal way. It is a concept that has always been considered by art and science as an unusual perception of reality that interconnects the senses and has been inspiring interest for decades (Jewanski *et al.*, 2020). This article deals with the basics of synesthesia, its connection with the phenomenon of sensory perception, neural mechanisms, and art, paying attention to the possible synesthetic experiences of Picasso and the impact of his work in this field.

Presentation of the Theme

Synesthesia is an interesting interconnection between two or more senses in which the activation of one sense results in the engagement of other senses in a rather peculiar manner (Brang & Ramachandran, 2020). This state of the sense's interconnection brings into question the basic functions of human perception and our brain's ability to interpret the surrounding environment. Moreover, sensory perception is relevant when analyzing an experience because this term describes how an organism responds to stimuli and organizes information from the senses into a unified whole (Klempe, 2022b).

Synesthesia as the Key Element in Art and Neuroscience

In Klempe's chapter titled "Sound and Reason: The 'Synesthesia as Metacognition,'" Klempe focuses on the synesthesia experience and the role of sound, especially with the influence of Gestalt psychology (Klempe, 2022a). He qualifies that synesthesia is personal and might have a general cognitive role relevant to everyone. Interestingly and rather convincingly, Klempe concludes that synesthesia is a primary sorting mechanism essential for higher-order processing. He stresses that synesthetic experiences are not constrained but points at how and why every synesthete builds a different system with limited freedom within neurological structures. As per Klempe, the rules systems for language, logic, music, and other cognitive areas are built in interaction between an individual synesthetic categorization system and the regulation systems of the cultural community (Klempe, 2022a). Thus, the field of synesthesia opened a very colorful and complex perspective for artists to transgress the conventional antique norms and rules of aesthetics and emotions and open up new horizons for practicing creativity with innovative forms and types (Florea & Cojocar, 2021). At the same time, though, as a neuroscientist, one cannot deny that synesthesia is an interesting subject to study about sensory integration and how idiopathic connections in the brain may affect perception.

Objectives of the Article

The main goal of this article is to investigate synesthesia and special perception in the framework of art analysis, together with a focus on works by Pablo Picasso. Symptoms of synesthesia in Picasso's life and works

¹ The Wellbeing Planet, Al Nakheel, Ras Al Khaimah, United Arab Emirates

* Corresponding author's e-mail: direccion@thewellbeingplanet.org

and the role of the individual sense perception in forming an innovative approach to art will be analyzed (Igorevna, 2022). Further, the present day's neurological findings concerning synesthesia and concern showed that improving clarity in creativity and perception in art shall be covered.

METHODOLOGY

Overview

With a focus on synesthesia, this review combines several fields of science (multidisciplinary approach) to study how it relates to human sensory perception understanding from perspectives like neurobiology and art, along with highlights of Pablo Picasso's work as a creation (Fiorillo, 2020). One avenue to explore the effects of sensory inter-areal neural processes on creativity is through a phenomenological condition known as synesthesia, where stimulation of one sense results in involuntary experiences involving another.

What is Synesthesia

Synesthesia is a neurological disorder in which the actions of one sensory or cognitive system cause automatic experiences of another sensory or cognitive system (Lorusso *et al.*, 2022). This neurological quirk ushers in a singular communication between senses, thwarting one's concept of how the brain receives stimuli. Synesthetic perceptions are congruent and highly practiced; synesthetic experiences without having to be cautious about it, and these perceptions do not change with time (Benítez-Burraco *et al.*, 2023). To enhance the understanding of this phenomenon, it is necessary to reveal its nature and how it can be observed in the sphere of perception (Hamada *et al.*, 2020).

How Does It Work

In other words, synesthesia works so that when a certain stimulus from one modality of sensory is activated, another modality of sensory will have a corresponding reaction. It is marked by continuous and automatic cross-wiring of sensations so that stimuli in one sensory stream can induce perceptions in another. For instance, some people may see graphic-color synesthetic, where letters or numbers should be associated with colors. In the same way, in sound-color synesthesia, one sees colors and shapes as music or sound is played (KIHARA *et al.*, 2024). These connections are personal and particular to every synesthete and may create an elaborate real-world description (Meier, 2021).

Each type of synesthesia is characterized by its unique pairings of sensory or cognitive processes, and these associations remain consistent over time for individuals who experience them.

Definition and Explanation of the Phenomenon

Synesthesia is a rather interesting neurological condition in which the stimulation of the first sensory or cognitive area results in an automatic and uncontrollable stimulation

of the second sensory or cognitive area (Hamada *et al.*, 2020). Synesthesia is a neurological condition in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in a second sensory or cognitive pathway. For instance, a person with synesthesia may see color in letters and smell tastes in quintuplets (Williams, 2022). This condition exemplifies interesting properties of how the brain integrates sensory information and processes neural signals.

The Neurobiological Roots of Synesthesia

Neural Mechanisms

Cross-Activation and Connectivity

Research shows that synesthesia is associated with unusual forms of activation in the brain between different sensory areas (Van der Schyff *et al.*, 2022). For instance, reading letters or numbers might activate brain regions usually used to process color perception.

Imaging Shows Structural and Functional Differences

Imaging studies of the brain have demonstrated that synesthetes use a different cognitive process. They can also observe structural and functional differences in their brains, which are organized differently from non-synesthetes brains (Laeng *et al.*, 2021). These differences often mean a breakdown in the division of labor among regions that process different sensory modalities.

Neural Plasticity

The brain's "neural plasticity" provides an extraordinary justification for the phenomenon of synesthesia. This means that neural circuits can also be significantly reorganized through sensory input and experience in adults (Sotiropoulos & Anagnostouli, 2021).

Experimental Research

Behavioral Studies

In experiments usually performed on synesthetes, behavioral activities are required for the synesthetes to describe their experiences. This will enable a closer focus on the replicability and distinctiveness of the perceived synesthesia (Ward & Simner, 2020).

Brain Imaging Techniques

Functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and other techniques reveal active areas during synthetic experience. Understanding synesthesia mechanics may aid in the understanding and treatment of various neurological diseases characterized by abnormal sensory processing (Ward, 2021). Recent research suggests that early synesthesia reveals how our brains interpret information differently.

Types of Synesthesia

Analyzing the identified subtypes of synesthesia, it is possible to state that regardless of their numerous recognized forms, they are mostly distinguished by the variation of the involved sense (Trufanova, 2024).

Most Prominent Types

Grapheme-Color Synesthesia

Certain letters, numbers, or words in this type select a certain hue. For example, the initial letter of the alphabet, 'A,' is connected with the synesthete mind as red (Hamada *et al.*, 2020).

Sound-Color Synesthesia

Sounds, music, or tones trigger the experience of colors or visual patterns. For example, hearing a piece of music may be perceived as a vivid green color (KIHARA *et al.*, 2024).

Number-Form Synesthesia

Numbers represent mental maps or geographical configurations. Synesthetes may envision numbers arranged in precise spatial patterns, such as a mental number line (Makioka, 2021).

Lexical-Gustatory Synesthesia

Words or phonemes evoke taste sensations. Hearing or reading certain words may cause the person to experience distinct tastes in their mouth (Ward & Simner, 2020).

Spatial Sequence Synesthesia

Sequences such as numbers, months of the year, or days of the week are perceived as having a spatial arrangement (Gravener, 2021).

Auditory-Visual Synesthesia

It includes seeing colors, shapes, or patterns in reaction to auditory provocations like music or sounds. Each musical note may correspond to a specific visual experience (Nair & Brang, 2019).

Visual-Gustatory Synesthesia

Undergoing tastes or flavors based on visual spurs such as colors or shapes. Certain visual cues activate the sensation of specific tastes (Chen *et al.*, 2019).

Tactile-Emotional Synesthesia

When experiencing or reflecting on emotions, you may feel textures or physical sensations. Emotional experiences can be expressed as tactile sensations such as roughness or smoothness.

Each kind of synesthesia is distinguished by its distinct pairings of sensory or cognitive processes, and these associations stay persistent throughout time for those who experience them (Murray, 2021). Synesthesia offers a vivid example of the brain's ability to link and integrate information across different senses in unconventional ways, providing unique perceptual experiences to those with it.

Patterns of Synesthetic Experiences

These examples show the different experiences a synesthete can have apart from hearing and seeing; they show how these senses can be wired up in a way that can only be described as synesthetic (Spehar & Stevanov, 2021).

Emotional Responses and Colors

Sometimes, synesthetes feel emotions and personalities in certain colors. For example, they could associate happiness with the color yellow or excitement with a bright, bright orange.

Taste and Words

In certain situations, synesthetes can associate certain words or certain sounds with undefinable tastes. For instance, if the word formed is 'coffee,' then, in their understanding, it can be related to the taste of chocolates.

Textures and Sounds

Hypothesis for a synesthetic couple: one texture might cross-modally correspond with a sound. Thus, a sound comparable to that of a flute is likely to be described as possessing velvet-like characteristics as opposed to a sound produced by a trumpet; such sound might be compared to the roughness of sandpaper (Haag & Castillo, 2021).

Smells and Shapes

Some people associate odors with shapes or touches. For instance, the width may be felt by the smell concerning cinnamon, which may be linked to whirling designs or even spikes.

Time and Spatial Layout

Time units, such as days of the week or months, can be perceived in specific spatial arrangements. For example, the week might appear circular daily at particular points around the circle.

To clarify the synesthetic experience, let's contemplate the case of someone who experiences auditory-visual synesthesia. When people hear a tune, they can see bright colors and shapes in their minds that correspond to different musical notes (Chen *et al.*, 2019). For example, the high pitch of a violin can manifest as a bright blue color, while the low pitch of a bass can be perceived as a deep red color. This sensory connection is constant and coherent for the synesthetic person and is integral to how they perceive music and the world around them (Klempe, 2022b). Synesthesia is a neurological phenomenon in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in another unrelated path. For instance, when someone hears music, they might simultaneously see or associate specific colors with numbers or letters. It's like having "wires crossed" in the brain, causing sensory crossovers that most people don't experience (Spehar & Stevanov, 2021). Synesthetes perceive the world through multiple senses or perception abilities that aren't otherwise related.

How Does It Work

In typical sensory processing, our senses detect information from the environment, signal the brain, and undergo processing. Synesthetes, however, experience simultaneous processing through two or more areas (Hamada *et al.*, 2020).

Here's How It Unfolds

Primary Effect

Synesthetes perceive the sensory provided input (for instance, music).

Secondary Effect

For instance, they experience other feelings (e.g., perceiving colors from music) even when the related senses are not involved (Hamada *et al.*, 2020).

In Typical Sensory Processing

Detection

Receptors or sense organs in the organism detect environmental stimuli through the five basic senses: sight, sound, smell, taste, and touch.

Signaling

Both send information that informs the brain (for instance, coloring, shape, and pitch (Cheng *et al.*, 2023).

Processing

These signals are then taken into the brain to areas that interpret them so that we can make sense of our environment.

Recent findings suggest that studying synesthesia can reveal insights into how our brains process information differently, especially when it starts in childhood (Delgado-Lobete *et al.*, 2020).

Relevant Studies and Findings

Unique firing patterns of neurons characterize cohort members of synesthetes upon being stimulated, coupled with richer integration of sensory data within the brain (Kwon & Iedema, 2022). For example, Using functional MRI, investigators noted enhanced areas of the visual and auditory regions of synesthetes' brains during music listening. From these findings, it is clear that synesthesia is not fantasy but a solid neurological phenomenon characterized by changes in the structure and functionality of the brain (Castro). Neuroscience research in this line of study intends to discover how such associations are formed and maintained to expand the knowledge of neuroplasticity and the differences in rates of sensory processing in people.

In "The Tell-Tale Brain," Dr. V. S. Ramachandran describes synesthesia as people who perceive the world through cross-wiring, where they can taste color, see music, or even feel love as the touch (Kumar, 2020). This description outlines how synesthesia can alter conventional ways of perceiving the world and enhance the patient's outlook, which might dictate their creative endeavors or how they engage with their environment.

Researchers have only recently provided increasing evidence to discuss synesthesia's neuroscientific principles based on the complexity and plasticity of brain organization and functioning as the means to assimilate sensory data (Karim *et al.*, 2021). Such insights improve our understanding of synesthesia and widen

the perspectives concerning the multilevel and utterly dynamic character of artistic perception in general and in a person in particular.

Synesthesia in Art History

Impact of Synesthesia on Artistic Creativity

Synesthesia, a sensory experience where one sensory experience prompts another, has significantly influenced artists throughout history. Artists with synesthesia often create works that visualize their perception of sounds, time, letters, and numbers (Cho & Lee, 2021). This unique perspective allows artists to explore and express the world innovatively. Synesthete artists can translate cross-sensory experiences, such as seeing colors when listening to music, into their artworks, reflecting the complex connections between the senses (Cho, 2021). This unique approach challenges conventional perceptions and evokes intense emotions in the viewer.

Relationship between the Senses and Artistic Expression

Synesthetes blur the boundaries between senses, allowing them to associate colors with sounds, shapes with tastes, and more. Synesthesia has been documented in art and literature from ancient Greece to the Roman Era, with diverse cultural interpretations shaping its understanding in scientific and artistic communities (Duarte & Constantinidi, 2022). Scientists have yet to reach a consensus on the causes of synesthesia. Some argue this is a series of learned responses, but most point to a neurological basis. Research reveals uncommon connections in the adjacent brain regions of synesthetes, similar to those found in infants. All babies are thought to have synesthesia until four months of age, at which point the normal process of synaptic pruning severs those neural connections (Simmonds-Moore *et al.*, 2019). This condition, which affects about 4 percent of the population, is more prevalent in women than men and appears to have a genetic component (Meier, 2021). Although synesthesia can manifest itself in various ways, the most common include color-grapheme, in which numbers or letters evoke colors, and chromesthesia (sound-color), where sounds are associated with colors or shapes. Not surprisingly, synesthetes are eight times more likely to work in creative fields, and throughout history, numerous talented artists have been synesthetes.

Examples

Vincent van Gogh likely had chromesthesia, associating sounds with colors. Wassily Kandinsky linked musical notes to specific hues, creating iconic abstract paintings (Igrevna, 2022).

Examples of Synesthete Artists and Their Work

Vincent van Gogh (1853-1890)

Chromesthesia may have influenced his vibrant, expressive style. He associated sounds with colors and found playing the piano overwhelming due to the

colorful notes (PITTION). Sadly, Vincent Van Gogh seems to have been one of those synesthetes who was more affected than benefited by his condition. Research has highlighted the negative impact of his chromesthesia, mentioning that when Van Gogh took piano lessons in 1885, his instructor noticed that he associated musical notes with specific colors. Sadly, his teacher interpreted this as a sign of insanity and urged him to abandon the lessons (Ferguson, 2023).

Arthur Rimbaud and Charles Baudelaire

Synesthesia has left a deep imprint on the poetry of French symbolist poets such as Arthur Rimbaud and Charles Baudelaire (Jewanski *et al.*, 2020). These writers used synesthesia as a poetic tool to create vivid and evocative images that go beyond the conventional. In “The Drunken Boat”, Rimbaud masterfully fuses colors, sounds, and physical sensations, taking the reader on a sensory and emotional journey. Similarly, Baudelaire employs synesthesia in “The Flowers of Evil” to explore the duality between the material and the spiritual, creating images that fuse the tangible and the abstract into a rich and evocative poetic language (Lorusso *et al.*, 2022).

Wassily Kandinsky (866-1944)

Several artists believed to have experienced synesthesia have been highlighted throughout art history, and their work reflects this unique sensory influence. A notable example is the Russian painter Wassily Kandinsky (White, 2019). Kandinsky, a pioneer of abstract art, linked music and color, expressing each musical note through precise hues in his iconic works. He claimed he could see colors when listening to music and used this synesthetic connection to create abstract works that convey emotions and moods by combining shapes and colors (Igorovna, 2022).

Olivier Messiaen (1908-1992)

As a French composer, Messiaen associated specific musical tones with colors and shapes and used these synesthetic associations in his musical compositions to evoke visual images and tactile sensations in his listeners (Palmqvist, 2021). His synesthetic perceptions informed his innovative compositions, with vivid color associations to create a multisensory auditory experience.

Billie Eilish, Lady Gaga and Dave Grohl (Founder of the rock band Foo Fighters)

Both musicians experience synesthesia, visualizing music in color and structure as LEGO blocks (Ward, 2023).

Picasso’s Synesthesia Experiences and Artistic Development

Pablo Picasso (1881-1973)

Pablo Picasso may have experienced forms of synesthesia that influenced his creative approach and the evolution of his work throughout his various artistic periods and

the variety of genres he explored (Gage & Grovier, 2023). Synesthesia is divided into two main categories: biosensors, which involves the crossing of two senses, and multisensory, which encompasses the crossing of three or more senses. Within these categories, the individual variations of the synesthetic experience are endless, giving each person experiencing it a unique perception of the world.

Indications of Synesthesia Through His Work Pablo Picasso’s Blue Period (1901-1904)

During his Blue Period, Picasso explored themes of melancholy and sadness, using soft blue and green tones in his works. Possible synesthesia in this period could manifest in an emotional connection between color and tactile sensation, such as associating certain tones with a sense of calm or melancholy (O’Connor, 2021).

Pink Period 1909-1906

In his pink period, Picasso incorporated pink and warm tones in contrast to the previous blue, exploring a more cheerful and festive theme (Williams, 2022). Synesthesia could have influenced their ability to associate certain colors with emotions such as joy or vitality.

Analytical Cubism 1909-1912

During Analytic Cubism, Picasso decomposed reality into geometric shapes and multiple perspectives. Synesthesia could have manifested in the connection between visual form and tactile perception, such as representing textures through abstract shapes (MAHIR’S & GURCAN, 2023). This is trans-sensory perception.

Synthetic Cubism 1912-1919

In Synthetic Cubism, Picasso incorporated collage and mixed media elements to create more complex compositions. Synesthesia could have influenced combining brighter colors and bolder textures to convey tactile and emotional sensations, moving away from monochromatic and fragmented style of Analytical Cubism (Wang *et al.*, 2023).

Surrealism and Expressionism 1920 Onwards

In his later years, Picasso experimented with Surrealism and Expressionism, emerge in 1920s creating more abstract, and symbolic works. Picassos work during this period often incorporated dreamy, morphing shapes that evokes a sense of unreality and psychological depth. (Atkin, 2021). Surrealism’s aims to access deeper layers of consciousness (Spiteri, 2019). Expressionism emphasizes emotional intensity, subjective experience, and form distortion to convey inner feelings. Picasso’s “Guernica” (1937) is a powerful example of this style in the Spanish Civil War.

Different forms of Synesthesia in His Work

In the context of Pablo Picasso’s art throughout his distinct periods, several forms of synesthesia can be identified that could have influenced his creative

approach and the evolution of his work (Iosifyan *et al.*, 2022). Below, we're going to explore some of these forms of synesthesia concerning Picasso's work:

Synesthetic Art

Picasso experimented with depicting forms and objects from multiple perspectives during his Cubist period, creating a trans-sensory perception that challenged visual conventions. His ability to fuse sensory elements in his works could be considered synesthetic art.

Synesthetic Images

In many of his works, Picasso creates images that accumulate a surprising metaphorical resonance by combining visual and emotional elements in unexpected ways. For example, in "Guernica," the combination of angular shapes and intense colors evokes an emotionally and visually striking experience.

Literary Synesthesia

Although Picasso was primarily a visual artist, his collaboration with poets and writers, as in the illustrations for Max Jacob's "The 4 Seven," suggests a connection between his art and poetic expression or metaphorical articulation of a sensory correspondence (Earl, 2020).

Synesthetic Metaphor

In many of his cubist and surrealist works, Picasso uses synesthetic metaphors that exploit similarities between experiences in different sensory modalities (Zhao *et al.*, 2022). For example, in "Violin and Cup," geometric shapes and colors can be interpreted as a metaphor for musical harmony.

Kinetic Synesthesia

Although Picasso did not work directly in the kinetic medium, his interest in the representation of movement and the dynamics of forms in his works suggests a sensitivity toward kinetic synesthesia, especially in his works related to circus, ballet, and dance (Young, 2021).

Synesthetic Canvas

In the contemporary era, technology has created synesthetic canvases, such as electronic screens that combine images and sound (Ren & Liu, 2023). Although Picasso did not have access to this technology, his experimental approach and interest in the interaction of different media suggest an affinity with the idea of a mental synesthetic canvas, which was the basis of his creation.

Conceptual Synesthesia

Throughout his career, Picasso explored conceptual themes that could provoke a synesthetic experience, whether through the representation of time, the written word, the personality of his subjects, or the memory evoked by his works, for example, through traumatic events (Poplavskyi *et al.*, 2020).

Picasso Defying the Classical Vision

The challenge of the classical view of perception is a central theme in synesthetic art and Pablo Picasso's work, as both seek to go beyond conventional perception to explore new forms of sensory and cognitive experiences.

Some Examples

Integration of the Senses

Thus, the essence of synesthesia art and Picasso's work combines the senses into one package, which is opposed to the classical way. While other artistic works may be employed to impact one sense, these artistic productions attempt to work along so many of the senses simultaneously that it becomes more of a sense experience (Haag & Castillo, 2021). For instance, in the work of Picasso 'Les Demoiselles d'Avignon,' the decomposition of figures and an attempt at multiple-dimensional representations make the work demand spatial and tactile fields with active perception.

Exploration of Perceptual Subjectivity

As the abovementioned synesthetic art and Picasso do, both challenge the notion of objective reality shared by everyone in society. Instead, they rely on perceptual subjectivity since it concerns the exterior world, and grasping it depends on one's experiences, moods, and associations (Bakovic *et al.*, 2022). For example, in works of the Blue Period, including "La Celestina," the use of specific hues, including blue and green, not only serves as the representation of a certain feeling but also provides the viewers with the given stimulus for the interpretation and acquisition of the art piece in terms of the perceptive egocentricity of the receiver (Conti, 2023).

Deconstruction and Reconstruction of Reality

Nonetheless, synthetic art and Picasso present similar concepts that deviate from the classical perception of reality, though in their own way (Yang, 2020). Instead of simulating reality, these exhibitions employ methods such as abstraction and distortion and play with the imagery to unfold different perspectives and interpretations. For instance, in Picasso's Cubist paintings, different decoupages and the representation of multiple visions deny the existence of a fixed and unique vision of the reality presented, thus encouraging the spectator to reconstruct it actively (MATSUI, 2023).

Cubism and the Decomposition of Forms

In Cubism, Picasso and other artists focused on depicting figures and objects from different positions and at once in various planes. For instance, in "Still Life with Grid Chair," painted in 1912, Picasso breaks down the picture of a chair and other objects into geometric, angular forms that diverge from the classical representation of realistic images (Langley *et al.*, 2020). This is not only a cubist trick with the visual reception of the image but also an invitation to build the picture with one's own hands and reconstruct it in a spatial-tactile way (Brauer, 2023).

Emotive Colors in Expressionism

Picasso followed expressionism during his expressionistic stage, where they used intense colors and brush strokes to express feelings. In pieces like ‘Weeping Woman’ painted in 1937, dark hues and organic shapes depict sorrow and pain, defeating art that had adopted optimistic beauty and balance (Narag & Soriano, 2021). This willful expression of the state through color and form engages the viewer’s emotive appreciation and triggers a synesthetic reaction that fuses vision with feeling.

Collage and the Unification of Disparate Elements

In the collage works, Picasso used juxtaposition and collage to alter the audience’s perception of how things are seen individually and how they are seen together (Güliz, 2022). For instance, in Still Life with Grid Chair and Glued Papers (1914), Picasso uses glued paper to create a surface feel and combines different components to create a piece of work (Langley *et al.*, 2020). This technique overloads the sense of sight by playing with the perception and arrangements of objects and calls for the perception of the artwork not only through the sense of touch.

Surrealism and the Representation of the Subconscious

Although Picasso did not follow all the principles of Surrealism, it was this master who influenced the movement of representation of the dreamlike and symbolical. Thus, in works like “The Dream,” painted in 1932, Picasso offers a humorous, illogical representation that does not correspond to rational thinking and logical features the audience can decipher and analyze (Spiteri, 2019). Thus, this representation of the subconscious provokes the viewer’s associative perception and visualization and creates a synesthetic effect, which exceeds the possibilities of real reality.

Reflection on the Importance of Synesthesia in Picasso’s Art

Picasso’s art was influenced by synesthesia, which allowed him to experience and express the world through multiple integrated senses (Pirinen, 2020). This ability to associate colors with emotions, textures with sounds, and shapes with flavors or aromas allowed him to create emotionally rich and conceptually rich works. This synesthesia enriched his artistic perception, influencing his creative decisions and how he represented reality innovatively (Sjödín, 2020; Yang, 2020). In conclusion, Picasso’s art demonstrates the complexity of human perception and the interaction between the senses in the context of art and creativity.

Potential Synesthetic Experiences

Some famous artists who reported or were believed to have had some form of synesthesia include Pablo Picasso, whose work is said to be associated with synesthesia (Yang, 2020). The lack of direct evidence of synesthetic experiences can be explained; however, Picasso’s most

peculiar work, his rather revolutionary approach to the choice of colors, forms, and composition, alludes to a possible enhancement in his ability to perceive the world based on multiple channels.

Impact on Artistic Expression

Picasso’s traditionalist years of the Blue Period, Cubists, and the conventional style are noteworthy as they represent a journey that Picasso undertook to reform visual language and human perception (Finlay, 2023). This could be due to Lee’s skill of disturbing and decomposing forms of cubist compositions, which depict the synaesthetic approach of portraying multi-perspective and sensory perceptions through art.

Artistic Techniques and Innovations

Over the years, Picasso sought new possibilities in art, including collage, sculpture, and the latest techniques in his works that distanced from realistic aesthetics. In “Les Demoiselles d’Avignon” and “Guernica,” one can find elements of fragmented forms and distorted figures, which became the driving force of modern art and suggest a synesthetic ability to connect forms and emotions (Franz, 2023).

Picasso was synesthetic, and this research looked into how synesthesia affects art and how it caused Picasso to perceive and create art through a combination of the senses. With such associations, he could paint colors with emotions, textures with sounds, and shapes with tastes and smells (Franz, 2023); thus, he could produce emotionally and conceptually valuable paintings. This synesthesia gave him a fuller perception of art-making concerning his decisions while creatively presenting reality (Packard, 2023). Although underrated, the fifth sense of smell is very important in human perception and adds to the periphery in various ways. It seems Picasso used the phrase “smelling” colors to suggest that the senses are combined and invoked. Such a shift could have affected how Picasso observed and painted colors, thus bringing interpretations and symbolism to his works. From a neurological point of view, it may explain how olfactory and visual processing areas are connected, and it might provide answers about the organization of synesthesia or, generally, the inter-processing of different sensory modalities (Ward & Simner, 2020). This sensory relation could have helped establish the emotional and symbolic worth of Picasso’s paintings by awakening personal feelings and associations through the sense of vision and smell.

Legacy and Influence

Color

Picking up on the fact that Picasso had synesthesia, I can conclude that this man experienced colors personally and emotionally. Thus, he attributed one or several shades to some emotion or feeling, which he then imposed on his painting (Blum, 2021). This particular observation can be seen in the artist’s Blue Period, which he painted between

1901 and 1904 and used blue hues to represent sorrow and despair, or his Rose Period, painted between 1904 and 1906, where he used pink and red to depict happy and amorous moods (Bakovic *et al.*, 2022).

Form

Thus, synesthesia impacted Picasso's form-making, providing him with distinct possibilities for constructing forms and structures. His perception of form in more than a concrete visual way helped him evolve Cubism, where an object is dissected into small geometric shapes and rebuilt into an abstract image (Finlay, 2023). This movement was able to go against traditional views and tried to illustrate the subject from various points of view at virtually the same time.

Indications of Synesthesia in Picasso's Life and Work

Picasso's unique perception, shaped by synesthesia, enabled him to see the world differently and convey this vision through his art. His works often blend reality and imagination, merging what he saw based on what he felt or heard. His lines and compositions have a flowing, almost melodic cadence, which reflects this synesthetic mixing.

Analysis of Synesthesia's Impact on Picasso's Emotional Expression and Artistic Journey

Examples of Synesthesia in Picasso's Life and Work

Picasso's unique sense, shaped by synesthesia, enabled him to experience the world in novel ways and communicate this vision via his work (Finlay, 2023). His paintings typically merge reality and fiction, blending what he saw with what he felt or heard. His lines and compositions have a fluid, almost musical rhythm representing synesthetic blending.

Chromesthesia

The most prevalent type of synesthesia among artists is chromesthesia, which is when sound or music is perceived as a color. This ailment most likely influenced Picasso's creative perspective. Imagine hearing a melody and simultaneously seeing vibrant hues dancing before your eyes (Ferguson, 2023). Picasso's imagination was like a piano with many strings, resonating with the interplay of color and music. Picasso's paintings demonstrate how the interaction of colour and shape enabled him to produce dynamic and visually captivating works that continue to fascinate viewers.

Innovative Techniques

Picasso's skill stems from his ability to portray complicated emotions using new ways. His unconventional approach to painting produces strong emotional responses from viewers. He produced works that defied convention by combining color, shape, and perception. His works, like "Les Femmes d'Alger," questioned expectations and evoked strong emotions (Meier, 2021).

Abstract Art

Synesthesia significantly impacted the creation of abstract art in the early twentieth century (McDonnell, 2020). Picasso, Wassily Kandinsky, and other painters explored sensory convergence. Picasso's vibrant colors, distorted figures, and rhythmic compositions all have a synesthetic influence. His paintings became abstract, concentrating on rhythm and structure, much like polyphony in music.

Emotional Resonance

Picasso's emotional expression wasn't limited to mere representation; it was visceral. His Blue Period, characterized by melancholy and introspection, used cool blue tones to evoke sadness (Bakovic *et al.*, 2022). Later, during his Rose Period, warmer colors symbolized hope and sensuality. His Cubist phase deconstructed forms, challenging perception and inviting viewers to engage emotionally with fragmented realities.

To summarize, Picasso's synesthetic encounters broadened his artistic palette, allowing him to produce works that spoke beyond the canvas. Color, form, and perception melded perfectly, creating a unique visual language that continues to enchant audiences worldwide (Blum, 2021). Pablo Picasso's synesthetic experiences, in which he could see one sensation about another (for example, seeing colors while hearing noises), improved his emotional expression and creative growth by giving a distinct lens through which he observed and depicted the world (Bakovic *et al.*, 2022). This multimodal technique enables him to stretch the boundaries of conventional art and produce pieces that engage with viewers on several sensory levels.

Research & Studies

Scientific Research on Synesthesia in Art

Synesthesia, a phenomenon in which activation of one sensory or cognitive route causes involuntary feelings in another, has piqued the interest of scholars investigating potential applications in art (Meier, 2021). Numerous studies have examined how synesthetic experiences affect creative creativity and perception.

Cross-Modal Perception

According to a research study, synesthetes have heightened cross-modal awareness, which happens when one sensory pathway is aroused, prompting emotions in another. (Iosifyan *et al.*, 2022). This may tremendously impact how artists see and interpret their environment.

Neuroscientific Studies

Neuroimaging studies have improved our understanding of the neurological foundations of synesthesia, discovering distinct patterns of brain activity during synesthetic experiences. (Laeng *et al.*, 2021). Understanding these processes can help us better understand how synesthesia affects creative expression.

Impact on Artistic Expression

Synesthesia can impact an artist's palette, forms, and compositions. Synesthetes, for instance, artists may associate precise hues with sounds and tastes, impelling their artistic decisions and resulting in one-of-a-kind, multisensory artworks (Finlay, 2023).

Impact of Synesthesia on Picasso's Aesthetic Perception

Picasso, known for his ground-breaking offerings to modern art, reportedly experienced synesthesia (Finlay, 2023). His paintings repeatedly incorporate vivid colors, warped perspectives, and abstract structures, which may represent his synesthetic senses.

Color Symbolism

Picasso's use of vivid color on his canvases, such as "Les Femmes d'Alger" and "Guernica," reveals a synesthetic approach in which colors evoke emotions and meanings beyond their visual appearance (Klempe, 2022b). His Artwork tells the tale of emotion and psychological and different neuronal activities.

Impact on Artistic Style

Synesthesia might have prejudiced Picasso's avant-garde artistic panache, which contains cubism and surrealism (Spiteri, 2019). His ability to blend several vantage themes and deform shapes might ascribed to synesthetic imprints of spatial linkages and sensory mixing.

Interdisciplinary Perspectives

Picasso's analysis necessitates a multidisciplinary examination of the work, combining art, neurology, and psychology to show the complicated relationship between sensation and creation. It may be interesting to study synesthesia, particularly its impact on art and specific artists like Picasso (Cucci *et al.*, 2023).

CONCLUSION

Examining synesthesia in art and its effects on personalities such as Picasso makes it easier to understand how perception and creativity affect creative breakthroughs in art. With the interaction of scientific rigor and the arts, synesthetic perception patterns' contribution to the creation of art and the construction of cultural messages can be unveiled (Finlay, 2023).

In other words, Picasso's work has great potential for neuroscience studies because it evokes important issues related to perception, creative process, and expressing oneself, which can be explained in or through combining different orientations (Cucci *et al.*, 2023). This way, the works produced and appreciated by people will be easier to understand by combining the insights of artists and scientists regarding the various aspects of the human mind. The interaction between arts and sciences shall be of tremendous utility for finding out more about how the human mind works.

Challenges

Picasso's challenge in his work, particularly via movements like Cubism, may be viewed as a synesthetic adaptation in certain ways. (Jozefacka & Mahler, 2022). Picasso's paintings defied visual conventions by depicting objects from several perspectives and blending forms and colors in unique ways, referred to as synesthesia. (Mallen, 2024). This working approach demonstrates a particular sensory integration that might be interpreted as a synesthetic adaptation in the context of his creative expression.

Synesthetic Integration in Picasso's Art

Picasso indirectly used synesthesia in his work by combining visual and philosophical aspects, which inspired his experimental approaches and disobedience of established creative conventions. Picasso accomplished a creative adaptation beyond normal visual perception, creating new artistic languages (Veerman, 2021). Thus, Picasso's challenge might be interpreted as a synesthetic adaptation, with sensory integration fueling his remarkable creative expression. This adaption enabled him to explore unexpected aesthetic qualities, influencing contemporary art by opening up new creative and perceptual pathways for artists and spectators.

Potential Study Areas for Synesthesia in Art

Pablo Picasso's art, renowned for challenging norms and offering unique perspectives, can be studied from the neuroscience perspective to understand human perception, creativity, and expression. This provides insights into potential research areas in neuroscience (Robson & Currie, 2022).

Visual Perception and Synesthesia

Picasso's cubist techniques challenge visual perception by presenting objects from multiple perspectives, potentially providing insights into human brain processes and sensory integration mechanisms (Ward & Simner, 2022).

Creativity and Cognition

Picasso's innovative artistic vision may reveal fundamental aspects of creative cognition through research on the human brain's creative processes in art.

Emotions and Artistic Expression

Picasso's art often evokes complex emotions, offering insights into the connection between human emotions and creative expression through the analysis of emotional reactions and neurological processes.

Neural Plasticity and Learning

Picasso's lifelong learning and adaptability in art may be explained by studying neuronal plasticity and learning mechanisms, which may help understand brain adaptation and creative talent development (Sotiropoulos & Anagnostouli, 2021).

Art-Brain-Viewer Interaction

Picasso's paintings' aesthetic experience can provide insights into how the brain processes and responds to complex visual information and the emotional, cognitive, and perceptual aspects of art appreciation.

Weaknesses and Limitations

Subjectivity and Bias

Picasso's interpretation is subjective, and it may be influenced by individualist views, culture, and art historical tendencies, perhaps resulting in disregard for competing opinions.

Framework Understanding

Picasso's artworks cover all styles and periods, which are determined by many things such as politics, experiences, and movements. (Iosifyan *et al.*, 2022). Concentrating on one factor or a particular period without reference to other factors will affect the depth and accuracy of the interpretation.

Interpretive Challenges

Picasso's works are often political and abstract, adding to the complexity of analysis (Chernyakevich, 2023). Thus, the elements of symbolism, the use of metaphors, and elements of the visual language often cannot have a clear and definite meaning and can be interpreted differently depending on the scholars and critics.

Limited Information

Some may rely on non-data-specific knowledge about Picasso or his intentions and influences on the piece. The artist himself rarely expounded on his art; thus, there are silences in the work that can be filled only with speculation.

Areas Requiring Further Exploration

Cross-cultural Perspectives

The degree of influence of Picasso's artwork also opens up discussion from other cultures that are not strictly defined in the methodology of Western Art History (Ward, 2023). Focusing on how his ideas have been received in cultures outside of the Western world may have revealed more or his works' effect and reception in the world more broadly.

Psychological and Emotional Dimensions

More research could be applied to the psychological and emotional aspects of Picasso's works to align with the man and examine how his life experiences influenced his creations (Troughton & Casanovas, 2023).

Technological Advances

For example, scientific analysis, X-ray fluorescence, or multispectral imaging could potentially determine more layers, changes, or different materials in Picasso's works (Cohen, 2020). This could provide this researcher with fresh interpretations of his composition method and used substances.

Comparative Studies

It might be useful to compare Picasso to other artists of his time or even artists from different epochs to reveal certain specifics of his manner of creating and his contribution to the development of new art (Sattari Sarbanqoli & Jamali, 2021).

REFERENCES

- Adiletta, M. J., & Thomas, O. (2020). An artistic visualization of music modeling a synesthetic experience. *arXiv preprint arXiv:2012.08034*.
- Atkin, W. (2021). *Historical Dictionary of Surrealism*. Rowman & Littlefield.
- Bakovic, M., Karapandza, S., Mcheik, S., & Pejović-Milić, A. (2022). Scientific Study of the Origin of the Painting from the Early 20th Century Leads to Pablo Picasso. *Heritage*, 5(2), 1120-1140.
- Benítez-Burraco, A., Adornetti, I., Ferretti, F., & Progovac, L. (2023). An evolutionary account of impairment of self in cognitive disorders. *Cognitive Processing*, 24(1), 107-127.
- Blum, H. P. (2021). Picasso's prolonged adolescence, his Blue Period, and blind figures. In *Art in Psychoanalysis* (pp. 39-55). Routledge.
- Brang, D., & Ramachandran, V. S. (2020). How do crossmodal correspondences and multisensory processes relate to synesthesia? In *Multisensory Perception* (pp. 259-281). Elsevier.
- Brauer, F. (2023). *Vitalist modernism: art, science, energy and creative evolution*. Taylor & Francis.
- Castro, A. J., Gary, S., Sergeant, M. J. T., & Jones, S. (1999). *The human nervous system: Functional anatomy*. Essential Psychology, 199.
- Chen, I.-H., Zhao, Q., Long, Y., Lu, Q., & Huang, C.-R. (2019). Mandarin Chinese modality exclusivity norms. *PLoS one*, 14(2), e0211336.
- Cheng, X., Zhang, H., Zhang, J., Gao, S., Li, S., Huang, Z., Bai, L., Yang, Z., Zheng, X., & Yang, L. (2023). Intelligent multi-modal sensing-communication integration: Synesthesia of machines. *IEEE Communications Surveys & Tutorials*.
- Chernyakevich, B. (2023). Reassessing Gombrich's Theory of Illusion for the 21st Century. Aalto University.
- Cho, J.-D., & Lee, Y. (2021). Colorpoetry: Multi-sensory experience of color with poetry in visual arts appreciation of persons with visual impairment. *Electronics*, 10(9), 1064.
- Cho, J. D. (2021). A study of multi-sensory experience and color recognition in visual arts appreciation of people with visual impairment. *Electronics*, 10(4), 470.
- Cohen, J. I. (2020). *The Black Art Renaissance: African Sculpture and Modernism across Continents*. University of California Press.
- Conti, C. A. (2023). *The Intermediality of Fernando de Rojas' La Celestina Through Adaptations and Translations From Literature, Cinema, and Art*. University of California, Riverside.
- Cucci, C., Picollo, M., Stefani, L., & Jiménez, R. (2023).

- The man who became a Blue Glass. Reflectance hyperspectral imaging discloses a hidden Picasso painting of the Blue period. *Journal of Cultural Heritage*, 62, 484-492.
- Delgado-Lobete, L., Pértega-Díaz, S., Santos-del-Riego, S., & Montes-Montes, R. (2020). Sensory processing patterns in developmental coordination disorder, attention deficit hyperactivity disorder and typical development. *Research in Developmental Disabilities*, 100, 103608. <https://doi.org/10.1016/j.ridd.2020.103608>
- Duarte, A., & Constantinidi, N. P. (2022). Traces of knowledge and use of cues of sensory processing in ancient Greek art. *Arte, Individuo y Sociedad*, 34(2), 521-540.
- Earl, H. (2020). Virginia Woolf's Synesthesia. *Twentieth Century Literature*, 66(4), 463-484.
- Ferguson, P. (2023). *Open Secrets: Poetry of Nature and Grace*. Wipf and Stock Publishers.
- Finlay, J. (2023). Encuentros híbridos: Reencuadrando la Suite Volard de Picasso. *Revista Eviterna*, 14, 51-69.
- Fiorillo, F. (2020). Assessment of a best practise approach for the attribution and authentication of paintings.
- Florea, E., & Cojocaru, S. (2021). The Presence of the Phenomenon of Artistic Synesthesia in Painting. *Review of Artistic Education*, 22(1), 244-252.
- Franz, E. K. (2023). Facing *L'Origine du Monde*: The Model's Role in the Studio Romance. The University of Wisconsin-Madison.
- Gage, J., & Grovier, K. (2023). *Colour in art*. Thames & Hudson.
- Gravener, M. (2021). The Neurocognitive Mechanisms of Grapheme-Color Synesthesia.
- Güliz, B. (2022). The place of the collage as a way of expression in graphic design. *European Journal of Arts*, 3-4, 19-27.
- Haag, C., & Castillo, L. (2021). What Innovation Can Learn from Avant-garde. *ISPIM Conference Proceedings*.
- Hamada, D., Yamamoto, H., & Saiki, J. (2020). Association between synesthetic colors and sensitivity to physical colors changed by type of synesthetic experience in grapheme-color synesthesia. *Consciousness and cognition*, 83, 102973.
- Igorevna, K.-A. E. (2022). "Haptic Optic" and Non-visual Perception in Art of the 20th and Early 21st Centuries. *American Journal of Art and Design*, 7(4), 144-149.
- Iosifyan, M., Sidoroff-Dorso, A., & Wolfe, J. (2022). Cross-modal associations between paintings and sounds: Effects of embodiment. *Perception*, 51(12), 871-888.
- Jewanski, J., Simner, J., Day, S. A., Rothen, N., & Ward, J. (2020). The evolution of the concept of synesthesia in the nineteenth century as revealed through the history of its name. *Journal of the History of the Neurosciences*, 29(3), 259-285.
- Jozefacka, A., & Mahler, L. (2022). Reading Picasso in Munich and Prague in 1922. *Art/Umění*, 70(2).
- Karim, A., Proulx, M. J., de Sousa, A. A., & Likova, L. T. (2021). Neuroplasticity and crossmodal connectivity in the normal, healthy brain. *Psychology & Neuroscience*, 14(3), 298.
- Kihara, M., Hamada, D., & Nagata, N. (2024). Possible acquired synesthesia underlying the consistency of favorable colors – A case study of grapheme-color synesthesia and sound-color synesthesia among competitive Karuta players. In *International Symposium on Affective Science and Engineering ISASE2024*.
- Klempe, S. H. (2022a). The Experimental Psychology's Use of Music to Uncover Mental Capabilities. In *Sound and Reason: Synesthesia as Metacognition* (pp. 53-90). Springer.
- Klempe, S. H. (2022). A psychological approach to complexity: Synesthesia. In S. H. Klempe (Ed.), *Sound and reason: Synesthesia as metacognition* (pp. 127-166). Springer.
- Kumar, N. (2020). Parapsychology - Towards causal research. *International Journal of Social Impact*, 5, ISSN: 2455-670X.
- Kwon, J., & Iedema, A. (2022). Body and the senses in spatial experience: The implications of kinesthetic and synesthetic perceptions for design thinking. *Frontiers in psychology*, 13, 864009.
- Laeng, B., Flaaten, C. B., Walle, K. M., Hochkepler, A., & Specht, K. (2021). "Mickey Mousing" in the Brain: Motion-Sound Synesthesia and the Subcortical Substrate of Audio-Visual Integration. *Frontiers in Human Neuroscience*, 15, 605166.
- Langley, A., Muir, K., & Sutherland, K. (2020). Scenes from the life of Picasso's Still Life (1922): History, materials, and conservation. *SN Applied Sciences*, 2(8), 1384.
- Lorusso, L., Ione, A., Franchini, A. F., & Porro, A. (2022). Synesthesia and Emotional Sound. In *The Musical Neurons* (pp. 13-26). Springer.
- Mahir's, P., & Gurcan, A. T. (2023). The effect of music on painting: J. S. Bach's Fugue form in Paul Klee and Mehmet.
- Makioka, S. (2021). Idiosyncratic spatial representations of the days of the week in individuals without synesthesia. *Cognition*, 207, 104500.
- Mallen, E. (2024). Pablo Picasso: In Search of Language. *International Journal of Culture and History*, 11(1), P17-P17.
- MATSUI, H. (2023). Top-down processing in Cubism: The diagram of human proportion in Picasso's Cubist works. *Psychologia*, 65(2), 233-253.
- McDonnell, M. (2020). *Finding Visual Music in Its 20th-Century History*. Dublin: Trinity College.
- Meier, B. (2021). Synesthesia. In G. F. Koob, M. Le Moal, & R. F. Thompson (Eds.), *Encyclopedia of behavioral neuroscience*.
- Murray, R. (2021). A review of Synesthesia: historical and current perspectives. *UWL Journal of Undergraduate Research XXIV*.
- Nair, A., & Brang, D. (2019). Inducing synesthesia in non-synesthetes: Short-term visual deprivation facilitates

- auditory-evoked visual percepts. *Consciousness and cognition*, 70, 70-79.
- Narag, M. J. G., & Soriano, M. (2021). Discovering artistic influences of painters from expressionism, impressionism, and surrealism art movements using convolutional neural network. *Journal of Cultural Heritage*, 51, 182-193.
- O'Connor, E. F. (2021). *Pamela Colman Smith: Artist, Feminist, and Mystic*. Liverpool University Press.
- Packard, C. (2023). *Art Rules: How Great Artists Think, Create and Work*. Frances Lincoln Childrens Books.
- Palmqvist, M. (2021). A Palette of my Inner Universe—To Use Synesthesia in Artistic Processes.
- Pirinen, M. (2020). Game of the name: titles and titling of visual artworks in theoretical discussions from 1960 to 2015. *JYU dissertations*.
- Pittion, U. Representations of music in nineteenth-century French art.
- Poplavskiy, M., Rybinska, Y., & Ponochovna-Rysak, T. (2020). The specific of synesthesia in contemporary American and English poetry and its impact on the reader. *Cogito*, 12(3).
- Ren, H., & Liu, S. (2023). The education of synesthetic interaction design and the aesthetics of engineering and technology. In *TENCON 2023-2023 IEEE Region 10 Conference (TENCON)*.
- Robson, J., & Currie, G. (2022). Aesthetics and cognitive science.
- Sattari Sarbanqoli, S., & Jamali, S. (2021). A comparative study of painting and architecture stylistics of contemporary Iranian and western arts. *Journal of Art and Architecture Studies*, 10(2), 31-41.
- Simmonds-Moore, C. A., Alvarado, C. S., & Zingrone, N. L. (2019). A survey exploring synesthetic experiences: Exceptional experiences, schizotypy, and psychological well-being. *Psychology of Consciousness: Theory, Research, and Practice*, 6(1), 99. <https://doi.org/10.1037/cns0000177>
- Sjödin, Å. (2020). The whole is “other” than the sum of its parts: An investigation of synesthesia and perception through a patchwork. In.
- Sotiropoulos, M. G., & Anagnostouli, M. (2021). Genes, brain dynamics and art: the genetic underpinnings of creativity in dancing, musicality and visual arts. *Journal of Integrative Neuroscience*, 20(4), 1095-1104.
- Spehar, B., & Stevanov, J. (2021). Expressive qualities of synthetic textures. *Psychology of Consciousness: Theory, Research, and Practice*, 8(2), 217.
- Spiteri, R. (2019). Surrealism, Modernism, Dissensus. *Australian and New Zealand Journal of Art*, 19(1), 107-122.
- Troughton, I. A., & Casanovas, À. P. (2023). Picasso, Schlemmer and beyond: Scenography and costume design from a critical disability studies lens. *Studies in Costume & Performance*, 8(2), 175-190.
- Trufanova, I. V. (2024). Types of Synesthesia in B. Pasternak's Story “Childhood Lovers”(“Childhood Eyelets”). *RUDN Journal of Language Studies, Semiotics and Semantics*, 15(1), 126-137.
- Van der Schyff, D., Schiavio, A., & Elliott, D. J. (2022). *Musical bodies, musical minds: Enactive cognitive science and the meaning of human musicality*. MIT Press.
- Veerman, J. (2021). *Entangled: The Synesthetic Art Museum*.
- Wang, M., Loiudice, A., Okatenko, V., Sharp, I. D., & Buonsanti, R. (2023). The spatial distribution of cobalt phthalocyanine and copper nanocubes controls the selectivity towards C2 products in tandem electrocatalytic CO2 reduction. *Chemical Science*, 14(5), 1097-1104.
- Ward, J. (2021). Synaesthesia as a model system for understanding variation in the human mind and brain. *Cognitive Neuropsychology*, 38(4), 259-278.
- Ward, J., & Simner, J. (2020). Synesthesia: The current state of the field. In *Multisensory perception* (pp. 283-300). Elsevier.
- Ward, J., & Simner, J. (2022). How do different types of synesthesia cluster together? Implications for causal mechanisms. *Perception*, 51(2), 91-113.
- Ward, R. J. (2023). Virtual Synaesthesia: Crossmodal Correspondences and Synesthetic Experiences The University of Liverpool (United Kingdom)].
- White, R. J. (2019). Kandinsky: Thinking about the Spiritual in Art. *Religion and the Arts*, 23(1-2), 26-49.
- Williams, J. M. (2022). *The Synesthesia Suite: The color pieces of Andy Akibo*. The University of Memphis.
- Yang, S. (2020). Picasso for Preaching: The Demand and Possibility of a Cubist Homiletic. *Religions*, 11(5), 232.
- Young, K. (2021). Synesthetic gestures: making the imaginary perceptible. *The Senses and Society*, 16(1), 89-101.
- Zhao, Q., Ahrens, K., & Huang, C.-R. (2022). Linguistic synesthesia is metaphorical: a lexical-conceptual account. *Cognitive Linguistics*, 33(3), 553-583.