

ALZHEİMER HASTALIĞINDA GÖRSEL ALGI DEĞİŞİMLERİ VE SANATSAL ÜRETİME ETKİLERİ

VISUAL PERCEPTION CHANGES IN ALZHEIMER'S DISEASE AND THEIR EFFECTS ON ARTISTIC PRODUCTION

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ÖZET

Bu çalışma, Alzheimer hastalığında (AH) ortaya çıkan görsel algı değişimlerinin sanatsal üretim ve estetik deneyim üzerindeki etkilerini incelemektedir. Nörodejeneratif süreçlerin retina ve kortikal görsel sistemler üzerindeki etkileri, kontrast duyarlılığı, renk algısı, derinlik ve uzamsal organizasyon gibi temel görsel işlevlerde bozulmalara yol açmaktadır. Bu bozulmalar yalnızca günlük yaşam aktivitelerini değil, aynı zamanda bireylerin sanatsal üretim biçimlerini ve estetik algılarını da dönüştürmektedir. Literatürde Alzheimer hastalarının eserlerinde perspektif kaybı, form sadeleşmesi ve renk kullanımında değişim gibi sistematik dönüşümler rapor edilmiştir. Bununla birlikte, sanatsal yaratıcılık tamamen ortadan kalkmamakta, aksine bilişsel ve algısal yeniden yapılanma doğrultusunda niteliksel bir dönüşüm geçirmektedir. Özellikle limbik sistemin görece korunmuş olması, sanatsal üretimde duygusal yoğunluğu ve spontanlığı artırabilmektedir. Bu çalışma, nörooftalmoloji, bilişsel sinirbilim ve estetik teori perspektiflerini bir araya getirerek disiplinlerarası bir değerlendirme sunmakta; Alzheimer hastalığında görsel algı ile sanatsal ifade arasındaki ilişkiyi açıklamayı amaçlamaktadır.

Anahtar Kelimeler: Alzheimer hastalığı, görsel algı, sanatsal üretim, estetik deneyim, yaratıcılık

ABSTRACT

This study examines the effects of visual perception changes in Alzheimer's disease (AD) on artistic production and aesthetic experience. Neurodegenerative processes affecting retinal structures and cortical visual systems lead to impairments in fundamental visual functions such as contrast sensitivity, color perception, depth perception, and visuospatial organization. These impairments not only influence daily activities but also transform the ways in which individuals produce art and experience aesthetics. Previous literature reports systematic changes in artworks created by individuals with AD, including loss of perspective, simplification of form, and alterations in color usage. However, artistic creativity does not completely disappear; rather, it undergoes a qualitative transformation in line with cognitive and perceptual reorganization. The relative preservation of the limbic system may enhance emotional intensity and spontaneity in artistic expression. This study provides an interdisciplinary evaluation by integrating perspectives from neuro-ophthalmology, cognitive neuroscience, and aesthetic theory, aiming to explain the relationship between visual perception and artistic expression in Alzheimer's disease.

Keywords: Alzheimer's disease, visual perception, artistic expression, aesthetic experience, creativity

1. INTRODUCTION

Alzheimer's disease (AD) is the most common cause of dementia worldwide and represents an increasing public health burden as life expectancy continues to rise (Pineiro, 2025: 5963). Globally affecting millions of individuals, the prevalence of dementia is expected to increase significantly in the coming decades (Bulduk, 2017: 37). The neurodegenerative nature of the disease not only impairs cognitive functions but also significantly affects visual perception and aesthetic experience.

Recent studies suggest that, due to the close relationship between the eye and the brain, ocular structures may serve as potential biomarkers for the early detection of AD (Salobarar, 2019: 45). Structural changes in the retina, including the loss of retinal ganglion cells and optic nerve integrity, lead to deficits in basic visual functions such as visual acuity, contrast sensitivity, color perception, and depth perception (Pineiro, 2025: 5965; Arıtürk, 2012: 68). Neurodegenerative changes in cortical visual processing centers extend beyond retinal alterations and affect higher-order perceptual processes. These impairments become particularly evident in everyday activities requiring visual information processing, such as reading, spatial navigation, and social interaction (Salobarar, 2019: 47). For instance, reduced contrast sensitivity limits object recognition under low-light conditions, while impaired depth perception disrupts accurate spatial localization (Erdağ & Çıtırık, 2024: 567; Arıtürk, 2012: 69).

Within the context of art and aesthetic production, these perceptual and cognitive changes alter how individuals create and interpret visual representations. Previous studies report systematic transformations in artworks produced by individuals with AD, including loss of perspective, disrupted spatial organization, simplification of form, and altered color usage (Gretton & ffytche, 2013: 115; Maurer & Prvulovic, 2004: 1061). These changes provide important insights into how neurodegeneration reshapes artistic expression and aesthetic perception. Accordingly, this study aims to examine the effects of visual perception changes in Alzheimer's disease on artistic production and aesthetic experience, offering an interdisciplinary evaluation that integrates perspectives from neuroscience, visual perception, and aesthetic theory.

2. VISUAL PERCEPTION IN ALZHEIMER'S DISEASE

Recent evidence suggests that engagement in artistic creation and aesthetic exploration may function not only as a form of self-expression but also as a cognitive and sensory exercise. Sustained involvement in such activities may contribute to the preservation of cognitive functions and potentially delay the progression of Alzheimer's disease. In particular, the integration of sensory exploration, visuospatial processing, and emotional engagement inherent in artistic production may enhance neural plasticity and support residual cognitive reserves, thereby mitigating some of the perceptual and executive deficits associated with the disease.

A notable example illustrating the impact of Alzheimer's disease on visual production is the self-portrait series of American artist William Utermohlen. Following his diagnosis, Utermohlen's progressively simplified portraits demonstrate clear visual deficits, including loss of perspective, asymmetry, and reduction in detail, providing a striking visual record of neurodegenerative effects on artistic expression (Cipriani et al., 2019: 218). Alzheimer's disease affects visual perception through both retinal and cortical mechanisms. Structural alterations in the retina, optic nerve, and retinal ganglion cells lead to impairments in visual acuity, contrast sensitivity, color discrimination, and depth perception (Pineiro, 2025;

Salobarar, 2019; Arıtürk, 2012). These deficits extend beyond basic visual functions and influence higher-order perceptual processes.

Neurodegeneration in cortical visual processing areas further disrupts the interpretation of visual information. As a result, individuals with AD experience difficulties in tasks that rely on visual processing, such as reading, spatial navigation, and social interaction (Salobarar, 2019). Reduced contrast sensitivity limits the ability to recognize objects in low-visibility conditions, while impaired depth perception affects the accurate evaluation of spatial relationships (Erdağ & Çıtırık, 2024; Arıtürk, 2012). Artistic production provides an important lens through which these perceptual changes can be observed. Studies indicate that visual deficits in AD systematically influence how individuals organize and express visual information in artistic contexts. Common patterns include disrupted perspective, simplification of forms, and alterations in color usage (Gretton & ffytche, 2013). These changes are not random but reflect underlying alterations in cortical visual networks and perceptual processing.

Increased contrast and emphasis on outlines in artworks may represent adaptive strategies to compensate for declining visual discrimination. Similarly, the simplification of details is consistent with a shift toward lower spatial frequency processing in visual perception (Maurer & Prvulovic, 2004). Changes in depth perception and spatial organization often result in flattened or fragmented representations, indicating a transition from objective depiction toward more subjective and emotionally influenced visual expression (Crutch & Rossor, 2006). Overall, visual perception changes in Alzheimer's disease should be understood not merely as deficits, but as indicators of broader perceptual and cognitive reorganization. These transformations provide valuable insight into the relationship between neurodegeneration, perception, and artistic expression.

3. ARTISTIC PRODUCTION AND PERCEPTUAL CHANGES

Visual perception deficits in Alzheimer's disease (AD) have a direct and systematic impact on artistic production. These effects extend beyond simple visual impairment and reflect deeper changes in perceptual organization, cognitive processing, and expressive behavior. Artistic production in AD should therefore be understood as a complex interaction between perceptual decline and adaptive reorganization. One of the most prominent transformations observed in artworks created by individuals with AD is the simplification of visual forms. Rather than producing detailed and complex representations, individuals increasingly rely on generalized shapes and reduced compositional complexity. This shift is consistent with impairments in high-spatial-frequency processing, which limit the ability to perceive fine details (Maurer & Prvulovic, 2004).

Alterations in spatial organization and perspective are also common. Degeneration in dorsal visual pathways and parietal regions leads to difficulties in representing three-dimensional space, resulting in flattened or fragmented compositions. Perspective distortion and loss of spatial coherence are frequently observed, reflecting disruptions in visuospatial integration. However, these changes should not be interpreted as a complete loss of meaning; rather, they indicate a transition toward more subjective and emotionally driven representations (Crutch & Rossor, 2006). Color perception undergoes significant changes as well. Deficits in retinal cone function and ventral visual pathway processing, particularly for cooler tones, often lead to a predominance of warm colors such as red, orange, and yellow (Salobarar, 2019; Gretton & ffytche, 2013). At the same time, the overall color palette tends to become more limited, reflecting reduced perceptual discrimination. In many cases, individuals with AD compensate for declining visual accuracy by increasing contrast and

emphasizing outlines in their artworks. These strategies may enhance visual clarity and support object recognition, functioning as adaptive mechanisms within altered perceptual conditions (Gretton & ffytche, 2013). Similarly, the reduction of detail can be interpreted as a reorganization of perceptual priorities, favoring global structure over fine detail.

Importantly, these transformations do not indicate the disappearance of artistic creativity. On the contrary, artistic production in AD often becomes more spontaneous, expressive, and emotionally charged. The shift from precise representation toward intuitive and affect-driven expression suggests that creativity is not solely dependent on cognitive control, but also emerges from preserved emotional and perceptual capacities.

Overall, artistic production in Alzheimer's disease reflects a dynamic process of adaptation in response to perceptual and cognitive changes. These alterations provide valuable insights into how the brain reorganizes visual and expressive functions under neurodegenerative conditions, highlighting the complex relationship between perception, cognition, and creativity.

4. NEUROBIOLOGY OF CREATIVITY

Artistic creativity arises from the dynamic interaction of multiple neural systems, including perceptual processing, memory, executive control, and emotional evaluation. Rather than being localized in a single brain region, creativity depends on distributed and interconnected neural networks that integrate cognitive and affective processes (Maurer & Prvulovic, 2004; Gretton & ffytche, 2013).

Neuroimaging studies indicate that these networks involve the prefrontal cortex, posterior parietal regions, temporal lobes, and the limbic system. These regions collectively support both top-down cognitive control and bottom-up sensory and emotional inputs, enabling the generation and evaluation of creative output (Kutsche et al., 2025; Alvite-Piñeiro et al., 2025).

In Alzheimer's disease (AD), these neural systems are affected in uneven and stage-dependent ways. Degeneration in prefrontal and parietal areas leads to impairments in executive functions such as planning, organization, and cognitive flexibility. As a result, individuals experience difficulties in structuring complex artistic compositions (Maurer & Prvulovic, 2004). However, reduced executive control does not eliminate creativity. On the contrary, artistic production in AD often becomes more spontaneous, intuitive, and emotionally driven. This shift suggests that the decline in top-down control allows more automatic and affective processes to emerge, resulting in a different mode of creative expression (Crutch & Rossor, 2006; Gretton & ffytche, 2013).

The limbic system plays a central role in this transformation. Structures such as the amygdala and medial temporal regions are closely associated with emotional processing and aesthetic experience. Although these areas may also be affected during disease progression, emotional responsiveness and aesthetic appreciation can remain relatively preserved, particularly in the early and moderate stages of AD (Alvite-Piñeiro et al., 2025; Salobar, 2019).

Artistic production also relies on memory systems. In AD, impairments in episodic memory reduce narrative coherence and continuity in artistic works. Nevertheless, relatively preserved procedural and emotional memory allows individuals to continue engaging in creative activity. As a result, visual representations often become more schematic and generalized, while still retaining their capacity to convey emotional meaning (Crutch &

Rossor, 2006). This reorganization reflects a shift in aesthetic experience, from externally accurate representation toward internally driven expression. Artistic production becomes less focused on objective realism and more oriented toward subjective and emotional interpretation.

Overall, the neurobiology of creativity in Alzheimer's disease demonstrates that creative expression is not entirely dependent on intact cognitive control. Instead, it emerges from the interaction of multiple neural systems, some of which remain functional despite neurodegeneration. This highlights the adaptability of the brain and the resilience of emotional and perceptual processes in sustaining creativity under pathological conditions.

5. ARTISTIC PRODUCTION IN CLINICAL AND DIAGNOSTIC CONTEXTS

Artistic production in individuals with Alzheimer's disease (AD) does not disappear entirely; rather, it undergoes a qualitative transformation. In the early and moderate stages of the disease, individuals are often able to continue producing artworks, although these works gradually become simpler, more schematic, and increasingly emotionally expressive. These changes reflect not merely a decline in ability, but an adaptive response to cognitive and perceptual alterations.

A well-documented example of this transformation is the self-portrait series of American artist William Utermohlen. Following his diagnosis of Alzheimer's disease, Utermohlen produced a sequence of portraits that progressively exhibited loss of perspective, asymmetry, and reduction in detail. These works provide a compelling visual record of how neurodegenerative changes manifest in artistic production, linking neurological deterioration directly to visual expression.

Visual-spatial impairments and declines in executive function contribute significantly to these observable changes. Loss of perspective, decreased spatial coherence, and simplification of forms correspond with deficits in visuospatial integration and planning abilities. However, these transformations should not be interpreted as a loss of aesthetic value. On the contrary, the reduction in formal control often results in more spontaneous, direct, and emotionally resonant artistic expression. Color perception also changes throughout the progression of Alzheimer's disease. Deterioration in retinal cone function and the ventral visual pathway affects color discrimination, particularly for cooler tones. Consequently, artworks often display a predominance of warm colors, such as red, orange, and yellow, along with a reduced color range. This shift further illustrates the relationship between perceptual alteration and creative adaptation.

Beyond artistic expression, these changes hold significant clinical and diagnostic value. Observing alterations in artistic production may provide indirect insights into the progression of cognitive and perceptual decline, offering a unique perspective on the patient's internal experience. Artistic output can therefore serve as a complementary tool in clinical assessment. In addition, engagement in art-based activities has been shown to support attention, emotional regulation, and overall quality of life in individuals with Alzheimer's disease. Patients often demonstrate sustained attention and more consistent responses to sensory stimuli during artistic activities compared to routine tasks. These findings highlight the therapeutic and cognitive-supportive potential of creative engagement.

Overall, artistic production in Alzheimer's disease should be understood not only as a reflection of neurological decline but also as an adaptive and meaningful form of expression. Its clinical, diagnostic, and therapeutic implications underscore the importance of integrating artistic approaches into the study and care of individuals with neurodegenerative conditions.

6. DISCUSSION

The findings of this study indicate that Alzheimer's disease (AD) affects not only cognitive functions such as memory and executive control, but also fundamental aspects of visual perception and aesthetic experience. Changes in retinal structures and cortical visual networks result in impairments in contrast sensitivity, depth perception, color discrimination, and visuospatial processing. These deficits are reflected in artistic production through simplification of form, loss of perspective, and transformation of color usage. However, these changes should not be interpreted solely as signs of decline. Rather, they represent a reorganization of perceptual and cognitive processes. Artistic production in AD demonstrates that creativity persists through adaptive mechanisms, even as certain cognitive functions deteriorate. The shift from detailed and realistic representation toward more schematic, intuitive, and emotionally driven expression reflects this transformation.

The relative preservation of limbic structures and emotional processing plays a crucial role in sustaining artistic expression. As executive control weakens, emotional and intuitive processes become more prominent, leading to artworks that emphasize affective intensity and subjective experience. This finding challenges traditional views that associate creativity primarily with cognitive control and technical skill. Furthermore, the results highlight the importance of reconsidering aesthetic evaluation criteria in the context of neurodegenerative conditions. Conventional standards-such as accuracy of perspective, anatomical correctness, and technical precision-may not adequately capture the expressive and emotional value of artworks produced by individuals with AD. Instead, aesthetic value should be understood in terms of emotional resonance, expressive power, and communicative impact. From a clinical perspective, artistic production offers valuable insights into the progression of Alzheimer's disease. Changes in visual representation can serve as indirect indicators of cognitive and perceptual decline, while engagement in artistic activities may support attention, emotional regulation, and overall well-being. These findings emphasize the potential of art as both an analytical tool and a therapeutic resource.

Overall, the discussion underscores that Alzheimer's disease does not eliminate creativity but reshapes it. Artistic production becomes a site of adaptation where perceptual limitations and preserved emotional capacities interact, revealing the resilience of human expression in the face of neurodegeneration.

7. CONCLUSION

This study has demonstrated that Alzheimer's disease (AD) affects not only cognitive functions but also visual perception and artistic production. Neurodegenerative changes in retinal structures and cortical visual networks lead to impairments in contrast sensitivity, depth perception, color discrimination, and visuospatial processing. These perceptual alterations are reflected in artistic output through simplification of form, loss of perspective, and changes in color usage.

Importantly, these transformations should not be understood merely as deficits. Instead, they reveal processes of perceptual and cognitive reorganization. Artistic production in AD represents an adaptive response in which creativity is reshaped rather than eliminated. As cognitive control declines, emotional and intuitive aspects of expression become more prominent, resulting in artworks that emphasize affective intensity and subjective interpretation. The findings highlight that artistic creativity in Alzheimer's disease is sustained through the interaction of preserved emotional processing and altered perceptual

systems. This challenges conventional assumptions that link creativity exclusively to higher-order cognitive control and technical proficiency.

From a practical perspective, the study suggests that artistic production can play a valuable role in clinical and therapeutic contexts. Engagement in art-based activities may support attention, emotional well-being, and quality of life in individuals with AD, while also providing insight into disease progression.

Future research should adopt interdisciplinary approaches that combine artistic analysis with neuroimaging, cognitive assessment, and longitudinal methodologies. Such studies may contribute to early diagnostic strategies and the development of interventions aimed at preserving cognitive and emotional functioning. In conclusion, artistic production in Alzheimer's disease offers a unique perspective on the resilience of human creativity. Rather than representing a simple decline, it reflects the brain's capacity to reorganize perception and expression under conditions of neurodegeneration.

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