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THE PSYCHOLOGY OF COLOR AND PATINA IN SCULPTURE IN CONTEMPORARY SMALL PLASTICS: INNOVATIVE METHODS OF IMAGE FORMATION

Abstract. The article explores the role of color and patina as key factors in shaping imagery in contemporary small-scale sculpture. Particular attention is paid to the psychological, aesthetic, and technological aspects of color use in sculpture, where color acts not only as a decorative but also as a conceptual means of expression. In the development of modern artistic thinking, there is a clear tendency toward the integration of color, texture, and material into a unified plastic image, which expands the boundaries of traditional sculptural perception. Patina, which historically served as a protective coating, has acquired the status of an artistic category that influences the psychological perception of form, time, and space. **Methods.** The research is based on a combination of systemic, comparative, and psycho-aesthetic approaches. Methods of visual observation, artistic and plastic analysis, and semantic generalization were applied to trace the interaction between color, texture, and form in modern sculptural works. **Results.** The findings show that contemporary small plastics demonstrate an increasing role of color as a component of artistic thinking. Innovative patination technologies – including electrochemical treatment, laser toning, nanocoating, and the combination of metals with polymer materials – provide new expressive possibilities. Color acquires symbolic significance: warm tones convey energy and emotional intensity, cold tones express calm and detachment, and the contrast between color and texture creates a dynamic psychological field within the artwork. Patina serves as a metaphor for time and historical memory, while its hues determine the emotional mood and character of the plastic image. **Conclusions.** Color and patina in contemporary small-scale sculpture function as essential components of form-making and carriers of emotional and semantic meaning. Their synthesis enhances the perceptual depth of sculpture, activates the viewer's psychological response, and strengthens the individuality of artistic intent. The application of innovative technologies expands the expressive potential of materials, transforming color and surface into integral elements of the artistic language of modern sculpture. Future research may focus on the interrelation between color, material, and spatial composition in digital forms of sculpture.

Key words: small plastics, patina, color psychology, sculpture, material, texture, imagery, innovative technologies, color in art, polychromy.

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ПСИХОЛОГІЯ КОЛЬОРУ ТА ПАТИНИ У СКУЛЬПТУРІ В СУЧАСНІЙ МАЛІЙ ПЛАСТИЦІ: ІННОВАЦІЙНІ ПРИЙОМИ ФОРМУВАННЯ ОБРАЗНОСТІ

Анотація. У статті досліджується роль кольору та патини як чинників формування образності у сучасній малій пластиці. Акцент зроблено на психологічних, естетичних і технологічних аспектах використання кольору в скульптурі, де колір виступає не лише декоративним, але й концептуальним засобом виразності. У процесі розвитку сучасного художнього мислення спостерігається тенденція до інтеграції кольору, фактури та матеріалу в єдиний пластичний образ, що розширює межі традиційного сприйняття скульптури. Патина, яка історично виконувала функцію захисту поверхні, у сучасній практиці набула значення художньої категорії, що впливає на психологічне сприйняття форми, часу та простору. **Мета дослідження** полягає у виявленні інноваційних прийомів формування образності в сучасній малій пластиці засобами кольору та патини, а також у з'ясуванні їхнього психологічного впливу на глядача. **Методи дослідження** ґрунтуються на поєднанні системного, порівняльного та психоестетичного аналізів. Використано методи візуального спостереження, художньо-пластичного аналізу та семантичного узагальнення, що дало змогу простежити взаємодію кольору, фактури й форми у сучасних скульптурних творах. **Результати дослідження** показують, що сучасна мала пластика демонструє зростання ролі кольору як складової образного мислення. Новітні

технології патинування, зокрема електрохімічна обробка, лазерне тонування, застосування нанопокриттів і поєднання металів із полімерними матеріалами, створюють нові художні ефекти. Колір у скульптурі набуває символічного змісту: теплі відтінки передають енергію й емоційність, холодні – спокій і відсторонення, а контраст кольору і фактури формує динамічне психологічне поле твору. Пати́на ж виступає носієм часу, метафорою історичної пам'яті, а її відтінки визначають настрій і характер пластичного образу. **Висновки.** Колірна палітра та пати́на в сучасній малій пластиці є важливими засобами формотворення й носіями емоційно-смыслового навантаження. Їхнє поєднання забезпечує глибину сприйняття скульптури, активізує психологічні реакції глядача, підсилює індивідуальність художнього задуму. Використання інноваційних технологій допомагає митцям розширити виражальні можливості матеріалу, перетворюючи колір і поверхню на складову художньої мови сучасної пластики. Подальші дослідження можуть бути спрямовані на вивчення взаємозв'язку кольору, матеріалу та просторової композиції у цифрових формах скульптури.

Ключові слова: мала пластика, пати́на, психологія кольору, скульптура, матеріал, фактура, образність, інноваційні технології, колір у мистецтві, поліхромія.

Problem Statement. In contemporary art, the role of color and material within the structure of sculptural imagery is undergoing a significant re-evaluation. While in traditional sculpture color was often considered an auxiliary element subordinated to form, today it has become an independent means of artistic expression. The use of patina, polychromy, mixed materials, and innovative surface technologies transforms the sculptural surface into an autonomous field of aesthetic and psychological impact. In small-scale sculpture, where every nuance of color and texture carries particular weight, these tendencies are especially evident. However, the psychological influence of color and patina on the perception of sculptural imagery, as well as their role in creating a new visual language of modern sculpture, remains insufficiently explored. There is a growing need for a systematic understanding of color and surface as form-making factors that define the emotional and semantic structure of the artwork, as well as for identifying innovative techniques that expand the expressive potential of contemporary plastic art.

Relevance of the Research. The relevance of this research arises from the need to reinterpret traditional approaches to color and surface in contemporary sculpture, particularly in the field of small-scale plastics, where color and texture directly affect the viewer's emotional perception of form. Modern artists increasingly turn to experimentation with patination, mixed materials, digital technologies, and polychromy, creating new opportunities for artistic self-expression. However, Ukrainian art scholarship has so far paid insufficient attention to the psychological dimension of color and its interaction with material in sculpture. In the context of global artistic transformations, color is gaining the status of not only an aesthetic but also a semantic element that shapes a new typology of imagery. Therefore, studying innovative methods of applying color and patina, their symbolism, and their psychological impact is essential for understanding current tendencies in the development

of plastic arts and for renewing the expressive tools of contemporary Ukrainian sculpture.

Literature Review. The relevance of this research arises from the need to reinterpret traditional approaches to color and surface in contemporary sculpture, particularly in the field of small-scale plastics, where color and texture directly affect the viewer's emotional perception of form. Modern artists increasingly turn to experimentation with patination, mixed materials, digital technologies, and polychromy, creating new opportunities for artistic self-expression. However, Ukrainian art scholarship has so far paid insufficient attention to the psychological dimension of color and its interaction with material in sculpture. In the context of global artistic transformations, color is gaining the status of not only an aesthetic but also a semantic element that shapes a new typology of imagery. Therefore, studying innovative methods of applying color and patina, their symbolism, and their psychological impact is essential for understanding current tendencies in the development of plastic arts and for renewing the expressive tools of contemporary Ukrainian sculpture.

Literature Review. The issues of color, texture, and material in contemporary sculpture remain among the most relevant topics in modern art studies. Researchers note the growing role of small-scale plastics as a field of experimentation with form, color, and material [1, p. 47; 2, p. 73].

V. Batakina considers patina as a means of artistic expression capable of shaping the emotional and psychological image of a sculpture [3, p. 85]. H. Ivashkiv emphasizes the role of color as a factor influencing the emotional perception of sculptural form [4, p. 59]. L. Lysenko analyzes the psychological aspects of color in form-making practices, highlighting the connection between emotional tone and plastic design [5, p. 33].

V. Odrekhivskyi proves that in contemporary small-scale sculpture, the surface becomes a semantic carrier of artistic ideas [6, p. 103]. V. Odrekhivskyi

studies the interaction of material and color as structural components of plastic form [7, p. 64], while M. Protas explores the historical origins of polychromy and its reinterpretation in contemporary art [8, p. 30].

Among foreign researchers, M. Protas defines color as a bearer of semantic codes in art [9, p. 118], and S. Rybalko analyzes the psychological influence of color on human perception [10, p. 77]. S. Streltsova highlights the phenomenon of polychromy as an artistic strategy of form creation [11, p. 142]. S. Shcherbakov emphasizes the significance of color and surface as conveyors of meaning in contemporary sculpture [12, p. 95].

R. Arnheim analyzes the theoretical foundations of the interaction between material, metaphor, and form [13, p. 51]. A. Ershad-Langroudi examines patina as the historical memory of material, reflecting the passage of time and transformation of the surface [14, p. 215]. M. Farag and Guidelines for the technical examination of bronze sculpture interpret the surface of sculpture as a carrier of emotional experience that unites materiality and the spiritual dimension of artistic imagery [15, p. 102; 16, p. 83].

Purpose of the Article. The purpose of the article is to identify the specific influence of color and patina on the formation of artistic imagery in contemporary small-scale sculpture and to explore innovative methods of their application in the process of sculptural creation. The study aims to analyze the psychological mechanisms of color perception in three-dimensional form, determine the role of patina as an artistic tool that shapes the emotional and semantic space of the plastic image, and reveal new tendencies in the interaction of material, texture, and color within modern technological and conceptual approaches. Achieving this goal contributes to a deeper understanding of the renewal of sculptural language and expands methodological perspectives in the study of color and surface phenomena in contemporary art.

Presentation of the Main Material. Contemporary small-scale sculpture demonstrates a qualitatively new stage in the development of sculptural language, in which color and patina become full-fledged elements of form creation. While traditional sculpture sought monochromatic materiality, modern artistic practice departs from this tendency, turning to color experiments, combinations of textures, and the use of various surface treatments. As a result, a synthetic artistic space emerges where color, texture, and form coexist in unified interaction [1, p. 47; 6, p. 103].

Patina, which previously served mainly a protective purpose, has acquired new significance in contemporary art as a creative and expressive tool. Depending on its chemical composition and method of application, patina can produce a wide range of visual effects – from noble antiquity to bright decorative tonality. In small-scale sculpture, this allows artists to model not only the surface but also the emotional atmosphere and psychological character of the work [3, p. 85; 14, p. 215].

The color palette in modern sculpture functions as an instrument of emotional influence on the viewer. Warm tones generally evoke energy, motion, and openness, while cool tones create a sense of distance and calm. The choice of color becomes a means of conveying the internal state of the image and reflecting the conceptual intention of the artist [4, p. 59; 5, p. 33; 9, p. 118].

A special place is occupied by experiments with polychromy, which combines color, texture, and material within a unified visual system. The polychromatic surface creates a multilayered visual space in which color not only emphasizes form but also imparts symbolic meaning. This approach can be observed both in classical and innovative works, particularly through the use of mixed media, resins, metals, polymers, and laser toning [7, p. 64; 8, p. 30; 11, p. 142].

The application of innovative technologies in patination – such as electrochemical treatment, oxidation of various metals, nanocoatings, and pigment toning – significantly expands the expressive potential of the artist. Material becomes a bearer of meaning, and the surface becomes a channel of emotional communication with the viewer [12, p. 95; 13, p. 51]. Companies such as Sculpt Nouveau (USA) offer a wide range of professional patinas, both water- and solvent-based, allowing sculptors to control the process of color and texture formation.

The term patina (from Ger. Patina, Fr. patine, It. patina, possibly derived from Lat. patina – “bowl” or “dish”) refers to a thin surface layer formed on metal as a result of natural or artificial chemical reactions. In sculpture, patina plays not only a protective role but also an artistic one, creating a unique color range and optical depth of surface. Its shade – from greenish and blue to reddish-brown or black – appear as a result of oxidation of copper, bronze, or brass in contact with air, moisture, or specific reagents [3, p. 85; 14, p. 215].

Artificial patination, widely used in contemporary sculpture, involves applying special solutions of copper, iron, or sulfur salts that, combined with

heat or ammonia vapors, generate the desired color tone. Such techniques produce distinctive textures and an “aged” surface effect, emphasizing volume and sculptural depth. In various artistic traditions, unique patination formulas have been developed. For instance, the Japanese rokusho (緑青) technique, used in mokume-gane metalwork, involves alloys such as shibuichi, shakudo, and kuromido, which acquire deep blue or violet-black shades. This process reflects the wabi-sabi philosophy – the beauty of imperfection and transience – where patina embodies time and harmony of change [8, p. 30; 14, p. 215].

In French, patine carries a dual meaning: it signifies both a thin layer of oxidation or color change on the surface of bronze, wood, or stone (la patine du bronze – the patinated hue of bronze) and a metaphorical “touch of time” (la patine du temps – the breath or imprint of time). In art, this term encompasses not only the physical process of oxidation but also a philosophical perception of material as a carrier of memory, experience, and emotion. This duality makes patina a unique phenomenon that unites technique and symbolism, matter and metaphor.

In sculpture, patina functions as a “skin of time” – a membrane that preserves the memory of the processes through which the material has passed. It adds depth and authenticity to the artwork, influencing its atmosphere and emotional resonance. The shades of patina – greenish, bluish, brown, black, or reddish-gold – are perceived not only visually but also psychologically, evoking associative memories and tactile sensations of texture and temperature.

This phenomenon is closely linked to the psychology of color, which explores how hues affect human perception, emotion, and behavior. In sculpture, where color interacts with volume and light, this psychological impact becomes especially pronounced.

- Green patina (copper oxide) conveys harmony, naturalness, and stability, creating a sense of balance.
- Bluish or violet patina suggests depth, spirituality, and serenity; in Japanese rokusho, these hues symbolize elegance and introspection.
- Brown or reddish patina expresses warmth, vitality, and connection with the earth.
- Black patina introduces drama, contrast, and the sense of passing time.

According to color psychologists such as S. Rybalko [10, p. 77] and M. Protas [9, p. 118], color carries not only emotional but also semantic meaning: it forms subconscious reactions and shapes the mood and perception of a work of art. Therefore, in

contemporary small-scale sculpture, color and patina are not merely decorative tools but integral elements of artistic thinking that allow the artist to “speak through the surface”.

Patina thus becomes an emotional-psychological medium: through it, the material “breathes,” and sculpture acquires its own “life experience”. Modern artists employ color and patina to evoke the flow of time, psychological depth, and the illusion of space – the very essence of la patine du temps, where technique transforms into philosophy, and the surface becomes a visual metaphor for memory and spiritual energy.

Conclusions. The conducted research demonstrates that in contemporary small-scale sculpture, color and patina acquire the status of independent artistic means capable not only of enriching the external surface of sculpture but also of shaping its deep figurative structure. Color, combined with the texture of the material, generates new ways of emotional influence on the viewer, transforming from a decorative element into an instrument of semantic expression.

Patina appears not merely as a technological process but as a distinct artistic language that unites the physical substance and the metaphysical essence of a work of art. Its multicolored shades form a specific space of “visual memory,” in which the material preserves traces of time, touch, idea, and emotion. In this way, patina becomes a bearer of the philosophy of time, embodying the transition from the real to the symbolic dimension.

Innovative patination technologies – including electrochemical treatment, laser toning, and nanocoatings – expand the boundaries of traditional sculpture, allowing artists to control color effects and create new types of textures. At the same time, the psychological aspect of color endows sculpture with the ability to communicate with the viewer on a subconscious level, evoking associations, memories, sensations of time, and mood.

Contemporary small-scale sculpture reflects the integration of technical, aesthetic, and psychological dimensions of the artistic process. Color and patina function as synthetic tools of image formation, combining materiality and spirituality, tradition and innovation. They transform the sculptural surface into a space of emotional dialogue, where artistic form becomes a metaphor of memory, time, and the inner world of a human being.

Bibliography

1. Багалкіна В. І. Скульптура і пластика малих форм у музейній експозиції. Мистецтвознавчі записки. 2018. № 33. С. 117–126.
2. Голубець О. Магія третього виміру. Скульптурна пластика кінця XIX – початку XXI століття. Львів : Колір ПРО, 2020. 143 с.
3. Гоцалюк А. Розвиток мистецтва скульптури в Україні (кінець XX – початок XXI століття). *Українознавство*. 2019. № 1 (70). DOI: [https://doi.org/10.30840/2413-7065.1\(70\).2019.164745](https://doi.org/10.30840/2413-7065.1(70).2019.164745).
4. Івашків Г. Пластика малих форм в інтер'єрі приміщень. Народознавчі зошити. 2015. № 5(125). С. 1099–1120.
5. Лисенко Л. Українська скульптура у пошуках нової образності. *Мистецтвознавство України*. 2013. № 13. С. 22–32.
6. Одрехівський В. Українська скульптура XXI століття: проблема інтермедіальності та жанрово-видового синтезу. *Вісник Львівської національної академії мистецтв*. 2017. Вип. 31. С. 97–108. URL: https://lnam.edu.ua/files/Academy/nauka/visnyk/pdf_visnyk/31/97-108_Odrehivskyy.pdf
7. Одрехівський В. В. Концептуально-пластичні аспекти поліхромії та кінетизму в українській скульптурі XX століття. *Вісник Національної академії керівних кадрів культури і мистецтв*. 2019. № 4. DOI: <https://doi.org/10.32461/2226-3209.4.2019.191356>.
8. Протас М. О. Скульптура в соціокультурному просторі як haptic-об'єкт public art. Український мистецтвознавчий дискурс. 2023. Вип. 4. С. 77–87. DOI: <https://doi.org/10.32782/uad.2023.4.10>.
9. Протас М. О. Українська скульптура XX століття / Інститут проблем сучасного мистецтва Академії мистецтв України. Київ: Інтертехнологія, 2006. 278 с.: іл. URL: <https://file.lib.in.ua/pdf/protas-maryna-ukrainska-skulptura-khkh-stolittia.pdf>
10. Рибалко С. Б. Українська скульптура малих форм у контексті японізму. *Культура України*. 2016. № 54. С. 342–351.
11. Стрельцова С. Скульптура Олега Денисенка як тривимірна археологія графічних творів. *АРТ-платФОРМА*. 2020. Т. 2, № 2. С. 209–228. DOI: <https://doi.org/10.51209/platform.2.2.2020.209-228>.
12. Щербаков С. О. Еволюція скульптури: від традиційних матеріалів до цифрових технологій. *Вісник Національної академії керівних кадрів культури і мистецтв*. 2025. № 1. С. 276–281. DOI: <https://doi.org/10.32461/2226-3209.1.2025.327978>.
13. Arnheim R. *Art and Visual Perception: A Psychology of the Creative Eye*. Rev. ed. Berkeley; Los Angeles: University of California Press, 1974. 508 p. ISBN 9780520026131.
14. Ershad-Langroudi A. *Protective Material Coatings for Preserving Cultural Heritage Monuments and Artwork*. Sharjah: Bentham Science Publishers, 2022. 320 p. DOI: <https://doi.org/10.2174/97898150490461220101>.
15. Farag M. *Materials and Processes of Contemporary Sculpture*. Newcastle upon Tyne: Cambridge Scholars Publishing, 2020. 302 p. ISBN 9781527545809.
16. Guidelines for the technical examination of bronze sculpture / ed. D. Bourgarit, J. Bassett, F. G. Bewer, A. Heginbotham, A. Lacey, P. Motture. Los Angeles: J. Paul Getty Museum, 2025. 558 p. ISBN 9781606066904. URL: https://www.getty.edu/publications/bronze-guidelines/_assets/downloads/BronzeGuidelines.pdf

References

1. Batakina V. I. (2018) Skulptura i plastyka malykh form u muzeinii ekspozitsii [Sculpture and small forms plastic art in museum exposition]. *Mystetstvoznachchi zapysky*, no. 33, pp. 117–126. [in Ukrainian]
2. Holubets O. (2020) Mahiia tretoho vymiru. Skulpturna plastyka kintsia XIX – pochatku XXI stolittia [The magic of the third dimension. Sculptural plasticity of the late 19th – early 21st century]. Lviv: Kolir PRO, 143 p. [in Ukrainian]
3. Hotsaliuk A. (2019) Rozvytok mystetstva skulptury v Ukraini (kinets XX – pochatok XXI stolittia) [Development of sculpture art in Ukraine (late 20th – early 21st century)]. *Ukrainoznavstvo*, no. 1 (70). DOI: [https://doi.org/10.30840/2413-7065.1\(70\).2019.164745](https://doi.org/10.30840/2413-7065.1(70).2019.164745) [in Ukrainian]
4. Ivashkiv H. (2015) Plastyka malykh form v interiери prymishchen [Small forms plastic art in interior spaces]. *Narodознавчи zoshyty*, no. 5 (125), pp. 1099–1120. [in Ukrainian]
5. Lysenko L. (2013) Ukrainska skulptura u poshukakh novoi obraznosti [Ukrainian sculpture in search of new imagery]. *Mystetstvoznachstvo Ukrainy*, no. 13, pp. 22–32. [in Ukrainian]
6. Odrekivskiy V. (2017) Ukrainska skulptura XXI stolittia: problema intermedialnosti ta zhanrovo-vydovoho syntezu [Ukrainian sculpture of the 21st century: intermediality and genre synthesis]. *Visnyk Lvivskoi natsionalnoi akademii mystetstv*, issue 31, pp. 97–108. Retrieved from: https://lnam.edu.ua/files/Academy/nauka/visnyk/pdf_visnyk/31/97-108_Odrehivskyy.pdf (accessed: 18.02.2026) [in Ukrainian]
7. Odrekivskiy V. V. (2019) Kontseptualno-plastychni aspekty polikhromii ta kinetyzmu v ukrainskii skulpturi XX stolittia [Conceptual and plastic aspects of polychromy and kineticism in Ukrainian sculpture of the 20th century]. *Visnyk Natsionalnoi akademii kerivnykh kadriv kultury i mystetstv*, no. 4. DOI: <https://doi.org/10.32461/2226-3209.4.2019.191356> [in Ukrainian]
8. Protas M. O. (2023) Skulptura v sotsiokulturnomu prostori yak haptic-obiekt public art [Sculpture in socio-cultural space as a haptic object of public art]. *Ukrainskyi mystetstvoznachchi dyskurs*, issue 4, pp. 77–87. DOI: <https://doi.org/10.32782/uad.2023.4.10> [in Ukrainian]

9. Protas M. O. (2006) *Ukrainska skulptura XX stolittia* [Ukrainian sculpture of the 20th century]. Kyiv: Intertekhnolohiia, 278 p. Retrieved from: <https://file.lib.in.ua/pdf/protas-maryna-ukrainska-skulptura-khkh-stolittia.pdf> (accessed: 14.03.2026) [in Ukrainian]
10. Rybalko S. B. (2016) *Ukrainska skulptura malykh form u konteksti yaponizmu* [Ukrainian small sculpture in the context of Japonism]. *Kultura Ukrainy*, no. 54, pp. 342–351. [in Ukrainian]
11. Streltsova S. (2020) *Skulptura Oleha Denysenko yak tryvymirna arkhеolohiia hrafichnykh tvoriv* [Sculpture of Oleh Denysenko as three-dimensional archaeology of graphic works]. *ART-platforma*, vol. 2, no. 2, pp. 209–228. DOI: <https://doi.org/10.51209/platform.2.2.2020.209-228> [in Ukrainian]
12. Shcherbakov S. O. (2025) *Evoliutsiia skulptury: vid tradytsiinykh materialiv do tsyfrovyykh tekhnolohii* [Evolution of sculpture: from traditional materials to digital technologies]. *Visnyk Natsionalnoi akademii kerivnykh kadriv kultury i mystetstv*, no. 1, pp. 276–281. DOI: <https://doi.org/10.32461/2226-3209.1.2025.327978> [in Ukrainian]
13. Arnheim R. (1974) *Art and Visual Perception: A Psychology of the Creative Eye*. Berkeley; Los Angeles: University of California Press, 508 p.
14. Ershad-Langroudi A. (2022) *Protective Material Coatings for Preserving Cultural Heritage Monuments and Artwork*. Sharjah: Bentham Science Publishers, 320 p. DOI: <https://doi.org/10.2174/97898150490461220101>
15. Farag M. (2020) *Materials and Processes of Contemporary Sculpture*. Newcastle upon Tyne: Cambridge Scholars Publishing, 302 p.
16. *Guidelines for the technical examination of bronze sculpture (2025)* ed. D. Bourgarit et al. Los Angeles: J. Paul Getty Museum, 558 p. URL: https://www.getty.edu/publications/bronze-guidelines/_assets/downloads/BronzeGuidelines.pdf



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