

AUTHENTICITY VS 3D REPRODUCTION

NEVER THE TWAIN SHALL MEET?

Liselore Tissen

Leiden University, Leiden, the Netherlands

Delft University of Technology, Delft, the Netherlands

This article discusses a 3D print of Rembrandt van Rijn's Saul and David to introduce the debate on art reproduction. Confusion about and a rejection of 3D printing is caused by the fact that this technology is hard to define as a form of art reproduction. Furthermore, 3D printing causes tension within the way that value is granted to original paintings. Walter Benjamin's theory of aura and other contemporary texts, such as Thierry Lenain's book on art forgery and David Lowenthal's articles on the authenticity of artworks and reproductions, provide a theoretical framework with which to introduce the current debate on 'original' and 'copy', a discourse that is becoming more important because of the increasing quality of reproductions through 3D printing. Exploring the concept of authenticity, this article shows how contemporary society grants value to artworks and reproductions. Authenticity as a concept is not static; it is a social construction that allows various perceptions of art that can change over time, resulting in shifting perceptions of both original artworks and (3D) reproductions. Finally, this article relates the various perspectives of authenticity to 3D prints in assessing whether these reproductions can become authentic in and of themselves.

INTRODUCTION

As you walked into the exhibition *Rembrandt? The Case of Saul and David* at the Mauritshuis in The Hague (2015), your eyes were left to wander as you were inclined to think you were seeing double: the recently restored painting *Saul and David* (1651-1655 and 1655-1658) by Rembrandt van Rijn (1606-1669) was displayed next to a three-dimensional (3D) print of the painting that was almost indistinguishable from the original. This shocking encounter prompted various questions: What does this reproduction mean for the artistic and

authentic value of the original? What value does the 3D print have on its own? Will this technology change the way we perceive original artworks?

The reproduction of artwork has been a topic of debate since philosopher Walter Benjamin identified that reproduction decreases art's historic value and relevance.¹ Nonetheless, today's reproduction technologies offer possibilities Benjamin could have never imagined: we have the ability to print paintings in 3D. Even though we are familiar with art reproduction, there is a rising awareness of the possibility of replicating artworks through 3D printing, which is new compared to previous replication methods (e.g. photography and film). 3D technologies enable rapid replication of both the texture and visual qualities of art at a high resolution.

3D printing, its accuracy, and the way it mediates original artworks — both in physical and digital form — creates tension in our perception of authenticity. Therefore, by means of an in-depth examination of advancements in reproduction technology, this article explores what the introduction of 3D printing means to the value of artworks in the twenty-first century. Reflecting on 3D printing within the realm of 'mechanical' art reproduction (e.g. etchings, virtual copies) unveils some of the new opportunities and dangers this technology introduces to original artworks. A deeper investigation of authenticity as a concept, and Benjamin's comparable concept of 'aura', demonstrates the changing meaning of originals and their 3D reproductions. In this way, their reciprocal connection become more clear: reproductions and originals are undeniably intertwined. In the spirit of 2019, being the 350th anniversary of Rembrandt van Rijn's death, a 3D print of Rembrandt's *Saul and David* (Figs 1 and 2) — which was made to show the painting's original format before it was cut into pieces in the nineteenth century — is used as a case study.² Through an analysis of the role of authenticity in the relationship between existing artworks and their copies, my article concludes by discussing whether a 3D print can itself be considered original and authentic in the near future.

¹ Walter Benjamin, "Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit," *Zeitschrift für Sozialforschung* 5 (1936), 40-68.

² Rembrandt van Rijn, *Saul and David*, 1651-1655 and 1655-1658, oil on canvas, 130 x 164.5 cm, Mauritshuis, The Hague, the Netherlands.



Fig. 1. Rembrandt van Rijn, *Saul and David*, 1651-1655 and 1655-1658. 130 x 164.5 cm, oil on canvas. Mauritshuis, The Hague, the Netherlands

3D PRINTING AS THE NEXT GENERATION OF ART REPRODUCTION

We encounter reproductions and representations of Rembrandt's paintings everywhere on a daily basis: in catalogues, on posters, on the Internet, and on tourist miscellanea. Yet, 3D printing offers something different than already existing reproduction methods.

Reproduction, however, is not a new practice: the Romans copied Greek statues out of admiration, and Renaissance painters reproduced the work of their masters to become better artists.³ As the

³ Nicole Ex and Ernst van de Wetering, *Zo goed als oud: de achterkant van het restaureren* (Amsterdam: Amber, 1993), 59-64.



Fig. 2. TU Delft and Océ Technologies, *Saul and David*, 3D printed, 2015. 130 x 164.5 cm, PLA elevated printing. TU Delft, Delft, the Netherlands

sixteenth-century historian and artist Giorgio Vasari (1511-1574) explained in his 1546 work *Vite*, reproduction is essential to artworks and the creation of new ones: “Design cannot have a good origin if it has not come from continual practice in copying natural objects, and from the study of pictures by excellent masters and of ancient statues in relief [...]”.⁴ Vasari’s emphasis on the necessity of reproduction would be repeated by others over time. In the artistic practice of the seventeenth century, reproduction was especially common. Rembrandt expert Ernst van der Wetering explains that painters such

⁴ “Il qual disegno non può avere buon’origine, se non s’ha dato continuamente opera a ritrarre cose naturali e studiato pitture d’eccellenti maestri ed statue antiche di rilievo [...]”; Stefano Pierguidi, “Vasari, Borghini, and the Merits of Drawing from Life,” *Master Drawings* 49.2 (2011), 171.

as Rembrandt supported the replication of their works as this practice contributed to the spreading of their oeuvre, artistic knowledge, and ideas.⁵ Rembrandt and his contemporaries did not solely rely on hand-painted reproductions made by pupils, but gladly used technologies that facilitated the creation of multiple works, such as etching and engraving. These techniques and developments in the technologies of the printing press sped up the process of creating high-quality copies. In his 1936 essay, *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin referred to this phenomenon as the start of a radical change in replication history.⁶ According to Benjamin, ‘mechanical reproduction’ allows the fast creation of multiple high-quality reproductions of one original. He emphasized that art has always been more or less reproducible (e.g. multiple bronze statues from one cast), but that the *nature* of copying had changed with the invention of photography in the nineteenth century: “With photography, in the process of pictorial reproduction the hand was for the first time relieved of the principal artistic responsibilities, which henceforth lay on the eye alone as it peered into the lens.”⁷

Benjamin specifies that the artist’s hand is no longer present or needed to create reproductions of art, having been replaced by machines. Moreover, this new kind of replica is made with a different medium and materiality than the original.⁸ This means that the original artwork is translated into the ‘language’ and material of the reproduction medium, resulting in a product without physical traces of time (*patina*). Besides, the artwork is shown in a two-dimensional way, causing a loss of the unique material qualities of paintings, such as *craquelure* (the fine pattern of cracks on painted surfaces), transparency, reflection, and *impasto* (the thick application of a pigment or paint): elements that express the three-dimensionality of painted surfaces.⁹ Nowadays, computers can also be considered mediums that transform the qualities of artworks into their own digital or virtual language. Because

⁵ E. van de Wetering, et al., “Licht en kleur bij Caravaggio en Rembrandt door de ogen van hun tijdgenoten,” *Caravaggio-Rembrandt* (Zwolle: Waanders/Rijksmuseum Amsterdam, 2006), 164-79.

⁶ Benjamin, “Das Kunstwerk,” 6-10.

⁷ “Mit der Fotografie war die Hand im Prozess bildlicher Reproduktion zum ersten Mal von den wichtigsten künstlerischen Obliegenheiten entlastet, welche nunmehr dem ins Objektiv blickenden”; trans. J.A. Underwood, *Ibid.*, 6.

⁸ *Ibid.*, 6-9.

⁹ *Ibid.*, 22-26, 42.

of this change in medium, Benjamin says that the reproduction itself can become autonomous as it no longer needs to be presented in the same medium in order to be considered a replication. Additionally, the replication technique can manipulate the way an artwork is presented — for example, by changing the scale or colour saturation — allowing for more and different ways of interpretation. Many of these types of technologies followed, such as film, digital imaging, and more recent reproduction methods like augmented reality (AR) and virtual reality (VR) which are concurrent with the technology central to this article: 3D printing.¹⁰

3D printing has existed since the 1980s, but its technology has recently boomed in various sectors — including the medical and mechanical industries — where its possibilities are endlessly explored and perfected. To 3D print an object, two elements are needed: rapid prototyping and stereo lithography (SLA). Rapid prototyping is a technology that translates computer data into a three-dimensional product. This technology is combined with stereo lithography, which involves hardening polymer by exposing it to ultraviolet (UV) light.¹¹ This invention made it possible to print forms layer by layer by curing photopolymers with UV light lasers (Fig. 3).¹²

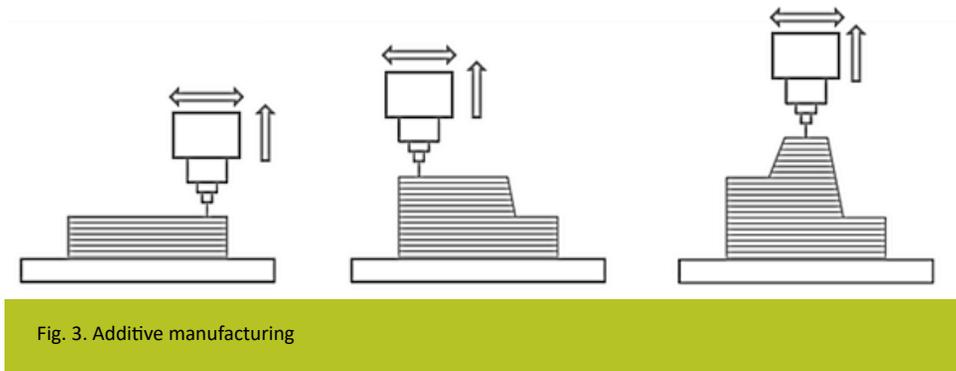


Fig. 3. Additive manufacturing

¹⁰ Andrea Witcomb, “The Materiality of Virtual Technologies: A New Approach to Thinking About the Impact of Multimedia in Museums,” *Theorizing Digital Cultural Heritage: A Critical Discourse* (Cambridge, MA, MIT, 2007), 35–47.

¹¹ The polymers used for 3D printing are Polylactic Acid (PLA), Acrylonitrile Butadiene Styrene (ABS) and Polyvinyl Alcohol Plastic (PVA).

¹² Petar Kocovic, “History of Additive Manufacturing,” in *3D Printing and Its Impact on the Production of Fully Functional Components: Emerging Research and Opportunities*, ed. P. Kocovic (Hershey: IGI Global, 2017), 1–21.

The technique used to reproduce paintings is slightly different from ‘regular’ 3D printing because texture is printed on a flat polymer base. As this printing technology does not print a three-dimensional object but a textured layer, it is referred to as ‘elevated printing’.¹³ To print a painting, both texture and pigments are measured by scanning the surface. By looking from different angles and combining this information, it is possible to measure the craquelure, irregularities, and the reflection of the painting’s surface. Paintings are especially valued because of their visual qualities, so not only does the texture of the print have to be accurate, also the paint has to be nearly flawless in order to be convincing.¹⁴ The layers that are used to create texture are uniform and monotonous. Only the final layer is printed in colour with an inkjet printing system. The end result is a three-dimensional polymer print of a painting including all its textural characteristics and its aesthetic qualities (Fig. 4).

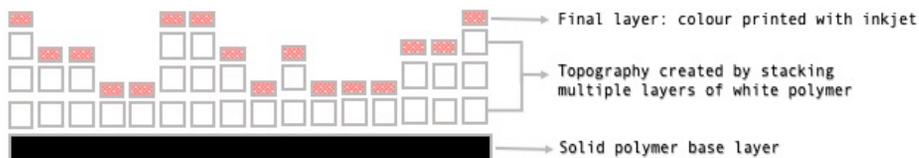


Fig. 4. Construction of a printed painting using elevated printing

In comparison to the reproduction technologies mentioned, a 3D print is not just a visual representation of the original painting like a poster you would buy at IKEA or in a museum shop. It is a body double — a second version, if you will — that includes every detail of the painting’s surface: its colour, *patina*, and topography (Fig. 5). Besides, 3D printing is different from the newer and more recent technologies AR and VR, because their reproductions are mainly digital and therefore do not function within the physical realm, meaning that — in contrast to 3D printing — no confusion between original and reproduction can exist.

¹³ Willemijn Elkhuisen, personal interview, 11 October 2017.

¹⁴ Willemijn Elkhuisen, et al., *Digital Manufacturing of Fine Art Reproductions for Appearance*, poster session presented at the 3rd International Conference on Innovation in Art Research and Technology, Parma, Italy (2018).

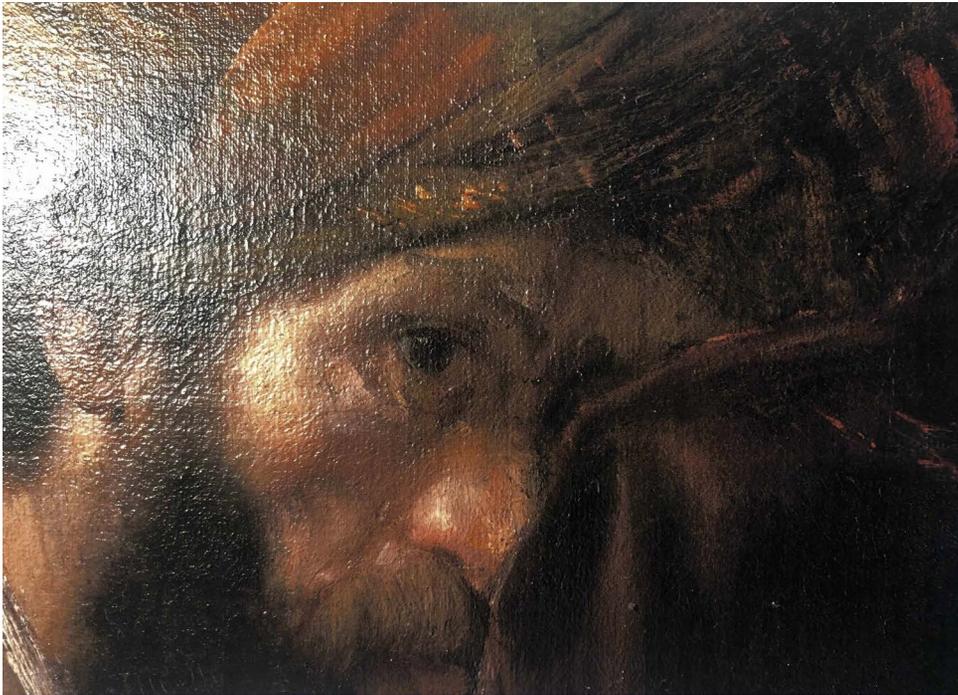


Fig. 5. Detail of the face of Saul with raking light from the left (3D print of *Saul and David*)

During research conducted in 2018, I interviewed museum visitors and art specialists (directors, curators, and conservators) of various Dutch museums and cultural institutions. My research showed that the technology is often rejected because it is hard to compare 3D prints to existing two-dimensional reproductions such as posters and photographs. It is still unclear how the added three-dimensionality of these replicas affects the perception of originals and reproductions.¹⁵ To understand the effects of this technology on the function, perception, and appreciation of the original — good or bad — it is necessary to first explore how the 3D-printed *Saul and David* should be understood as the body double of Rembrandt's original.

¹⁵ Liselore N.M. Tissen, "Indistinguishable Likeness: 3D Replication as a Conservation Strategy and the Moral and Ethical Discussions on Our Perception of Art" (Master's thesis, Leiden University, 2018), <https://openaccess.leidenuniv.nl/handle/1887/64816>.

3D PRINT VS REPRODUCTION VS FORGERY

Relating 3D printing to Benjamin's definition of 'mechanical reproduction' is rather problematic. It is undeniable that this technology is 'mechanical' because machines — 3D printers — enable endless replication of existing artworks. Nevertheless, it is hard to define 3D prints as 'reproductions' of art. According to the Oxford English Dictionary *reproduction* is "1. The act or process of copying something [...] 1.1. A copy of a work of art, especially a print or photograph of a painting". Synonyms include copy, replica, facsimile, reproduction, reconstruction, and duplicate.¹⁶ Even though *reproduction* and its synonyms all refer to things that closely resemble an original, many art scholars emphasize that these concepts have divergent meanings — especially within the art world — and should not be used interchangeably.¹⁷ Still, there are few to no texts that provide an overview of the differences between these concepts. Texts that do provide an overview, such as The International Council on Monuments and Sites' (ICOMOS) *Burra Charter* (1979) and *Terminology for Further Expansion* in the *Tate Papers* (2007), do not consider the applicability of these concepts to paintings nor 3D printing.¹⁸ Thus, a short description of these concepts is needed.

A 'copy' is the result of the act of copying, usually made by someone or something other than the artist who created the original. It can be endlessly reproduced and does not necessarily need the original artwork for multiple versions to be created.¹⁹ The goal is to refer to the original artwork by preserving some visual resemblance. For this reason, it does not need to be identical, allowing variations in size and material. For example, when we see a painting, we can copy it by photographing it. We can later reproduce the painting using the photograph instead of the original artwork. The 3D print of *Saul and David* is a copy in the sense that it shows a visual resemblance with the original painting, is not made by

¹⁶ Lexico Online Dictionary (2019), <https://en.oxforddictionaries.com/definition/reproduction>.

¹⁷ Darren H. Hick, et al., *The Aesthetics and Ethics of Copying* (London: Bloomsbury, 2016); Thierry Lenain, *Art Forgery: The History of a Modern Obsession* (London: Reaktion Books, 2011).

¹⁸ ICOMOS, *The Australia ICOMOS Charter for Places of Cultural Significance ["Burra Charter"]* (2013), <https://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>; Matthew Gale, et al., "Terminology for Further Expansion," *Tate Papers* 8 (2007).

¹⁹ Dieter Birnbacher, "Copying and the Limits of Substitutability," in *The Aesthetics and Ethics of Copying*, ed. D. H. Hick et al., 26-39.

Rembrandt himself, and can be recreated endlessly. However, 3D printing's goal is not to have a slight visual resemblance to the original, like a poster, but to recreate every aspect of the original as closely as possible.²⁰ Thus, this definition is not specific enough and does not suffice.

Replicas and duplicates are visually identical to the original. As art scholar Thierry Lenain describes, the replica is a 'second version' of the original — ideally made by the same artist — which has a symbolic resemblance, allowing some variations in size, and can function as a 'stand in' when the original is not present.²¹ Examples of this are Auguste Rodin's bronze sculptures that were made with the same cast: they are all more or less identical and equally original. The difference between duplicates and replicas is that duplicates are identical copies of an original — allowing no variations of any kind — and are valid replacements. Philosopher Nelson Goodman describes paintings as autographic works: there is one definitive object that compromises a work; hence, duplicates of paintings cannot exist.²² The 3D print of *Saul and David* is a visually detailed copy, but is not made of the same materials, nor at the same time, nor by the same person, and can for this reason not be considered a replica nor a duplicate.

Although 'facsimile' is a term mostly used to refer to photomechanical reprints of books — which are often made with reproduction in mind — it is still worth mentioning. 'Facsimile' is derived from the Latin *fac simile*, which means 'make alike'.²³ It is, like a replica, as true to the original as possible in terms of content, appearance, and dimension. However, Lenain explains that a facsimile does not function as a 'body double', but as a 'new body', one that records every aspect of the original. It can function as a replacement if the original were to decay beyond repair, for example.²⁴ In this way, the original's value is transferred to a newer or different version in terms of its materiality. In the case of 3D printing, the

²⁰ Willemijn Elkhuisen, personal interview, 11 October 2017.

²¹ Lenain, *Art Forgery*, 36-40.

²² Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Bobbs-Merrill, 1968), 194-98.

²³ Lexico Online Dictionary, <https://en.oxforddictionaries.com/definition/facsimile>.

²⁴ Lenain, *Art Forgery*, 36-40.

technology directly and closely reproduces the painting's topography and colours without a loss of knowledge or detail, suggesting that a 3D print can indeed be a facsimile. Because of the latter, in the case of *Saul and David*, 'facsimile' seems the most fitting of the above-mentioned terms.

Thus far, we have seen that copying, replication, duplication, and facsimilation are all acts that create a product that is as close to the original as possible, some allowing more variation and interpretation than others. Reproduction and reconstruction are forms of copying that allow more dissimilarities and visual discrepancies than the previously mentioned acts, because their focus is not visual similarity, but likeness of the artist's practice or the object's function.²⁵ An example is the television show *Het geheim van de meester* ("The Secret of the Master") produced by the Dutch public broadcasting station AVROTROS, where a group of specialists elaborately research various Dutch masterpieces — such as Rembrandt's *Self-portrait* (1628) — to understand with which technique and materials the artist created his or her painting (Fig. 6).²⁶ Afterwards, artist Charlotte Caspers uses the information gathered during the research to accurately reproduce the original painting.²⁷ She explains that reproductions are made by using the same process and idea with which the original was made, with the intent to learn more about the artist, materials, and technique.²⁸ In summary, art historian Robert Verhoogt (2007) says that this means that a reproduction is a close copy made after the original, allowing minor differences, in the same technique but with comparable or newer materials.²⁹ Comparing Rembrandt's *Self-portrait* with Caspers' version shows that they are very alike, but not identical.³⁰

Using this definition, the 3D print of *Saul and David* fits the idea of recreating the original painting in a newer and fresher material with the intention to learn more about the artist

²⁵ Gale, et al., *Terminology*.

²⁶ Rembrandt van Rijn, *Self-portrait*, 1628, oil on canvas, 22.6 x 18.7 cm, Rijksmuseum, Amsterdam, the Netherlands.

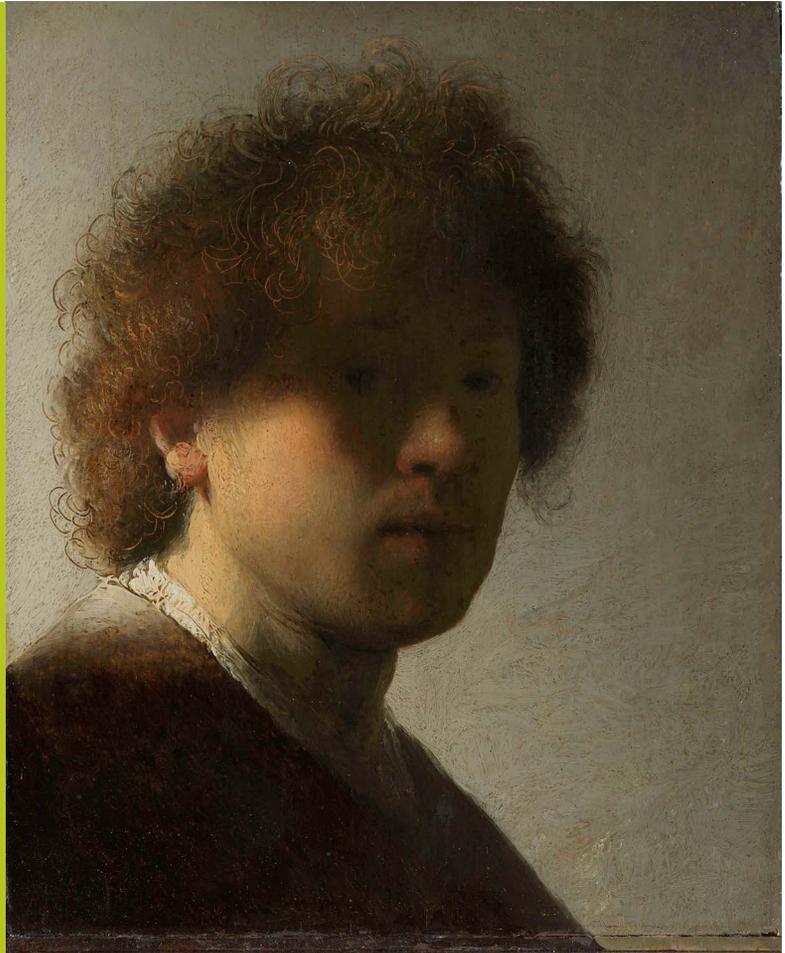
²⁷ *Het geheim van de meester*, AVROTROS, TV series aired 2016-2019.

²⁸ "Van vernis tot vermiljoen: vervalsen," *Het geheim van de meester*, AVROTROS, TV episode aired 19 February 2019.

²⁹ Robert Verhoogt, *Art in Reproduction: Nineteenth-Century Prints after Lawrence Alma-Tadema, Jozef Israëls and Ary Scheffer* (Amsterdam: Amsterdam University, 2007), 31-38.

³⁰ "Rembrandt – zelfportret op jeugdige leeftijd," *Het geheim van de meester*, AVROTROS, TV episode aired 15 September 2016.

Fig. 6. Rembrandt van Rijn,
Self-portrait, 1628
22.6 x 18.7 cm, oil on canvas,
Rijksmuseum, Amsterdam,
the Netherlands



and painting. Yet, the 3D print is not made of oil paint or canvas, nor with the same techniques Rembrandt used. Reconstruction, on the other hand, does allow the use of newer materials. Reconstructions are rarely made of fine art (i.e. paintings and statues), but are more often employed in architecture and archaeology to restore something that has been damaged or lost to a preferred historical time or visual state.³¹ New materials are combined with original components to durably recreate something in a new perspective, using newly

³¹ ICOMOS (2013); Gale, et al., *Terminology*.

gathered information to puzzle together what an artifact might have looked like at a certain point in time. In the case of *Saul and David*, 3D printing was used to visualize what was revealed during a restoration project, and it facilitated the reconstruction of the original shape of the painting in new materials. Reconstruction, then, replaces facsimile as the most precise designation for 3D printing.

So far, it seems that copying and 3D printing are acts that are usually harmless to or in favour of an original. Nonetheless, nowadays any form of copying leaves a bad aftertaste and it is often associated with forgery. As Lenain and other scholars indicate, forgery is a ‘negative’ copy that is made with the intention of deceiving. It is a product that deliberately steals the identity, place in time, and status of the original it simulates.³² The intention of creating the 3D print of *Saul and David* — and any other 3D-printed painting — has not yet been of this kind. However, with the increasing likeness of reconstructions and the growing number of copies we encounter daily, the fear of counterfeit is rising. This has resulted in rigorous measures: the International Council of Museums’ (ICOM) *Code of Ethics* (2017) describes that one of museums’ main tasks is to display primary evidence of history, and that if museums decide to use copies, reproductions, and facsimiles they should label them clearly as such.³³ Interestingly, although we live in a world with more and better reproductions than ever, there still exists a mania for showing authentic artworks in museums, resulting in a rejection of reproductions and their potential value or use. It is necessary to explain where this urge for preserving an authentic experience is rooted, and if 3D reconstructions are changing this phenomenon. This way, what the 3D print of *Saul and David* means to the original at the Mauritshuis can be explained.

AUTHENTICITY IN THE AGE OF 3D PRINTING

According to Benjamin, ‘mechanical reproduction’ and the plural existence of artworks alters the ‘holy’ status of an authentic artwork.³⁴ The importance granted to artworks can

³² Lenain, *Art Forgery*, 35-45; Hick, et al. *Aesthetics and Ethics*.

³³ *ICOM Code of Ethics* (2017), <https://icom.museum/wp-content/uploads/2018/07/ICOM-code-En-web.pdf>.

³⁴ Benjamin, “Das Kunstwerk,” 12-16.

be attributed to their unique existence in history, provided by their materiality: the paint, canvas, and colours offer proof of a unique moment in the past, and create an emotional bond with the viewer. Benjamin defines this phenomenon as ‘aura’; a quality that provides the artwork with the ability to become the relic of a social cult, causing the work of art to obtain a ‘cult value’.³⁵ With the introduction of ‘mechanical reproduction’ methods, such as 3D printing, art loses its exclusive nature as a cult object and becomes an object of the masses. It evokes a diminution of artistic value and ‘aura’, as the importance of art is no longer based on historical and emotional connections but on its omnipresent aesthetic qualities. The latter marks a shift from ‘cult value’ to ‘exhibition value’: the dominant cultural connections of the artwork shifted from one that is unique in time (*Einmaligkeit*) to one that is ephemeral and repetitive (*Reproduzierbarkeit*). So according to Benjamin, the ‘cult value’ of the original will vanish together with the ‘aura’, leaving the original and the myth of the artist.³⁶ Benjamin ends his essay with the idea that mechanical reproduction marks the death of art: art is transformed into a tool for propaganda and consumerism, losing all of its significance for human history and artistic achievement.³⁷

Even though Benjamin wrote this assumption almost a century ago, it could be argued that his stance towards art reproductions is still meaningful in today’s world of 3D printing. Marking 2019 as the Year of Rembrandt perfectly exemplifies his statement that art’s status has changed from ‘cult value’ to ‘exhibition value’: museums everywhere promote Rembrandt’s artworks — or the artist as a brand — via numerous exhibitions, events, and reproductions. Nevertheless, Benjamin’s idea about the increase in reproductions and art’s popularity has not caused a decrease in the value of the original. On the contrary, the Dutch organization *Museumvereniging* shows that Dutch museum visits are continuously increasing, suggesting that people still want to see original artwork and feel the sensation of an artwork as proof of history and artistry.³⁸ When we come face-to-face with the

³⁵ Ibid., 20-22.

³⁶ Ibid., 14-16.

³⁷ Ibid., 40-46.

³⁸ Museumvereniging, *Museumcijfers 2017*, 2 October 2018, https://www.museumvereniging.nl/media/publicationpage/publicationFile/2017_museumcijfers-nieuw.pdf

original *Saul and David*, we seek proof of the past and a connection with the artist through the uniqueness of the material features of the painting. A 3D print cannot substitute the original in this sense: it is indeed a reconstruction of something that was, but one which does not carry traces of time and connection with history.

Even though today we value artworks primarily through their materiality, this has not always been the case: the focus on material authenticity in the West began only two centuries ago with the French Revolution, during which the romanticization of nationalism amplified the emphasis on individuality and consequently changed the role of individual artworks and artists. Before that time, artworks were enjoyed because of their context, function, and collective significance, as with the *Ghent Altarpiece* (1432) attributed to the brothers Hubert and Jan van Eyck, for instance, which was valued because it was perceived to possess a magical connection to the saints of the Church and for its function as a visual reinforcement for understanding the liturgy (Fig. 7).³⁹ Therefore, various art and conservation specialists have noted that authenticity is a social process with variations in cultural and historical preferences. Art historian David Lowenthal emphasises that it is important to understand that there is no single perspective of granting value to originals (and reproductions), and most importantly, these perspectives are fluid and can change over time, perhaps one day resulting in a different appreciation of originals and 3D prints.⁴⁰

AUTHENTICITY AS A MATTER OF PERSPECTIVE

Authenticity is regarded as something that has the quality of being authentic, original, or genuine. It refers to something that is genuinely made or done in a traditional way that faithfully resembles an original based on reliable facts. Early twentieth-century art historian Alois Riegl described artworks as ‘monuments’.⁴¹ He states that monuments are artifacts that can be granted ‘age value’ and ‘memory value’. Anything can acquire ‘age

³⁹ Lenain, *Art Forgery*, 74-76.

⁴⁰ David Lowenthal, “Authenticity? The Dogma of Self-Delusion,” *Why Fakes Matter: Essays on Problems of Authenticity*, ed. Mark Jones (London: British Museum, 1992) 184-90.

⁴¹ Alois Riegl, *Der moderne Denkmalkultus, seine Wesen und seine Entstehung* (Vienna: K.K. Zentral-Kommission für Kunst-und Historische Denkmale, 1901), 23-49.



Fig. 7. Jan van Eyck, Hubert van Eyck, *Ghent Altarpiece*, 1432. 350 x 460 cm, oil on panel. St. Bavo's Cathedral, Ghent, Belgium

value': as time passes, objects become proof of an earlier moment in time. This value is steadily advancing, unchangeable, and inherent to an artwork. In contrast to 'ordinary' objects, Riegl says that 'monuments' also have 'memory value': a value that in a way satisfies humanity's social, psychological, and intellectual needs. 'Memory value' is not fixed like 'age value'; it transforms over time.⁴² It is a phenomenon that is better understood as an assessment made by a particular evaluator in a particular context. Therefore, 'memory values' can be granted in many forms, but together with an object's 'age value' they generate the authenticity, or 'aura', of artworks ('monuments').

But what are these 'memory values'? Ex and Lowenthal explain that 'memory value' can be

⁴² Ibid.

granted in various ways.⁴³ One specific ‘memory value’ that is becoming more important today is the originally nineteenth-century ideal of *l’art pour l’art*, which is presently interpreted as a ‘conceptual authenticity’: this means that the thought and production process of the artist are the most valued aspects of an artwork. Furthermore, Lowenthal and Ex describe functional or contextual authenticity as a form of granting value that safeguards the original function of artworks, an interest in showing artworks only in the environment or context that properly belongs to them. In the case of the *Ghent Altarpiece*, it becomes dislocated when placed in a museum (i.e. the crypt of the cathedral that was turned into a permanent exhibition space); showing it in Saint Bavo’s Cathedral in Ghent would be true to the function and context of the artwork.

So, if a 3D print can never replace an artwork’s material authenticity, can it ever become more than just a copy? By approaching the 3D print of *Saul and David* from the other mentioned stages of authenticity — conceptual, functional, and contextual — it can be determined if the 3D reconstruction can become authentic on its own.

THE AUTHENTIC 3D PRINT

In terms of ‘age value’, a 3D print can obtain this characteristic: all it takes is time. The 3D print of *Saul and David* will become authentic in terms of ‘age value’ as it will one day be a material reference to what could be achieved with 3D printing, and also function as a reminder of the Mauritshuis exhibition. Yet, in terms of ‘memory value’, the authentication in relation to the original is rather contradictory: the 3D construction by its nature is considered to be something that can never be original because it depends on an existing artwork, but it has to have an ‘aura’ to become acceptable as authentic.⁴⁴ In other words, the acceptance of the 3D print as authentic happens when the reproduction realizes a ‘memory value’ the original cannot. This has happened, for example, to the copy of Michelangelo’s *David* in front of the Palazzo Vecchio that fulfils the original’s functional authenticity, because the

⁴³ Ex, *Zo goed als oud*, 30-31, 56-64, 66-70, 82-85, 94-97, 108-9, 115-23; David Lowenthal, “Counterfeit Art: Authentic Fakes?” *International Journal of Cultural Property* 1.1 (1992), 81-85, 90-97.

⁴⁴ Lowenthal, “Counterfeit Art,” 90-97.

original would have been long gone if it had not been preserved in a museum.⁴⁵ *David* is important both because of its *materiality* as a proof of Michelangelo's skills and because of its *function* in front of the Palazzo as a symbol for the independence of Florence; therefore the reproduction takes on its own value — one that the original cannot fulfil anymore due to its materiality — making it as meaningful as the original for its own reasons.

Another example of an authentic copy is *Lascaux II* (the copy of the parietal wall paintings in the French Lascaux caves). Like the 3D print of *Saul and David*, it is a reconstruction of an original in a newer material, and was made because the original prehistoric cave was no longer accessible due to the fragility of its material.⁴⁶ To ensure an authentic experience, *Lascaux II* was placed close to the original cave. Like the reproduction of *David*, *Lascaux II* conserved a quality — an authenticity — the original could no longer sustain: it took over the function of the original cave, because without *Lascaux II* the murals of the prehistoric cave would no longer be visible and accessible. It is worth mentioning that as time passed, the material of *Lascaux II* decayed, just like its original. However, instead of reproducing the replica, *Lascaux II* was restored and later declared a historical monument.⁴⁷ This emphasizes the possibility for a reconstruction to increase in value and obtain its own material value and importance.

As the examples have shown, a replica obtains 'memory value' when it fulfils a purpose the original cannot (anymore). In the case of the 3D print of *Saul and David* — keeping in mind that it is now rather new — the 3D print *could* replace the original's functional authenticity: its materiality allows the painting to be shown in a manner that is more like the conditions in which Rembrandt and his contemporaries saw the artwork (e.g. in candlelight or near a fireplace). However, what is more interesting is that not only does the original artwork age, but so too does the 3D print. In contrast to Rembrandt's painting, the 3D print of *Saul and David* is made of polymer, a material that decays more slowly than the materials of the original. The 3D print is a snapshot of the material state of the original painting in 2015. In

⁴⁵ Ex, *Zo goed als oud*, 60-62.

⁴⁶ Jon Bryant, "Prehistoric Cave Art Celebrated at New Lascaux Centre in Dordogne," *The Guardian*, 15 December 2016.

⁴⁷ *Ibid.*

Lowenthal's words, this means that over time the print will provide a more historical and conceptually more correct version of *Saul and David* than Rembrandt's oil-painted version, as it will eventually show less decay and discolouration than the original.⁴⁸

In the case of material authenticity, it is clear that the 3D print cannot take over the material qualities of the original painting while it is still accessible to provide the 'auratic' experience. Nonetheless, if *Saul and David* were to vanish or decay beyond repair, there is a possibility that the 3D-printed facsimile could become a new body that reminds one of the original work and which can eventually (partly) replace the original. Even though this is speculative, this technology prompts us to consider what is more valuable to us over time: is it *Saul and David* which is older in materiality, but a ruin of what it once was, or will it be the 3D print that is different in materiality and newer, but in concept or composition (i.e. conceptual authenticity) closer to what Rembrandt intended? This discussion driven by the authentic copy may one day affect the authenticity society grants Rembrandt's painting and has the potential to change our perception of original artworks.

CONCLUSION

The introduction of 3D reproductions that are almost indistinguishable from the original liquefies the borders between what is 'real' and 'authentic' and what is not, making it hard to identify what, precisely, a 3D print is, and how this technology should be understood as part of reproduction and art history. Benjamin's fear that 'mechanical reproduction' together with technological invention would mean the death of art can be refuted: technology has increased the obsession with the materiality of original artworks. The existence of 3D prints can be seen as a *conditio sine qua non*: appreciation of the original's 'aura' would not exist if there was not something — in this case a copy — to threaten it. Simultaneously, artworks and 3D prints gain their own 'age value' as they withstand the passage of time and become symbols of artistic and technological triumph. It is important to emphasize that the perceived authenticity of both the original and the 3D print is a social construction that is not static, but changes according to what society considers to be 'authentic'. Shifts

⁴⁸ Lowenthal, "Counterfeit Art," 96-97.

in the appreciation of functional, material, or conceptual authenticity changes the meaning of the original, which can elevate the 3D print's relevance and its own historical value detached from the original it was based on. The importance of material authenticity that has been inherent to the Western perception of art is shaken as 3D reconstructions disclose new information about original artworks. Additionally, 3D prints are created through code, meaning that information about artworks can be easily shared and even tweaked according to one's liking. For example, *Saul and David* can be reprinted in the state it was in before it was restored. In this way, the story behind the painting and the artist can be disclosed in different ways, prompting a reinterpretation of the artwork's qualities and its importance to history. It is society's task to reach a consensus about the way 'aura' is granted in an age where different versions of Rembrandt's original masterpieces exist. Returning to the title of this article, it could be argued that as time passes and society changes its perception of art, there is a chance that 3D reconstruction and authenticity shall one day meet.

Liselore Tissen is based at Leiden University and Delft University of Technology, where she is currently preparing a doctoral dissertation on the applicability of 3D printing for the conservation of paintings, and the moral and ethical discussions prompted by the introduction of this technology to the art world. She specializes in conservation studies and 3D printing fine art, with a particular interest in the sociological importance of this technology, and the development of this technology for material science and practical conservation and presentation purposes.