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Curator: The Museum Journal

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ARTICLE OPEN ACCESS

Beyond the Tangible: Adults' Views on Authenticity in a Digitized Natural History Collection

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Received: 9 January 2024 | **Revised:** 13 August 2025 | **Accepted:** 13 October 2025

ABSTRACT

Authenticity is an important aspect in natural history museums. Many museums aim to give their visitors an authentic experience. Now that increasingly more museums are digitizing their collection, the topic of digital authenticity has become relevant. To study how people interpret authenticity in a digital museum collection, we conducted 14 semi-structured interviews with adults from the Netherlands about the digitized collection of a Dutch natural history museum. Overall, the interviewees perceived the digital collection as less authentic than the physical collection, but the digital collection did still have authentic qualities. Participants recognized the authenticity of the digitized objects, especially if the objects were accompanied by extra information, and if the objects looked lifelike. But the essence of the object was lost in the digital collection. Participants did value the digital collection for its educational purposes. In addition, visitors' personal interest impacted how they perceived and valued the authenticity of a digitized collection. Outcomes of this study suggest that although some of the authenticity is lost, digital collections may serve an important goal of providing information and of increasing the accessibility of the collection.

1 | Introduction

Viewing and interacting with authentic objects is one of the powerful aspects of science museums (Braund and Reiss 2006). Therefore, how people perceive authenticity has a great influence on their experiences, especially in a museum setting. In a museum, authenticity adds meaning to a visit and therefore museums often emphasize the authentic aspects of the objects within their collection. Visitors generally find authentic objects more museum-worthy than replicas (Schwan and Dutz 2020). People estimate authentic objects to be more expensive, and people have a stronger urge to touch, own, and be near authentic objects (Frazier et al. 2009). People describe objects as authentic if the object connects the viewer to special, historical events, if the object is rare, prestigious, or very detailed, or simply because the object feels authentic. When visitors perceive objects as inauthentic, they may value these objects less compared to their authentic counterparts. However, authenticity is not a straightforward, linear scale ranging from authentic to inauthentic, where an increase in authenticity directly leads to higher valuation. Instead, the relevance of authenticity to visitors depends on a variety of factors, including the type of object, the context in which it is displayed, and the observer's personal background and expectations (Hampp and Schwan 2014). For instance, a historical artifact might be valued more for its authenticity in a museum setting, whereas a replica could be equally appreciated in an educational context where the focus is on learning rather than originality. Similarly, an observer with a keen interest in historical accuracy might place greater importance on authenticity than a casual visitor. Therefore, the relationship between authenticity and valuation is multifaceted and context-dependent.

How objects are perceived by visitors plays a role in how they experience a museum visit. When visiting a science or natural history museum people expect to find authentic objects on display (Hampp and Schwan 2015). However increasingly, science and natural history museums are providing digitized versions of their collection for the public to explore. Previous research has highlighted the importance of visitor interaction with

authentic objects in natural history museums. However, it is still unknown how visitors experience authenticity when interacting with a digitized collection. In this study, we have examined how visitors of a digitized natural history collection perceive authenticity and the added value of such a digital collection.

1.1 | Authenticity Frameworks in Natural History Museums

Authenticity and authentic experiences have been studied in various fields, including psychology (Newman 2019), consumer research (Beverland and Farrelly 2010), and visitor studies (van Gerven et al. 2018). All these fields have produced their own definitions and frameworks to explain authenticity, building on the broad definition suggested by Evans et al. (2002), who describe authentic objects as original, and in contrast with the artefactual and illusory. These definitions and frameworks are very field-specific and do not always overlap (Newman 2019).

One type of framework is objectivism, which views authenticity to be an intrinsic part of the object that can be judged objectively (van Gerven et al. 2019). Newman (2019), for example, describes different ways that authenticity can be defined based on factual information about the object (physical, historical, the intent of the maker). In contrast, the constructivist interpretation of authenticity views authenticity as something that has been socially constructed and is influenced by the context in which the object resides (Holtorf 2013; Wang 1999). Within constructivism, there is a focus on perceived authenticity, the impact of context and the expectation and perspective of the viewer.

Both types of frameworks have their respective strengths and limitations. Objectivism disregards the context of the object, which can be an important factor in the way people interpret the object (Sogbesan 2021). Constructivism does factor in the context and personal experience of the viewer, but it can become too unconstrained making it an impractical framework since all objects can be seen as either authentic or inauthentic depending on the context and the viewer (Holtorf 2013). Recent research has tried to find a definition of authenticity that combines the properties of the object and the lens through which people view it. van Gerven et al. (2019) proposed such a framework. This framework falls into the psychological concept of essentialism, and it sees objects as possessing an essence. This essence is unique to the object and lies deeper than only the materiality of the object. The essence can encompass the life history of an object, the maker of the object, material properties, and aesthetics.

The essentialist framework is a particularly fitting framework to use when assessing objects that are typically found in natural history museums. Natural history museums are places where visitors expect to interact with authentic objects (Hampp and Schwan 2015) and where experiences with authentic objects are highly valued (Braund and Reiss 2006). For example, children valued real dinosaur bones over replicas, even if the real bones were fragmented and the replicas showed a perfect copy of the original bone (van Gerven et al. 2018).

Objects in natural history museums are usually not made from highly valued materials, or by famous artists. Viewing them through a purely objectivist lens will not accurately describe the authentic experience visitors have when interacting with these objects. The worth of objects in natural history museums is often tied to the life history of the object, the context they are in, and the perspective or background of the viewer. All these aspects are accounted for in the essentialist framework.

1.2 | Digital Authenticity

The different types of authenticity mentioned above are mostly based on physical objects. But how should we consider authenticity when looking at the digital space? Many museums have been digitizing their collections. This process was fast-tracked when the 2020 Coronavirus pandemic caused museums all over the world to close their doors.

Digital objects are inherently different from physical objects. Digital objects are entities that exist in the digital realm, such as files, software, databases, or digital images. Unlike physical objects, they do not have a tangible presence and are defined by their digital code. Digital objects are more dynamic, compared to more static physical objects; they evolve, and change based on their interactions within digital environments. Where the life history of physical objects is tied to the object, the life history of a digital object can be erased in a second by changing the digital code. Digital objects are part of larger networks. For example, a piece of software interacts with hardware, other software, and users. To understand the nature of a digital object it is important to understand these interactions, since without these interactions the digital object would lose its meaning (Hui 2012).

The dynamic and context-dependent nature of digital objects raises questions about what happens to the authentic experience when physical objects are photographed and placed in a digital space. Authenticity and viewer experience of reproduced images of objects have been discussed since the development of photography. In a 1935 essay, Walter Benjamin wrote: “Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be. This unique existence of the work of art determined the history to which it was subject throughout the time of its existence.” He emphasizes the loss of the essence of the object, in this case art, when it is mechanically reproduced. He argues that people see a photographic reproduction of an object as a snapshot in time of that object, and no longer as the object itself (Benjamin 1935). But now, almost one hundred years later, photographic reproductions have become a standard part of most of our lives and the role of digital tools has expanded into most aspects of our daily routine. This is also the case in museums, where digital exhibitions are becoming more common.

Research projects focusing on cultural heritage have explored the potential of digital objects. Were (2015) studied how indigenous communities in Papua New Guinea value digital 3D images of cultural artifacts. His research concluded that digital technologies can reconnect people with lost heritage, restoring a sense of cultural completeness. Under the right circumstances, digital versions of objects were able to convey an authentic representation of the past to these communities (Were 2015). This study shows that authenticity still plays a role when considering

objects in a digital space. In our study, we are specifically interested in digitized versions of physical museum collection items. We are not considering genuine digital objects without a physical counterpart, such as digital art.

1.3 | Personal Interest and Authenticity

The perception of objects is influenced not only by the objects themselves and their context but also by the viewer's perception of the object. In a museum space, the way objects are perceived can vary among different types of visitors. Research by Falk (2006) highlights that individuals value different aspects when visiting a museum, based on their motivations and experiences. Digital museum collections may also cater to these varied motivations by offering several advantages. For instance, digital museums can provide access to a much larger portion of the collection than what is available in physical spaces, and they often offer more extensive information about the objects. Physical context might be less important to visitors who are motivated to go to a museum to learn. A digital museum collection could be more valuable to these visitors because of the extra information that might be provided and the convenience of visiting a digital museum collection compared to a physical museum visit.

An online exhibition can enhance or even replace a visit to a physical museum, depending on personal motivation and circumstance (Evrard and Krebs 2018). Almost all surveyed visitors of the French art museum the Louvre agreed with the statement: "nothing can replace the direct contact with artworks." But, depending on their proximity to the museum, age, familiarity with digital tools, and relationship to art, people also agreed with the statements: "the digital reproduction of an artwork can replace the direct contact with the genuine artwork" and "both of them are interdependent since their respective benefits are different" (Evrard and Krebs 2018).

The concept of authenticity in museums is multifaceted, encompassing both the intrinsic qualities of objects and the subjective experiences of visitors. While physical objects in science and natural history museums are often valued for their tangible connections to history and their unique material properties, the rise of digital collections presents new opportunities and challenges for engaging audiences. As museums increasingly digitize their collections, it is crucial to understand how visitors perceive the authenticity of digitized objects and the added value they bring to the museum experience. Natural history museums, with their diverse collections where visitors expect to find authentic objects, provide a rich context for exploring these issues.

This study aims to investigate how adults experience authenticity in a digitized collection of a natural history museum. This topic will be broken down into three sub-questions.

1. How do adults perceive authenticity in a digitized collection of a natural history museum?
2. How does the authentic experience of the digitized collection compare to that of the physical museum?
3. How does personal interest influence how visitors experience a digitized collection of a natural history museum?

2 | Methods

To study the authentic experience people have when interacting with a digitized museum collection, we conducted semi-structured interviews with adults who independently used a website containing the digitized collection of a natural history museum. Since the topic of authenticity regarding a digitized collection is a relatively new field of study and complex in nature, semi-structured interviews provided in-depth insights into participants' perspectives (Jensen and Laurie 2016). The semi-structured nature of the interviews allowed for comparisons to be made between participants but also allowed participants to elaborate on their unique views and experiences.

2.1 | Setting

For this study, the digitized collection of Naturalis Biodiversity Center in Leiden, the Netherlands, was used. Natural history museums, with their diverse collections are places where people expect to find authentic objects on display (Hampp and Schwan 2015), which is a powerful aspect of the museum experience (Braund and Reiss 2006). Viewing authentic objects is one of the key attractions of natural history museums. This expectation of authenticity makes natural history museums an ideal setting for our study, as it allows us to explore the differences in visitor experiences between physical and digital collections.

Combining their educational, historical, and research collection, Naturalis holds over 42 million objects, but only a small fraction of the collection can be displayed in the museum building. Since 2022, Naturalis offers an online platform ("Expeditie Online," https://expeditieonline.naturalis.nl/nl/kaart) which contains a digitized version of part of their collection. The website contains detailed photographs and scans of over 2.4 million objects from the physical collection. In this article, we refer to these records as "digitized objects." The collection is visualized using a world map where visitors can click on dots on the map. Each dot represents the original location of an object in the collection. Clicking on the dot provides visitors with a high-quality image of the object together with the common name, scientific name, description of the organism, information about the collection the object belongs to, and information about the habitat of the organism. If applicable, object records are accompanied by hyperlinks to popular science articles written by Naturalis experts about the object. Visitors can also search for specific organisms by using the search bar. Figure 1 shows the starting page of Expeditie Online, showing the map and search bar. Participants were asked to individually use the website for 30–60 min, in order to mimic a spontaneous visit to the website as much as possible as proposed by Komarac and Ozretić Došen (2023).

2.2 | Participants

Fourteen adults participated in this study. They were found through various networks (social media, museum newsletter, personal connections) and through snowballing. During the interviews, participants were asked to make comparisons to their experiences in the physical museum. Therefore, all participants had to be familiar with and have visited the museum at least

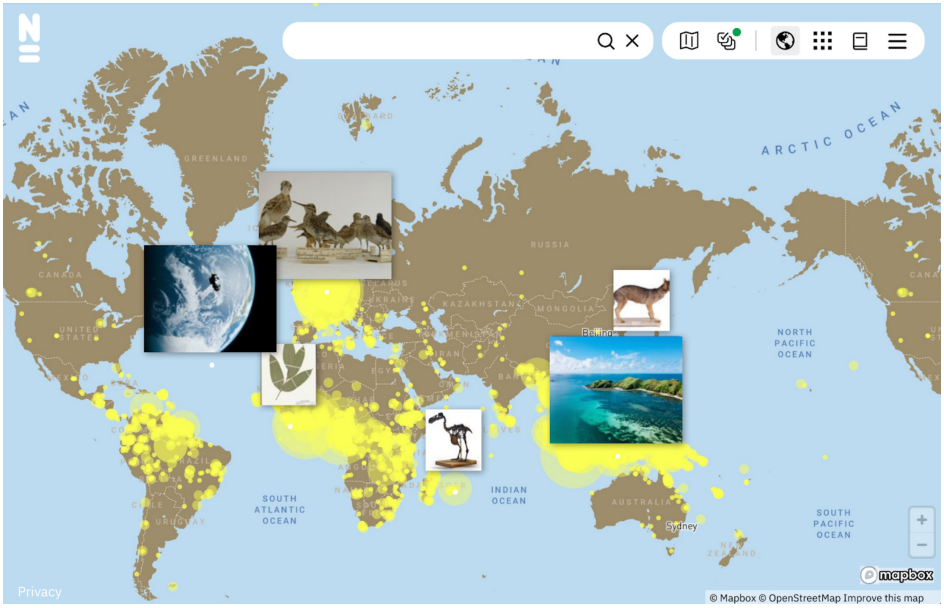

FIGURE 1 | The starting page of Expeditie Online. [Color figure can be viewed at wileyonlinelibrary.com]

once in the past 5 years. Although we recorded as little personal information as possible for privacy reasons, we can note that participants ranged in age from 20 to 75 years old and that the gender balance was quite evenly distributed. Participants gave informed consent before the start of the interview.

2.3 | Data Collection

After using the website individually for 30–60 min, participants were questioned in the form of a semi-structured interview about their experiences with the digitized collection. These interviews lasted for 40 min on average and took place either in person, at a place other than the museum, or online through a video call (when traveling was not feasible). We did not see any difference in responses between participants that were interviewed in person versus online. The interviews were conducted in Dutch.

The interview started with questions about what authenticity meant for the participants in general and continued with questions on how they perceived the authenticity of the digitized objects and how this compared to their experiences in the physical museum. We also asked about their interaction with the digital collection in particular and discussed the objects they found when using the website and which objects were particularly interesting to them. The interviews ended with discussing a premade selection of objects. This selection included animals versus plants, skeletons versus taxidermized objects, historical versus modern objects, and objects found in the Netherlands versus outside of Europe. Participants were then asked to assess which object was more authentic to them between two given objects. These preselected objects allowed us to determine if participants gave similar explanations when prompted with new objects they had not seen before. This approach facilitated data triangulation, ensuring that the consistency and reliability of the participants' responses could be evaluated across different sets of objects and different questions within the interview. Data collection was done over the course of 3 months in the spring of 2022. The audio of the interviews was recorded and transcribed. Transcribing and subsequent coding of the data were done simultaneously.

2.4 | Data Analysis

The interviews were qualitatively coded using the software Atlas.ti. The full interview guide can be found in Appendix S1. Coding was conducted in three rounds. First, we conducted a round of open coding to find emerging patterns, and to get a feel of the data to start creating themes and codes as suggested by Jensen and Laurie (2016). In the second and third rounds of coding, we fine-tuned the codes until most of the data was accounted for. The codes can be organized into four themes; the full codebook can be found in Appendix S2. Authentic Aspects is the first theme and it holds codes that are used to describe what makes an object authentic, such as the age of an object. The second theme is Physical versus Digital and this theme includes codes that refer to comparisons made between the physical and digital collection. The third theme is Personal Interest. Codes in this theme are related to the personal interest of participants in nature, digital tools, or other miscellaneous interests. Comparison was the final theme and it contains codes about the comparisons made regarding the preselected objects. A small section of the data (around 10%) was independently coded by a second coder. Initially there was a 48% agreement. After discussion between the two coders, disagreement was mostly caused by discrepancies between which text element was selected, but not by the codes that were assigned. Table 1 contains an overview of the themes, codes and example quotes.

3 | Results

In this section, we will discuss the main outcomes from the interviews, related to participants' interpretation of digital authenticity, their comparisons between digital versus physical

TABLE 1 | Codebook used to code the interview transcripts.

Code title	Example quote
Theme 1: Authentic aspects	
Object aspects—physical	*Authenticity for me has to do with the material nature of the object, the details, texture*
Object aspects—nonphysical	*It is definitely authentic. I'm not sure if I would feel the same with other objects without context*
Special	*It feels more authentic because it is very rare for something to fossilize, and even more rare for it to be found, and even more rare to be found in this condition*
Origin	*To be authentic an object doesn't have to be old, as long as it came from nature*
Information	*What makes something truly authentic is the story behind it*
Location	*For me, it's objects that are far away from me, like an extinct animal or something from Brazil*
Old historical	*Authentic to me is something that refers to a time past*
Theme 2: Physical vs. Digital	
Digital > Physical	*What I prefer online is that you can have as much information as you want, and you are not limited to the space on a sign*
Physical–Digital complement	*I would like the website to accompany a physical visit to the museum*
Physical < Digital	*I'm not really looking at a dinosaur skeleton, I'm looking at a picture and personally, I find it cooler to look at the real thing*
Theme 3: Personal interest	
Personal interest nature	*I prefer animals over plants*
Personal interest in digital tools	*I don't purposely learn about digital tools, but I think we live in an age where you learn about new digital tools by accident*
Personal interest miscellaneous	*I personally like looking at world maps, that is also part of my study, old world maps, and I like that this is like a natural world map*
Theme 4: Comparison	
Comparison 1 (Eagle vs. banana leaf)	*The eagle gives me that authentic feeling because I feel like it's more similar to a living eagle. The banana leaf didn't look like this at all, it used to be green and part of a tree*
Comparison 2 (dolphin skull vs. dragonfly)	*The dolphin feels more authentic because there are not so many living dolphins, it is rarer to find a skull like this*
Comparison 3 (seal skull vs. ground finch)	*I would say the finch because for me it's the older something is the more authentic it becomes*

collections, how they value the digitized collection, and the role of personal interest. Relevant quotes are used to illustrate the most common comments for each topic. The interviews were conducted in Dutch but for the purpose of this paper the quotes have been translated into English. Participants are identified with a number instead of their names.

3.1 | Interpretation of Digital Authenticity

During the interviews, we first talked about what makes a physical object authentic. All 14 participants talked about the physical qualities of objects when asked to describe what contributes to the authenticity of an object. Some of the qualities that were described as authentic were the age of the object, visible details, the size of the object, and the fact that the object was unbroken. Out of all 14 participants, nine people linked authenticity to objects that were man-made: "... because it was made, it was formed... so I would say the eagle because it was taxidermized" (participant 5). Eight people associated authenticity with objects that originated in nature: "It doesn't have to be old as long as it came from nature... came from a real organism, or is a trace of a real organism, that's pretty authentic to me" (participant 2).

Participants who associated authenticity with natural objects often did so because they found natural objects to be "real" and

man-made objects to be "fake" or "replicas." When asked to name an inauthentic object participant 6 described this as follows: "if it is a fake [...] if it was made but they say it's a real fossil." On the other hand, participants who associated authenticity with man-made objects often did so because they linked authenticity to uniqueness, which they saw as a human quality. Objects that were seen as rare or unique were more often described as authentic by both participants who preferred natural and man-made objects. This went both ways: an object was perceived as rare and therefore it became authentic or an object was seen as authentic making it more special.

People also described qualities of authentic objects that were not directly physical. Some of these qualities were the context making the object authentic or the fact that the object was representative of a larger group of objects. For example, participant 6 said: "That feeling when you're standing next to an object that really is that old [...] I mean, that is quite special." This feeling was described by multiple participants. But this feeling of closeness to the object was never described when talking about digitized objects. Participant 9 was asked what the difference was between seeing an object in a physical museum and seeing the same object as a digital image. They said "well... I think it has to do with seeing something through the eyes of someone else [...] See, Darwin didn't see a photograph of a finch, he saw a finch, therefore I want to see the finch and not the photograph of the finch."

In addition, context was also an important nonphysical aspect of authenticity. The connection that viewers feel towards the digitized object is increased when context is provided, causing a more powerful feeling of authenticity: "it's about giving context... if I Google dolphins or porpoises I'll find loads of pictures of them, but if I look them up on the map [Expeditie Online] then I'm looking for porpoises in the North Sea, then I'm searching for them through a different lens which provides more context, which gives it authenticity for me. It's more of a story, that's the difference" (participant 10).

Participants often struggled to articulate their thoughts on the authenticity of digitized objects. In six out of the 14 interviews, this struggle was explicitly mentioned by the participant. They felt something was different when looking at a digital picture of an object compared to looking at the physical object, but they could not pinpoint what. Their conclusion was often that the essence of the object was missing in the picture. Participant 4 used the following comparison to explain why digital and physical were not the same to them: "it's a bit like listening to all of Harry Styles' songs on Spotify, and seeing all of his videos and maybe even having a 3D hologram of him in your room, but when you go to his concert, that's when you have seen him. That's when you know what it's like to see him."

3.2 | Digital Collection vs. Physical Museum

When we asked participants to specifically compare digitized objects to their physical counterparts, they mentioned various similarities and differences. Authenticity was mostly described as falling somewhere on a scale, not as something binary. All participants mentioned at least once that the physical object was more authentic than the digitized object but digitizing the object did not make it lose its authenticity completely: "They are both authentic. The story of this picture, with all the extra information, is super interesting to see how it is done. This is authentic to me. But say I could go into the [collection] tower and hold the object, that would be even more authentic. Then you can smell and feel it. That would really go the extra mile, although this digital image is also authentic to me" (participant 6).

When comparing the physical to the digital experience participants often felt that the physical museum experience is more inter-connected. All parts of the museum, from the building to the company, to the exhibition design, all together form the museum experience. This provides context and aids the feeling of authenticity: "I don't think a website could ever compare to the real museum. I think people are looking for a story. Museum exhibitions have been curated with great care, they tell a story..." (participant 13). This digitized collection, Expeditie Online, was lacking context and felt less connected. Participants saw the objects separately from each other. This lack of context also caused participants to have a lesser authentic experience: "... I think it's impossible to translate that feeling to a website, to a picture. It just can't be done" (participant 13).

The biggest difference between visiting the physical museum and the museum website for most participants came down to the sensory experience and the physical context of the objects. Digital objects inherently exist solely in the digital realm and lack a tangible presence, even if they originate from a physical object. Consequently, the sense of authenticity felt stronger with physical objects, as participants perceived a greater sense of permanence and stability.

The feeling of authenticity also felt stronger when participants had the physical experience of being inside a museum, being surrounded by objects: "because a museum visit is an active deed, to go to a museum, to step into there and be in the same space and surroundings as those objects. That gives them an extra dimension. And doing so together with other people. A website is something you go to when you are at home, somewhere where you always are. It's something that can be fun and interesting, but it doesn't have that extra feeling of going to a museum and looking around and experiencing what you can see there" (participant 6).

Participants often mentioned the difference between the size of the object in the physical museum and the digital image. Out of the 14 participants, eight people brought up the size of the object. Even if the picture was extremely detailed and lifelike, it was no longer the real thing which made it less authentic. In a conversation about a detailed picture of a small insect participant 10 said: "well, here it is clear the object has been manipulated, it is smaller in real life. I like to get a feeling of the size of the object. The pros are that you can see the details and that is also important to me. I'm conflicted on this one because for me authenticity has to do with the material side of the object, the details, the texture, and those things are very visible in this picture, but I know this isn't real, this isn't how I would see it in real life." The digital image was rarely described as lifelike, whereas the physical object often was.

Another difference that sometimes made participants consider the digitized object as inauthentic was that the object was no longer 3D: "it makes it less authentic... because it is a picture, it is 2D" (participant 3). The object felt less tangible, and most importantly the digitized object was not unique: "it could be a picture from anywhere, everything on the internet is accessible from everywhere" (participant 3). This effect was mentioned in 10 of the interviews.

3.3 | Personal Interest

Six of the participants did value the digital collection higher than the physical collection in certain instances. These were the participants with a strong personal interest in (a subsection of) the digitized collection who were looking for more information on the topic. Their personal interest came up unprovoked, as participants shared their interests without being specifically asked. They talked about their favorite species, field of study, or personal hobbies. For these participants, detailed information was more important than seeing the physical object: "if you want to learn something about a very specific topic and you want to get the information fast, then a website like this is a good and fun place, and it can be super valuable" (participant 1).

When their main goal was to find information, participants often had stronger feelings of authenticity toward the digital collection, sometimes even more than towards the physical museum. "What I prefer online is that you can have as much information as you want, and you are not limited to the space on a sign... The information proves the authenticity." (participant 3).

Gaining more information was not always the goal of people with a strong personal interest. Some participants had a more emotional connection with a subject that influenced the way participants experienced objects. When participants had a more emotional personal interest in a certain object or object group they wanted to be near the physical object. Participant 4, who was an avid birdwatcher said: "that is purely a feeling. Then it's real, and a video is just a video. Yeah, I'm not sure. Even though it's just as real, you probably see more [in a video of a bird] than when you see them in nature." Participant 13 shared this sentiment and said that when you find something interesting you want to see it in real life: "say it was a museum of modern art than 100% yes. If I see something I really like I would think 'wow this is awesome, I want to see that painting in real life'. I don't have that feeling with objects that don't interest me that much."

Participants often felt conflicted when talking about digital authenticity and personal interest. On the one hand, they felt like personal interest shouldn't influence authenticity, but one of the most mentioned aspects of authentic objects was the rarity or how special the object is. If people were interested in the object or object group before visiting the website they were able to assess how rare an object was, automatically making the object more authentic. For example, participant 7 said that they did not know why special objects feel more authentic: "I think a special object feels more authentic. Emphasis on feels. I can't really explain why. It's rare that something becomes fossilized, and even more rare that we find it, and even more rare that it is this complete. But does that make it more authentic than a bird that just fell out of the sky and we decide to stuff?"

Finally, personal interest influenced how participants approached the website. Since the digitized collection contained over 2.4 million objects, participants could not view all the objects in one sitting. They selected objects in two ways. The first way was by convenience. People selected objects at random, or by clicking the objects that were displayed largest on the map. The second way participants selected objects they wanted to view was through their personal interests and lives. Like participant 2, a student of South American history, when asked why they looked specifically at South American objects said: "I study South American history and that's why I started learning more about South America and I want to learn more about South American nature." All participants used the search bar to look up objects they were personally interested in, and they used the map to find objects that were collected in places that they were interested in or had a personal connection to, like their hometown.

4 | Discussion and Conclusion

The aim of this research was to examine how people perceived authenticity in a digitized natural history museum collection. Fourteen participants were interviewed about their experience with a digitized collection of a natural history museum in the Netherlands. These outcomes can be linked to existing research to broaden the understanding of digital authenticity in science museums.

4.1 | Adults' Perception of Authenticity in a Digitized Collection of a Natural History Museum

Authenticity and its effects can be described using different frameworks and has most recently been described through the principles of essentialism (van Gerven et al. 2019). Within this framework, authenticity comes from the essence of an object, which encompasses its physicality, life history, and maker. Objects in natural history museums often derive their authenticity from this essence (van Gerven et al. 2018). This mechanism was also discussed during the 14 interviews where most participants described these aspects when explaining why certain physical objects were authentic to them. This feeling of authenticity changed for the participants when the object was photographed and placed online. The participants felt that the connection to the object was no longer fully present. This is in line with Hui's comparison of physical and digital objects (Hui 2012). Digital objects don't have a tangible presence, and their life history can be erased or altered instantly. The loss of this connection to the life history of the object meant that most participants saw digitized objects as less authentic than their physical counterparts. Aspects such as rarity, aesthetic qualities, and true representation of history (van Gerven et al. 2019) can contribute to the authenticity of digitized objects. More objective, physical aspects such as size, whether the object is three- or two-dimensional, and if the object feels tangible (Schwan and Dutz 2020), are altered when the object is digitized. However, not all authenticity is lost when an object is digitized. The digitized object is still a

representation of the physical object for participants. The digitized object exists in the context of the digital collection, and this context provides additional information about the object, thereby giving it a sense of authenticity.

4.2 | Digital Collection vs. the Physical Museum

According to the participants of this study, the most significant difference between visiting a physical museum and exploring a digital collection is the immersive experience of being inside a museum, surrounded by objects. The study's primary aim was not to directly compare digital collections with physical exhibitions. Instead, we focused the interviews on the objects themselves, asking participants to compare specific digitized objects to their physical counterparts. Despite our efforts to center the discussion on the objects, participants naturally began comparing the overall museum experience with their experience on the website.

Through digitizing the object participants felt a loss of the presence of the essence. Similarly as described by Benjamin (1935) and Hui (2012), even a perfect replica of an object loses its specific place and time in history. Building on this principle, it is to be expected that the loss of authenticity was most noticeable in digitized objects that had a special or well-known life history. Particularly rare, old, or extinct organisms hold such a special life history or essence, and these were the objects most often described by participants as less authentic when they were viewed digitally. Objects that did not have a special or well-known life history, such as common or uninteresting looking plants, were often seen as equally authentic digitally and physically. A reason for this may be that these objects were not seen as having a strong essence to begin with. The loss of this essence when digitizing the object did not influence the authenticity of the object.

A more unexpected outcome was how in physical objects people value details, and see detailed objects as authentic (Newman 2019). However, when, through digitization, the object was pictured with more visible details, participants still felt that the object was less authentic, since it no longer represented the living organism it once was. This shows what happens when two authentic aspects, details and true representation of life, occur in a conflicting manner. According to the interviewees, authenticity did not completely disappear when the object was digitized. This was most obvious when we asked them about the digital image directly, without comparing it to its physical counterpart. As shown in other research, authenticity can be placed on a scale (van Gerven et al. 2018). Participants still recognize that the digitized object is authentic but place the physical object higher on a scale of authenticity.

4.3 | The Influence of Personal Interest on How People Experience a Digitized Collection

The level of personal interest in a topic influences the way people interact with this topic (Hidi and Renninger 2006). When researching physical interaction with a subject area of personal interest there are two trains of thought. Firstly, the stronger the personal interest the more context-dependent it becomes (Azevedo 2011). This would mean that digitizing the collection would lessen the experience. Another framework of personal interest states that the stronger a personal interest becomes the less dependent it is on context and people will find different ways to interact with their area of personal interest (Hidi and Renninger 2006). This divide was visible in the 14 interviews. Some of the participants expressed that they valued the website more because they were highly interested in parts of the content that were present on the website. These participants valued the information which accompanied the objects and their experience was not influenced as much by the digitization of the content. This links back to the idea that identity-related motivations influence how people value a digital museum collection (Falk 2006). These participants had a highly developed personal interest in a topic that revolved around information and therefore valued the amount of information that was provided within the digitized collection.

Another group of participants also had a highly developed personal interest in the content of the digital collection, but they did not experience the digital collection in the same way they experienced the physical collection. Their personal interest was more context-dependent and therefore they did not value the digital collection as highly as the physical collection. Their personal interest was not so much information-based as it was based on an emotional connection to the content. This emotional connection can be explained through the essentialist framework where visitors experience contagion when they are near the object of their personal interest (Newman and Knobe 2019). This closeness to the object was something these participants did not experience digitally, and they expressed a strong preference for interacting with the content physically.

4.4 | Limitations

There are a number of limitations that should be taken into account when interpreting these results. Firstly, the concept of authenticity and digital authenticity was new for most participants. We did not provide them with a full definition of authenticity, but instead, we asked them to describe what authenticity meant to them. This was done to prevent interviewer bias from influencing the answers of the participants. This approach sometimes led to confusion and frustration among the participants, which might be explained by Kahneman's (2011) psychological concept of fast and slow thinking. Without a clear definition, participants had to engage in slow thinking to construct their own understanding of authenticity, which can be cognitively demanding and may result in varied interpretations. However, we still believe that interviews were an appropriate method, as they encouraged slow thinking and provided participants with the time to develop their opinions on the topic.

A few of the participants held on to their definition of authenticity which was that everything that is not fake is authentic. In addition, the extent to which individuals valued a specific object occasionally shaped their perception of authenticity. This sometimes limited the conversation, but after emphasizing the feeling of authenticity people get when seeing certain objects, all participants were able to articulate more nuanced ideas about digital authenticity.

Secondly, this research was about digital authenticity, but because the digital collection we used for this research was stored on a website. This changed the topic from "digital authenticity" to "online authenticity." Most of the time this difference was so subtle it was unnoticeable, but it did introduce the aspect of misinformation online. We did not expect participants to question the validity of the images they were shown, because they were online. When asked directly, participants did not doubt the images on the Expeditie Online website, but still, they mentioned proof of authenticity only when discussing the digital images. This can be because participants are used to questioning images they see online because of the amount of false or misleading content that can be found on the internet. The need for proof can also come from the limited ways in which participants can view the objects digitally. Most digitized objects are only accompanied by one picture. Participants only had this image to judge the authenticity of the object. The lack of visual representation of the image could have led to the need for different forms of proof of authenticity.

Lastly, due to the sampling method, we were able to find 14 participants, but most of these participants were frequent museum visitors and some had strong opinions about the cultural sector. These opinions sometimes colored their answers. Still, for this group of participants we did reach data saturation, meaning the final interviews did not provide us with major new insights. For an even more rounded view of this topic, a larger set of participants would be beneficial.

5 | Conclusion

Authenticity does exist in a digital space according to the participants of this study, but it is not as easily achieved as it is in a physical space. Most participants qualified the digital collection as less authentic overall. However, authenticity is influenced by many different aspects, physical and others. The fact that much more information is available in a digital collection, adds to the authenticity of digitized objects. A digital collection will not be equally valuable to all types of visitors. Personal interest influences how people experience the digital collection. Participants with high interest, focused on seeking information, valued the digital collection as more authentic than participants whose high interest was based on an emotional connection. The world is becoming more digital, and more museums are digitizing their collections. This can be of great value, especially for visitors who experience barriers visiting a traditional museum. To maximize the value for visitors in a digital collection it is important to keep authenticity in mind and to bring out the aspects of authenticity that are relevant for a digital collection such as information about an object's origin and life history. To do so, further research can better unravel the influence of personal interest of people visiting a digital collection and the differences between different types of digital collections.

Acknowledgments

We would like to thank Naturalis Biodiversity Centre for their collaboration. We also thank the participants of the interviews.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendices S1–S2:** cura70010-sup-0001-AppendicesS1-S2.docx.

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