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A Systematic Literature Review of Cultural Heritage Representation in Entertainment Videogames

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Abstract

Nowadays, an increasing number of videogames have incorporated cultural heritage elements that belong to a wide variety of regions. This has prompted a growing body of academic research regarding this topic. This paper presents the results of a systematic literature review, investigating how different aspects of cultural heritage are represented in entertainment videogames. A thematic analysis of 80 publications was conducted, categorising the studied cultural heritage elements into tangible and intangible themes of cultural heritage. Our review revealed that existing publications have extensively explored the representation of tangible cultural heritage in games, especially architecture and artefacts. In contrast, the representation of intangible cultural heritage has received significantly less attention, such as religious rituals, folklore, and symbolic references. Moreover, we observed that game designers tend to select cultural heritage elements familiar to their target audiences, which lied in depictions of historical periods, notable historical figures, and architectural styles. Finally, this review highlights gaps in current research including a narrow focus on certain game genres and a lack of in-depth study on the representation of intangible cultural heritage.

Keywords

Videogames; cultural heritage; history; culture; representation; systematic literature review

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Videogames have long been the subject of societal debate, often conceptualized as a superficial medium that lacks the artistic depth and cultural significance attributed to other forms of creative expression, such as music and film (Ebert, 2010). However, this perception has been challenged in recent years, as videogames have evolved to encompass greater social and cultural depth, supported by advancements in computer technology. With increasingly sophisticated visual design and narrative complexity, many entertainment videogames—which are those digital

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games played on electronic systems primarily designed for enjoyment and engagement rather than educational and serious purposes—now engage with meaningful themes and offer profound, emotionally resonant experiences (Klimmt & Possler, 2019; Oliver & Bartsch, 2010; Possler et al., 2021).

One significant area where videogames have evolved is in the representation of cultural heritage. The rich and diverse cultural heritage of humankind has become a prominent resource for game developers, allowing videogames to offer more meaningful interactions by immersing players in narratives that reflect historical and cultural identities (Camuñas-García et al., 2023). Research has shown that the representation of cultural heritage in media not only promotes national identity but also enhances players' sense of cultural belonging and provides eudaimonic experiences, where players feel deeply moved and connected to the content (Edney, 2015; Fung, 2014). As videogames continue to grow as a medium for cultural expression, game scholars have increasingly highlighted the culturally relevant experiences they can offer through the representation of cultural heritage (Shaw, 2010; Klimmt & Possler, 2019). These representations allow videogames to go beyond mere entertainment, fostering an enriched interaction with cultural history and identity.

This paper presents a systematic literature review focused on the academic investigation of how cultural heritage is represented in entertainment videogames. Previous literature reviews have covered this topic, but they lacked a specific focus on publications of entertainment videogame content. For example, Khan et al. (2020) focused on literature studying cultural heritage represented in both serious games and entertainment games, and Marques et al. (2023) included studies of game content, player groups, and game technology regarding the representation of cultural heritage. In this literature review we specifically focused on publications investigating entertainment videogames with game content analysis as their methodology. This purposeful focus assists in highlighting the state of the art of academic research regarding the representation of cultural heritage in entertainment games.

The analysis included a total of 80 publications that were published between 2005 and 2022 and stored in Scopus and was guided by the following research question: *What aspects of cultural heritage represented in entertainment videogames have been investigated within the academic realm?*

Cultural heritage and its dimensions

In this section we define and conceptualise the concept ‘cultural heritage’ and how it is understood within the scope of this study. According to UNESCO, cultural heritage encompasses legacies that carry social, historical, and aesthetic meanings, which contribute to the identity and continuity of communities. These legacies can be divided into both tangible and intangible forms (UNESCO, n.d.-a; UNESCO Insti-

tute for Statistics, 2009). UNESCO Institute for Statistics (2009) defines tangible cultural heritage to be physical artefacts, structures, and locations that can be found in different types of environments, lands, waters, and spaces. In contrast, intangible cultural heritage refers to the non-material aspects of culture, such as rituals, traditions, performing arts, social practices, and other forms of knowledge and expression that are transmitted through generations (UNESCO, n.d.-b).

For the purposes of analysing cultural heritage in videogames, it is important to adopt a structured framework that captures both tangible and intangible dimensions. Balela and Mundy (2015) proposed a theoretical model that facilitates the analysis of cultural heritage representation in videogames by distinguishing between these two dimensions. Their framework organizes cultural heritage into four thematic categories: arts and artefacts, environment, people, and history (see Appendix 1 and figure 1). By employing this framework, we are able to systematically examine how different dimensions of cultural heritage – whether through physical objects, landscapes, historical narratives, or cultural practices— have been analysed in the existing academic literature on this topic. This approach enables us to assess the breadth and depth of existing academic literature on the representation of cultural heritage in entertainment videogames, also helping to identify how cultural heritage has been represented and understood in the context of entertainment videogames.

Tangible Dimensions					
		No Evidence	**Limited Evidence**	**Satisfactory Evidence**	**Significant Evidence**
Arts and Artifacts	Architecture; Sculpture; Visual Image; Documents and Writing; Performance Arts; Clothes; Design Ethos; Other Arts				
Environment	Places of Scenic Interest; Landscape				
People	People				
History	Historic Sites; Historic Artifacts; Historic People				
Intangible Dimensions					
Arts and Artifacts	Language; Music; Folklore				
Environment	Climate				
People	Behaviour				
History	Religion; Customs; Time; Ages				

Figure 1. Dimensions of cultural heritage proposed by Balela and Mundy (2015).

Methodology

For the purpose of this research, a systematic literature review was conducted. To uphold the credibility of this systematic review, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) outlined by Page et al. (2021, p. 5) (see Figure 2). The systematic review was conducted through May to July 2023, and it encompassed a collection of 80 publications published between 2005 and 2022.

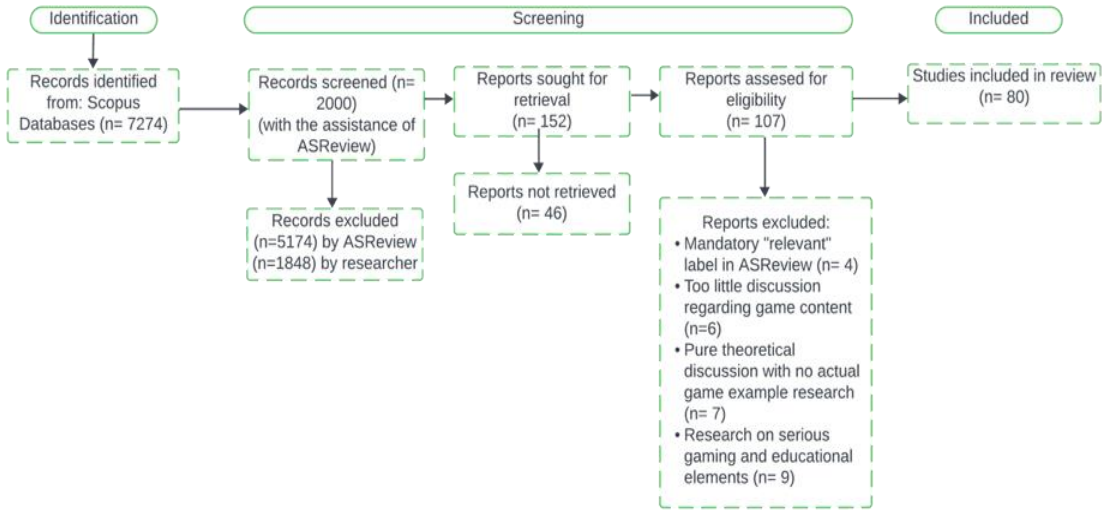

Figure 2. PRISMA flow diagram.

Data research

The sampling process for this systematic review began with the development and execution of a search protocol. Scopus was selected as the primary database due to its expertly curated database (Page et al., 2021). The search string used was (culture* OR heritage OR "cultural heritage" OR "cultural elements") AND (game* OR "mobile game*" OR "videogame*" OR "digital game*"). The search string was designed to include various aspects of cultural heritage and different genres of videogames. After testing different combination of keywords, this resulted to be the most efficient to identify studies exploring the intersection of cultural heritage, representation, and videogames. In the identification phase, the research string was used to search within titles and abstracts of the publications from Scopus. We limited our search to the specific domains of social sciences (including psychology), arts, and humanities, because we were interested in papers focused on the meaning and interpretation of the representation of cultural heritage in games. We therefore excluded studies from other disciplines such as computer sciences, as these are more focused on technical aspects of these representations. No year limitation was included. We exported the yielded results from Scopus at the last date of search on March 27th, 2023.

This stage yielded 7274 results, including articles, book chapters, review articles, and books.

In the second phase, we screened the 7274 publications by applying three inclusion and exclusion criteria. Firstly, only publications related to representation of cultural heritage in videogames were included. Secondly, considering the language skills of the complete research team, only studies written in English, translated to English, or summarised in English were selected. Thirdly, only studies targeting entertainment videogames were selected. Lastly, only published articles, books, and book sections were included. Other formats, such as blogs, online newspaper articles, and website pages, were excluded.

To facilitate the screening process, we employed ASReview LAB (v.1.1), a machine learning tool designed to assist with literature screening (ASReview LAB Developers, 2023). After uploading the entire set of publications to ASReview LAB, we manually labelled a subset of publications as "relevant" or "irrelevant" based on our inclusion criteria. ASReview LAB then used this labelling history to generate a ranked list of potentially relevant publications, which were presented for further manual review. The program continually learned from our decisions, allowing us to focus on the most relevant studies without needing to screen all 7,274 results. After reaching a saturation point—where the majority of publications presented by the tool were consistently labelled as irrelevant—we concluded the screening process, having reviewed the titles and abstracts of approximately 2,000 publications. The screening process resulted in 157 publications labelled as “relevant”. Of these, 107 publications were accessible for full-text download. The first author was responsible of the screening process, the results of each phase of the screening process were reviewed by the other two authors.

After reading through these full texts, we excluded 27 publications for the following reasons: four were deemed irrelevant despite being initially marked as "relevant" by ASReview LAB, six provided limited discussion of game content, seven were theoretical without specific game research, and nine focused on serious or educational games. Ultimately, 80 publications were selected for inclusion in this study. The data collection was conducted during March and April 2023, covering publications from 2005 to 2022.

Data analysis and operationalisation

The theoretical framework for our method of data analysis was drawn from Balela and Mundy (2015) as explained in the previous section. Based on the framework, we constructed a codebook for data analysis. The codebook consists of two main dimensions of cultural heritage, namely tangible and intangible ones. However, we also found several categories and examples that are not appropriate in the theoretical framework from Balela and Mundy (2015). In concrete, although UNESCO considers natural heritage as part of cultural heritage, this aspect of cultural heritage is

not contemplated in the theoretical framework proposed by Balela and Mundy, which is focused on aspects related to the representation of cultural identity, history, and traditions. Additionally, some examples of cultural heritage provided in the categorisation proposed by Balela and Mundy (2015) were reassigned to more appropriate categories considering UNESCO's definition of tangible and intangible cultural heritage. In concrete, we moved "performing arts" under the tangible Arts and Artefacts category to the intangible one. The final codebook focused on three key aspects under each dimension: history, arts and artefacts, and people (see Appendix 2 for codebook examples). Besides this, we have also coded the countries of the corresponding author's affiliations, the methodologies used in the studies analysed as well as types of games analysed in these publications to understand the state of the art in the field.

We employed thematic analysis as the primary method for analysing the data, following Braun and Clarke's (2022) six-phase process: (1) becoming familiar with the dataset, (2) coding, (3) generating initial themes, (4) developing and reviewing themes, (5) refining and defining themes, and (6) writing (Braun & Clarke, 2022). We uploaded the selected publications onto Atlas.ti (v.8.4.5.), a qualitative data analysis software, and conducted a close reading of each publication. Relevant information, particularly from the discussion and analysis sections, was marked according to the codebook. Then, we gathered all the topics and organised them, classifying the codes into sub-themes such as historical times, after which we summarised all the sub-themes into themes according to our codebook. The first author was responsible of the coding process, the results of each phase of the coding and analysis process were reviewed by the other two authors.

Results

The results presented in this section are structured according to the modified version of the theoretical framework of Balela and Mundy (2015). A detailed coding tree with the references of all reviewed publications is presented in Appendix 3. This section will start with a discussion of general results, and then it presents the identified themes, sub-themes and topics of cultural heritage discussed in the literature.

General results: Research location, methodology, and game genres

Firstly, this section provides an overview of the sources analysed in this study, including the countries of the corresponding authors' affiliations, methodologies used, and types of games chosen as the body of research in these publications.

Regarding the countries where the studies were conducted (see Figure 3), most of the reviewed publications were conducted in countries in Europe (44/80), while other studies were conducted in Australia (10/80), North America (17/80), and Asia (2/80). This suggests that researchers affiliated with European institutions show

greater academic interest in the topic of cultural heritage representation in videogames. Our thematic analysis showed that the authors in these regions did not necessarily study the local cultural heritage. Their choice of targeted cultural heritage was based on the reputation of the targeted videogames and the popularity of well-known cultural heritage elements in games. Within the wide range of regions with significantly rich cultural heritage, European cultural heritage, such as Nordic European mythology and architecture, has been the largest source of academic scrutiny. Moreover, modern American culture is another centre of academic attention for the popularity of *Grand Theft Auto* series. Meanwhile, representation of Asian cultural heritage is understudied, such as Japanese and Chinese culture.

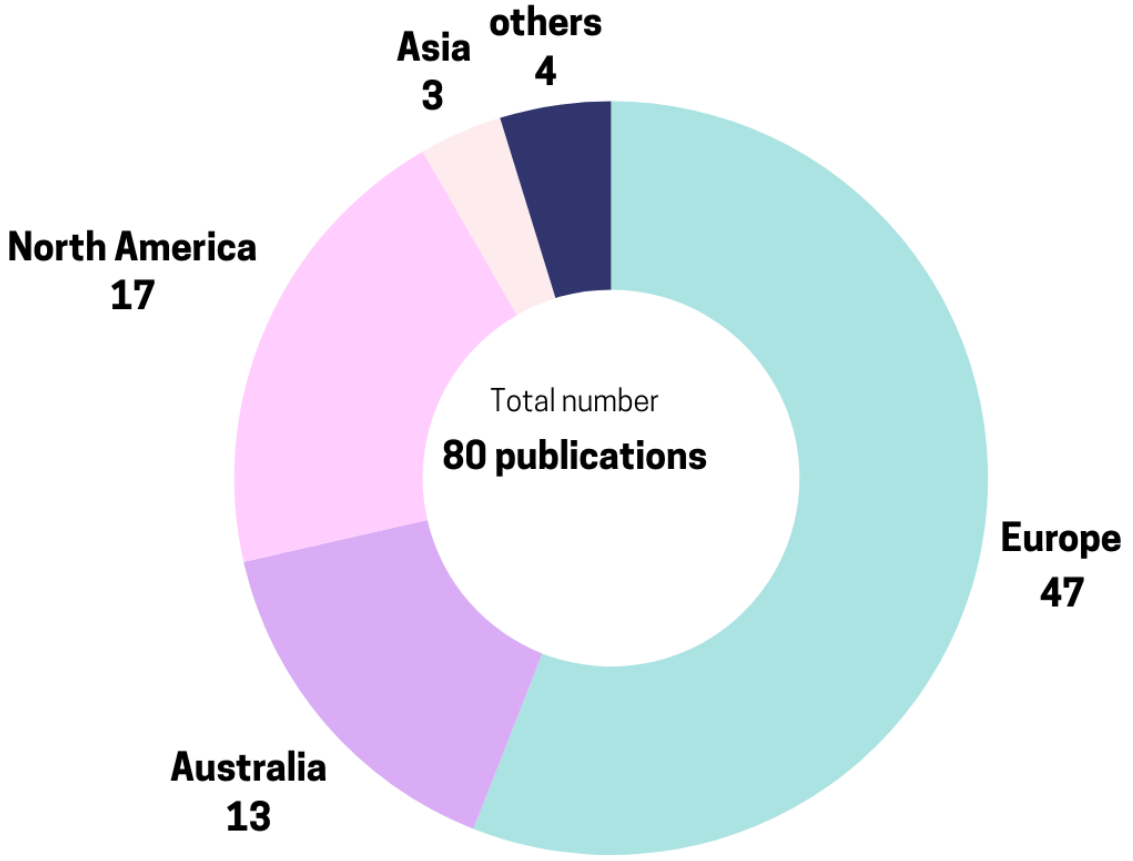

Figure 3. Continent distribution of author affiliations among included studies.

Secondly, in terms of the methodologies used, qualitative game content analysis was the most common methodological approach in the reviewed publications, including visual analysis (e.g., López, 2021), discourse analysis (e.g. Locke & MacKay, 2021; Šisler et al., 2022; Wills, 2021), narrative analysis (e.g. Cole, 2022; Locke & MacKay, 2021; Young, 2016), and textual analysis (e.g. Krzywinska, 2006; Nijdam, 2021; Zabecki, 2019). A few other selected studies were theoretical in focus, using game content analysis for clarification of their theoretical position (e.g. Balela & Mundy, 2016; Zeiler & Thomas, 2021). This shows that qualitative research method was still the preferred method used in game content analysis.

Lastly, as for types of games being investigated in the reviewed publications, Role-Playing games (RPG) and Real-Time Strategy (RTS) games were most frequently analysed (68/80). Furthermore, the reviewed studies mainly opted for Triple-A games produced by leading studios as their body of research, while only a few articles (3) focused on indie games (LaPensée, 2021; Nacher & Jankowski, 2021; Nijdam, 2021). Additionally, the selected studies primarily chose games released on PC and consoles as their body of research, such as PlayStation, Xbox, and Nintendo Switch, while a small portion of the publications (3) in our selection focused on mobile games (e.g. Li, 2021). This result shows that the academia still focuses largely on PC and console RPGs. Meanwhile, there is an academic gap in studying videogames released on other platforms, such as mobile games.

Tangible heritage: Touchable traces in the virtual world

This section focuses on studies that explored the tangible aspects of cultural heritage. Within this theme, we have identified three sub-themes: history, populations and arts and artefacts (see Table 1, for details see Appendix 3).

1.	**Tangible Cultural Heritage**		
1.1.	Arts and artefacts		
1.1.1.	*Architecture (10)*	*1.1.2.*	*Weapons (7)*
		1.1.3.	*Others (3)*
1.2.	People		
1.2.1.	*Indigenous residents (7)*	*1.2.2.*	*Racial diversity (6)*
1.3.	History		
1.3.1.	*Historical figures (6)*	*1.3.2.*	*Religion (12)*
2.	**Intangible cultural heritage**		
2.1.	History		
2.1.1.	*Time (41)*	*2.1.2.*	*Mythology (24)*
2.2.	People		
2.2.1.	*Indigenous diversity- morality and behaviour (5)*	*2.2.2.*	*Racial diversity- morality and behaviour (5)*
2.3.	Arts and artefacts		
2.3.1.	*Language- indigenous language (3)*	*2.3.2.*	*Others (3)*

Table 1. Quantitative summary of selected paper (sort by the number of articles belonging to each sub-theme).

Historical representation: Icons and beliefs in digital spaces

Based on our theoretical framework, the historical tangible cultural heritage includes physical architecture, buildings, figures, and sites of historical significance.

Within this section we identified two topics studied in eighteen publications that fall within this sub-theme: historical figures and religion. Also, under the topic of religion, we identified two sub-topics: religious gods and the Bible.

Historical figures: Designing familiar heroes for global audiences

Six publications (6/18) have investigated the manifestation of historical figures in videogames, generally conducting visual analysis and narrative analysis to determine which historical figures were represented. Examples of these are the study of the representation of Yip Man and Chunli in the Chinese version of *Temple Run 2* (Dong & Mangiron, 2018) and the study of the fictional adaptation of Abe no Seimei in *Onmyoji* (Noh, 2020). Different from the people sub-theme in the next section, this sub-theme refers to the people who have historical significance and recognisable reputation. Hence, this result contributes to the differentiation between historical figures and population in the modified theoretical framework. Yao and Chen (2022) concluded in their visual analysis that to familiarise players with the characters in a short time period, it is convenient to design a gameworld that borrows character design from history, and such implementation usually took place in Multiplayer Online Battle Arena Games (MOBA games). It is a game genre that presents real-time combats between players with a base of characters (also called heroes) to choose from. This facilitates the representation of historical figures in MOBA games.

Additionally, several studies also concluded that the decision of which historical figures to be included in the games was based on their targeting markets. For example, Dong and Mangiron (2018) investigated the Korean mobile game *Hello Hero: Epic Battle* (SKYWALK, 2023). Their study implied that *Hello Hero: Epic Battle* (SKYWALK, 2023) included characters from the famous Chinese literature *Journey to the West* when designing its Chinese version, such as the Tang Sanzang. The discussions of the historical figures sub-theme stressed the vital role of gamers' acknowledgement to history in the consideration of game design. Game designers tend to depict historical figures that are familiar to players, enabling players to develop a sense of connection and engagement.

Religion in games: Holy Characters and selective sacredness

In the analysed literature, we also identified ten publications (10/18) that included the discussion of the representation of tangible aspects of *religion* in videogames. A range of sub-topics were discussed, with two of them standing out in the publications, which were religious *gods* and the *Bible*. The discussion of the depiction of gods is related to the representation of holy characters in mythical stories, while the discussion of the Bible includes tangible elements inspired by the Bible (e.g. Bainbridge & Bainbridge, 2007; Šisler, 2017).

Firstly, ten studies identified various approaches to portray *gods* in videogames, and they mainly conducted visual analysis. Gods in videogames were mostly found to be unreachable, holy, and virtuous. These sacred characters were represented as pow-

erful and helpful roles but still with a distance (Bainbridge & Bainbridge, 2007; Hemmann, 2021; Xidakis, 2022). For example, Bainbridge and Bainbridge (2007) indicated in their research of the game *Chronicles of Narnia: The Lion*, *The Witch*, *and The Wardrobe* (Traveller's Tales, 2005), that the reborn Christ figure Aslan was not interactable, creating a sacred distance from him to the players. Contrastively, another approach of representation studied in the selected literature is creating a down-to-earth image of gods with human-like emotions. For example, Bainbridge and Bainbridge (2007) indicated that Greek gods in *God of War* (Santa Monica Studio et al., 2005) were represented in a complex way with meaningful links to love, familial ties, and losses. This indicates the huge freedom that designers have when portraying fictional cultural elements in terms of their personality and storyline.

Another sub-topic related to religion was the representation of the *Bible* in videogames, which was explored by two studies (Bainbridge & Bainbridge, 2007; Šisler, 2017). There are several references in the analysed literature where videogames borrowed tangible content from the Bible to be represented in their virtual worlds. For example, some fictional weapons utilised by game protagonists were found to be based on the descriptions in the Bible (e.g. Bainbridge & Bainbridge, 2007; Zeiler & Mukherjee, 2022). Bainbridge and Bainbridge (2007) identified several uses of weapons in the game *Constantine* (Bits Studios, 2005) that were inspired by the Bible, including for example a pistol with its bullet from Damascus and holy water grenades. Hence, it is found by the selected publications that designers only pick up random elements that are suitable for depiction and mix them into videogames.

Populations: Indigenous residents and racial diversity

The tangible dimension of population involves the representation of diverse groups of people in videogames, and it also includes the choices made in depicting these populations through character design (Balela & Mundy, 2015, 2016). Within this theme, we identified two topics discussed in thirteen publications: indigenous residents and racial diversity. Within this sub-theme, a total of six publications studied the representation of Native Americans within videogames, with an additional focus on European indigenous Sámi residents in a study by Nijdam (2021). Additionally, the representation of two specific groups within the topic of racial diversity were discussed in six articles: Black people and Asian people. These topics are the most prominent results under this sub-theme and are therefore complementary to the modified theoretical framework.

Indigenous residents: Nostalgia and marginalised voices in game narratives

Indigenous residents used to receive limited attention from mainstream media industries, and the game industry is no exception (Nacher & Jankowski, 2021). However, there are still scholars who dedicate themselves to understanding the depiction of this group of people in entertainment videogames. Altogether seven publications (7/13) discussed the inclusion of indigenous residents, discussing both indie games and Triple-A games. Several researchers noticed that the narratives of the

games analysed in their studies were related to invasion (Bird, 2021; LaPensée, 2021; Nacher & Jankowski, 2021) and the formation of protagonists' identities (Bird, 2021).

Within the selected literature, two types of game characters representing Native Americans were discussed: non-Player Characters (NPCs) and protagonists. These studies showed that the inclusion of indigenous residents is increasing, although it is still relatively limited. For example, Locke and MacKay (2021) investigated the Progressive Era in American history (1890s- 1920s), during which an indigenous NPC was included in the main character's camp in *Red Dead Redemption 2* (Rockstar Studios, 2018), but no specific interactions were triggered if the players avoided contact with him. Bird (2021) also highlighted that *Assassin's Creed III* (AC III) (Ubisoft Montreal, 2012) was the first Triple-A game to feature an American indigenous protagonist. Connor Kenway, or Ratonhnhaké:ton as his Mohawk name, was the protagonist in AC III that was depicted as half-British and half-Mohawk. The Mohawk language was also integrated in *AC III* (Ubisoft Montreal, 2012).

Three publications analysed indie games representing indigenous residents. For example, LaPensée (2021) and Nacher and Jankowski (2021) have discussed *When Rivers Were Trails* (Indian Land Tenure Foundation et al., 2019) in which Native Americans were integrated as both protagonist and NPCs in the game. Nijdam (2021) pointed out that the visual representation of Sámi people in *Gufihtara eallu* (Karpoff et al., 2018) was limited to vocal narration, giving a sense of nostalgia while saving budget for visual design. This indicated the great potential of various populations to be depicted in videogames, and game genre and budget play vital roles in determining which game elements to be utilised in such representation.

Racial diversity: Evolving depictions and persistent stereotypes

Another topic explored within the theme of population was *racial diversity* (6/13). Our analysis of the literature shows that there is a larger representation of Black and Asian people in videogames compared to indigenous residents. In terms of Black people, for instance, Miller (2008) and Wills (2021) studied *Grand Theft Auto V* (GTA V) (Rockstar North, 2013) where one of the protagonists belonged to the Black community. Miller (2008) and Wills (2021) noticed that the characters players encountered in *GTA V* (Rockstar North, 2013) were predominantly black, that is of African American origin. In contrast, regarding Asian people, only one publication discussed the representation of them in videogames. Leonard (2003) focused on how Asian people were portrayed as NPCs, specifically gangster members, in the game *GTA III* (DMA Design, 2001).

Arts and artefacts: Recreating and reimagining cultural treasures

The tangible aspect of arts and artefacts encompasses art pieces and manufactured artefacts that people utilise, visit, and become accustomed with. These are culturally significant, because they reflect or even represent the aesthetic and technical

uniqueness of cultures (Balela & Mundy, 2015, p. 8). Altogether 20 studies in our selection explored this aspect of cultural heritage represented in entertainment videogames, and they mainly employed the methods of visual analysis. Within this subtheme we identified that two topics, namely architecture and weapons stood out in the publications.

Architecture: Iconic monuments as interactive gameworlds

Ten publications (10/20) discussed extensively the representation of historically significant architecture in games. For example, López (2021) indicated that the *AC* series, such as *AC Unity* (Ubisoft Montreal, 2014) included architecture that already gained significant fame worldwide. In addition, these studies discussed various approaches of how these architectures were represented in videogames. Within these publications, authors such as Champion (2020) and López (2021) discuss how developers mainly strived for the direct depiction of famous buildings. According to López (2021), this highlights how game designers often incorporate historical monuments into games, because they are easily recognised by players. This was a common phenomenon that occurred mostly in Triple-A games as identified by several publications (Alcindor et al., 2022; Malegiannaki & Daradoumis, 2017; Mochocki, 2021; Wright, 2022). The presence of existing architecture in Triple-A games is understandable because it requires thorough on-site surveying and historical research to ensure an accurate recreation of these existing famous architectures, which is obviously budget-consuming during game development. According to the analysed publications, the direct depiction that the developers strived for is not limited to mere sightseeing landmarks. Instead, these buildings were depicted as locations where players had to complete missions and could interact with major non-Player Characters (NPCs).

These studies also addressed how counterfactual details are sometimes purposively included in the depiction of the buildings. For example, López (2021) paid special attention to the Notre-Dame de Paris in the *AC Unity* (Ubisoft Montreal, 2014). Notre-Dame was represented with its iconic Viollet-le-Duc spire, but the author noticed that the spire was built during the restoration 1840s, which is fifty years after the *AC* narrative taking place. What was highlighted by López (2021) was that the developer still decided to include the spire, because Notre-Dame would not be recognisable for the general public without the Viollet-le-Duc spire. The case investigated by López (2021) stressed the importance of representing iconic and recognisable details of historical buildings when including architecture in games, even when it was counterfactual.

Weapons: Historical armaments as tools of immersion

Seven publications (7/20) investigated the representation of another topic of tangible arts and artefacts, which is weapons. De Groot (2016) and Finney (2017) state that weapons are typically suitable for being integrated into First-person Shooter games (FPS) and action games. Among the publications, the weapons being discussed the most were guns and grenades, which, according to the literature, are

usually represented together with famous historical incidents, such as the First and Second World Wars (Finney, 2017). De Groot (2016), for example, highlights how war games and FPS games tried their best to provide lavish details of military weapons. Also, in three of the publications analysed it is discussed that weapons are not only represented during actual simulated war time but could also be viewed in gamers' storage, which contributes to their cultural relevance (de Groot, 2016; Finney, 2017; Saucier, 2012). The authors discuss how this provides additional appreciation opportunities that are used by military fans to show off their collections. In the same vein, two publications discussed how such representation significantly broadened the horizon of gamers who had little military knowledge (de Groot, 2016; Finney, 2017). According to the studies analysed, because weapons are rarely seen in real life, the representation of weapons is therefore considered to be educational to players in terms of their parameters and responsiveness.

There were other tangible arts and artefacts discussed in the literature, including costumes (e.g., Fu & Liang, 2022), board games (e.g., Che & Ip, 2017), and art works (e.g., Balela & Mundy, 2016). For example, Che and Ip (2017) highlighted the digitalised versions of traditional Chinese tangible board games, such as chess and poker. Within this theme, Balela and Mundy (2016) argued that it is necessary to focus more in research on how statues and paintings are depicted in videogames.

Intangible heritage: Invisible strings in virtual worlds

The studies reviewed also devoted attention to the representation of intangible facets of cultural heritage. We identified three sub-themes investigated in the analysed literature: arts and artefacts (e.g. Cragoe, 2016; Tozoğlu & Kuran, 2022), history (e.g. Krzywinska, 2013; San Nicolás Romera et al., 2018), and people (e.g. LaPensée, 2021; Young, 2016).

Historical time and religion

Different from the tangible aspect of history which focused on historical figures and religious works, the intangible elements of history encompass a general understanding of historical time and stories that cannot be depicted with visual images. Instead, their representations are usually manifested in game narratives and gameworld design, which is explored in the publications with narrative analysis and discourse analysis. Within this sub-theme we identified two topics discussed in our sample, which were time and religion.

Time: Recreating the past, war, and modernity in-game

Altogether 42 studies explored how different aspects of time were represented in videogames. Within the topic of *time*, we identified three distinct subtopics: historical time, war time, and modern time, and the selected literature mostly chose narrative analysis and discourse analysis to understand the time depicted in videogames.

Historical time, reflecting time in the past, constitutes a significant component in cultural heritage, because it provides a context to its development (Balela & Mundy, 2016). The representation of historical time is explored across various game genres and platforms within 28 studies (28/42), ranging from multiple Triple-A RPGs to a handful of Triple-A strategy games, and from console and PC games to mobile games. For example, the *AC III* (Ubisoft Montreal, 2012) and *AC Unity* (Ubisoft Montreal, 2014) as RPG (López, 2021), and *Disciples: Liberation* (Frima Studio, 2021) as strategy RPG (Šisler et al., 2022). Regarding the choice of historical era, the analysis of the literature shows that the storylines of these RPGs were often set in well-known historical times that would be easily recognised by the general public. For instance, López (2021) highlighted that the *AC* series, such as *AC III* (Ubisoft Montreal, 2012) and *AC Unity* (Ubisoft Montreal, 2014), utilised settings like the Crusades, the Italian Renaissance, or the Victorian era.

Another aspect of time studied in the selected publications was *war time* (10/42). Finney (2017) illustrated that this was mainly seen in FPS games. Šindelář (2022) noticed that Western perspectives, especially on World War I and World War II, became their primary source for battleground design. Our analysis of the literature suggests that videogames designers incorporate war time and war elements to create recognisable scenarios. Šisler et al. (2022), for example, concludes that the game *Disciples: Liberation* (Frima Studio, 2021) withheld a clear historical war background and, instead, revealed the historical war context as memories, traumatising the protagonist and triggering unusual behaviours. According to Krobová et al. (2023), such implementation serves to effectively avoid a cliché scenario of battlefield combat in most war games.

Another aspect of time investigated in four reviewed publications (4/42) was *modern time*, which was also mostly seen in RPGs (e.g. Miller, 2008; Van Der Merwe, 2021; Wills, 2021; Wright, 2022). For example, Wills (2021) investigated how in the GTA series modern American times were depicted and with what purpose (DMA Design, 2001; Rockstar North, 2013). What Wills (2021) discovered was that the GTA series, implemented a lavish depiction of Southern California for players to fully immerse and mimic the capitalist values espoused by huge corporations. This representation of local lifestyle and the exaggerated parody of modern industries, implied by Wills (2021), was implemented to reveal social and political issues, including inequality, and (racial) exclusion. Therefore, modern times, as implied by the selected literature, is suitable for latently reflecting the reality.

Religious narratives: Mythologies and moralities in gameplay

There were 23 studies also explored the representation of the intangible aspects of religion in videogames (e.g. Bainbridge & Bainbridge, 2007; Champion et al., 2022; Krzywinska, 2006; Podvalnyi, 2019), including the representation of mythological stories and how these stories were incorporated in videogames.

Firstly, all the publications mentioned that intangible elements in mythologies, such as storylines, ideologies, and rituals, were used to construct gameworlds. For example, Fung and Ho (2015) noticed that several Chinese Massive Multiplayer Online Games (MMOGs) followed the terms of magic, power, and Immortal cultivation from Chinese traditional mythic Xianxia (fairies and heroes) and Wuxia (Kungfu and heroes) settings. Also, Yoon (2021) noticed that *World of Warcraft* (Blizzard Entertainment, 2004) structured its plot based on a holy war with battles in dungeons and swamps, which had clearly hinted at some storylines from the Christian Bible.

Secondly, five studies pointed out that games embedded mythology within character design and game mechanics. It refers to the fictional character design of character powers and characteristics based on mythology instead of the inclusion of realistic people that existed in history. For example, according to Yoon (2021), *WoW* (Blizzard Entertainment, 2004) designed the monsters and protagonists to gain mythical powers that linked closely to how some religious groups in history worshiped nature.

Behavioural portrayals of indigenous and racial groups

According to Balela and Mundy (2015), the intangible aspect of the sub-theme populations consists of the depiction of people's behaviour in videogames. This aspect of intangible cultural heritage was present in ten studies of the representation of the behaviour and moral capacity of indigenous residents and racial diversity in videogames.

Indigenous behaviours: From victims to resistance in game narratives

In terms of the *indigenous residents*, LaPensée (2021) indicated that the depiction of indigenous residents in videogames are usually based on their history of being invaded by foreign parties. Altogether five studies (5/10) investigated how the behaviour and morality of indigenous residents were represented in videogames. The publications discussing these topics concluded that indigenous residents are represented in games in two different ways. Firstly, Native Americans are found to be represented mostly as innocent and weak victims (LaPensée, 2021). They are usually depicted to be vulnerable, in contrast to the invaders that are portrayed as amazingly powerful. Secondly, another example was studied by Zabecki (2019) who found a simplistic representation of the political reality of indigenous people fighting back in *Age of Empires III: The WarChiefs* (Ensemble Studios, 2006).

Racial diversity: Moral capacities and social realities in gameworlds

Our analysis of the selected literature indicated that the representation of *racial diversity* in videogames tends to align with social reality (5/10). Similar to what was found concerning the representation of indigenous residents, two publications reflected on how population of colours were depicted with low moral capacity. As noticed by Chism (2020), a Eurocentric ideology is manifested in several Middle Earth games where the light-skinned characters were represented as virtuous, while the

dark-skinned figures were portrayed as vicious. In contrast, it was also found that some games steered away from this direction. For example, Locke and MacKay (2021) observed that Rockstar depicted Black characters as less violent than white characters in *Red Dead Redemption 2* (Rockstar Studios, 2018) which according to them served the purpose of satirising toxic masculinity and whiteness in American history. Additionally, Apperley (2018) found a unique case in the game *Victoria: Empire Under the Sun* (Paradox Entertainment, 2003). The game offered a degree of freedom to interact positively with Australian minorities, allowing players to determine the moral capacity of people of colour.

Language: Underrepresented voices in the digital realm

Balela and Mundy (2016) suggested that the intangible aspect of arts and artefacts include language, music, and folklore. In the sources analysed in our study the topic of language occurred and was analysed in three publications only.

Language: The silent legacy of ethnic languages in videogames

Nowadays, English continues to be one of the most prevalent language options in videogames. This is attributed to the global reach of the English language. Even in countries known for their strong game-developing capability, such as Japan, game studios also build games featuring English-speaking characters. Therefore, the study of *languages* other than English holds potential for providing insights for cultural heritage studies in videogames.

Notably, the representation of *ethnic languages* was a sub-topic within the broader research focused on marginalised or ethnic groups, and this sub-topic was identified in three publications. This was manifested in the study of LaPensée (2021) where *When Rivers Were Trails* (WRWT) (Indian Land Tenure Foundation et al., 2019) was studied. This game focused on the experience of Native Americans during colonisation, most of the NPCs in the game are Native Americans. LaPensée (2021) found that *WRWT* integrates Anishinaabe language into various scenarios, including greetings, goodbyes, and basic questions, which is a result of the involvement of native language speakers in the development of this game. Also, noted by Zabecki (2019), a similar phenomenon of language representation is manifested in other videogames featuring indigenous people. For example, players are able to control indigenous teams who spoke a basic native language in the RTS game *Age of Empires III: WarChiefs* (Ensemble Studios, 2006); *Huni Kuin: Yube Baitana* (Philosophical School of Games, 2016) is available in mainstream languages and Hãtxa Kuin, the language of the Kaxinawá people.

Discussion and conclusion

This study aimed to explore the aspects of cultural heritage represented in entertainment videogames as investigated in previous academic research. A systematic

literature review was conducted, analysing 80 scholarly publications. It enabled us to provide an overview of the state of the art on the study of the representation of cultural heritage in entertainment videogames. The review showed that existing literature has investigated the representation of tangible cultural heritage in games extensively, especially the representation of architectures and artefacts. Contrastively, the representation of intangible cultural heritage in games such as religious rituals, folklore, and symbolic references, was studied far less. This gap in the literature suggests a need for future research to more extensively address the representation of intangible heritage in videogames.

Unlike previous studies on related topics, this research contributes to the field of cultural heritage in videogames by providing results from its unique perspectives. Similar to Khan et al. (2020), who explored how gamification techniques are implemented to promote cultural heritage, our focus on entertainment videogames also revealed that tangible cultural heritage received the most academic attention. While Marques et al. (2023) provided insights from publications related to heritage categories, gamification design, and techniques, this analysis explicitly examined studies on entertainment game content analysis regarding cultural heritage representation. Both Khan et al. (2020) and Marques et al. (2023) observed in their selected studies that augmented reality (AR) and virtual reality (VR) were utilised as novel approaches for the gamification of cultural heritage. Contrastively, our analysis identified less instances where AR and VR were emphasised in the representation of cultural heritage within the selected literature. Malegiannaki and Daradoumis (2017), who focused on studies investigating spatial educational games, highlighted the significance of the interactive tangible spaces. Similarly, our literature review regarding entertainment videogames supports this, revealing the importance of interactivity in game design for representing cultural heritage in gameworld. Additionally, this study offered insights into other game genres and their approaches to portraying a systematic categorisation of cultural heritage in the selected publications.

In the realm of tangible heritage, three sub-themes emerged: history, populations, and arts and artefacts. This review identified that research predominantly focused on the representation of historical figures, marginalized populations (such as Black, Indigenous, and Asian people), and artistic depictions of artefacts—both through direct representation and counterfactual adjustments. These studies reveal a strong focus on historical accuracy but also expose issues related to biased or stereotypical representations, particularly concerning marginalized groups.

The analysis on the studies of the representation of intangible cultural heritage in games revealed a narrower scope of previous research on this matter. Existing studies focus mainly on the representation of mythology and the portrayal of marginalized groups. We could conclude from the publications that those games either depicted the marginalised groups as weak and miserable, or focused on the depiction followed a socio-cultural stereotypical image of these groups. Moreover, within the

theme of arts and artefacts, language was the only intangible cultural element explored, suggesting a significant research gap in other intangible aspects like music, dance, and oral traditions.

The analysed publications showed a clear focus with respect to game genre and platform. Genre-wise the research thus far almost exclusively focused on two genres (RPG and RTS) and rarely discussed games in other genres. Other genres, such as fighting games, may also be relevant because of their distinctive features of interactivity, which could relate to different ways of representing cultural heritage. Platform-wise it stood out in our results that the selected studies about cultural heritage mainly focused on games released on PC and consoles, such as PlayStation and Xbox. However, considering the immense popularity of mobile games, it would be relevant to analyse next how cultural heritage is depicted on mobile platforms.

The empirical results discussed so far were embedded in the theoretical framework of Balela and Mundy (2015). Looking back on what our content analysis revealed about the representation of cultural heritage, we can first conclude that the Balela and Mundy framework was instrumental in analysing previous research, for example with respect to the differentiation between tangible and intangible aspects and the themes and sub-themes of cultural heritage. Our second conclusion, however, is that the Balela and Mundy (2015) framework needs to be supplemented. Our research provided more detailed sub-themes with practical examples from the analysed publications, which should be incorporated in the framework. In addition, our research distinguished between the sub-theme 'historical figures' and the theme 'population' to solve the confusion in the Balela and Mundy (2015) framework about why 'historical figures' were categorised under the theme 'history'. This theoretical addition aims to provide a more solid framework for future studies to probe into cultural heritage in game content.

While the current study contributes significantly to understanding the representation of cultural heritage in videogames, it is also limited by its exclusive focus on English-language publications. Firstly, we only included English language publications in our database, which meant that our results are mainly based in the English-speaking academic realm. Other countries, such as China and Japan, are also cradles and markets of videogames, and these countries have their unique and long-lasting cultural heritage, to say the least. Therefore, it is academically valuable for probing into studies conducted and written in Chinese and Japanese languages to gain a wider understanding regarding the representation of cultural heritage in entertainment videogames. Secondly, the analysis of cultural heritage representation of this study concluded at the continent level, such as America, Europe, and Asia. Meanwhile, the specific countries of origin for the cultural heritage explored in the selected studies were not examined in detail. Therefore, future research is suggested to investigate the representation of cultural heritage in videogames at a more detailed level by focusing on individual countries of origin. Lastly, we did not set a time restriction during the initial searching stage on Scopus, and the most recent paper

retrieved was published in 2022. Given continuous development of videogames and cultural heritage study in academia, it is likely that new research perspectives and relevant videogames are likely to have emerged since then. Hence, we recommend that future research consider publications released after 2022.

In conclusion, while the academic study regarding the representation of cultural heritage in videogames has advanced considerably, particularly in what respects to the representation of tangible cultural heritage, significant gaps remain. Future research should prioritize the exploration of the representation of intangible cultural heritage and diversify the genres and platforms analysed. Additionally, expanding the scope to non-English publications is crucial for a more comprehensive understanding of global perspectives on cultural heritage representation in entertainment videogames.

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Appendix 1

Tangible Dimensions	**Intangible Dimensions**
Arts and Artefacts Architecture; Sculpture; Visual Image; Documents and Writing; Performance Arts; Clothes; Design Ethos; Other Arts	*Arts and Artefacts* Language; Music; Folklore
Environment Places of Scenic Interest; Landscape	*Environment* Climate
People People	*People* Behaviour
History Historical Sites; Historical Artefacts; Historical People	*History* Religion; Customs; Time; Ages

Table 2. Dimensions of cultural heritage in game content raised by Balela and Mundy (2015).

Appendix 2

Tangible Dimensions	**Intangible Dimensions**
Arts and Artefacts Creative expressions in tangible forms and objects created by human. Example: Architecture; Sculpture; Visual Image; Documents and Writing; Clothes; Design Ethos; Other Arts	*Arts and Artefacts* Creative expressions in intangible forms and non-physical human culture Example: Language; Music; Folklore; Performance Arts
Population Example: people, race, ethnicity	*Population* Example: Behaviour and morality of people, race, ethnicity
History Physical existence of heritage related to history. Example: Historical Sites; Historical Figures; Religious characters	*History* Non-physical elements related to history. Example: Religious mythology; Religious Customs; Time; Ages
General Aspects About the Study	
Methodology used Content analysis, thematic analysis, narrative analysis, discourse analysis.	
Type of game analysed in the study Genre: Real-time Strategy games, Role-Playing games, Multiplayer Online Battle Arena games, First-Person Shooter games, fighting games, Platform: PC (personal computer), console (PlayStation, Xbox, Nintendo Switch), mobile phone Tripple A/Indie games	
Continents of the corresponding author's affiliations Europe, North America, Asia, Australia	

Table 3. Codebook for data analysis.

Appendix 3

Tangible cultural heritage		
Arts and artefacts	**People**	**History**
Architecture (Alcindor et al., 2022; Champion et al., 2022; López, 2021; Malegiannaki & Daradoumis, 2017; Mochocki, 2021; Ramos, 2020; Rosenbaum, 2012; Wright, 2022; Yamamura, 2018; Zeiler & Mukherjee, 2022)	*Indigenous residents* (Bird, 2021; Champion, 2020; LaPensée, 2021; Locke & MacKay, 2021; Nacher & Jankowski, 2021; Nijdam, 2021; Zeiler & Thomas, 2021)	*Historical figures* (Dong & Mangiron, 2018; Li, 2021; Liboriussen & Martin, 2020; Noh, 2020; Spanos, 2021; Yao & Chen, 2022)
Weapons (Bainbridge & Bainbridge, 2007; Cole, 2022; de Groot, 2016; Finney, 2017; Robinson, 2019; Saucier, 2012; Watabe, 2021)	*Racial diversity* (Apperley, 2018; Hinton, 2013; Miller, 2008; Mukherjee, 2017; Pashchenko et al., 2021; Wright, 2022)	*Religion- religious gods* (Bainbridge & Bainbridge, 2007; de Wildt & Aupers, 2023; Geraci, 2012; Hemmann, 2021; Otmazgin, 2021; Podvalnyi, 2019; Scholtz, 2005; Spanos, 2021; Yoon, 2021; Zeiler & Mukherjee, 2022)
Others (Balela & Mundy, 2016; Haahr, 2018; Suominen & Sivula, 2013)		*Religion- bible* (Bainbridge & Bainbridge, 2007; Šisler, 2017)

Intangible cultural heritage		
History	**People**	**Arts and artefacts**
Time- historical time (Allison, 2018; Belyaev & Belyaeva, 2021; Champion, 2020; Champion et al., 2022; Cole, 2022; de Byl, 2019; de Groot, 2016; de Wildt & Aupers, 2023; Finney, 2017; Grever & Van Nieuwenhuyse, 2020; Körber et al., 2021; Krzywinska, 2013; Li, 2021; Liboriussen & Martin, 2020; López, 2021; Mochocki, 2021; Naji & Iwar, 2013; Ramos, 2020; Rosenbaum, 2012; San Nicolás Romera	*Indigenous diversity- morality and behaviour* (Bird, 2021; LaPensée, 2021; Locke & MacKay, 2021; Nacher & Jankowski, 2021; Zeiler & Thomas, 2021)	*Language- indigenous language* (LaPensée, 2021; Nacher & Jankowski, 2021; Zabecki, 2019)

et al., 2018; Snyder, 2022; Spanos, 2021; Sukhov, 2018; Suominen & Sivula, 2013; Tozoğlu & Kuran, 2022; Wainwright, 2019; Yamamura, 2018; Yao & Chen, 2022)		
Time- war time (de Groot, 2016; Grever & Van Nieuwenhuyse, 2020; Krobová et al., 2023; Mukherjee, 2017; Otmazgin, 2021; Robinson, 2019; Saucier, 2012; Šindelář, 2022; Sukhov, 2018; Žukauskas, 2018)	*Racial diversity- morality and behaviour* (Apperley, 2018; Miller, 2008; Mukherjee, 2017; Wright, 2022; Young, 2016)	*Others* (Foster & Tolbert, 2016; Fu & Liang, 2022; Miller, 2008)
Time- modern time (Miller, 2008; Van Der Merwe, 2021; Wills, 2021; Wright, 2022)		
Religion- mythology (Andreen 2014; Bainbridge & Bainbridge, 2007; Buchanan-Oliver & Seo, 2012; Champion et al., 2022; Cragoe, 2016; de Byl, 2019; de Wildt & Aupers, 2020, 2023; Geraci, 2012; Harwood, 2022; Hemmann, 2021; Krzywinska, 2006, 2013; Noh, 2020; Otmazgin, 2021; Podvalnyi, 2019; Scholtz, 2005; Šisler, 2017; Spanos, 2021; Tozoğlu & Kuran, 2022; Xidakis, 2022; Yoon, 2021; Zeiler & Mukherjee, 2022; Zeiler & Thomas, 2021)		

Table 4. Coding tree with references of literature.

Appendix 4: Search string history

Search string	Number of results
culture* AND game*	7866
culture* AND heritage AND game*	1581
heritage AND game*	2443
(culture* OR heritage OR “cultural heritage” OR “cultural elements”) AND (game* OR “mobile game*” OR “video game*” OR “digital game*”)	7274

Table 5. Search string history.

Appendix 5: Summary of included literature

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