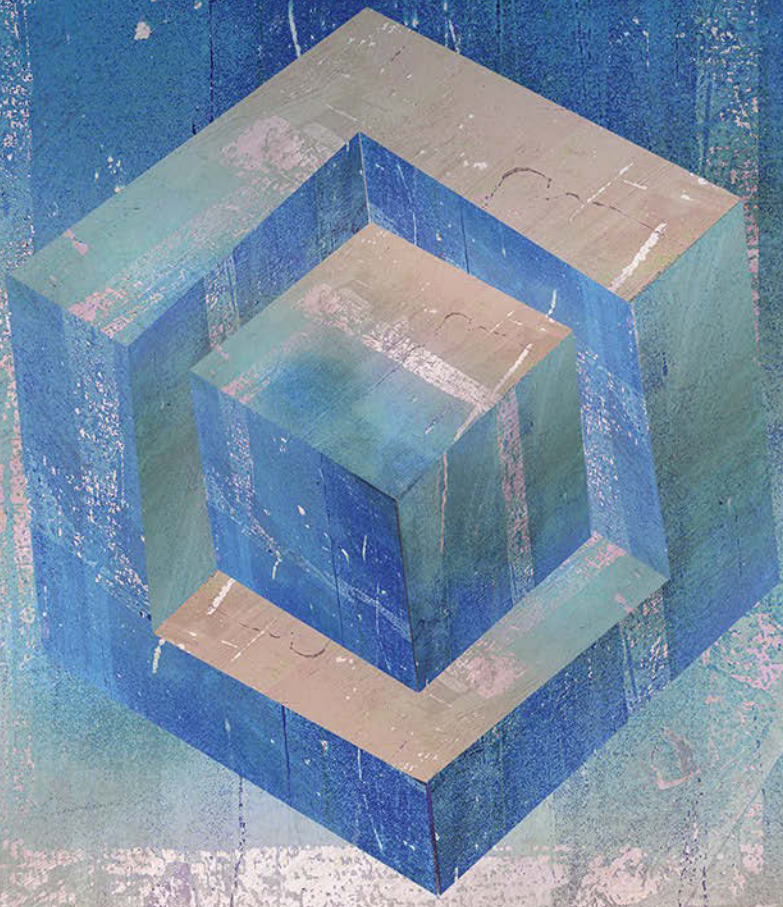
Benjamin Beil, Gundolf S. Freyermuth,
Hanns Christian Schmidt, Raven Rusch (eds.)

# Playful Materialities

## The Stuff That Games Are Made Of



[transcript] Studies of Digital Media Culture

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# Preface and Acknowledgments

BENJAMIN BEIL/GUNDOLF S. FREYERMUTH/

HANNS CHRISTIAN SCHMIDT/RAVEN RUSCH

Since the beginnings of human civilization, game culture and material culture have been closely linked. In the act of free play—*paidia*, according to Caillois[1]—children, as well as adults, transform simple objects into multifaceted toys in an almost magical way. Analog forms of rule-based play—*ludus*[2]—would hardly be conceivable without dice, cards, and game boards. Digital play is no less suffused with materiality: Games are not only mediated by technical interfaces, which we access via hardware and tangible peripherals. They are also subject to material hybridization, paratextual framing, and attempts of dematerialization and rematerialization. Of course, these contentious processes do not only affect digital games. For over three decades, they have marked the marginalization of industrial methods and modes in favor of digital ones, in production and consumption, in work and culture—via buzzwords and practices such as 'ubiquitous computing,' 'augmented reality,' and more recently, to an increasing extent, 'metaverse.'[3]

1 Caillois, Roger: *Man, Play and Games,* Urbana: University of Illinois Press 2001 (*1958), p. 13.

2 Ibid.

3 All three concepts originated in the pioneering days of digital networking, around 1990, which also saw the emergence of the World Wide Web. Mark Weiser coined the term 'ubiquitous computing' that today we associate with the 'Internet of Things' (IoT) already in 1988. Four years later, Thomas Caudell, for the first time, described the fusion of the real and the virtual as 'augmented reality.' In the same year, 1992, Neal Stephenson published his novel *Snow Crash*, in which he evoked a virtual reality variant of such a fusion as the 'metaverse.'—For 'ubiquitous computing' see Weiser, Mark: "The Computer for the 21st Century," in: *Scientific American*, September 1991,

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The work on this anthology started with the organization of a Game Studies Summit on "Playful Materialities" that took place at the Cologne Game Lab of TH Köln in July 2021 as part of the *11th Clash of Realities—International Conference on the Art, Technology, and Theory of Digital Games*. This volume documents the lectures given at the online summit and includes additional topics and perspectives. The contributions cover four major areas: "Places" explores locations and settings revealing the historical and artistic interdependence of the real and the virtual, the material and the immaterial; "Exhibits" focuses on practices and procedures employed in the material representation of digital gaming; "Modifications" traces examples of material pre-configurations of immaterial gaming experiences, augmenting adaptations as well as constricting controls; "Pieces," finally, addresses the material means of analog, digital and hybrid gaming, from pawns to puppets to pieces of paper.

The first section, "Places," opens with Gundolf S. Freyermuth's "Vegas, Disney, and the Metaverse: On the Material Anticipation of Virtual Worlds and Virtual Play in the Second Half of the 20th Century."[4] The study investigates the dialectical interrelation of material and virtual realities, i.e., "the progressive replacement of analog hardware and material processes by digital software" since the 1950s and the "countertrend toward the rematerialization of digitized data and media works" since the 1980s.[5] Drawing on Walter Benjamin's theorem of the aesthetic-technical anticipation of new media in 19th-century Paris, Freyermuth understands "the immersive and participatory experiences provided by Las Vegas' entertainment architecture" and ride attractions as a series of material anticipations of later virtual achievements and affordances in "graphics, simulation, games, AR, VR, the World Wide Web, and the Metaverse."[6]

The investigation of the 'future place' Las Vegas is followed by a contribution focusing on the contemporary digital auditory augmentation of a 'past place,' the

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pp. 94-104; https://users.ece.utexas.edu/~ethomaz/courses/asr/papers/intro/21st-century.pdf. For 'augmented reality' see Caudell, Thomas, and David Mizell: "Augmented Reality: An Application of Heads-Up Display Technology to Manual Manufacturing Processes," in: *Proceedings of the Twenty-Fifth Hawaii International Conference on System Sciences*2 (1992), pp. 659-669, https://www.researchgate.net/publication/3510119_Augmented_reality_An_application_of_heads-up_display_technology_to_manual_manufacturing_processes. For 'metaverse' see Stephenson, Neal: *Snow Crash,* New York: Bantam Books 1992.

4 In this volume pp. 17-97.

5 p. 18.

6 p. 19.

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19th-century dropforge Hendrichs, preserved as an industry monument, in Solingen, North-Rhine Westphalia. In "Augmenting Materialities: A Case Study of Maschinenklangwerk," the authors Isabel Grünberg, Raven Rusch, and David Wildemann describe "the distinct materiality and mediality of augmented reality and discern its characteristics." Their goal is "to set new precedents for augmented reality both as a technology and as an artistic medium; to reinvigorate and expand its scholarly discussion, and to inspire innovation in the creation of augmented reality artifacts."[7]

The first section, "Places," thus ends with the artistic-theoretical reflection of an interactive sound installation in an industrial museum. Correspondingly, the second section, "Exhibits," begins with the exemplary analysis of another sound installation—a virtual one, contrasting the digital and the analog. In "Let's Play the Exhibition! Radiohead's KID A MNESIA Exhibition, Virtual Museums, and Games," Isabelle Hamm explores virtual exhibitions and their differences from analog experiences, asking: "what are the possibilities of a virtual exhibition? And what distinguishes it from a 'classic' exhibition? What kind of art is especially suitable for virtual exhibitions?"[8] In trying to answer these questions, the author emphasizes the potential of the medial interconnections between the fields of art and games.

The particular challenges of exhibiting games are addressed in the next contribution, "To Craft a Game Arts Curators Kit: A Collective Record of How to Publicly Exhibit Video Games Around the Globe."[9] Rene G. Cepeda and Chaz Evans document the genesis of this "collectively authored document that represents roughly a decade of practical experience producing game art exhibitions and public programs at museums and other cultural venues."[10] The paper sums up the main themes of the GACK and explains the role of a curation of digital games in museums and galleries "that treats video games with the respect and specificity they deserve."[11]

The second section concludes with a short history of video game exhibitions. Benjamin Beil's "On Chainsaws and Display Cases: Exhibiting Video Games" takes as its starting point a peripheral device released for RESIDENT EVIL 4 in 2005—"a small chainsaw covered in blood splatter."[12] Beil's historical-

7 In this volume pp. 99-119, here p. 99 f.

8 In this volume pp. 123-143, here p. 126.

9 In this volume pp. 145-157.

10 p. 145.

11 p. 155.

12 In this volume pp. 159-183.

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theoretical investigation of the aesthetics and rhetorics of presenting games in museums and galleries pays particular attention to the widespread practice of both materially and functionally isolating digital artifacts like this exotic controller. The result is a surprising "praise of the display case": "By detaching an exhibition object from its everyday media environment—making it a semiophor—a form of historicity and especially a historical connection of hardware and software becomes visible."[13]

The engagement with the materiality of the chainsaw controller leads into the third section, "Modifications," which debates material arrangements preconfiguring the use and the perception of the virtual. The first contribution tackles the central issue of accessibility, the urgently needed adaptation of digital hardware to individual physical needs. In "Unpacking the Blackbox of 'Normal Gaming': A Sociomaterial Approach to Video Game Controllers and 'Disability,'" Markus Spöhrer examines the Microsoft Adaptive Controller as an experimental system for alternative bodily and technosensory configurations of digital gaming.[14] Deconstructing "the black box of 'normal gaming' with game controllers," Spöhrer introduces—via a case study—an "alternative approach of 'en-/disabling' gaming practices."[15]

The analysis of the material conditions of gameplay—the demands that the diverse bodies of the players place on interfaces—is complemented in the following article with a discourse on the use of material qualities and constraints in designing digital games. In "Being a Child Again Through Gameplay: Playable Child Perspectives and the Sitting Simulator BACKSEAT," Cordula Heithausen describes her desire to create a realistic and relatable child perspective that invites identification.[16] In analyzing the few games that have already undertaken such efforts, the author identified three basic approaches—Dark, Playful, Blended—as well as four essential elements: "a childlike position, a childlike comprehension/ perception, a projection surface, and optionally the sensations of nostalgia and/or retro."[17] Consequently, in creating her own game, she strongly emphasized the child's physical position in the virtual game space as well as "playful material(ities) that invite the player to interact and convey a narrative perspective in return."[18]

13 p. 177.

14 In this volume pp. 187-222.

15 p. 190.

16 In this volume pp. 223-252.

17 p. 249.

18 p. 250.

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The third section concludes with a presentation of a game literacy workshop, which essentially unfolds its effects in interactive transitions between material and virtual play. Drawing on various approaches to understanding and teaching literacy, Hanns Christian Schmidt's "Lego Level Up: Game Literacy and Playful Materialities"[19] outlines the practical and iterative development of procedures, software, and apparatuses—in particular, the editor game software A MAZE IN TILES and the augmented reality arcade cabinet DARIO'S BOX. With their help, children can acquire game literacy by becoming "'brickcoleurs' of their own computer game worlds by incorporating a playful materiality—literally brick by brick."[20]

These bricks lead on to the fourth and final section, "Pieces," which opens with a discussion of the quintessential 'piece' of analog games—board game figures. In a multifaceted approach, Peter Podrez's "Beyond Pawns and Meeples: Material Meanings of Analog Game Figures" explores the different forms, functions, and meanings of the materiality of analog game figures combining perspectives from analog and digital game research with approaches from actor-network theories and affordance theories. [21] Podrez advocates for game figures as a point of convergence of analog and digital gaming—as such, they are "highly interesting research objects of holistic game research: They offer the opportunity to rethink a media theory of play(ing) and to observe different figural forms, functions, and meanings in an analytical way."[22]

This point of convergence of playful analog material and the digital is continued in Michael Conrad's exploration of the diachronous history of paper and the digital computer. "Have We Left the Paperverse Yet? Maps, Boxes, and other Paper Objects as Imaginative Devices of Unfulfilled Desires in Early Gaming" takes readers on a journey through the history of early digital gaming and points out the numerous instances where paper has been the co-creative material partner. [23] The journey spans from the origins of paper in the Middle Ages to Alan Turing's universal machine to its application as a paratextual framework and material supplement for early digital games. Conrad concludes that "the medial identity of early games should be considered as open and fluid, material-immaterial hybrids."[24]

While Conrad leaves open the question of whether paper is disappearing from digital games and game design, Micael Sousa assures that another, far older,

19 In this volume pp. 253-276.

20 p. 256.

21 In this volume pp. 279-314.

22 p. 310.

23 In this volume pp. 315-349.

24 p. 322.

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material game piece—the die—is alive and well. "Keep the Innovation Rolling: A Modern Board Game Review of Dice Usages and their Mechanisms" systematically lays out the material and aesthetic affordances of this ancient material as he proposes a new taxonomy of dice usages in modern board games. [25] By analyzing the online database of "Board Game Geek," he identifies different types of dice and what game mechanics these support while also classifying and identifying current innovations and trends in dice games. Sousa finds that the creative meld of semiotic meaning, mechanical significance, and aesthetic experience is the driver for innovation in modern dice games and that "successful applications of dice are the result of mixing their material dimensions with mechanisms that build engaging game experiences."[26]

The section "Pieces," and with it, this anthology, concludes with something that has been foreshadowed throughout—the complete dematerialization of the playful material in the digital game. With "Immateriality and Immortality: Digital Toys in Video Games," Emma Reay takes the puzzle-platform game UNRAVEL as a case study to explore how the "haptic-panoptic" quality of digital toys can locate players in the liminal space between material reality and immaterial imaginings.[27] Drawing across Zoe Jaques' theorization of the 'spectrality' of stuffed animals and Katriina Heljakka's examination of toys as avatars, Reay argues that toylike protagonists in video games are intuitive vehicles to shuttle players between the realms of the physical and the digital. This volume began with the physical materialization of digital desires in the playscapes of Las Vegas and concludes with its inversion: the dematerialization of players as digital "ghosts"[28] inhabiting virtual materialities and leaving behind "play-echoes."[29]

## ACKNOWLEDGMENTS

The anthology would not have been possible without the hard work of many people and the support of several sponsors. The *Clash of Realities* conference was planned by a Program Board chaired by Björn Bartholdy and Gundolf S. Freyermuth of the Cologne Game Lab (CGL). Cooperating institutions were the Institute for Media Culture and Theater of the University of Cologne, the Institute for

25 In this volume pp. 351-378.

26 p. 373.

27 In this volume pp. 379-398.

28 p. 379.

29 p. 380.

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Both, the Game Studies Summit "Playing Materialities" and this volume, were planned and organized by Benjamin Beil, Gundolf S. Freyermuth, Hanns Christian Schmidt, and Raven Rusch. The summit owes much of its success to the extraordinary staff of the *Clash of Realities* conference, in particular, Vanessa Ossa, Judith Abend, Philipp Bojahr, Laura Frings, Isabelle Hamm, Alexandra Hühner, Susanne Kaiser, Su-Jin Song, and the many members of CGL student support groups as well as Mathias Mehr (CGL) who provided technical assistance. The present volume was tirelessly laid out by Raven Rusch. We thank them all for their extraordinary help!

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# Places

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# Vegas, Disney, and the Metaverse

## On the Material Anticipation of Virtual Worlds and Virtual Play in the Second Half of the 20th Century

GUNDOLF S. FREYERMUTH

For Edgar Pankow

In his technophilosophical investigation *Reality+: Virtual Worlds and the Problems of Philosophy,* David J. Chalmers discusses the historical skepticism about the human capacity to recognize material reality. Already in the centuries before our era, Chinese, Indian, and Greek thinkers independently raised whether humans could distinguish between what was real and what was an illusion. Chalmers outlines Zuanghzi's dream about being a butterfly, Narada's dream in which he lived an entire life as a woman, and Plato's allegory of the cave whose imprisoned inhabitants mistake distorted and selective reflections for reality. He interprets these doubts as examples of philosophical domains: "Knowledge: *How can Zhuangzi know whether or not he's dreaming?* Reality: *Is Narada's transformation real or illusory?* Value: *Can one lead a good life in Plato's cave?*"[1] Classical philosophy's concerns about the perceptibility of material reality continued into the modern era, culminating in René Descartes's *Meditations on First Philosophy*.[2] With them, Chalmers writes, Descartes "set the agenda for centuries of Western

1 Chalmers, David John: *Reality+: Virtual Worlds and the Problems of Philosophy*, New York: W. W. Norton & Company 2022, loc. 362.

2 Descartes, René: *Meditations on First philosophy: In Which the Existence of God and Immortality of the Soul are Demonstrated*, Arlington, VA: Richer Resources Publications 2012 (*1641).

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philosophy to come. Descartes posed what I'll call the problem of the external world: How do you know anything at all about the reality outside you?"[3]

This questioning of the realness of the external reality, which seemed to consist primarily of material entities for millennia, received a new twist in the mid-20th century: Technical digitization and cultural digitalization promoted dematerialization—the progressive replacement of analog hardware and material processes by digital software. Since the 1950s, functional mathematization turned more and more materials, tools, and apparatuses of the material world into programs. For example, in media production, software replaced paper and typewriter; canvas, brush, and paint; celluloid, film processing laboratory, and cutting room. The material basis of this process of virtualization was the digital computer as a universal machine. Eventually, its hardware components and finally, the computer itself became subject to emulation as well: virtual RAM, virtual drives, virtual server, virtual machines. However, since the 1970s, a countertrend toward the rematerialization of digitized data and media works has also set in, including the implementation of desktop publishing, rewritable CD-ROMs and DVDs, and 3D printing.

In this paper, I examine how the course and consequences of both virtualization and dialectical or compensatory efforts of (re)materialization affect our understanding of what is real—or seems at least realistic. The focus is on the field of audiovisual storytelling, in particular the implications for the defining industrial medium film and the emergence of new audiovisions such as digital games and virtual reality.

Crucial for an understanding of the development of digital audiovisuality—or more generally: of the circumstances under which new media and their specific mechanics emerge—is perhaps an observation that Walter Benjamin made when looking back at the prehistory of cinema: Long before the new medium became technically possible, artistic experiments in other media, from painting to literature to innovative experimental apparatuses, attempted to create effects aesthetically that would later be inherent in film qua medium.[4] This investigation traces a similar phenomenon: During the second half of the 20th century, a multitude of efforts can be observed to anticipate in other—old and new—media the effects of augmented and virtual reality, virtual worldbuilding, and virtual play that would become possible in the transmedium of software only decades later.

3 Chalmers: *Reality+*, loc. 147.

4 Benjamin, Walter: "Paris, the Capital of the Nineteenth Century," in: *The Arcades Project*, Cambridge, Mass.: Belknap Press 1999, pp. 3-13.—See the detailed discussion of Benjamin's theory of anticipation below pp. 20-29.

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In the 1950s, when this development set in, all existing media were analog. Nota bene, aesthetic anticipations of the emerging digital transmedium's effects and future genres had to happen materially. Beyond the apparent parallels, this is also the reason for the drastic differences between the evolution of film and that of digital genres, especially games. The leap from the analog audiovisual medium of theater to the analog audiovisual medium of cinema took place in material reality: It consisted of the transition from live performances to the recording and subsequent editing of (audio-) visual play through industrial technology. In contrast, the leap from the industrial media of film and television to digital audiovisual media is characterized by the transition from material generation—in constructed settings and using human actors—to virtual and procedural generation in the transmedium of software. The shift from analog to digital audiovisuality thus seems more fundamental than the earlier one from mechanical audiovisuality (theater) to industrial audiovisuality (film) because this recent change presents the crucial issue of the relationship between material and virtual realities, their opposition as well as their intertwining.

I will proceed in nine steps. First, I will try to substantiate the hypothesis of aesthetic anticipation by discussing the theoretical foundations of the concept of future places in general and Las Vegas as a future place in particular (*I Understanding Anticipation: Non-Synchronism & Future Places*). In the second step, I position Las Vegas in the context and at the intersection of two media-historical changes that commenced in the late 1940s and early 1950s: the advent of immersive fantasy spaces, i.e., theme parks, and the conception of the digital transmedium, i.e., software. (*II Framing Las Vegas: Disney & Digital*).

In the following six chapters, I investigate the immersive and participatory experiences provided by Las Vegas's entertainment architecture. For each phase of the city's history, I will draw parallels to developments of and in the digital transmedium: graphics, simulation, games, AR, VR, the World Wide Web, and the Metaverse. The emphasis will be on the interplay between aesthetic desires and experiments on the one hand and evolving technologies and media on the other (*III Anticipating Augmented Realities: 1950s; IV Anticipating the Ultimate Display: 1960s; V Anticipating Virtual Worlds: 1990s; VI Anticipating Virtual Design:1990s; VII Anticipating Virtual Agency: 1990s; VIII Anticipating Virtual Play: 1990s.*)

I conclude by demonstrating how, at the turn of the 21st century, Las Vegas engaged in a virtualization of reality that foreshadowed the evolved modes of merging materiality and virtuality in our contemporary digital culture. (*IX Re-Framing Las Vegas: Anticipating the Metaverse*).

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## I UNDERSTANDING ANTICIPATION: NON-SYNCHRONISM & FUTURE PLACES

There are many Paris. Some exist in reality, some only in media—from the Paris that Rick and Ilsa will always have[5] to the Paris that Travis Henderson never found in Texas.[6] Since 1999, one such Paris can be visited in Nevada.[7] The *Paris Las Vegas Hotel & Casino* is, naturally, not a one-to-one copy of the French capital. Built for almost $800 million on the Strip, across from the faux Italian town of the *Bellagio Hotel & Casino* and down the street from the *New York-New York Hotel & Casino*, the architectural complex of the *Paris Las Vegas Hotel & Casino* offers an eclectic and condensed montage of landmark features: from the Arc de Triomphe, which is massive, but still a third smaller than the original, to the obligatory street bistros, from the Eiffel Tower, which stands 165 meters tall, but is only half the size of the original, to the Louvre-like façade to the extras in the lobby playing Parisians with baguettes and Basque berets. The arcade-like—and not all that gaudy—indoor-outdoor environments of the themed resort assemble essential components of the historical Paris that Walter Benjamin described in his *Arcades Project* and which at the same time Siegfried Kracauer conjured up in his underestimated *Jacques Offenbach and the Paris of His Time*.[8]

On the one hand, it is somewhat ironic that Las Vegas, as the future place of the late 20th century, integrated an immersive replica of Paris, a future place of the 19th century. On the other hand, the entanglement of a long-ago future with elements of a future that at the end of the 20th century seemed to be imminent suggests that we can learn a few things about Las Vegas if we take a closer look at the concept of anticipation and future places.

The basic idea that the not-yet-experienced can be anticipated goes back to the enlightenment. In the *Critique of Pure Reason*, Immanuel Kant wrote: "We are really in possession of synthetic a priori cognition, as is established by the principles of understanding, which anticipate experience."[9] Based on the principles of

5 CASABLANCA (USA 1942, D: Michael Curtiz)

6 PARIS, TEXAS (West Germany / France 1984, D: Wim Wenders)

7 Shoro, Mike: "Paris Las Vegas Turns 20," *Las Vegas Review Journal*, August 31, 2019, https://www.reviewjournal.com/business/casinos-gaming/paris-las-vegas-turns-20-photos-1838639/

8 Kracauer, Siegfried: *Jacques Offenbach and the Paris of His Time*, New York, Cambridge, Mass.: Zone Books, Distributed by MIT Press 2002.

9 Kant, Immanuel: *Critique of Pure Reason*, Cambridge; New York: Cambridge University Press 1998 (*1781), p. 655.

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reason and the mind's fundamental ability to recognize patterns, we are able to give shape to the universe even before we can observe it. In the 19th century, Georg Wilhelm Friedrich Hegel continued the effort to realize future entities and events. In the lectures on aesthetics, he uses the germ-tree example to explain the relationship between concept and reality:

"In the germ [...] all determinations are contained, which the tree will show. [...] The germ is the concept, the tree the reality. [...] In the germ is contained all [...] as potential what will appear in the tree in practice."[10]

Thus, Hegel formulated the idealistic claim that concepts conceived by the mind are prior to reality. Both Kant's and Hegel's notions continued to have an impact in the 20th century.

In the early 1930s, when Las Vegas was a remote desert town of barely five thousand inhabitants, the philosopher Ernst Bloch, one of the four million residents of the German capital Berlin, developed the idea of the simultaneity of the non-simultaneous. "Not all people exist in the same Now," he stated, outlining his concept of "Ungleichzeitigkeit."[11] Hard to translate, the term denotes temporal incommensurability, a non-synchronism or non-simultaneity among individuals, groups, and places. Its effect is to create a state of non-contemporaneity within and between societies and cultures. To illustrate his concept of people living at the same time and yet in different times, Bloch could have chosen the contrast of the backward rural town of Las Vegas and the advanced industrial metropolis Berlin: the not only geographical but also temporal distance between the two places.

From a similar perspective, Bloch's Berlin contemporary and soon fellow emigrant Walter Benjamin investigated such a temporal gap between an earlier avant-gardist city and the traditional ways of life surrounding it. In his *Arcades Project*, he set out to describe how far ahead of the rest of France and the world Paris had been once. For the motto of his investigation, Benjamin adopted an insight of 19th-century historian Jules Michelet: "Each epoch dreams the one to follow."[12] Looking for such dreamy anticipations, he found that mainly three artistic achievements accompanied, augmented, and expedited the transformation of Paris from a regular city of its time to a future place:

10 Hegel, Georg Wilhelm Friedrich: *Vorlesungen über die Ästhetik I, Die Idee und das Ideal. Hg. G. Lasson*, Leipzig: F. Meiner 1931, p. 157 (my translation).

11 Bloch, Ernst: "Nonsynchronism and the Obligation to Its Dialectics," *New German Critique* 11 (1977): pp. 22-38, here p. 22.

12 W. Benjamin: "Paris, the Capital of the Nineteenth Century," p. 4.

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- First, the creation of innovative architecture and urban design, i.e., the demolition and modernization of old Paris into a (proto-) industrial metropolis, on whose wide boulevards the increasing traffic and the (proto-) industrial masses could flow.[13]
- Second, radical experiments in the existing media and arts, particularly literature, theater, and painting, performed by a steady succession of artistic avant-gardes.[14]
- Third, the rise and enthusiastic appropriation of entirely new media and forms of art and entertainment like operettas, comedic and erotic stage shows, gambling and sexual services but also technology, fashion, and consumerism, and, most importantly, daguerreotype and photography, followed by their mechanical upgrades: stereoscopy, chronophotography, and finally silent film.[15]

As a result, Benjamin came to define Paris as the "capital of the 19th century."[16] The revolutionary urban design, flourishing art scene, and booming entertainment industry had a central vanishing point that was only to be reached in the 20th century: the sound film as the defining medium of industrial modernity. While working on his *Arcades Project*, Benjamin described this process in his seminal study on "The Work of Art in the Age of Mechanical Reproduction," which made him one of the founders of media studies.[17] The observation that artists—or rather their aesthetic works in traditional media—foreshadowed future media raised a crucial question: What kind of 'clairvoyance' allowed innovative art practices to point to aesthetic affordances of a medium that does not yet exist?

To answer this question, Benjamin proposed the theorem of anticipation. He observed that such 'dreamy clairvoyance' usually manifests itself in three areas: in technological and artistic experiments and changes in reception habits.

13 See in particular "Fourier, or the Arcades" and "Haussman, or the Barricades," in: Ibid., pp. 11-13.

14 See in particular "Daguerre, or the Panoramas," "Grandville, or the World Exhibitions," and "Baudelaire, or the Streets of Paris," in: Ibid., pp. 5-6, pp. 7-8, pp. 10-11.

15 Ibid.

16 Ibid.

17 Benjamin, Walter: "The Work of Art in the Age of Mechanical Reproduction," in: *Illuminations. Essays and Reflections. Edited and With an Introduction by Hannah Arendt. Preface by Leon Wieseltier*, New York: Schocken Books 2007, pp. 217-252.

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- "Technology works toward a certain form of art. Before the advent of the film there were photo booklets with pictures which flitted by the onlooker upon pressure of the thumb […]."[18]
- "Secondly, the traditional art forms in certain phases of their development strenuously work toward effects which later are effortlessly attained by the new ones. Before the rise of the movie the Dadaists' performances tried to create an audience reaction which Chaplin later evoked in a more natural way."[19]
- "Thirdly, unspectacular social changes often promote a change in receptivity which will benefit the new art form. Before the movie had begun to create its public, pictures that were no longer immobile captivated an assembled audience in the so-called Kaiserpanorama."[20]

To better understand the mechanisms of these observed dreams of the future and provide a materialistic basis for his theorem of anticipation, Benjamin borrowed some of the tools from *The Interpretation of Dreams*[21] and some of the basic assumptions of dialectical materialism. They led him to determine two origins and driving forces of Paris's advancement to a future place.

First, early on, the French capital offered a fusion of the traditional pre-industrial everyday life in a city of the mid-19th century with avant-gardist elements of (proto-)industrial work and consumption, particularly new technologies of transport and media of communication. The ensuing shock-like experiences of accelerated change impressed and altered the perceptual apparatus of the urban masses of Paris as well as hundreds of thousands of visitors from all over the world. Among them was a disproportionate number of intellectuals and artists who took it upon themselves to embrace, describe, analyze and shape the new way of life. In his analysis of their reactions, reflections, and works, Benjamin followed the pattern that Freud had established for dreams and daydreams. Through the mental processing of their experiences in the advanced Paris present—the day's residue of the dream—these artists gained the patterns and raw materials to anticipate, for example, technical aspects and effects of future media artistically. As a result, they managed to satisfy, with their reflections and aesthetic experiments, the novel

18 Ibid., p. 249 (Endnote 17).

19 Ibid., pp. 249-50 (Endnote 17).

20 Ibid., p. 250 (Endnote 17).

21 Freud, Sigmund: *The Interpretation of Dreams*, London: G. Allen & Company, Ltd. 1913.

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entertainment desires arising from Paris's unique experiences and thus reinforced the city's path to the future.

With his Freudian analysis, Benjamin provided a materialistic basis for the intellectual and artistic ability to anticipate: individual perceptions of contemporary life that are sometimes more, sometimes less consciously processed. In the same direction of a materialistic grounding also goes the determination of the second driving force: material potentials—affordances—in existing technologies and media. In his artwork essay, Benjamin wrote, "Just as the illustrated newspaper virtually lay hidden within lithography, so the sound film was latent in photography."[22] In comparison to Hegel's idealistic germ-tree-example—potential and realization—the sentence represents an apparent turn from biology to technology and media: from a hidden organic possibility to a material existence of elements of the future in the present.

In the following decades, similar notions of non-synchronism shaped the nascent discipline of futurology: the idea that the future which awaits the rest of humanity can already be observed in certain particularly advanced places and subcultures. Consequently, Robert Jungk titled his groundbreaking study on the future of humankind *Tomorrow Is Already Here.*[23] In the second half of the 20th century, it was not least futurological research that led to an increasing acceptance of the initially odd view that contemporaries and even locals can live in different times and often do so. "The future is already here—it's just not very evenly distributed," William Gibson quipped in 1999.[24] By then, Las Vegas, with a population of 470 000 and almost 36 million tourists per year,[25] had become a looking glass onto the future, particularly of architecture and popular entertainment like musicals,

22 Benjamin, Walter: *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media*, Cambridge, Mass.: Belknap Press of Harvard University Press 2008, p. 21.—The translation in *Illuminations* is less clear: "Just as lithography virtually implied the illustrated newspaper, so did photography foreshadow the sound film." W. Benjamin: "The Work of Art," p. 219.

23 Jungk, Robert: *Tomorrow is Already Here: Scenes from a Man-Made World*, London: R. Hart-Davis 1954.—The title of the German edition *Die Zukunft hat schon begonnen* translates: "The future has already begun."

24 Gibson, William: "Talk of the Nation: The Science in Science Fiction," *National Public Radio* (Interview), November 30, 1999, Citation 11:50 min., http://www.npr.org/templates/story/story.php?storyId=1067220

25 N.N.: "Number of Visitors to Las Vegas in the United States from 2000 to 2019," 2020, https://www.statista.com/statistics/221042/visitors-to-las-vegas/

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comedic and erotic stage shows, and, of course, gambling and sexual services but also technology and consumerism in general.

To learn from Las Vegas, I will adopt Benjamin's model of the effects of technological and social change on the human perceptual apparatus and the resulting development of new media to our digital present. In addition, I will supplement and augment this approach with Neal Stephenson's more recent concept of "hieroglyphic" anticipation. Writing about Science Fiction, Stephenson claims that this genre—in novels, movies, games, or other media—can do more than encourage innovation. Science Fiction can supply enchanted blueprints, "hieroglyphs of the future": "a plausible, fully thought-out picture of an alternate reality in which some sort of compelling innovation has taken place."[26] I will apply Stephenson's perspective on Science Fiction to other forms of artistic expression, namely the architecture and attractions of Las Vegas.

In modern history, there are, undoubtedly, numerous examples of cities that rose to prominence because they were, as they say, a little ahead of their time: from Venice and Florence in the Renaissance to Manchester, London, and Paris in the 19th century to Vienna during the Fin de Siècle to Berlin in the 1920s. These places developed and implemented nascent technologies first, accompanied by a concentration of capital and the rise of new classes. Together with innovative forms of work and everyday life, unique aesthetic needs emerged. They, in turn, resulted in new modes of aesthetic representation and perception. I propose understanding parts of the American West as such a future place in the second half of the 20th century.[27]

The rise of California and its neighboring states to such a—scattered-networked, i.e., post-urban—'suburb of the 20th century' already began at the time of the second industrial revolution, in the early 1920s, when the mild climate attracted two of the technologically and aesthetically most modern sectors, the aircraft and film industries. During the Second World War, the influx of high-tech companies and research institutes intensified. The region fully transformed into a laboratory of the future, whose basic inventions and products dominated globally

26 Stephenson, Neal: "Innovation Starvation," *Wired*, October 27, 2011, https://www.wired.com/2011/10/stephenson-innovation-starvation/

27 The parallels between the Paris of the early industrial era and the American West of the early digital era were first described by me in 1996. See Freyermuth, Gundolf S.: *Cyberland: Eine Führung durch den High-Tech-Underground*, Berlin: Rowohlt 1996, pp. 22 ff.

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in the wake of the semiconductor and microprocessor revolution.[28] Between the late 1940s and the end of the century, in the American West, new technologies and types of urbanity, modern lifestyles, and media developed that, with some delay, took over the rest of the world. The PC, its operating systems and programs, the design of the chips, input and output devices such as the computer mouse and laser writer, and the hardware and software underlying global networking were mainly West Coast innovations. At the turn of the century, California high-tech companies dominated the world market for IT products relatively unchallenged.[29] The region's economic power was correspondingly high. Based on its gross national product, California alone would have ranked amongst the nation-states fifth in 2000, just behind Great Britain and ahead of France.[30]

The economic importance of digital technology was matched by its regional use, i.e., by the development of new digital forms of work and life. In the quarter-century from the dawn of the PC to the turn of the century, Americans, on average, implemented and used digital means of production and communication more intensively than the rest of humanity. As late as the mid-1990s, 40 percent of all PCs and the majority of digital networks were located in the United States.[31] Statistically, computer use and networking were nowhere as high as on the West Coast.[32]

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28 In the 1950s, Silicon Valley was only the second American high-tech region after the area along Route 128. Both centers had formed around top universities: Stanford in the west, MIT in the east. Cf. Campbell-Kelly, Martin and William Aspray: *Computer: A History of the Information Machine*, New York: Basic Books 1996, p. 123.

29 Among the thousands of tech and game companies founded in the last third of the century in and around Silicon Valley were Intel (1968 in Santa Clara), Atari (1972 in Sunnyvale), Apple (1976/77 in Cupertino), Oracle (1977 in Santa Clara), 3Com (1979 in Santa Clara), Activision (1979 in Sunnyvale), Sierra Online (1979 in Simi Valley), Adobe (1982 in Los Altos), Electronic Arts (1982 in San Mateo), Compaq (1982 in Palo Alto), Sun (1982 in Stanford), Silicon Graphics (1982 in Santa Clara), Cisco (1984 in Stanford), Blizzard (1991 in Irvine), Crystal Dynamics (1992 in Redwood City), Yahoo (1994 in Sunnyvale), eBay (1995 in San Jose), PayPal (1998 in Palo Alto), Google (1998 in Menlo Park).

30 Robinson-Jacobs, Karen: "Take That, France—We're No. 5; Economy: If It Were a Separate Country, California Would Be Right Behind the U.K," *Los Angeles Times*, June 14, 2001.

31 Vgl. Leyden, Peter: "On the Edge of the Digital Age," *Star Tribune*, June 4, 1995.

32 Relevant research throughout the 1990s tended to show that the West, and the Bay Area in particular, led the way in the use of digital work and communications tools. Cf. Gilmour, Kim: "Network Neighbourhoods," *Internet Magazine*, July 1, 2001;

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In this essay, I will limit myself to one vertex of the geographical triangle formed by Los Angeles in the South, San Francisco in the North, and Las Vegas in the East. Within this innovative economic zone, Las Vegas, the so-called "sin city," took on the function that red-light districts had served in the industrial metropolises of the 19th century: To the classes that rose with the latest technology, the city offered, as Paris did once, relief by satisfying traditional entertainment needs—from gambling to prostitution—as well as novel desires resulting from the social and cultural experiences of post-industrialization and digitalization.

My claim of Las Vegas as a future place is, of course, not original. The unique role of this city has been noted many times in various ways and by multiple authors, most famously in the late 1960s by Robert Venturi, Denise Scott Brown, and Steven Izenour in their seminal study *Learning from Las Vegas*.[33] Venturi was also among the first to notice the cutting-edge role of the city after its demolition and reconstruction in the 1990s.[34] Another was Ada Louise Huxtable. In 1997, the long-time architecture critic of *The New York Times* described Las Vegas as "an urban design frontier where extraordinary things are happening."[35] Three years later, I reported after an extended visit:

"Las Vegas is no longer a city in the modern sense. Like nowhere else, attempts are being made here to produce in analog form what virtual reality technologies promise, but the current state of technology cannot yet deliver in satisfactory quality: the experience of distant spaces or imaginary worlds, as well as myths and fictions that can be entered and allow participation. In this respect, all Las Vegas is a Fata Morgana, an aesthetic illusion, a utopian model that heralds both more advanced virtualities and augmented post-realities of the digital era."[36]

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Shim, Richard: "West Coast Cities Tops in Wireless," *CNET News.com*, March 3, 2003.

33 Venturi, Robert, Denise Scott Brown, and Steven Izenour: *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*, Cambridge Mass.: MIT Press 1977.

34 Venturi, Robert: "Las Vegas After Its Classical Age," in: *Iconography and Electronics Upon a Generic Architecture: A View From the Drafting Room*, ed. Robert Venturi, Cambridge, Mass.: MIT Press 1996, pp. 123-128.

35 Huxtable, Ada Louise: "Living With the Fake, and Liking It," *The New York Times*, March 30, 1997, https://www.nytimes.com/1997/03/30/arts/living-with-the-fake-and-liking-it.html

36 Freyermuth, Gundolf S.: "Vegas, Virtuelle Stadt," *Telepolis*, March 9, 2000, https://www.heise.de/tp/features/Vegas-virtuelle-Stadt-3441695.html?seite=all (my translation).

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Later in the same year, Eckhardt Schmidt completed a documentary film entitled LAS VEGAS—THE FIRST CITY OF THE 21ST CENTURY. An online summary states: "Las Vegas, the city of players and fantasists, mutated into a city of realized virtual realities."[37] In 2007, Laura Bieger analyzed the "aesthetics of immersion" of Las Vegas, noting that the city is a "pioneer of paradigmatic cultural developments,"[38] namely the "strategic cross-fading of world and image, inviting us to a physical immersion in the reality they have generated."[39]

To understand the cultural function of Las Vegas's unique urbanity, Bieger also refers to a concept that Michel Foucault developed in the late 1960s. In his exploration of spaces opposing the ordinary environments of social life, Foucault identified, on the one hand, utopian visions: "Utopias are sites with no real place."[40] And on the other hand, places that actually exist, but to a certain extent outside everyday reality. Foucault called such places "heterotopias" and defined them as "counter-sites," "a kind of effectively enacted utopia."[41] Within the multiplicity of heterotopic spaces, he distinguished "two extreme poles": spaces of illusion—such as theater and cinema, museum and library—and spaces of compensation. "[T]heir role is to create a space that is other, another real space, as perfect, as meticulous, as well arranged as ours is messy, ill constructed, and jumbled."[42] Laura Bieger suggests that Las Vegas should be regarded as such a heterotopia as it contains "hybrid forms between utopian (i.e., unreal) and real space."[43]

Thus, the essential question of my investigation of Las Vegas as a future place is: What exactly are the mechanisms of its dream-like historical anticipations (Benjamin), its creation of future-inspiring hieroglyphs (Stephenson), and its realization of playful immersive heterotopic spaces (Foucault)?

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37 LAS VEGAS—DIE ERSTE STADT DES 21. JAHRHUNDERTS (Germany 2000, D: Eckhardt Schmidt); summary: N.N.: "Las Vegas—die erste Stadt des 21. Jahrhunderts," *Moviepilot*, no date, https://www.moviepilot.de/movies/las-vegas-die-erste-stadt-des-21-jahrhunderts (my translation).

38 Bieger, Laura: *Ästhetik der Immersion. Raum-Erleben zwischen Welt und Bild. Las Vegas, Washington und die White City*, Bielefeld: transcript 2007, p. 10 (my translation).

39 Ibid., p. 19 (my translation).

40 Foucault, Michel: "Of Other Spaces: Utopias and Heterotopias," *foucault.info*, 1967, translated from Architecture, Mouvement, Continuité no. 5 (1984): pp. 46-49, https://foucault.info/documents/heterotopia/foucault.heteroTopia.en/

41 Ibid.

42 Ibid.

43 L. Bieger: *Ästhetik der Immersion*, p. 12 (my translation).

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The focus is on media anticipations. In all future places of the modern era, the adoption of new media played an essential role. In the Renaissance, the formative new media were perspective painting and the picture-frame stage. In the industrial 19th century, the formative new media were the daily newspaper, photography, stereoscopy, and operetta. In the second half of the 20th century, the aesthetics of Las Vegas and its entertainment evolved under the influence of the industrial media of (Hollywood) film, television, and theme parks, as well as in temporal parallel to the emerging digital transmedium and networked transmedia storytelling, namely in games, augmented reality (AR), and virtual reality (VR).

My central assumption is that since the 1950s, Las Vegas's entertainment sought to offer locally and in material reality—in the form of hardware—what only later digital technology could provide globally and virtually—in the form of software.

## II FRAMING LAS VEGAS: DISNEY & DIGITAL

The desire to experience worlds other than one's own everyday life, immersion in counter-worlds, by no means emerged only at the end of the industrial era. "Reality," says VR pioneer Brenda Laurel, "has always been too small for the human imagination."[44] The history of aesthetic immersion—in rite and religion, bourgeois education, art, politics, and ultimately entertainment—thus documents the state of civilization and, in particular, humanity's relationship to its tools of production, transportation, and communication.

Mind-expanding drugs offered the earliest escapes into alternative worlds. In a religious context, they created out-of-body experiences that, from today's perspective, evoke virtual reality experiences. The close connection between drug culture and high-tech culture, especially during the crucial decades of digitization in the American West, proves the persistence of the millennial fascination with psychedelic immersion. However, only the manifestation of counter-worldly experiences within a collectively perceivable reality could guarantee their sameness and repeatability. At the beginning of such staging were cave ceremonies:

"Youngsters were brought into the darkness of painted caves, where stories were told, images and songs were revealed in precise sequence, and the youths became immersed in their

44 Cited after McCarthy, Susan: "Techno-Soaps and Virtual Theater: Brenda Laurel Can Blow Anything Up," *Wired*, May/June, 1993, http://www.wired.com/wired/archive/1.02/brenda.html

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coming-of-age ceremonies. Only by shutting out the rest of the world and immersing themselves in this separate space could the learning occur that changed a child into an adult."[45]

With the development of advanced civilizations, artisan-made environments replaced artistically designed caves: Temples and gardens, palaces and parks, wonders of the world, and cathedrals.

With the rise of craft culture, the visual and performing arts came into play in decorating and displaying these religious and secular spaces of experience beyond everyday life. Their works and actions guided by rules materialized the fleeting fantasies and dreams previously initiated only by drugs or rites. Sculptures, sports and votive plays, and finally, the theater as it emerged in Greece in the fifth century B.C.E., opened up a view of worlds beyond everyday life, indeed beyond life itself, that was both more reliable and intersubjective in its aesthetic quality. The operators of the Roman Colosseum provided the most spectacular—and until the industrialization of the arts never again achieved—playful staging. As always in the mechanical epoch, biological power provided what was later achieved in a more 'humane' way by utilizing machines. In the nearly 50-meter-high entertainment structure, wooden, slave-operated machinery of 20 moving platforms and 28 smaller elevators 'magically' lifted the fighters, beasts of prey, and scenery into the arena.

The early modern era then largely dispensed with animal and human sacrifice and introduced perspective illusionism into the (audio-) visual media. The mathematical-technical procedures of perspective theory reliably projected real 3D relationships onto a 2D canvas, simultaneously eliminating and simulating actual spatiality. The model of perspective paintings is still followed today by picture frame stages, cinema screens, and the monitors of television sets or computers. They all offer framed views of worlds outside the reality of our lives. The reception practice common to these modern audiovisual media can be subsumed under the concept of the window view.[46]

What lies beyond a window can neither be entered nor manipulated, however. This reduction in the experience of alternative visual and audiovisual realities to passive viewing, as it characterized the representative media of high and mass

45 Pimentel, Ken and Kevin Teixeira: *Virtual Reality: Through the New Looking Glass*, New York: Intel/McGraw-Hill 1993, p. 15.

46 On the significance of the window view in modern media history see Freyermuth, Gundolf S.: "From Analog to Digital Image Space: Towards a Historical Theory of Immersion," in: *Immersion in the Arts and Media*, ed. Burcu Dogramaci and Fabienne Liptay, Amsterdam: Rodopi 2015, 165-203.

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culture for centuries, continuously awakened a desire for holistic representation and immersive use. Perspective boxes and chambers of wonder, panoramas, dioramas, and phantasmagorias experimented with deconstructing and overcoming the window view. The central high-cultural aspiration for more immersive experiences than the pre-industrial media could offer sought the "Gesamtkunstwerk," the total work of art. Its realization seemed conceivable to contemporaries only by bundling the existing media or arts. In this respect, almost all theorists of the Gesamtkunstwerk—from Wilhelm Heinse and Christoph Willibald Gluck to Herder, Novalis, and E.T.A. Hoffmann to Richard Wagner—propagated its realization as a heightening of opera's performance. Wagner finally theoretically conceived the longed-for "work of art of the future" around the middle of the 19th century.[47] After 1876, he brought it to the Bayreuth stage of illusion, which was driven by steam power and also otherwise characterized by industrial technology.

Wagner's operas, however, could not satisfy the utopian longings for more immersive media any more than film and television could in the 20th century. Parallel to their breakthrough as mass media, new media utopias as well as dystopian visions emerged that anticipated but feared such increased immersion. For example, in 1932, when the medium of sound film was only a few years old, Aldous Huxley described the evolution of movies into more immersive "feelies" in his dystopian *Brave New World*.[48] In 1940, Argentine writer Adolfo Bioy Casares, in the novel *The Invention of Morel*, designed a revolutionary imaging method that could populate the world with realistic three-dimensional copies of long-deceased people.[49] And in 1945, the French film critic Andre Bazin wrote about the path of cinema towards the 'Gesamtkunstwerk,' the "total cinema:" "a total and complete representation of reality […] the reconstruction of a perfect illusion of the outside world in sound, color, and relief […]."[50]

By this time, American movie magnate Walt Disney had long since decided to create a new medium that was more immersive than any existing offering. The initial trigger was Disney's threefold dissatisfaction with industrial modernity. First, he did not accept the medial limitations of sound film, especially its commitment to two-dimensional photorealism. Just as around the middle of the 19th

47 Wagner, Richard: *Das Kunstwerk der Zukunft*, Leipzig: O. Wigand 1850.

48 Huxley, Aldous: *Brave New World*, Garden City, N.Y.: Doubleday, Doran & Company, Inc. 1932.

49 Bioy Casares, Adolfo: *The Invention of Morel*, New York: New York Review Books 2003 (*1940).

50 Bazin, André: "The Myth of Total Cinema," in: *What Is Cinema?*, Berkeley: University of California Press 1967-1971 (*1946), pp. 23-27.

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century, Richard Wagner sought to overcome what he perceived as the medial weaknesses of opera by creating total works of art, so one hundred years later, Disney wanted to transcend the medial affordances of sound film in favor of a multisensory cinematic experience. With his fundamental decision in favor of animation, Disney had already opposed the limitations of industrial reproduction technology. In its artistic content and technical process, animated film art overruled industrial automatisms by recourse to manual manipulations. In this way, Disney's studio laboriously evaded the constraint of having to stage the real thing in real-time before the camera's eye. "The painstaking art of animation was, after all, the art of perfecting the world."[51] With the animated film, Disney had gained a freedom of design that only much later digital image generation was to grant in the photorealistic reproduction of live-action. But even the most fantastic animated films, like everything else captured on celluloid, remained medially flat. Animated movies could not fulfill Disney's aesthetic ideal because he was aspiring to three-dimensional lifelikeness: "a cartoon that immerses the audience."[52]

Second, as both a father and an entertainment entrepreneur, Disney was dissatisfied with what industrial amusement parks offered. In his eyes, they prevented a satisfying experience both by the primitive aesthetic form of their individual attractions and the lack of an overall artistic conception. Therefore, Disney divided his park into distinct areas—*Adventureland*, *Frontierland*, *Fantasyland*, *Tomorrowland*, and *Main Street USA*—that were self-contained and coherent in design, i.e., had a unifying 'theme.'[53] As aesthetic models served him a variety of historical entertainment forms, including the parks of early modern Europe and the industrial genre of world's fairs.[54]

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51 Marling, Karal Ann: "Imagineering the Disney Theme Parks," in: *Designing Disney's Theme Parks: The Architecture of Reassurance*, ed. Karal Ann Marling, Montréal, Paris: New York: Flammarion 1997, pp. 29-176, here p. 33.

52 Thomas, Bob: *Walt Disney: An American Original*, New York, N.Y.: Hyperion 1994, p. 11. Cited after Pine, B. Joseph and James H. Gilmore: *The Experience Economy: Work is Theatre & Every Business a Stage*, Boston: Harvard Business School Press 1999, p. 47.

53 Ibid.

54 See Harris, Neil: "Expository Expositions. Preparing for the Theme Parks," in: *Designing Disney's Theme Parks: The Architecture of Reassurance*, ed. Karal Ann Marling, Montréal, Paris, New York: Flammarion 1997, pp. 19-27; Tuan, Yi-Fu with Steven D. Hoelscher: "Disneyland: Its Place in World Culture," Ibid., pp. 191-198. Also Gottdiener, Mark: *The Theming of America: Dreams, Visions, and Commercial Spaces*, Boulder Colo.: Westview Press 1997, p. 38.

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Third, in the sprawling car suburbs of Southern California, Disney missed the qualities of traditional urban environments. His goal was to supplement the unloved but irreversible suburbanization with more human environments that were both quantitatively better manageable and qualitatively better designed. The means to this end seemed to be entertainment architecture because fantasy spaces, such as those offered for millennia by wonders of the world, magnificent castles, or spectacular houses of faith, were materialized structures of desire. They stabilized experiences and stimulated behaviors by building them up, so to speak. As Mark Gottdiener writes of Disney's parks, the architecture itself became "a form of entertainment. Each structure provides its own fantasy. The park itself is architecture that entertains."[55]

Disney's first theme park, Disneyland, which opened in a Los Angeles suburb, thus initiated the development of a new medium comparable in both its historical function and cultural impact to the mechanical stage and industrial cinema. Within a few decades, it was to become the "most popular attraction on the earth."[56] By the end of the century, theme parks were attracting some 550 million visitors per year worldwide, including some 226 million in the United States alone.[57] US theme park revenues were $9 billion per year around 2000, higher than the roughly $7.7 billion earned at the US box office.[58]

Structurally, the theme park concept resulted from years of research into overcoming these shortcomings of modernism—of film, entertainment parks, and urbanism. Disneyland killed all three birds with one stone. As the world's first theme park, it made the 2D fantasy worlds of feature films and TV shows accessible and experienceable. "What he [Disney] was doing in his theme parks was producing his cartoon images in three dimensions."[59] Theme parks replaced watching with walking and screens with spaces turning the passively-seated audience of cinema and TV into active 'guests' who no longer looked at 2D fictions but instead entered into 3D environments and experienced cinematic narrations in a multisensory way.

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55 M. Gottdiener: *The Theming of America*, p. 114.

56 Ibid., p. 108.

57 Tagliabue, John: "Giving Theme Parks a Whirl; Europeans Warm to an American-Style Entertainment," *The New York Times*, September 2, 2000.

58 For U.S. theme park revenues, cf. White, LaTrina: "Theme Parks With History Entice Eclectic Fun Seekers," *CNN.com*, July 14, 2003, http://www.cnn.com/2003/TRAVEL/07/01/sprj.st03.theme.parks/.—For box office figures, cf. e.g. http://www.boxofficemojo.com/yearly/

59 Blume, Mary: "Disney Conquers Another World: Design," *International Herald Tribune*, September 27, 1997.

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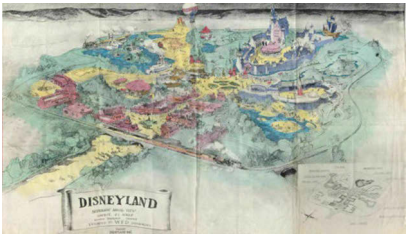
*Top left: Promotional Prospectus of Disneyland, 1953; Top Right: Opening Day at Disneyland, July 17, 1955; Middle: Promotional Aerial Shot of Disneyland, 1961;Bottom Left and Right: Disneyland Attractions in the 1950s*



Sources: Promotional Disney Material and Private Photographs by Unknown Visitors

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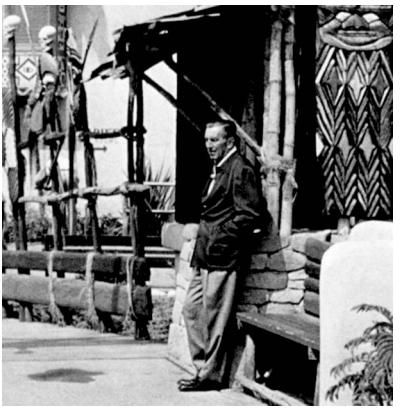
Further, Disneyland revolutionized the entertainment park genre. Its attractions no longer positioned the audience in front of theatrical or historical stages—as, for example, the Prater's grotto ride still did—to entertain them with a leisurely series of static 'pictures' or tableaus. Instead, Disneyland immersed its guests in a rapid succession of thematically stylized scenes, arranged in a cinematic manner and animated by human actors or animatronic puppets. Finally, Disneyland provided walkable 'streets' and 'lands' as architectural antidotes to the non-urban and car-centric environments of the American West. "Disneyland was created to fill a vacuum […] that was uniquely regional […] a deep need […] for a human-scale, pedestrian experience of immersion in a three-dimensional narrative."[60]

*Left: Walt Disney and Animator and Collaborator John Hench with the Map of Disneyland, Mid-1950s; right: Walt Disney at the Gate to Adventureland, Late 1950s*



Source: Promotional Disney Photographs

For all three purposes, Walt Disney and his collaborators used the means they knew, the analog simulation processes developed in Hollywood and the California aerospace industry: in particular, methods and tricks of set design, inter alia, forced perspective, the combination of partial scale change and spatial compression, or the so-called wienie, a purposefully set visual cue that directed reception,

60 Pearce, Celia: "Narrative Environments: From Disneyland to World of Warcraft," in: *Space Time Play: Computer Games, Architecture and Urbanism—The Next Level*, ed. Friedrich von Borries, Steffen P. Walz, and Matthias Böttger, Basel: Birkhäuser 2007, pp. 200-205, here p. 201.

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as well as motion platforms, electronic control and automation of visual and acoustic effects.[61] To that extent, the theme park was a child of cinema, though a rebellious one that broke media boundaries with its turn to three-dimensionality. The second parent, however, was television with its principle of programming. "Television […] provided the physical structure for the park. The show was organized around a menu of themes, each one corresponding to a part of the park, or to a sprawling roster of 'lands' […]."[62] In sum, Karal Ann Marling describes the transformation of screenplays and movies, and TV shows into a park as a fusion of fiction and architecture—urban environmental storytelling. "At Disneyland, Walt translated that verbal and pictorial narrative into a material, spatial dimension. He made a city, or a series of cities, that told a story."[63]

In the history of media, the invention of the theme park stands at the intersection of two trajectories. On the one hand, the new medium responded to the same dissatisfaction with the state of industrial reproduction technology that led Bazin to call for the "total cinema" and simultaneously instigated a variety of elaborate technical experiments in the 1950s—from innovative wide-screen formats to 3D films to Mort Heilig's *Sensorama*. Walt Disney's longing for immersive experiences is, therefore, part of cinema's artistic crisis that led to the postindustrialization of the media landscape: to the "new triumvirate of television, wide-screen cinema, and Disneyland."[64]

On the other hand, the new medium also points to the near future, the advent and popularization of an entirely new mediality. By allowing their 'guests' to navigate cinematic narratives interactively, theme park attractions simulated experiences that could not be achieved otherwise, or only at some risk or considerable cost. The medium materially contrived with mechanical-electronic means 'safe' immersive experiences of 'dangerous' events that a few decades later, digital media and, in particular, digital simulations and digital games were to provide virtually. The new medium of theme park entertainment thus occupied an intermediate position between analog audiovisuality (theater, cinema, television) and digital audiovisuality (digital film, digital games, augmented and virtual reality).

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61 Cf. e.g. the summary in M. Blume: "Disney Conquers Another World: Design."

62 K. Marling: "Imagineering the Disney Theme Parks," p. 73.

63 Ibid., here p. 85.

64 Huhtamo, Erkki: "Encapsulated Bodies in Motion: Simulators and the Quest for Total Immersion," in: *Critical Issues in Electronic Media*, ed. Simon Penny, Albany: State University of New York Press 1995, pp. 159-186, p. 162.—Tellingly, Disneyland presented the first 360-degree projection system *Circle-Vision 360°* in 1955.

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The latter's development started in the same period, the years at the end and after World War II, and in parallel to the development of the theme park genre as well as the rise of Las Vegas to an entertainment metropolis.[65] Alan Turing had already conceived the purely theoretical model of a universal computing machine in 1936.[66] Yet it was not until 1945 that John von Neumann, who had co-supervised Turing's dissertation, succeeded in its technological-practical application by developing the model of a stored-program computer, the so-called Von Neumann Architecture.[67] Its main innovation was separating the material machine and its mathematical control. This step created the dualism of what today is hard- and software, more precisely: the software that we call programs.[68]

Three years later, Claude Elwood Shannon proposed a method for digitizing communicative processes and cultural artifacts.[69] The adequate transfer of analog qualities and functions into mathematical values supplied the mathematical universal machine with its universal bit material: texts, sounds, images, etc.—the software we call files. In addition, the digital computer, which initially used cathode-ray tubes to perform its switching, also found a radically new hardware basis in 1948: The invention of the transistor by Bill Shockley et al. enabled a steady process of performance enhancement, miniaturization, and cost reduction. It transformed digital machines from large-scale industrial technology for collective and professional use (mainframes, minicomputers, microcomputers, etc.) into rela-

65 See below Chapter III.

66 Turing, Alan: "On Computable Numbers, with an Application to the Entscheidungsproblem," *Proceedings of the London Mathematical Society* ser. 2. vol. 42 (1936-7), pp. 230-265; corrections, Ibid, vol 43 (1937) pp. 544-546, http://www.abelard.org/turpap2/tp2-ie.asp

67 Neumann, John von: "First Draft of a Report on the EDVAC," (1945), https://web.mit.edu/STS.035/www/PDFs/edvac.pdf

68 The term software itself, however, was not coined until 13 years later. Cf. Leonhardt, David: "John Tukey, 85, Statistician; Coined the Word 'Software,'" *The New York Times*, July 28, 2000, http://www.nytimes.com/2000/07/28/us/john-tukey-85-statistician-coined-the-word-software.html

69 Shannon, Claude Elwood: "A Mathematical Theory of Communication." Reprinted with corrections from *The Bell System Technical Journal*, Vol. 27, pp. 379-423, 623-656, July, October (1948), http://people.math.harvard.edu/~ctm/home/text/others/shannon/entropy/entropy.pdf

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

tively affordable private devices, which could also be used playfully for entertainment purposes (PCs, consoles, handhelds, smartphones, smartwatches).[70]

What categorically distinguishes the digital computer from all analog machines is its universality—the fact that the same (hardware) apparatus, through different (software) controls, can process in multiple ways anything that can be digitized: numbers, texts, sounds, still and moving images, and so on. Analog machines, by contrast, were and are always special machines, limited to specific tasks. With these three innovations, the technological foundations of digital culture were laid at the end of the 1940s—even if their technical realization was to take decades.

The period around 1950 also constitutes a key period because, beyond the technological basics, new ways of cultural networking and knowledge generation and transfer were imagined. Besides Shannon's mathematical theory of information, four publications, in particular, represent this beginning: Vannevar Bush's "As We May Think" (1945)[71]— the vision of a networked personal information device and, at the same time, the origin of software crosslinking and thus of the World Wide Web; Arthur C. Clarke's "Extraterrestrial Relays" (1945)[72]—the onset of global networking and hence the establishment of planetary real-time communication; Alan Turings' "Computing Machinery and Intelligence"[73] —the concept of Artificial Intelligence; James D. Watson's and F. H. C. Crick's "A Structure for Deoxyribose Nucleic Acid" (1953)[74]—the insight into the control of biological life by a decipherable code and thus the beginning of both gene manipulation and a digital image of homo sapiens, which understands our species as a programmed and thus reprogrammable life form.

In their entirety, these seven conceptions between 1945 and 1953 triggered a fundamental thrust of progress. At first, the potential of digitization was realized

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70 On the dialectical relatedness of Shockley's and Shannon's work at Bell Laboratories, cf. e.g. Naughton, John: *A Brief History of the Future: The Origins of the Internet*, London: Weidenfeld & Nicolson 1999, p. 63.

71 Bush, Vannevar: "As We May Think," *The Atlantic Monthly*, July, 1945, http://www.theatlantic.com/unbound/flashbks/computer/bushf.htm

72 Clarke, Arthur C.: "Extraterrestial Relays," *Wireless World* (October, 1945), pp. 305-308, http://www.lsi.usp.br/~rbianchi/clarke/ACC.ETRelays.html

73 Turing, Alan: "Computing Machinery and Intelligence," *Mind*, no. 59 (1950), pp. 433-460, http://www.loebner.net/Prizef/TuringArticle.html

74 Watson, James D. and F.H.C. Cricks: "A Structure for Deoxyribose Nucleic Acid," *Nature*, April 2, 1953, p. 737, http://biocrs.biomed.brown.edu/Books/Chapters/Ch%208/DH-Paper.html

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technologically and economically primarily in the American West, in the region south of the Bay Area, which has been called "Silicon Valley" since the early 1970s precisely because of its rise in the wake of the silicon transistor to a global hub for technological innovation.

The first application of digital technology for entertainment purposes also happened in California, from George Lucas' unique special effects company Industrial Light and Magic in Marin County north of San Francisco to the countless start-ups of game companies in Silicon Valley—Atari, Activision, Blizzard, Electronic Arts, etc.—to the digitization of film production in the direct vicinity of Hollywood. The new genre of the theme park, which also emerged in California during this period of incipient digitalization and essentially anticipated virtual worlds, found its most forceful urban expression, however, just across the California border in Las Vegas, Nevada. Since the 1950s, the desert town rose to become the gambling and entertainment center of the American West—while also hosting the CES, the world's most influential consumer electronics trade show, where digital innovations have been presented annually for decades, from the first computer graphics to the first virtual reality apparatuses to the current attempts to realize the Metaverse.[75]

*Las Vegas in the 1940s: The Construction of El Rancho Hotel and Casino Along the Las Vegas Strip*

Source: Historic Aerial Photograph

75 The first Las Vegas CES was held in 1978. Cf. June, Laura and David Peirce: "Incredible Photos From The CES Vault: 1967 to 2014," *The Verge*, January 4, 2013, https://www.theverge.com/2013/1/4/3828848/ces-photo-history

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*El Rancho Hotel and Casino in the Late 1940s*

Source: Contemporary Promotional Postcard

## III ANTICIPATING AUGMENTED REALITIES: 1950S

The transformation of Las Vegas from a small town of no particular importance to a future place visited and experienced every year by millions of people from all over the world happened in four stages. During the first decades of the 20th century, Las Vegas barely existed. In 1905, when a railway line made it possible to lure players into the desert oasis, a few fake 'Western' saloons, including casinos, were built. They drew their inspiration from the rustic tradition of the frontier, which by then was already obsolete. For over 40 years, little changed in these modest attempts to enhance the experience of gambling through a rudimentary fictionalization. Only with the end of World War II did the second phase begin. It brought the Mafia and modernity to Las Vegas.

As the first of the more 'cosmopolitan' casino hotels, the *Flamingo* opened in 1946 on the Las Vegas Strip, then a rural highway a little more than four miles long outside the actual city limits. Others followed, most famously, the *Sahara* (1952), *The Sands* (1952), *The Dunes* (1955), and the *Stardust* (1958). The bare concrete that characterized these modern buildings was, of course, contrary to the central business objective: a hallucination of the senses as well as the mind that made the visitors forget everyday life and immerse themselves in gambling. The modern architecture that was the rule in the industrial cities of the mid-20th-century, impoverished in themes and signs, had to be adapted to the specific purposes of Las Vegas. This was achieved through electronic embellishment.

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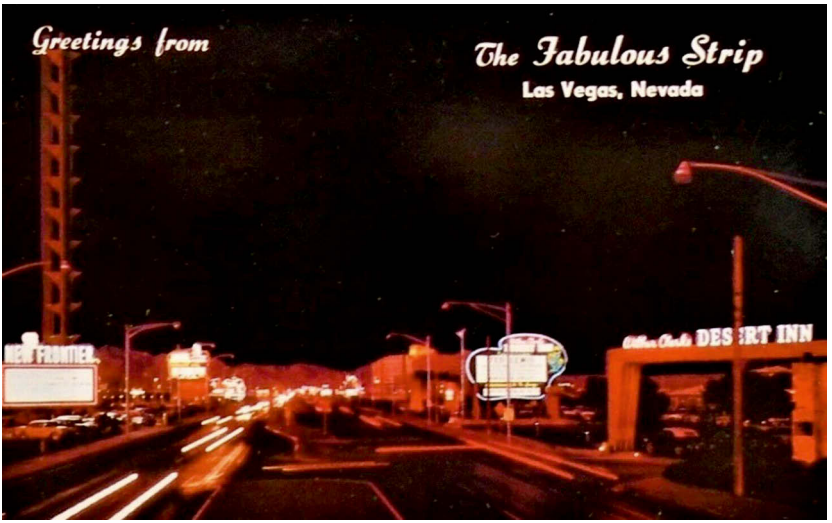
*Las Vegas in the 1950s and 1960s; Top Left: Flamingo Hotel and Casino; Top Middle: Sands Hotel and Casino; Top Right: Stardust Hotel and Casino; Middle Left: Sahara Hotel and Casino; Middle Right: Design Study of the Dunes Hotel and Casino; Bottom: The Las Vegas Strip in the 1960s*




Sources: Contemporary Promotional Photographs and Postcards

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Soon a characteristic of the booming town became the contrast between its 'normal' sight of unadorned buildings in the glaring desert sun and their lavish neon decoration. After sunset, it displayed gigantic bubbling waterfalls, swirling candy-colored hula hoop tires, bikini contours, and thousands of other flickering larger-than-life signs. In its day-night dualism, Las Vegas's neon or neo-modernism was reminiscent—quite in the sense of the inventors—of the landscapes of dreams charged with overdetermined meanings.[76]

The mixture of illusion and functionality of this hitherto unknown mix of modernist architecture and neon signage fascinated the contemporaries. The top-grossing musical film VIVA LAS VEGAS and particularly Elvis Presley's title song captured this excitement.[77] In the same year, *New Journalism* reporter Tom Wolfe eloquently captured neon modernism's sensory effect in his reportage "Las Vegas (What?) Las Vegas (Can't hear you! Too noisy) Las Vegas!!!."[78] One visitor named Raymond he portrayed as "a good example of the marvelous impact Las Vegas has on the senses":[79]

> "He had been rolling up and down the incredible electric-sign gauntlet of Las Vegas' Strip, U.S. Route 91, where the neon and the par lamps—bubbling, spiraling, rocketing, and exploding in sunbursts ten stories high out in the middle of the desert—celebrate one-story casinos.[80] […] Las Vegas has succeeded in wiring an entire city with this electronic stimulation, day and night, out in the middle of the desert."[81]

By creating a new style of architecture and urbanity, Las Vegas, in the early 1960s, had arrived for the first time at the frontier of the future. After researching the popular 'sin city' in 1968, the authors of the seminal architectural study *Learning*

76 Parallel to the development of neon modernism in Las Vegas, neon art emerged "as a significant phase in the development of what was to be electronic art." (Popper, Frank: *Art of the Electronic Age*, New York: Harry N. Abrams 1993, p. 17.)

77 VIVA LAS VEGAS VEGAS (USA 1964, D: George Sidney) was among the top grossing movies of the year, and the biggest success of all Elvis' films. (https://en.wikipedia.org/wiki/Viva_Las_Vegas). The single *Viva Las Vegas* sold 500.000 copies in the US alone (https://en.wikipedia.org/wiki/Viva_Las_Vegas_(song)#cite_note-2).

78 Wolfe, Tom: "Las Vegas (What?) Las Vegas (Can't hear you! Too noisy) Las Vegas!!!!," in: *The Kandy-Kolored Tangerine-Flake Streamline Baby*, New York: Noonday Press, 1966, pp. 3-28.

79 Ibid., p. 5.

80 Ibid.

81 Ibid., p. 7.

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*from Las Vegas* described the constant bombardment with sensory stimuli to which the city exposed its residents and visitors as an "intricate maze" that "disorients the occupant in space and time" by making both appear virtually "limitless."[82] In Las Vegas's unique gestalt, they recognized an anti-modern semiotic system overlaying the structures of geography, "an architecture of communication over space,"[83] an "'architecture as communication for the Information Age (rather than as space for the Industrial Age).'"[84]

Styles in which epochal tendencies express themselves usually emerge as correspondence among economic forces, technical possibilities, and cultural interests. The local and regional trade structures shaped the order of medieval towns built around the market. Later, the metropolises of the 19th century resonated with the national and international industrial economy. Siegfried Giedion judged the skyscrapers that rose to the heavens on the US East Coast in the first half of the 20th century to be "as significant and expressive for our period as the monolithic obelisk of Egypt and the Gothic cathedral tower were for their periods."[85] Similarly, in the second half of the century, the sprawling suburban landscapes of the American West, obscured by advertising signs targeted at drivers, expressed in their car-centered architecture and sub-urbanity the emerging lifestyle(s) of a consumer civilization shaped by mass mobility and mass-brands.

In retrospect, the rapidly growing popularity of Las Vegas as a national and global entertainment destination in the quarter-century after World War II evidenced societal and cultural change. New technology has always led to a re-organization of established forms of work. With digitalization, labor lost its dependence on fixed hierarchical and temporal processes. Furthermore, the share of immaterial production in value creation grew. Its basis was knowledge work, i.e., the networked manipulation of software symbols. Iteration and distributed virtual collaboration replaced linear succession. But to be successful, knowledge work must be probing, investigational, and experimental.[86] As a consequence, playful behavior gained value. Postindustrialization and digital technology, thus, initiated a

82 R. Venturi/D. Scott Brown/S. Izenour: *Learning from Las Vegas*, p. 49.

83 Ibid., pp. 8 ff.

84 Cited after Manovich, Lev: "The Poetics of Augmented Space," *Visual Communication* 5, no. 2 (2006): pp. 219-240, here p. 232.

85 Giedion, Siegfried: *Space, Time and Architecture: The Growth of a New Tradition*, Cambridge: Harvard University Press 1949, p. 635.

86 See Chaplin, Heather: "Will The 21st Century Be Defined By Games?" *Kotaku*, September 12, 2013, http://www.kotaku.com.au/2013/09/will-the-21st-century-be-defined-by-games/

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ludic turn. The rise of both the theme park genre and Las Vegas as the world capital first of gambling and then, in the 1990s, family entertainment owes much to this social shift.

In the history of architecture, the fascination with Las Vegas's neon modernism demonstrated a rising social need for more accessible and meaningful cityscapes. The neon signs flaring up on the concrete facades represented an epochal return of the ornament displaced by modernism and thus its postmodern deconstruction. The "era of capitalist industrialization [had] undercut the symbolic basis of the built environment," Mark Gottdiener wrote in his assessment of industrial urbanity: "Domination of design and planning by modernist principles eradicated developed thematic elements in cities through new construction that avoided symbols […]."[87] Consequently, "[…] capitalist downtowns were relatively devoid of meaning and were functionally structured by the needs of business."[88] Behind modern architecture, of course, were not only economic but also aesthetic intentions. Lev Manovich sums them up:

> "[M]odernist architecture […] communicated its […] narratives (the themes of progress, technology, efficiency, and rationality) through its new spaces constructed from simple geometric forms—and also through its bare, industrial looking surfaces. (Thus the absence of information from the surface, articulated in the famous 'ornament is crime' slogan by Adolf Loos, itself became a powerful communication technique of modern architecture)."[89]

The result, however, was poverty of information, meaning, and sense. Around the middle of the 20th century—compared to the present day—the opportunities to obtain information in urban environments were minimal. Analog street signs, house numbers, bell boards, directional signs, display boards, advertisement posters, etc., were static, therefore often outdated. And even if they were up-to-date, their generality did not necessarily convey the information needed individually at the moment. Additional information, however, could only be gathered in a time-consuming manner through printed listings and guides or verbal inquiries with shopkeepers, receptionists, cab drivers, passers-by, etc. In contrast, the profusion of signs conveying information and meaning in theme park sceneries and the casino hotels' neon modernism can be understood as an attempt to remedy the symbolic and informational paucity of modern architecture and industrial urbanism—as was possible with analog means and media. From today's perspective, Las

87 M. Gottdiener: *The Theming of America*, p. 15.

88 Ibid., p. 27.

89 L. Manovich: "The Poetics of Augmented Space," p. 233.

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Vegas's neon ornaments anticipated the informational and playful augmentation that digital connectivity was to bring.

The idea of supplementing the perception of reality through sign systems was first advanced by *Wizard-of-Oz*-writer Lyman Frank Baum in his 1901 novel *The Master Key: An Electrical Fairy Tale.*[90] Baum imagined futuristic glasses called "character markers." They projected letters on the forehead of every person encountered: "e" for "evil," "w" for "wise," etc. Actual experiments with such augmentation through personalized real-time information started already in the 1950s. Several military projects laid the foundations for the Global Positioning System (GPS), which was then developed since the mid-1970s.[91]

In the 1980s, the concept of mobile—portable and wearable—digital technology was advanced in science as well as in the arts. Telematic installations and immersive environments sought to integrate data and real space and build perceptual bridges between the real and virtual worlds.[92] In 1990, Mazda introduced the first GPS system for consumers that could triangulate a car's position by communicating with satellites in space and augment real-world navigation with individualized directions.[93] The same year, Boeing engineer Thomas P. Caudell coined the term "augmented reality" for such enhancements to human perception, decisions, and actions with networked information in real-time.[94] In the last decade of the century, large-scale scientific projects explored how interactive virtual

90 Baum, L. Frank and Fanny Y. Cory: *The Master Key: An Electrical Fairy Tale, Founded Upon the Mysteries of Electricity and the Optimism of Its Devotees*, Indianapolis: Bowen-Merrill Co. 1901.

91 See Parkinson, Bradford W., Stephen T. Powers, and others: "The Origins of GPS, and the Pioneers Who Launched the System. Part 1," *GPS World*, May 1 2010, https://www.gpsworld.com/origins-gps-part-1/

92 See Freyermuth, Gundolf S.: "Computer machen Leute," *c't–magazin für computertechnik*, February 16, 1998, pp. 90-97; Negroponte, Nicholas (with Neil Gershenfield): "Wearable Computing," *Wired*, Dezember, 1995.

93 Steinquist, Paul: "The Future of Car Navigation Has Arrived," *The New York Times*, February 25, 2021, https://www.nytimes.com/2021/02/25/business/GPS-car-systems.html

94 Caudell, Thomas and David Mizell: "Augmented Reality: An Application of Heads-Up Display Technology to Manual Manufacturing Processes," *Proceedings of the Twenty-Fifth Hawaii International Conference on System Sciences* 2 (1992), pp. 659-669, https://www.researchgate.net/publication/3510119_Augmented_reality_An_application_of_heads-up_display_technology_to_manual_manufacturing_processes

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sign systems could replace the existing analog ones.[95] The first hybrid synthetic vision system was presented by NASA in 1999.[96] In 2000, Bruce Thomas developed ARQuak, the first mobile augmented reality game, opening up urban space to playful interaction.[97]

In Las Vegas, this tendency to anticipate the emerging augmentation of the urban space reached its peak in 1995 with the opening of the *Fremont Street Experience*. It was designed by Californian architect Jon Jerde, a pioneer of entertainment architecture. As one critic wrote, Jerde wanted to tear down "the walls between celluloid and reality."[98] He sought to bring about the virtual superimposition of material reality with mediated information and narratives. At the cost of $70 million, he spanned Fremont Street, the historic center of gambling around the *Golden Nugget* casino hotel, with a massive canopy, half a kilometer long, 27 meters high, and lit by two million lights. Like the transistors of an LCD monitor, they served, together with the 540,000-watt sound system, to present digital audiovisions. The decisive factor for the success of the *Fremont Street Experience* was less the architecture itself than the program for which the canopy provided the projection surface. The evening shows, controlled by 121 computers, transformed the urban space into a gigantic display of virtual entertainment. Mark C. Taylor drew the connection between cityscape and data space:

"Long associated with the seedy side of old Vegas, 'Glitter Gulch' recently has been transformed into what is, in effect, a gigantic computer terminal or virtual-reality machine. Vegas city planners have converted the train terminal, that was inspired by the glass architecture of the Parisian arcades, into a computer terminal to create the new space

95 For example, the Endeavour Expedition (University of Berkeley, http://endeavour.cs.berkeley.edu) or the Oxygen-Project of the MIT Media Lab (http://oxygen.lcs.mit.edu)

96 N.N.: "Synthetic Vision Would Give Pilots Clear Skies All the Time," *NASA*, April 22 2008, https://www.nasa.gov/centers/langley/news/factsheets/SynthVision.html

97 Piekarski, Wayne and Bruce Thomas: "ARQuake: The Outdoor Augmented Reality Gaming System," *Communications of the ACM* 45, no. 1 (January 1, 2002), pp. 36-38, https://www.academia.edu/2218400/ARQuake_the_outdoor_augmented_reality_gaming_system

98 Iritani, Evelyn: "A Mall Master Takes On the World: Architect Jon Jerde Believes Cities Can Be Saved Through an Infusion of Fantasy and Fun That Blurs Cultural Boundaries. Not Everyone Likes the Idea," *Los Angeles Times*, July 5, 1996.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

of the virtual arcade. […] To roam through Glitter Gulch is to discover the timely timelessness of terminal space."[99]

The fusion of architecture and urban planning with the info design of communication media anticipated a shift in the civilizational space-time structure. Las Vegas engaged in adapting urban space to digitalization. In his classic study *City of Bits*, which appeared the same year the Fremont Street Experience opened, William J. Mitchell described a similar transformation: "The worldwide computer network—the electronic agora—subverts, displaces and radically redefines our notions of gathering place, community, and urban life."[100] Subsequently, at the turn of the 21st century, Joel Kotkin observed the emergence of a new "digital geography":

"[T]he rise of the digital economy is repealing the economic and social geography of contemporary America. The digital revolution not only accelerates the speed with which information is processed and disseminated, it also restates the relation of space and time within our communities."[101]

The telos of change seemed to be the replacement of the industrial city by the information-rich real-time city, in which location- and time-dependent information can be called up by the individual as needed—an augmented urban experience that only became recognized as an imminent future with mobile broadband networking after the turn of the millennium.[102]

99 Taylor, Mark C.: *Hiding*, Chicago: University of Chicago Press 1997, p. 262.

100 Mitchell, William John: *City of Bits: Space, Place, and the Infobahn*, Cambridge Mass.: MIT Press 1995, p. 5.

101 Kotkin, Joel: *The New Geography: How The Digital Revolution Is Reshaping the American Landscape*, New York: Random House 2000, p. 3.—Kotkin, however, countered Mitchell's assertion that virtualization would render the question of location irrelevant: "In truth, the importance of geography is not dwindling to nothing in the digital era; in fact, quite the opposite. In reality, place—geography—matters now more than ever before. If people, companies, or industries can truly live anywhere, or at least choose from a multiplicity of places, the question of where to locate becomes increasingly contingent on the peculiar attributes of any given location." (Ibid., p. 6).

102 On the utopia and emergence of the real-time city, cf. e.g. Freyermuth, Gundolf S.: *Kommunikette 2.0*, Hannover: Heise 2002, pp. 125 ff. and Rheingold, Howard: *Smart Mobs: The Next Social Revolution*, Cambridge, Mass.: Perseus Pub. 2002.

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*Freemont Street in Downtown Las Vegas; Top: the Neon 1950s; Middle: First Iteration of Freemont Street Experience Mid-1990s; Bottom: 2020s*

Source: Contemporary Promotional Postcards

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In sum, Las Vegas's neon modernism shared with the following periods that it was an epochal style. It allowed for observing the decline and deconstruction of classical modernism as well as the superimposition of the material reality with informational virtuality ahead of time. Of course, apart from the on-and-off and up-and-down flickering of the neon lettering and garlands that suggested movement, the information and narratives presented were as static as pre-modern ornamental forms of architecture. Only "today's electronic dynamic interactive displays make it possible for these messages to change continuously," creating "a potential space of contestation and dialog, which functions as the material manifestation of the often invisible public sphere," as Lev Manovich writes.[103]

Even though Las Vegas transformed itself into a future place with neon modernism anticipating digital enhancement of urban experiences, this phase was almost completely erased from the Las Vegas Strip since the late 1980s. One after the other, the classic casino hotels were imploded as their neon adorned facades and signature parking lots had to make place for something radically new.[104]

## IV ANTICIPATING THE ULTIMATE DISPLAY: 1960S

The origin of the subsequent two phases—the creation of immersive interior spaces and then immersive exterior spaces anticipating postmodern and digital architecture, as well as the virtualization of space in games and VR—dates back to the early 1960s. Under the influence of Hollywood, especially the epic historical drama CLEOPATRA,[105] real-estate developer Jay Sarno designed an entirely novel kind of casino hotel. When, after almost four years of construction, it opened in 1966, *Caesar's Palace* was the first casino to shift the usual gambling interactions into an immersive fictional space. In his history of special effects, Norman M. Klein describes the flashy interior decor featuring "'Rome swings,' and a Circus Maximus' showroom' [that] lined the 'exact' copies of Venus de Milo, Canova's Venus, many Venuses. Poolside was an 'Olympic'-sized replica of the baths of

103 L. Manovich, "The Poetics of Augmented Space," p. 232.

104 For example, *The Dunes* was demolished in 1993 and replaced with *The Bellagio*; *The Sands* was demolished in 1996 and replaced with *The Venetian*. See for descriptions and videos Kachelriess, Rob: "The 10 Best Implosions in Las Vegas History," *Thrillist*, February 25, 2014, https://www.thrillist.com/entertainment/las-vegas/the-10-best-implosions-in-las-vegas-history

105 CLEOPATRA (USA 1963, D: Joseph L. Mankiewicz)

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Pompeii, where showgirls dressed like Cleopatra greeted guests […].”[106] The casino, writes Laura Bieger, “promised its visitors an imaginary journey to the ‘imperial Rome.’”[107]

*Caesar’s Palace Developer Jay Sarno Riding a Flower Chariot with Entertainer Line Renaud on Opening Day August 6, 1966*

Source: Contemporary Promotional Photograph

Besides the direct influence of Hollywood cinema, a second inspiration was apparent: the aesthetics of fairs, circuses, amusement parks like *Coney Island* in New York, the Viennese *Prater*, the *Tivoli* in Copenhagen, and, of course, Disneyland. When Jay Sarno planned *Caesar’s Palace*, he took the new kind of themed transmedial environments that Disney had created a few years earlier as a model. But for his special needs, Sarno had to adapt the exterior attractions and thrill rides of the gated theme park to the interior environments of his semi-public casino hotel. This appropriation can be understood as an internalization of theme park

106 Klein, Norman M.: *The Vatican to Vegas: A History of Special Effects*, New York: New Press 2004, p. 4. See also L. Bieger: *Ästhetik der Immersion*, p. 161.

107 L. Bieger: *Ästhetik der Immersion*, p. 124 (Footnote 64), my translation.

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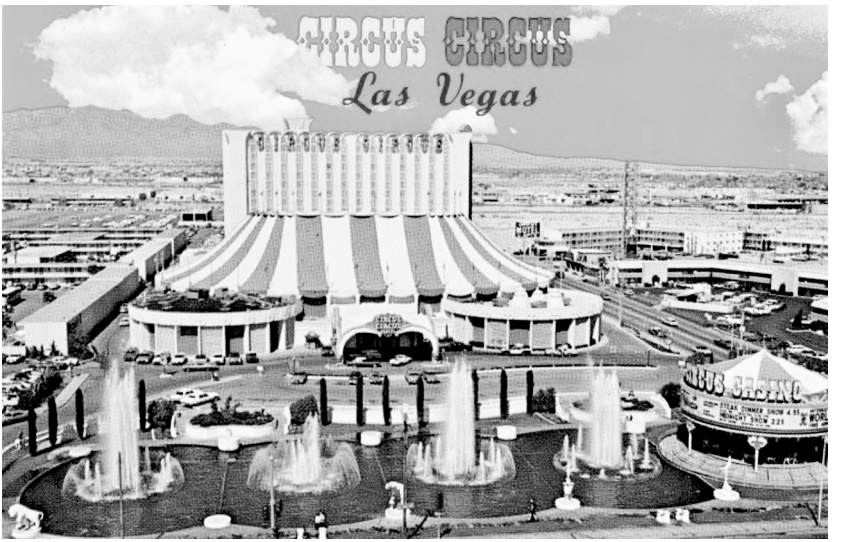
aesthetics. Most importantly, with the transfer from outside to inside, Sarno retained Disney's artistic intentions of heightened immersion. While Disneyland replaced cinema screens with built spaces and movie audiences that watched immobilized in their seats with walking theme park guests, *Caesar's Palace* replaced the standard Las Vegas attraction of neon signs, which could only be seen as long as one had not yet entered the casino, with themed interior environments that completely immersed visitors, i.e., gamblers, in a fictional recreation of antiquity.

*Circus Circus, Early 1970s*




Source: Contemporary Promotional Postcard

Two years after *Caesar's Palace*, Sarno opened a second casino hotel with sumptuous stage settings, the *Circus Circus*. In adapting circensic aesthetics to the casino's interior world, Sarno went two steps further than with *Caesar's Palace*. First, he integrated gambling and movement play—in the terminology coined by Roger Caillois in the late 1950s: alea and ilinx.[108] In his semi-factual account *Fear and Loathing in Las Vegas*, self-declared Gonzo journalist Hunter S. Thompson portrayed, with some disgust, *Circus Circus's* surreal blend of the thrill of gambling with sensations of vertigo:

108 Caillois, Roger: *Man, Play and Games*, Urbana: University of Illinois Press 2001 (*1958), pp. 12 ff.

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"[…] so you're down on the main floor playing blackjack, and the stakes are getting high when suddenly you chance to look up, and there, right smack above your head is a half-naked 14-year-old girl being chased through the air by a snarling wolverine, which is suddenly locked in a death battle with two silver-painted Polacks who come swinging down from opposite balconies and meet in mid-air on the wolverine's neck." [109]

*Circus Circus, Early 1970s*

Source: Contempory Promotional Photographs

Thompson's description also reveals the second innovative moment of the casino. *Circus Circus* facilitated an immersion in ludic sensations completely beyond the distanced window view as it had been originally established in modern painting and then continued by the theater. Their worlds and events could be viewed but not entered.

"In the industrial age, cinema continued the tradition of the window view. The framed screen, originally also covered by a curtain, processed aesthetically, as Anne Friedberg argued, the industrial experience of the mobilized gaze through—mostly closed—glass

109 Thompson, Hunter S.: *Fear and Loathing in Las Vegas: A Savage Journey to the Heart of the American Dream*, New York N.Y.: Warner Books 1982 (*1971), p. 46.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

windows of different means of transportation moving faster and faster through the natural as well as the urban landscape. Later, in the second half of the 20th century, this everyday experience of transparent distance from moving images found its mediated correspondent in the framed glass screens of TVs (and then computers)."[110]

In their employment of perspectival tricks of theatrical and cinematic stage settings and the consistent presentation of tableaux, Disneyland and *Caesar's Palace* still played on the cultural habit of window gazing. As Thompson's description makes clear, *Circus Circus* finally transcended the framed gaze of analog audiovisual media. The casino placed the gambling visitors in a room—or more correctly: tent—with the acrobats, positioning them in the arena.

How pioneering this experiment in enhancing audiovisual immersion was can be deduced from the fact that, at the same time, two other completely different areas of research pursued a very similar goal. One is the emerging discipline of computer graphics. Yvan Sutherland founded the field with his 1962 MIT dissertation *Sketchpad, A Man-Machine Graphical Communication System*, for which he programmed the first interactive graphics program.[111] Three years later, when Disneyland celebrated its tenth anniversary, and *Caesar's Palace* was nearing completion, Sutherland, then a professor at Harvard, presented a radical theoretical concept—the "ultimate display":

"The ultimate display would, of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. […] With appropriate programming such a display could literally be the Wonderland into which Alice walked."[112]

Thus, an ultimate display for computer graphics should move the experience of visual content away from the window view—the view on the simulation of a framed window—and into the perspectival picture behind it. It would not show

110 G. Freyermuth: "From Analog to Digital Image Space: Towards a Historical Theory of Immersion," p. 181. See also Friedberg, Anne: *Window Shopping: Cinema and the Postmodern*, Berkeley: University of California Press 1993.

111 Sutherland, Ivan Edward: *Sketchpad: A Man-Machine Graphical Communication System*, New York: Garland Pub. 1980 (*1963), https://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-574.pdf. The thesis advisor was Claude E. Shannon.

112 Sutherland, Ivan Edward: "The Ultimate Display," in: *Multimedia: From Wagner to Virtual Reality*, ed. Randall Packer and Ken Jordan, New York: Norton 2001 (*1965), pp. 232-236.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

2D copies of reality or images created in 2D but imagery that would be real in the sense that the user would be immersed and could experience the (audio-)visual worlds interactively.

In the following years, Sutherland tried in various ways to devise and construct elements of such an "ultimate display." In 1968, the year *Circus Circus* opened, he demonstrated the first head-mounted display (HMD), a cumbersome contraption nicknamed "The Sword of Damocles," the great grandfather of today's VR goggles.[113] What could not yet be realized as a room thus became a space for privatized perception. Simultaneously, Sutherland and his team programmed a scene generator, the great grandfather of game engines, that allowed the interactive manipulation of computer graphics, such as flight simulations.[114] With these three innovations: the concept of the Ultimate Display as not a window but a room, the HMD as a technical substitute for such a room, its simulation, and the Scene Generator as the software program to create immersive interactive visuals, Sutherland, in the second half of the 1960s, laid the foundations for virtual realities.

The second area of research that moved beyond the window view in the 1960s and placed the previous viewer in a room with the images was holography. In the late 1940s, Dennis Gabor, a physicist who had fled Nazi Germany for Britain, had proposed how a complete three-dimensional image could be recorded in form and projected into real space—by recording not just intensity (amplitude) and color (frequency) as photography did but also the phase of light. In 1971, he was to receive the Nobel Prize for his research. But at first, the technical means did not exist to reliably realize Gabor's experimental concept.

In contrast to the relatively slow development of hologrammatic research was its rapid progress in science fiction. Since Isaac Asimov's groundbreaking *Foundation* trilogy (1951-1953), novels, feature films, television series, and digital games have imagined holographic characters and worlds.[115] David J. Pizzanelli

113 Sutherland, Ivan Edward: "A Head-Mounted Three Dimensional Display," *AFIPS '68 (Fall, part I): Proceedings of the December 9-11, 1968, fall joint computer conference, part I*, December, 1968, pp. 757-764, https://www.cise.ufl.edu/research/lok/teaching/ve-s07/papers/sutherland-headmount.pdf

114 Rolfe, J. M. and K. J. Staples: *Flight Simulation*, Cambridge [Cambridgeshire]; New York: Cambridge University Press 1986, p. 234.

115 Asimov, Isaac: *Foundation*, New York: Gnome Press 1951; Asimov, Isaac: *Foundation and Empire*, New York: Gnome Press 1952; Asimov, Isaac: *Second Foundation*, New York: Gnome Press 1953.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

has analyzed this myth of holography as an expression of mass psychological needs for immersive imagery.[116]

In practice, hologrammatic recordings became possible only after the development of laser light in the 1960s, based on calculations made by Albert Einstein as early as 1917.[117] Holography thus established itself as a scientific field of research. In parallel, a multitude of artistic experiments occurred worldwide. Particularly in the psychedelically oriented counterculture of the American West, the seemingly weightless light sculptures fascinated the hippie public. At the same time, the transition from static to moving holographs was accomplished. In 1969, American physicists produced a 30-second holographic film showing tropical fish in an aquarium.[118] Exhibitions of holographic works that experimented with light and movement in ways never before seen attracted hundreds of thousands of visitors.[119] The first "School of Holography" opened in San Francisco in 1971, and the first "Museum of Holography" in New York in 1976.[120] Among the most successful pioneers of holographic art were the Americans Stephen Benton, Robert Whitman, James Turrell, Rockne Krebs, the Dutchman Rudie Berkhout, and the German Dieter Jung.[121] Even commercial mass medial use, for example, holographic television, no longer seemed out of the question at the time.[122] In this context, the position of analog holography in media history can be identified: as a techno-aesthetic break with the tradition of simulating three-dimensionality in perspective.[123]

116 Cf. Pizzanelli, Daniel J.: "The Evolution of the Mythical Hologram," *Proceedings of the SPIE. The International Society for Optical Engineering* (1992), pp. 430-437.

117 K. Popper: *Art of the Electronic Age*, p. 29.

118 Kac, Eduardo: "Beyond the Spatial Paradigm: Time and Cinematic Form in Holographic Art," Sixth International Symposium on Display Holography 3358 (1998), https://www.spiedigitallibrary.org/conference-proceedings-of-spie/3358/0000/Beyond-the-spatial-paradigm--time-and-cinematic-form-in/10.1117/12.301482.short?SSO=1

119 Johnston, Sean F.: "Whatever Became of Holography?" *American Scientist*, November/December, 2011, https://www.americanscientist.org/article/whatever-became-of-holography

120 Ibid.

121 K. Popper: *Art of the Electronic Age*, p. 29.

122 S. Johnston: "Whatever Became of Holography?"

123 Desbiens, Jacques: "The Dispositif of Holography," *Arts* 8, no. 1 (2019), p. 28, https://www.mdpi.com/2076-0752/8/1/28. "[T]he holographic dispositif breaks with the perspective tradition and opens a new field of artistic research and experimentation."

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The parallels to aesthetic experiments in Disneyland and Las Vegas are apparent: the movement from passive viewing to active entry into fictional spaces. In popular entertainment, this was undertaken by creating themed environments in the material world; in computer graphics, by designing themed environments in the realm of software; in holography, by recording not only amplitude and frequency—the different brightness and color—as in regular photography but also the phase of the object wave, i.e., the shape of the object. However, the drastic difference was in the (audio-)visual quality of the created experiences. The low resolution and 'unrealism' of the fledgling interactive computer graphics as well as of holography in the 1960s and 1970s, reminiscent of rough sketches or ghost images, contrasted considerably with the—so to speak 'high-resolution'—realism of the built fantasy worlds of Disneyland, *Caesar's Palace,* and *Circus Circus*.

Comparing these corresponding efforts to overcome the distanced window view in favor of a participatory entry into artificial worlds, it seems that theme parks and the Las Vegas entertainment architecture tried to produce experiences in the material world for which there was a specific demand that the emerging new analog and digital media could not satisfy yet. From this perspective, the themed attractions of the 1960s in the American West appear as anticipations; on the one hand of the contemporary holy grail of computer graphics: the "ultimate display" as a means for interactive spatial immersion; on the other hand of a holographic projection of images into real space, as it became possible only in our century with digital holography and its fusion with practices of augmented and virtual reality.

## V ANTICIPATING VIRTUAL WORLDS: 1990S

The aesthetic and economic risk Jay Sarno had taken with the partially themed casino hotels *Caesar's Palace* and *Circus Circus* found no successor in the corporate culture of the 1970s and early 1980s. Parallel to the decline of industrialism, Las Vegas entered a crisis that was both economic and aesthetic. Fremont Street, the old downtown gambling center, experienced inner-city decay like many major American cities. As time went by, even Las Vegas's ubiquitous neon magic started to wear thin. The mixture of lack of imagination and sleaziness that ensued deterred well-heeled gamblers. In the 1980s, aesthetic stagnation was followed by an economic recession.[124] During the day, Vegas resembled a typical, sprawling

124 "By the late seventies, however, the number of visitors to Las Vegas had plateaued and even briefly declined." (Lehrer, Jonah: "Royal Flush: How Roger Thomas

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American midtown. Empty strips of dusty desert lay between the aging concrete bunkers. At night, when the ten, twelve-story-high neon signs transformed the fortress-like fronts of the casino hotels, the entertainment possibilities beyond gambling were limited to half a dozen better restaurants and a selection of shows by stars whose best times lay behind them. Las Vegas was going out of fashion.

Toward the end of the decade, however, the fourth phase started: the biggest building boom in the city's history. Between 1989 and 1999, almost a dozen megaresorts were erected for over $10 billion on the Strip alone.[125] The driving force behind this new beginning was a change in the financing model: from dependence on gambling to its combination with family-oriented tourism.[126] It all started with Steve Wynn's *The Mirage*. When it opened in 1989, it was the first new casino hotel built on the Strip in thirteen years and with construction costs of nearly $630 million, the most expensive ever. Offering over 3,000 rooms, *The Mirage* was also the world's largest hotel and, most importantly, the first to replace neon signs with immersive fantasy environments. "Neon is cheap," Wynn declared: "It's yesterday's Las Vegas."[127] Inside the tropical hotel, the rainforest grew, and waterfalls roared. The actual sensation, however, awaited visitors before they entered: Wynn did away with the parking lot and illuminated facades and opted instead for a 3D volcano, seventeen meters high. After dark, the volcano erupted at regular intervals, thundering and spewing fire high in the sky—deliberately obstructing the guests' view of the old neon strip.

*The Mirage* marked the beginning of a dozen such fantasy environments spilling from the casinos' interiors onto the boulevard.[128] Just four years later, Wynn

redesigned Vegas," *The New Yorker*, March 19, 2012, https://www.newyorker.com/magazine/2012/03/26/royal-flush-2)

125 Among the most expensive new buildings were: *MGM Grand* (1993, ca. $1.1 billion); *Luxor* (1993-1998; ca. $1.2 billion); *New York New York* (1997, ca. $460 million); *Bellagio* (1998, ca. $1.6 billion); *Paris* (1999, ca. $760 million); *The Venetian* (1999, ca. $2.5 billion).

126 N.N.: "Vegas Hopes to Lure Families," *Journal and Courier*, December 3, 1989, https://www.newspapers.com/newspage/264230932/

127 Ibid.

128 The name *Mirage* was an obvious choice when building a tropical oasis in a desert city. However, it is at the same time an interesting coincidence that 'mirage' also served as the first known explanation of the term virtual reality: "When the French polymath Antonin Artaud introduced the expression 'la réalité virtuelle' as a description of theater in his 1932 essay 'The Alchemical Theater,' he […] likens theater to

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took this transition from two-dimensional neon aesthetics to three-dimensional entertainment environments a step further with *Treasure Island*. The casino hotel was themed as a pirate's nest and featured a street-side bay with two galleons that engaged in naval battles several times per day. Further down Las Vegas Boulevard, the *Excalibur* opened that same year, slated to be King Arthur's castle with candy-colored battlements and towers. Other fantasy resorts built during the decade were the Spanish 'Hemingway' village of *Sunset Station* hotel and the one-billion-dollar *Mandalay Bay*, the forbidden city of a lost South Sea culture. In its sandy bay, guests could surf in the desert for the first time thanks to a wave machine.[129]

Striking about these so-called 'megaresorts' that shot up in Las Vegas during the 1990s was not only that they introduced immersive 3D exteriors. Remarkable was also that many of these new spaces no longer promised immersion into fictional worlds—as the interiors of *Caesar's Palace* and *Circus Circus* had done since the 1960s, and the exteriors of *The Mirage*, *Treasure Island, Excalibur,* or *Mandalay Bay* since the early years of the construction boom. Starting in 1992 with another interior world, the Roman alleys and squares of *Caesar's Palace Forum Shops*, Las Vegas's entrepreneurs suddenly aspired to replicate existing monuments or cities. This new group of 'simulations of the real' included, in addition to the replicas already mentioned—Rome (1992/98) and Paris (1999)—the pyramid of *Luxor* (1993), the skyline of *New York, New York* (1997), the Italian Lake Como village at the foot of the *Bellagio* (1998), and—most expensive and most spectacular—*The Venetian* (1999), a life-size recreation of Venetian landmarks.

Two complementary forces seem to have been driving this turn to simulations of real places. The first explanatory model compares Las Vegas's replicas to the compressed and stylized mental images travelers tend to form of tourist destinations. Materializations of such personal memories and collective visions of the real—"architectural translations of locales"[130]—have been created for entertainment purposes since leisure traveling became a social desire and widespread practice. In the 19th and early 20th century, 'ersatz' and memory places ranged from

the 'fictitious and illusory" world of alchemy. Both of them are 'virtual arts,' and both involve a 'mirage' […]." (D. Chalmers: *Reality+*, loc. 3089.)

129 CF. for example Booth, Cathy: "In With The New," *Time*, November 2, 1998, http://content.time.com/time/world/article/0,8599,2053901,00.html

130 L. Bieger: *Ästhetik der Immersion*, p. 142, my translation.

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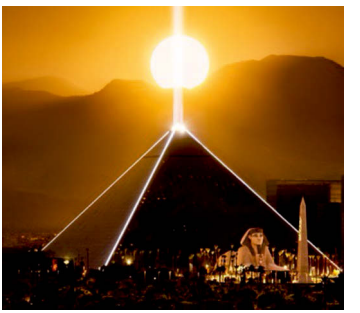
*City Simulations on the Las Vegas Strip, 1990s: Top: New York New York Hotel and Casino; Bottom Left: Paris Hotel and Casino; Bottom Right: The Luxor Hotel and Casino*



Source: Promotional Photographes of the Hotel Casinos

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panorama buildings whose paintings and diorama-like installations showed distant cities or landscapes to spectacular amusement park attractions. One of the most celebrated was the entertainment park "Venice in Vienna," which opened in 1895 on 50,000 square meters of the public *Prater* park and featured artistic reproductions of Venetian buildings and canals navigable by gondolas.[131]

A second approach positions Las Vegas's turn to simulations of the real at the frontier of digital culture. As mentioned above, Robert Venturi, William J. Mitchell, and numerous other theorists have explained the effect of digital technology and media on architecture and urbanity as a fundamental paradigm shift, not least in the perception of time, space, and the world, the increasing intertwining of material and virtual structures.[132] What began around 1990 in Las Vegas—the simultaneous dislocation of real-world places and their structural compression—could thus indicate the emergence of a new epochal style: the transition from industrial modernism and postmodernism to architecture and urban planning oriented towards digital culture and emerging lifestyles that have as their vanishing point a Metaverse-like fusion of reality and virtuality.

The elaborate simulation of cities and monuments, especially *The Venetian*, thus testify to an architectural adaptation comparable to the rise of panoramas and passages in early industrialization. The zones of Las Vegas, where simulations of real places were clustered and made their concentrated impact, were no longer part of a city in the modern sense but resembled virtual realities—aesthetically entirely and, to a lesser extent, functionally. These analog simulations of virtuality through real montages—the creation of post-realities whose aesthetic experience sought to replace the 'originals' that existed far away or only in fiction—foreshadowed the emerging transmedial realization of virtuality.[133]

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131 N.N.: "Venedig in Wien," *Wien Geschichte Wiki*, June 6, 2017, https://www.geschichtewiki.wien.gv.at/Venedig_in_Wien.—In addition to stores, restaurants, cafés, wine taverns and beer gardens, numerous stages offered concerts, operettas, revues, and wrestling tournaments.

132 Cf. Carpo, Mario: *The Alphabet and the Algorithm*, Cambridge, Mass.: MIT Press 2011; Shepard, Mark: *Sentient City: Ubiquitous Computing, Architecture, and the Future of Urban Space*, New York City, Cambridge, Mass.: Architectural League of New York; MIT Press 2011.

133 Technically, the themed architecture was made possible not least by the development of new high-tech machinery and building materials. Cf. e.g.: "So much lightweight material, including plastic designed to simulate nonplastic, is now used in the construction of the physical world that, according to a study published in a recent issue of the journal Daedalus, the amount of mass required to build the physical reality

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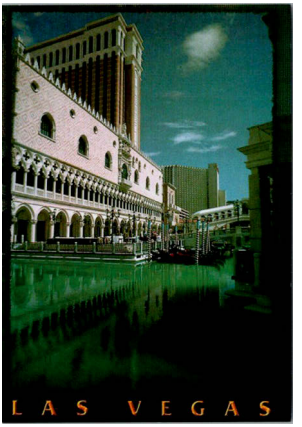
*The Venetian; Top Left: Promotional Postcard, 1990s; Top Middle: Exterior Canal with Gondolas; Top Right: Interior Canal with Gondola; Bottom Left; Replica of Doge Palace; Bottom Right; Replica of Campanile Tower.*



Sources: Promotional Postcards, Promotional Photography, and Gundolf S. Freyermuth

around us has on a per capita basis actually begun to decline." (Murphy, Cullen: "The Real Thing," *The Atlantic Monthly*, August 1997, https://www.theatlantic.com/magazine/archive/1997/08/the-real-thing/376923/)

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In digital graphics, related attempts were made to enable immersive experiences of artificially created environments without the costs, imponderables, and dangers of physical actions or journeys. Ivan Sutherland's 1960s experiments with head-mounted displays for flight simulations had led to the "Visually Coupled Airborne Simulator," produced for the US Air Force. These HMDs cost about $1 million apiece and seemed so futuristic that—in the times of the first STAR WARS sequels and the S*trategic Defense Imitative*, which was derisively nicknamed "Star Wars" as well—they were referred to as "Darth Vader helmets."[134] By the mid-1980s, however, the leading military technology became considerably cheaper due to a NASA project using prefabricated parts. Its goal was to build simulation systems that could be navigated and manipulated interactively but independently of specific hardware.

At this point, Jaron Lanier came into play. The young artist earned his living designing video games, including the successful music game MOONDUST for the Commodore 64.[135] But he was also experimenting with what was then called virtual environments (VE). Lanier recognized that NASA's approach meant the progression from 'special simulations' such as flight or driving simulations with specific hardware—certain cockpits, and so forth—to 'universal simulations,' i.e., simulation apparatuses as universal as the digital computer is a universal machine. For this new software-based simulation environment, which promised to realize Sutherland's concept of the ultimate display partially, Jaron Lanier coined the term *Virtual Reality*.[136]

In 1987, VPL Research—Lanier's company—built the first such universal simulation machine as a commercial product, the $250 000 *EyePhone.* It consisted of a Macintosh computer, serving as the control system, and two Silicon Graphics workstations, each of which calculated the virtual worlds at 30 frames per second for one eye. The head-mounted display featured built-in stereo speakers and two LCD eye monitors producing stereoscopic 3D images. A data glove or a full-body DataSuit completed the hardware setup. *EyePhone's* centerpiece was the

134 Bye, Ken: "50 years of VR with Tom Furness: The Super Cockpit, Virtual Retinal Display, HIT Lab, & Virtual World Society," *Voices of VR Podcast*, November 17, 2015, https://voicesofvr.com/245-50-years-of-vr-with-tom-furness-the-super-cockpit-virtual-retinal-display-hit-lab-virtual-world-society/

135 MOONDUST (Creative Software Inc. 1983, O: Jaron Lanier)

136 Steuer, Jonathan: "Defining Virtual Reality: Dimensions Determining Telepresence," *Journal of Communication*, no. 42, 4 (1992), pp. 73-93, here p. 73, https://steinhardtapps.es.its.nyu.edu/create/courses/2015/reading/steuer.pdf

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proprietary software that could dynamically execute a multitude of simulations—from flight to architecture to games—using the same set of hardware.[137]

More than thirty years later, the modernity of the system is stunning. The *EyePhone's* electromagnetic movement detection allowed for the first time two or more users to experience a virtual space simultaneously.[138] The software adjusted the virtual 3D worlds according to the direction of their gazes and gestures. Interactions in VR seemed like magic. Consequently, Lanier thought VR was "the dawn of a new era, like when Columbus returned to Spain with news of the New World. Only this time, the New World is infinite; it's the virtual world, still largely uninvented and unexplored."[139] Far-reaching hopes like these were widespread in the early 1990s when VR enjoyed its first boom phase though it was still expensive and somewhat primitive. In his classic reportage *Virtual Reality: The Revolutionary Technology of Computer-Generated Artificial Worlds—And How it Promises and Threatens to Transform Business and Society,* Howard Rheingold captured the spirit of optimism sparked by the new medium.[140]

Under capitalist circumstances, however, all utopian approaches—concepts as well as technologies—intertwine with their commercial exploitation, as Frederic Jameson has pointed out, albeit from the opposite perspective:

"[…] the works of mass culture cannot be ideological without at one and the same time being implicitly or explicitly Utopian as well: they cannot manipulate unless they offer some genuine shred of content as a fantasy bribe to the public about being so manipulated."[141]

Rheingold saw the situation of the utopian medium of virtual reality no differently. During the boom phase of the construction of imaginary places and copies of existing 'exotic' locales on the Las Vegas Strip, the "marriage of VR and Vegas

137 Sorene, Paul: "Jaron Lanier's EyePhone: Head and Glove Virtual Reality in the 1980s," *flashbak*, November 24, 2014, https://flashbak.com/jaron-laniers-eyephone-head-and-glove-virtual-reality-in-the-1980s-26180/

138 Mandel, Margery: "Careers: Entrepreneur Laid Foundations In Another World," *Boston Herald*, June 16, 1996.

139 Scheinin, Richard: "Through the Looking Glass: 'Virtual Realities' Can Take Us Into Other Worlds," *Chicago Tribune*, February 18, 1990.

140 Rheingold, Howard: *Virtual Reality*, New York: Summit Books 1991.

141 Jameson, Fredric: "Reification and Utopia in Mass Culture," *Social Text* 1 (1979): pp. 130-148, here p. 144, https://pdfs.semanticscholar.org/0106/0805d5df2d3ea7d050efa3a356a83aeb942e.pdf?_ga=2.178703139.644611213.1609164918-2123797577.1609164918

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[seemed] inevitable": "By building 'destination resorts' with fantasy experiences at the center, the casinos are appropriating the high-end illusion business from the moviemakers and theme parks."[142]

## VI ANTICIPATING VIRTUAL DESIGN: 1990S

In association with Las Vegas's usurpation of mass cultural entertainment tropes, central aesthetic methods of Hollywood movies and theme park attractions were also adopted and adapted. Particular significance gained cinematic editing and aesthetic theming, the design practice from which the theme park derived its name. An excellent example is the replica of the French capital on the Las Vegas Strip. When, between 1995 and 1999, the *Paris Las Vegas Hotel & Casino* was conceived and constructed, its design did not only point back to constitutive elements of Paris as a future place that Walter Benjamin had identified and which had since become mass cultural stereotypes. It also anticipated in the material world the affordances of future transmedia works by testing and developing processes of design and simulation that were applied almost twenty years later in the development of the virtual recreation of another long-past Paris in ASSASSINS' CREED UNITY.[143]

Thus, Las Vegas's dual turn to both artificial exterior 3D environments in general and simulations of the real in particular can be considered as one more attempt to fulfill aesthetic desires that digital technology had created but could not meet yet. These desires focused on profound improvements and enhancements of fictional worlds as well as reality itself—on what we now call hyperrealism and hyperreality.

Initially, the term hyperrealism referred to the final phase of Pop Art when fine artists challenged photography's territory of representationalism.144 Since the mid-1960s, Robert Bechtle, Chuck Close, Richard Estes, et al. employed the means of painting to produce pictures that looked as if a camera had captured them. Their works denoted a documentary-like visual impression without possessing the indexicality of analog photography, i.e., a direct and secure reference to something material. Today, we tend to call all photorealistic-looking images

142 Rheingold, Howard: "Total Immersion. Douglas Trumbull's Big Budget VR," *Wired*, November, 1993, http://www.wired.com/wired/archive/1.05/luxor.html. Rheingold wrote on the occasion of the opening of the Luxor Hotel and the Trumbull ride; see below p. 76.

143 ASSASSINS' CREED UNITY (Ubisoft 2014: Ubisoft Montreal)

144 Chase, Linda: *Hyperrealism*, London: Academy Editions 1975.

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hyper-realistic if they result not from an imprint of physical reality but digital animation; for example, within a game engine.

In contrast to hyperrealism, hyperreality does not refer to just a visual style but specific forms of reality: meticulously designed and materially built 'real' environments. The term goes back to Umberto Eco, who formulated his theory of hyperreality while visiting the United States in the 1970s.[145] He assumed that the imitation of works of art and the complete or select reproduction of historical monuments, as it had become customary in and outside of theme parks in the US, resulted in realities that were 'more real' than the works and environments they replicated because the process of replication included enhancement. Eco claimed that these super-realities—hyper-realities—would be "more real than reality"[146] and thus, the less spectacular 'original' "reality will always be inferior to it."[147]

Walt Disney's theme park hyperrealities were based primarily on two techniques. Both stemmed from the 2D medium of film, and both were adopted and refined in Las Vegas during the 1990s. The first procedure was of photographic origin. Every shot of still or moving images selects sections of reality and the perspective on them, thus creating—by the exclusion of unwanted sights—a distinctive perception, i.e., meaning. Disney applied this photographic and cinematic principle of focusing the viewer's gaze on elements that define style and meaning to the construction of 3D attractions. The design procedure of selecting audiovisual signs that denote and connote a distinctive aesthetic and meaning for the respective attraction, Disney called *theming*. From the multitude of competing, if not contradictory, opportunities for communication and meaning-making—in real-world cities, for example, through the random combination of buildings of the most diverse epochs and functions, through signposts and advertising signs—the process creates 'more beautiful' and 'more meaningful' environments that, however, stay recognizable. The goal is aesthetic filtering, the elimination of 'noise,' the excess that in the original models—realities as well as fictions—seem accidental or too multilayered, inconsistent, or confusing. Theming unifies appearances in style and statement.

Disney's second technique originated in cinematic storytelling: the design of a narrative continuum through the montage of perspectivized reproductions. This conditioning and formatting of the theme park experience, Disney called *scripting*. Theme parks do not present exact copies of real or fictional worlds. Instead, their

145 Eco, Umberto: *Travels in Hyper Reality: Essays*, San Diego: Harcourt Brace Jovanovich 1986.

146 Ibid., p. 45.

147 Ibid., p. 46.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

attractions follow the dialectical duplicity of selection and narrative montage as it had evolved in the first half-century of Hollywood filmmaking. This origination of the topics and the artistic design of the theme park from Hollywood cinema has often been noted.[148] Consequently, Disney called his *Main Street*, the entry into Disneyland, "Scene One" because it constituted the beginning of the theme park's three-dimensional stories.[149]

In direct contrast to the photorealistic principle of authenticity, theming and scripting apply to reality what is the rule in designing machines: optimization of the interface. The theme park's various "lands" were quicker to comprehend and easier to navigate than the more complex fictions and realities that modeled for them. Theming and scripting treat reality—or existing fictions—as changeable commodities. These raw materials are first stripped of all but the 'strongest' elements, those that, in a sense, remain in memory from the distance of days or months. In the second step, the remaining components are arranged to tell a better and more comprehensible story than was previously the case. The transfer of the two basic techniques of photorealistic production of moving images from their temporal 2D continuum into the spatial 3D continuum of architecture and cityscape, therefore, no longer resulted in any realism. Rather, the shaping of reality through cinematic processes, i.e., perspective, selection, and montage, produced de-realization: hyperrealistic buildings and environments that seemed more real than any reality yet had no exact counterpart. Eco accordingly defined hyperrealities as "the absolute fake […] where the boundaries between game and illusion are blurred."[150]

Several American architecture critics subsequently developed similar partly morally, partly politically motivated criticism of theme parks and Las Vegas. The urban designer Michael Sorkin, for instance, coined the term "Disneyfication" and spoke of an "architecture of deception."[151] Likewise, Ada Huxtable lamented the loss of authentic reality, the "replacement of reality with selective fantasy."[152] In the 1990s, beyond architectural criticism, the theme park genre became a symbol of what was new and either exhilarating or deplorable about post-industrial mass

148 See above p. 35f.

149 K. Marling: "Imagineering the Disney Theme Parks," p. 61.

150 U. Eco: *Travels in Hyper Reality*, p. 8.

151 Sorkin, Michael: "Introduction: Variations on a Theme Park," in: *Variations on a Theme Park: The New American City and the End of Public Space*, ed. Michael Sorkin, New York: Hill and Wang 1992, pp. xi-xv.

152 Huxtable, Ada Louise: *The Unreal America: Architecture and Illusion*, New York: New Press: Distributed by W.W. Norton 1997.

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culture. Susan G. Davis noted, for example, the "ordinariness of the theme park—its easy availability as a metaphor for much of contemporary mass culture."[153]

The way in which the artificial theme park worlds blurred the boundary between reality and fiction had a stylistic impact on the other contemporary arts, just as the narrative methods of film once had. Brian Eno, for example, saw in theme parks a "relatively new cultural form that is going to become more and more a place for artists to look."[154] Just as positively, Nicholas Negroponte characterized hypertext stories as "more of a theme park than a book."[155] However, the same aesthetic influence, insofar as it affected traditional media and genres, was negatively perceived by cultural critics.[156] The fact that blockbuster films and bestselling novels, for example, increasingly dispensed with (photo-) realistic storytelling and assimilated the fantastic thrill structure of themed attractions became a widespread lament.[157]

The designers and builders of the entertainment architecture that burgeoned in Las Vegas in the 1990s did adopt essential methods of theme park construction, particularly theming. But they adapted their approach twofold: first, to the fact that their public resorts lacked the control that gated theme parks afforded; second, to the enhanced possibilities that ensued from digital design, reproduction processes, and construction methods. *The Venetian* probably best exemplifies these advances in theme park aesthetics—particularly its relationship to digital imagery.

153 Davis, Susan G.: "Variations on a Theme Park: The New American City and the End of Public Space," *The Nation*, August 31, 1992.

154 Cited after Kelly, Kevin: "Eno: Gossip Is Philosophy. Kevin Kelly Talks to the Prototypical Renaissance 2.0 Artist," *Wired*, May, 1995, http://www.wired.com/wired/archive/3.05/eno_pr.html

155 Negroponte, Nicholas: *Being Digital*, New York: Vintage 1996 (*1995). p. 72.

156 Cf. on the criticism of Disney's innovations Marcus, Greil: "Forty Years of Overstatement. Criticism and the Disney Theme Parks," in: *Designing Disney's Theme Parks: The Architecture of Reassurance*, ed. Karal Ann Marling, Montréal, Paris, New York: Flammarion 1997, pp. 201-207.

157 Cf. e.g. Jonathan Coe's angry review of Spielberg's second Jurassic Park film, in which he remarks that Hollywood is moving "away from storytelling toward a kind of theme park experience:" "Spielberg has made a theme park, not a movie (although on one level the film seems to regard itself, laughably, as a critique of theme park culture), and the real genetic monstrosity here is not the velociraptor or the pterodactyl, but the mutation of what was once intended as an art-form into a mere machine for quickening the pulse." (Coe, Jonathan: "The Lost World Jurassic Park," *New Statesman*, July 18, 1997.)

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Erected for $2.5 billion on the site where the legendary *The Sands* used to stand, it was the most expensive and spectacular of the new casino hotels. When it opened at the end of the decade and the building boom, *The Venetian* offered a true-to-scale, but spatially compressed version of the Italian original, including a 96-meter-high Campanile, Canale Grande, and Rialto bridge; all of them created art-historically exact in plaster and marble. Robert Venturi, who a quarter-century earlier had recognized the cityscape of old neon Vegas as trailblazing, now analyzed the new development as a series of transformations from "signs to scenes," "electric to electronic," and, most shrewdly, "neon to pixel."[158] What is accurate about this observation is that the artistic methods and aesthetic principles underlying the *Venetian's* architecture are very close to those of digital photo-editing:

"While Disney had still oriented itself on the model of film and serially assembled perspective reproductions of details, the *Venetian's* designers, aesthetically following the guidelines of their software tools, constructed its elements along the lines of digital image processing. From what they perceived to be the 'model' or source material, they created an improved counter-reality, a super-reality in which all traces of processing and assembling were erased in hyper-realistic seamlessness."[159]

A few years later, Laura Bieger analyzed Las Vegas's aesthetic procedures similarly:

"It is, in other words, the image of a computer-simulated super-city that manipulates its reference reality with digital image processing techniques (e.g., cut-and-paste, clean-up, and smoothing procedures), achieving immense spatial and temporal compression. […] the new Las Vegas image space is a material translation of a virtual computer image."[160]

The decisive difference to digital photo-editing, however, is that *The Venetian* and many similar exterior and interior themed environments, for example the *Forum Shops* of *Caesar's Palace,* were not a montage of images but spaces. They turned the visual illusion of 'enhanced' and 'edited' 2D photos into massive architecture, a montage of the real, realized in materiality. As a result, the 'fake' Venice or Rome cannot only be looked at but entered and experienced with all senses.

158 R. Venturi: "Las Vegas After Its Classical Age," pp. 127-128.

159 Freyermuth, Gundolf S.: "Digitalisierung: Die transmediale Konversion von Kunst und Unterhaltung in der zweiten Hälfte des 20. Jahrhunderts" (Diss phil, Free University Berlin, 2004, p. 283, my translation.)

160 L. Bieger: *Ästhetik der Immersion*, p. 208, my translation.

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*Outdoor Environments Simulated Indoors: The Forum Shops of Caesar's Palace in the late 1990s*

Source: Gundolf S. Freyermuth

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## VII ANTICIPATING VIRTUAL AGENCY: 1990S

With their fantasy worlds or simulations of 'exotic' real-world places, the new mega-resorts managed to change the image of "sin city." Las Vegas's immersive 3D environments successfully appealed to new demographics, especially middle-class families with children. As a result, the last decade of the 20th century saw a unique economic boom. Contributing to this growth of visitors and revenues, in addition to the individual 3D attractions, was the large number of new casino hotels. Collectively, they transformed the Strip from a car-centric suburban street into a busy promenade.

Not ten years earlier, the eight kilometers of the Strip had to be explored by automobile. Most of the casino hotels stood at a great distance from each other, offering self-contained experiences. Visiting the various casinos produced a sequence of distinctive aesthetic experiences, similar to attending various cinema showings. The casinos' neon signs, better visible from afar than from too close, corresponded to this standard approach by car, as did the concrete parking lots that lay as a buffer zone between the Strip and the lobbies' entrances. In the nineties, the typical Las Vegas neon facades disappeared with almost no exception. Taking their place were fantasy installations such as *Treasure Island's* Buccaneer Bay, *Bellagio's* Lake Como, and the *Venetian's* Piazza, as well as people movers—electric walking belts, occasionally covered and air-conditioned—that transported the public past the installations and into the casino hotels.

"[T]he Las Vegas Strip has become one of the most pedestrian-oriented urban areas in the American West. […] If the postwar Strip was symptomatic of the suburban sprawl of the United States, the 21st-century Strip is representative of a nationwide migration from suburbia back to the cities, America's 'urban renaissance.'"[161]

The change in the sensory experience of the city was dramatic. Suddenly, several fantastic 3D environments competed with each other. Mark Gottdiener was one of the first to describe the effect: "Each differentiated casino with its separate theme, standing juxtaposed against other casinos, produces an overarching intertextuality that is the grand text of Las Vegas [....]."[162] To the rationally constructed 'real montage' of themed casino hotels, the Strip represented the irrational counterpart.

161 Cf. Al, Stefan: "The Most American City Isn't New York, L.A., Or Chicago," *Fast Company*, November 4, 2017, https://www.fastcompany.com/90109341/learning-from-las-vegas-no-really

162 M. Gottdiener: *The Theming of America*, p. 103.

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Individually, aesthetically self-contained worlds of experience were presented. In sum, the immersion resembled an aesthetic mad dash. The unplanned effect when strolling along the densely built-up Strip, as was now customary, amounted to disorientation. The jumble of fascinating monuments seemed as abrupt as if a drugged editor had spliced together the highlights from a dozen very different films: Paris of the twenties, Rome of the present, a flame-breathing volcano, the Campanile, a Caribbean pirate's nest, etc. Such a psychedelic effect of hyperreal illusion architecture, Umberto Eco described already in his 1970s analysis of San Luis Obispo's themed *Madonna Inn*:

"To convey its external appearance […], we can only venture some analogies. Let's say that Albert Speer, while leafing through a book on Gaudi, swallowed an overgenerous dose of LSD and began to build a nuptial catacomb for Liza Minnelli."[163]

However, the Strip's timeless, unhinged thematic chaos was familiar not only to those with drug experiences. The World Wide Web's few early adopters knew similar disorientation. Global digital networking allowed in virtuality for the first time what the Strip empowered strollers to do in reality: an abrupt commute between places and times and between simulacra of real attractions and others that related solely to cultural fantasies. It became possible, for example, to jump within seconds from the virtual presence of a German bank in Frankfurt to a stockbroker in New York, from a bookstore in Seattle to a library in Munich, from the *Los Angeles Times* to the Hamburg *Spiegel* magazine, from a *Star Trek* website to a Lufthansa flight schedule, and then into the world of knights in an online game. Cruising or strolling on the Strip resembled the contemporary experience of surfing the Web. If the individual gestalt of the themed casinos was aligned with image processing, their agglomeration was aligned with the central experience of virtual communication: the arbitrary neighborhoods of the emerging WWW.

As a material foreshadowing of networked 3D online worlds, the themed buildings and cityscapes, however, lacked the fluidity and interactivity of software. In the public sphere of the Strip, as in the semi-public sphere of the casino hotels, it was difficult to supplement the experience of immersion with that of playful interaction and to use scripting to control the narrative reception of the themed environments. Las Vegas's entertainment architecture used the history or histories of many people and nations, which they partly reconstructed authentically and partly freely expanded. But the hotel casinos themselves did not tell any stories. Their architects and designers felt this shortcoming and tried to remedy it.

163 U. Eco: *Travels in Hyper Reality*, p. 24.

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The first approach consisted in resorting to passive attractions, the kind of voyeuristic and exploratory curiosity that was otherwise reserved for circuses, zoos, theaters, vaudeville, and trips around the world. The spectrum of what the hotel casino's integrated in the nineties, depending on their 'theme,' ranged from the artistic acts of *Circus Circus* to the spectacle of the volcano that regularly erupted in front of the *Mirage*, to the elaborate water features of the *Bellagio* and the cinematic sea battle in front of *Treasure Island*. Other examples included the *Mirage's* tigers in glass cages, the *Bellagio's* dépendance of the Guggenheim Museum presenting the world's most valuable collection of Impressionist paintings, the *Venetian's* gondola rides, the animatronic Atlantis show at the *Forum Shops*, where Poseidon fought his fiery son and icy daughter for succession to lightning, smoke and fountain steam, and the *Luxor's* authentic replica of the Tomb of Tut-Ench-Amun and gigantic laser beam still visible 400 kilometers away. Spectacles were thus embedded in the architectural 3D immersion, some of them at least rudimentarily narrative. However, the voyeuristic curiosity was satisfied at the price of removing physical immersion: the visitors to the themed buildings were once again transformed into passive viewers. They were no longer part of the fiction, but only its audience.

For this lack, a second group of productions tried to compensate with participatory spectacles. Most casino hotels employed extras who greeted the visitors and encouraged them to participate in the respective 3D fiction by interacting playfully. The *Circus Circus*, for instance, had clowns, the *Paris* flics and bike messengers delivering baguettes, the *Star Trek Hilton* Klingons and Ferengis, and the *Venetian* prominent residents like Marco Polo as well as marauding squads of masked carnivalists. Themed guest meals also served the same goal of participatory immersion. The *Excalibur* offered medieval dining, the *Star Trek Hilton* food as a science fiction experience, and the *Caesar's Palace* had a Magical Empire dinner theater with jugglers and ghosts who romped around the Roman catacomb tables.

Finally, the third group of productions sought to set the audience itself in motion, thus organizing narrative sequences along the lines of the journey, the archetypal figure of storytelling. While the paths of single walkers could hardly be controlled, and therefore it was impossible to determine how they individually received the 3D fictional spaces, their positioning in vehicles allowed for a detailed pre-planning of the sequences and thus better scripting of the themed experience. The *Luxor*, for example, invited its guests to take a Nile ride from the reception to the elevator as an initiation; the *New York, New York* featured a Coney Island roller coaster ride around the Empire State Building, Statue of Liberty, and other replicated city landmarks; the *Paris* offered a high glide to the observation deck of the

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Eiffel Tower; the *Venetian* provided a half-hour gondola ride with 'real' Venetian gondoliers on the inner and outer canals of the artificial city.

These attractions had their historical model in the driving pleasures that emerged with industrialization:

"The ideas of encapsulating bodies in a 'machine' and physically moving them to produce pleasure was already a central feature of the earliest mechanical amusement park attractions in the late nineteenth century, such as water 'chutes,' Ferris wheels, and roller coasters. Their proliferation was clearly related metapsychologically to the increasing mechanization of man's relationship to his surroundings and to his experience of time and space. Being 'bonded' to different technological 'prostheses' was as traumatic as liberating […]."[164]

Rides on fixed routes and at controlled speeds that defined the perceptual range were also an essential form of theme park entertainment, starting with Disneyland in the 1950s—along with more subtle forms of navigational guidance, such as structural obstacles or signage. Unlike the rides of industrial amusement parks, however, these installations used to be not only themed but also scripted: "Narrative was what separated Disneyland from all those other parks."[165] The fast-paced rides were complemented by themed scenic design. Extras or animatronic automata generated additional narrative elements. In the process, Erkki Huhtamo writes, "two-dimensional motion picture stories and spaces, were reconstructed in three-dimensional space and transformed into amusement park rides."[166] For example, *Adventureland's* JUNGLE RIVER CRUISE, the most spectacular ride when Disneyland opened, was modeled after John Huston's 1951 film AFRICAN QUEEN: "It was a cinematic experience, an art director's pipe dream composed of curves and well-placed switchbacks that hid one part of the set from another and so preserved the illusion."[167]

The necessity to organize narrative movement as a ride in real space suggested building up narrative tension beyond theatrical elements as an escalating series of those physical thrills that every mechanical movement of the body beyond its

164 E. Huhtamo: "Encapsulated Bodies in Motion," p. 167.

165 K. Marling: "Imagineering the Disney Theme Parks," p. 74.

166 E. Huhtamo: "Encapsulated Bodies in Motion," p. 162.

167 K. Marling: "Imagineering the Disney Theme Parks," p. 105. See also "[…] Harper Goff's original rendition of Adventureland's Jungle River Cruise, the boats inspired by the Bogart-Hepburn African Queen, was easily the greatest of all the new Disney 'ride' genres at the park's opening in 1955." (Sklar, Marty: "The Artist as Imagineer," Ibid., Montréal, Paris, New York: Flammarion, pp. 13-17, here p. 15.).

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natural capacities produces. The exact scripting of such thrills functioned as the narrative complement to environmental theming. At first glance, this play on danger seemed to conflict with the fundamental aesthetic promise of the theme park genre "to create a cultural space where people could experience, however briefly, freedom from fear."[168] However, it was precisely the theme park's fundamental aesthetic of "reassurance" that made the enjoyment of physical danger possible. Disney thus used Kant's insight that the experience of the "dynamically sublime," such as the "nature as might,"[169] turns into an object of curiosity as long as we do not believe ourselves to be in physical danger. The entire passage reads as if Kant had already visited the Las Vegas of the 1990s:

"[C]onsider bold, overhanging and, as it were, threatening rocks, thunderclouds piling up in the sky and moving about accompanied by lightning and thunderclaps, volcanoes with all their destructive power, hurricanes with all the devastation they leave behind, the boundless ocean heaved up, the high waterfall of a mighty river, and so on. Compared to the might of any of these, our ability to resist becomes an insignificant trifle. Yet the sight of them becomes all the more attractive the more fearful it is, provided we are in a safe place."[170]

Thanks to digital control technology, the end of the 20th century saw a dramatic change in what could be created as a 'safe' experience in the material world. For example, Six Flags' California park *Magic Mountain* opened the $20 million SUPERMAN—THE ESCAPE ride in 1997. Its highlight was a fall from twice the height of the Niagara Falls, during which consumers became cosmonauts by first having to withstand the pressure of 4.5 times the force of gravity and then experiencing space weightlessness for 6.5 seconds.[171] Casino hotels could hardly compete with such rides in their confined urban exteriors and limited indoor spaces. Therefore, in the competition for the audience, they focused on a new type of attraction that had become available since the late 1980s: virtual rides that moved the motion thrills out of the material world and into software-driven simulations.

168 Watts, Steven: "The Magic Kingdom: Walt Disney and the American Way of Life," *The New Republic*, June 15, 1998.

169 Kant, Immanuel: *Critique of Judgment*, Indianapolis, Ind.: Hackett Pub. Co. 1987 (*1790), p. 119.

170 Ibid., p. 120.

171 Cf. Ferrell, David: "Riding A Speeding Bullet: You Can Test Your Nerves Of Steel On Superman the Escape," *Los Angeles Times*, March 13, 1997; N.N.: "Roller-Coasters: Hold On To Your Hat," *The Economist U.S. Edition*, February 24, 1996.

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## VIII ANTICIPATING VIRTUAL PLAY: 1990S

In the early 1980s, when *Time* magazine declared the personal computer the "Machine of the Year,"[172] when William Gibson's novel *Neuromancer*[173] invoked entry into Cyberspace and when the first transmedia GUI computer, the Mac, was launched, when Woody Allen imagined the merging of fiction and reality in THE PURPLE ROSE OF CAIRO,[174] when NASA researchers made a data helmet out of cheap Radio Shack merchandise, and Jaron Lanier founded the company that was to be the first to turn virtual reality into a purchasable product, the new entertainment genre of virtual rides also emerged, working with both analog and digital simulation. Of all the variants of contemporary entertainment, only virtual rides—using aerospace know-how and advanced military-industrial control technology and robotics—enabled thematic immersion and scripted interaction both in a confined space and without endangering the participants. Though the ride-shows were fundamentally simulations, the artistic concept was no longer just a matter of realistically creating individual sensations like flying, as military and commercial flight simulators or attractions at fairgrounds used to do. Instead, the objective was an immersion into entire fictional worlds through transmedial and environmental storytelling.[175]

A key artist whose achievements can outline this development was Douglas Trumbull.[176] Like Walt Disney a generation before, the filmmaker considered the level of immersion offered by 2D feature films to be insufficient. While working on the special effects of science fiction classics such as 2001—A SPACE ODYSSEY, SILENT RUNNING, CLOSE ENCOUNTERS OF THE THIRD KIND, and BLADE RUNNER,[177] Trumbull explored ways to increase audience immersion. The future of

172 McCracken, Harry: "Time's Machine of the Year, 30 Years Later," *Time*, January 4, 2013, https://techland.time.com/2013/01/04/times-machine-of-the-year-30-years-later/

173 Gibson, William: *Neuromancer*, New York: Ace Books 1984.

174 THE PURPLE ROSE OF CAIRO (USA 1985, D: Woody Allen)

175 Cf. Carson, Don: "Environmental Storytelling: Creating Immersive 3D Worlds Using Lessons Learned from the Theme Park Industry," *Gamasutra*, March 1, 2000, https://www.gamedeveloper.com/design/environmental-storytelling-creating-immersive-3d-worlds-using-lessons-learned-from-the-theme-park-industry

176 Greenwald, Jeff: "Trumbull's Vision," *Wired*, January, 1997, http://www.wired.com/wired/archive/5.01/fftrumbull_pr.html

177 2001—A SPACE ODYSSEY (GB/USA 1968, D: Stanley Kubrick); SILENT RUNNING (USA 1972, D: Douglas Trumbull); CLOSE ENCOUNTERS OF THE THIRD KIND (USA 1977, D: Steven Spielberg); BLADE RUNNER (USA 1982, D: Ridley Scott).

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cinema, he said, "was occurring outside of mainstream cinema—in theme park rides and attractions and world's fairs."[178] This insight allowed Trumbull to become perhaps the most influential avant-gardist of motion cinema.

In 1974, he designed the first motion capsule. Ten years later, he built the first virtual ride, A TOUR OF THE UNIVERSE, for $10 million.[179] The attraction simulated a spaceport of the future year 2019, from which a shuttle took off on a round trip towards Jupiter. The spectacular ride caught the attention of George Lucas. The creator of the transmedial STAR WARS universe commissioned Trumbull to design STAR TOURS, a STAR WARS ride adaptation for Disneyland.[180] It opened in early 1987. Technically, the virtual ride was based on the computer-controlled synchronization of wide-screen film images, pre-produced and presented on spherical screens, with hydraulic movement platforms, such as those used to train combat pilots. Aesthetically, STAR TOURS allowed for a physically tangible real-time participation in typical STAR WARS action.

Six years later, Douglas Trumbull produced the first such attraction in Las Vegas. IN SEARCH OF THE OBELISK, located in the *Luxor Hotel & Casino,* became the gold standard of the new genre. It was advanced in both aesthetic and technical terms. The narrative quality heightened that the ride through the fictitious cave under the pyramid was the first part of a fantasy trilogy called SECRETS OF THE LUXOR PYRAMID, i.e., it was—initially—embedded in a broader fictional context.[181] The first-person-audiovisuals owed their technical superiority to two improvements. First, the analog captured ride film was digitally enhanced. Second, the projection of the hybrid images—partially photorealistic, partly hyperrealistic[182]—was synchronized with a novel motion device developed by Trumbull and

178 Greenwald: "Trumbull's Vision."

179 Conroy, Ed: "The History of the Tour of the Universe Spaceship Simulator at the CN Tower," *blogTO*, October, 2019, https://www.blogto.com/city/2020/09/tour-of-the-universe-cn-tower/. The promotional video can be watched here: https://www.youtube.com/watch?v=yfjcbsYQK1I&t=47s

180 STAR TOURS opened in 1987 and closed in 2010. A year later the successor ride STAR TOURS—THE ADVENTURE CONTINUES opened.

181 For critics and the public alike, however, the ride itself remained the main attraction. Cf Gorman, Tom: "Weekend Escape: Las Vegas; The Strip Says, 'Kids, Got Clean Thrills For You, But You Gotta Bring Your Boring Parents. Deal?'" *Los Angeles Times*, November 20, 1994. Part 2 and 3 of the attraction were closed after a relatively short time.

182 Ibid., p. 22.

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controlled by 40 Silicon Graphics workstations and a dozen other computers.[183] IN SEARCH OF THE OBELISK was, in Trumbull's words, an "experiment in finally going over the edge of a belief barrier through careful control of photography and projection, to the point where a motion picture can be seen to be a real live event."[184]

The success established the trend for virtual reality entertainment in Las Vegas. By the end of the 1990s, dozens of simulators had been put into operation. The defense company McFadden alone installed some 30 simulator platforms.[185] The majority—such as the CINEMA RIDE at *Caesar's Palace* or the THEATER OF SENSATIONS at *The Venetian*—were aimed solely at fairground thrills. Some productions, however, could rival Trumbull's IN SEARCH OF THE OBELISK, such as the $35 million RACE FOR ATLANTIS in the *Forum Shops* annex of *Caesar's Palace*.[186] Its dramatic elements were limited to sportive competition, but the grippingly realistic Imax 3D images made the ride unique.

The most artistically and technically advanced attraction opened, after three years of construction, at the Las Vegas Hilton in early 1998: STAR TREK: THE EXPERIENCE. The $70 million, 6,000 square-foot installation mixed analog and digitally generated simulations with various scenes featuring actors.[187] Director Mario Kamberg had the material spaceship models used in the STAR TREK TV production scanned and digitally generated two-thirds of the four-minute film. The other third consisted of traditionally shot and digitally enhanced images. The ride film was shown in a hyper-realistic replica of DEEP SPACE NINE, the space station from the STAR TREK series.[188] The entirely digitally controlled 3D backdrops had

183 Swain, Bob: "Specially Effective Fun: Interactive Movies," *The Guardian*, August 25, 1994.

184 H. Rheingold: "Total Immersion. Douglas Trumbull's Big Budget VR."

185 N.N.: "Virtual Rides Take Off," *Los Angeles Times*, August 4, 1997.

186 RACE FOR ATLANTIS (USA 1998, D: Arish Fyzee), https://www.giantscreencinema.com/Films/Film-Database/FilmDatabaseDetailView/movieid/239

187 Rubin, Judith: "Are You Experienced? Landmark Entertainment, Paramount Parks, and a Galaxy of Artisans Beam Aboard the $70 Million Star Trek Extravaganza at the Las Vegas Hilton," *TCI (Theatre Crafts International)*, April, 1998.

188 N.N.: "Presskit Star Trek—The Experience," 1999.—See also Freyermuth, Gundolf S.: "Holodeck heute," *c't–magazin für computertechnik*, August 30, 1999, pp. 72-77, http://freyermuth.com/reprints/archiv2008/reprintJMar2008/Holodeck_heute.html.—There are several videos documenting STAR TREK-THE EXPERIENCE; for example *Star Trek: The Technorama Experience* (2008, 49 min.; https://www.youtube.com/watch?v=LulQBf4kLnk) and *The Final Frontier of Star Trek: The Experience – Las*

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37 themed scenes. Elements of the museum, the theater, and a second simulation—a 'real' elevator ride that ended with the virtual abduction into the future—further supplemented the immersion to create an interactive fiction totaling 22 minutes in length. 700 000 visitors flocked to the facility in the first six months after it opened, and waiting times of two hours were not uncommon.[189] The central appeal of STAR TREK: THE EXPERIENCE was the possibility of personal participation in a popular mass cultural fiction. "The experience most people have had with STAR TREK over the years has focused on watching television or a movie," Producer Rick Berman stated. "This blows away the proscenium."[190]

The experience of presence was significantly enhanced by the outstanding characteristic of ride films, which set them apart from regular cinematic productions: The viewers in their motion seats followed the events from a first-person perspective, subjectivized as if in a stream of consciousness. Psychologists first described this effect in the late 19th century. Avant-garde writers then employed it as a narrative technique in the early 20th century. Audiovisually, the origins of the first-person perspective go back to the first decades of the 20th century as well, to early flight simulators using point-of-view silent movies.

While the narrative cinema, with a few exceptions, avoided the first-person perspective—the most famous of these exceptions is the noir murder mystery LADY IN THE LAKE[191]—it found its further technological development in the analog flight simulators of the 1950s and 1960s. Remote-controlled TV cameras 'landing' into model landscapes enabled for the first time interactive first-person simulations.[192] Since the 1970s, flight simulation switched to digital 2D and later

*Vegas | Expedition Extinct* (2020, 28 min; https://www.youtube.com/watch?v=RXcq5C_yAQc)

189 Except for the room-sized reconstruction of the Enterprise D from STAR TREK—THE NEXT GENERATION, the command bridge and the large corridor, all facilities existed twice. That's why the shows could start 30 seconds apart. At peak times, about 2000 paying time travelers per hour were transported into the simulated future. See N.N.: "Presskit Star Trek—The Experience."

190 Cited after ibid.

191 LADY IN THE LAKE (USA 1947, D: Robert Montgomery)

192 J. Rolfe/K. Staples: *Flight Simulation*, p. 156.— Rolfe, J. M. and K. J. Staples: *Flight Simulation*, Cambridge [Cambridgeshire]; New York: Cambridge University Press 1986, p. 156.—At the same time, Walt Disney also started to experiment with first person perspectives. The perspective of analog rides in Disneyland often put the visitors in the role of the hero. The cast of the 1955 ride *Snow White*, for example, spared Snow White: "[S]he was absent in representational form because the spectator was

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3D polygon graphics generated and manipulated in real-time. In the late 1980s, when motion rides gained popularity, the first-person perspective was used with particular effectiveness in Virtual Reality. In addition to Lanier's *EyePhone* and other goggle-based systems, the contemporary options included *CAVE* installations (*Cave Automatic Virtual Environment*), which used a set of projectors and 3D glasses and were demonstrated first in 1991.

Compared to these VR experiences, the increased immersion that motion rides achieved by exploiting the first-person perspective contrasted with the continued immobilization of the viewers in their seats, even though these seats were moving a few inches in synchronization with the moving images of the ride film.

"Although motion simulators have tried to bridge the gap between the audience space and the virtual world of the screen and to create a more dynamic response from the passengers, they still share a very traditional nineteenth-century conception about the audience. It was encountered in the diorama as well as in the opera or the melodrama theatre."[193]

The virtual rides ran automatically and identically, like any film, and thus independently of the audience and its behavior. As a result, the experience was physically intensive but still primarily passive. Only before and after the motion ride, when the participants moved by foot through themed narrative spaces, often guided by actors, opportunities arose to interact. To this end, the typical attraction had three stages. The pre-show or onboarding produced "the immersive experience by gradually dissolving the border separating the physical world and the virtual world of the screen, even though this takes place in the sphere of play and the willing suspension of disbelief."[194] It was followed by the ride-show as the centerpiece and then the post-show or debriefing, which predominantly had the audience exit through an appropriately themed gift store, i.e., a sales area whose offers were mainly merchandising goods from the just lived-through fiction.

The ride-show itself usually consisted of three acts as well. The first act was about establishing the normality of the fictional world. Actors, appropriately costumed, introduced the participants to the supposed event or travel plan and instructed them how to react to certain dangers or emergencies, which were, of course, presented as very unlikely. Thereupon the announced ordinary course of events would set in, usually a form of visiting, sightseeing, or voyage. An

meant to take her place in the story." (K. Marling: "Imagineering the Disney Theme Parks," p. 75)

193 E. Huhtamo: "Encapsulated Bodies in Motion," p. 174.

194 Ibid., pp. 171-172.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

unexpected turning point, a breaking catastrophe or attack, marked the end of the first act. The second act then was about survival and escape. At its center was the motion ride. As the show's climax, it let the participants physically experience moments of extreme hopelessness and then a dramatic rescue. In the end, the participants emerged to safety.

Looking back on the 1990s, parallels with another emerging and tremendously popular entertainment genre are striking. First-person virtual rides were put into operation and became successful with both critics and the public when pioneering games like WOLFENSTEIN 3D, DOOM, and QUAKE were released and popularized the FPS game genre.[195] Even though their pixel graphics could not keep up with the 'high resolution' of the ride attractions, which consisted of material environments and moving images in cinematic quality, the first-person shooters' affinity to the motion rides can hardly be overlooked.

In this sense, the achievements of motion rides such as IN SEARCH OF THE OBELISK and STAR TREK—THE EXPERIENCE were twofold: They serviced the exact needs for interactive post-cinematic immersion that digital games, and especially first-person shooters, aimed to satisfy, and they enabled such post-cinematic immersion in a sensual quality that in the 1990s was not yet available digitally. Compared to digital games, the price for this was a lower level of interactivity. Karen Collins alludes to this anticipation of playfully acting in and interacting with hyperreal environments when she writes: "If video games had parents, one would be the bespectacled academic world of computer science and the other would be the flamboyant and fun penny arcade, with a close cousin in Las Vegas."[196] Thus, again, essential elements of digital audiovisuality, particularly games, were anticipated in Las Vegas: the possibility to experience high-resolution hyperrealities in the first-person perspective.

## IX RE-FRAMING LAS VEGAS: ANTICIPATING THE METAVERSE

In summary, since the end of World War II and until the turn of the century, the remote desert town of Las Vegas transformed into a national and then global

195 WOLFENSTEIN 3D (id Software 1992, O: John Romero, Tom Hall); DOOM (id software 1993, O: John Carmack, John Romero et al.); QUAKE (id Software, O: John Carmack, John Romero et al.)

196 Collins, Karen: *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design*, Cambridge, Mass.: MIT Press 2008, p. 7.

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metropolis of post-industrial entertainment. Three significant phases could be distinguished. In the early 1950s, the faux frontier town of Las Vegas caught up with industrial modernism while at the same time developing anticipatory forms of postmodern and digital urbanity. The moving magic of neon décor typical for Las Vegas in the 1950s and 1960s illuminated, enchanted, and enhanced the material reality of concrete buildings. This augmentation with signs and meanings via analog visual media anticipated the semiotic augmentation of urban spaces with digital augmented reality applications decades later.

In a second phase, since the mid-1960s, casino hotels adopted techniques Walt Disney had developed for his first theme park Disneyland a few years earlier. With the theming of their interiors, casinos such as *Caesar's Palace* tried to overcome the window view on fictional worlds in favor of an immersive entry. At the same time, in the realm of digital graphics, Yvan Sutherland called for a similar immersion into artificial worlds with his utopian concept of the "ultimate display."

Between 1968, when the *Circus Circus* casino hotel opened featuring neon signs and classically themed attractions, and 1989, when the new *Mirage* casino hotel replaced the standard parking lot, and the neon signs, with a three-dimensional 'material' volcano, Las Vegas suffered through two decades of aesthetic as well as economic stagnation. In this same period, digital technology—computers as well as digital networking, pioneered in the American West—pushed its way out of the large institutions of science, the military, and government and into everyday life. The Arpanet went online in 1969, and game consoles and personal computers appeared in the 1970s. With them, digital games and productivity software such as spreadsheets and Word processing became popular. The Internet, the networking of tens of thousands of individual networks, was launched in 1983. The first GUI computer for the mass market, the Apple Macintosh, was introduced in 1984, and the first commercial Virtual Reality System, VPL's Eyephone, in 1988.

The rapid popularization of digital technology in work and entertainment prompted a range of speculation about the future of media. Such efforts to imagine new media run through the modern era. Common to these media utopias—the total work of art, the feelies, the total cinema—was that they aimed for an increased degree of sensuality compared to existing audiovisual media: While audiences viewed theatrical performances, feature films, and television programs with a sense of detachment, as if through a window into another world, the media utopias promised complete immersion. However, these visions not only stimulated the imagination. They also shaped contemporary media practice. The function of such guiding principles, Michael Friedewald writes, is to "steer the individual

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perceptions and value systems of the people involved in producing technical knowledge in a common direction."[197]

In the period when the dissatisfaction with Las Vegas came into evidence, and a radical rebuilding of the city was initiated, three new media utopias emerged. In 1982, William Gibson conceived of a new communication medium—"Cyberspace"—as a disembodied "consensual hallucination."[198] His vision extended the technological development of digital networking and dematerialization into the future. Consequently, the term Cyberspace became a buzzword during the boom period of the WWW in the 1990s.[199] Five years later, Gene Roddenberry introduced the holodeck in ENCOUNTER AT FARPOINT, the pilot episode of the TV series STAR TREK: THE NEXT GENERATION (1987-1994).[200] This futuristic variant of 'materialized' holographic 3D images influenced the collective imagination 114 times through the many episodes of the TV series and several STAR TREK motion pictures.[201]

The utopian holodeck, like STAR TREK's universal replicator, was situated in the context of efforts to complement the decades-long process of progressing virtualization—replacing more and more hardware with software—with options to re-materialize the media produced in the digital transmedium. The 1980s saw the rise of desktop publishing through laser printers. At the end of the decade, consumers gained the ability to burn CD-ROMs and later DVD-ROMs. Also, 3D printers entered the market, allowing material instantiations of virtual objects if only very rudimentarily in the first decades.

In this respect, the third phase of Las Vegas as a place of the future, which commenced in the 1990s, can be interpreted as a re-materialization of digital desires, i.e., as attempts to realize in the material world the virtual realities that could not be produced virtually, or not yet in satisfactory quality. The new casino hotels along the Strip pioneered immersion in fantasy buildings and replicas of existing

197 Friedewald, Michael: *Der Computer als Werkzeug und Medium: Die geistigen und technischen Wurzeln des Personal Computers*, Berlin: GNT-Verlag, 1999, p. 23, my translation.

198 W. Gibson: *Neuromancer*, p. 6.

199 See G. Freyermuth: *Cyberland*.

200 ENCOUNTER AT FARPOINT (USA 1987, D: Corey Allen).

201 Sezen, Tonguc Ibrahim: "Beyond the Holonovel. The Holographic Interactive Digital Entertainment Utopia of Star Trek," in: *Playing Utopia: Futures in Digital Games*, ed. Benjamin Beil, Gundolf S. Freyermuth, and Hanns Christian Schmidt, Bielefeld: transcript, 2019, pp. 187-207, here p. 184. See also Murray, Janet Horowitz: *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, New York: Free Press 1997.

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exotic locations through hyperrealistic worldbuilding. Their designers created a digital update of the Hollywood film-inspired analog practice of theming, which now became more aligned with digital image processing. They also tried to simulate interactions with fictional worlds in material reality. Last but not least, Las Vegas's casino hotels anticipated elements of digital play with innovative motion rides that were themed and scripted and combined elements of theater, cinema, and digital simulation.

The technological and cultural change that loomed during this transitional phase in Las Vegas was, in this respect, twofold. On the one hand, it concerned the design of transmedia 3D spaces for playful action. It happened in parallel to developments in digital gaming. The theme park and game designer Don Carson remembers accordingly that, for him, in the early 1990s, digital games approached the qualities of these real-world attractions. "Not until the release of games like MYST and DOOM did I fully see a potential bridge between the theme park world I was working in and the world of the computer on my desktop."[202] Game designer Celia Pearce expresses the same sentiment, including online worlds:

> "Thanks in part to the advent of 3D and eventually real-time 3D in the 1990s, video games have come increasingly to resemble theme parks in terms of both design and culture. [...] In addition to making use of the major facets of theme park creation—spatial narrative, experience design, 'illusion of authenticity' and immersion—digital games and networks also introduce three new key dimensions to spatial media: Agency, Identity and Persistent Community."[203]

Since then, three decades have passed, and digital games have made great strides in their effort to replicate in the transmedium of software the immersive experience of hyperreality that theme parks and Las Vegas offered first. Strong "synergies between computer games, architecture and urbanism"[204] were established during this process. Immersive narrative in virtual urban spaces has characterized many seminal digital games, among them games about Las Vegas, beginning with GODFATHER: THE GAME.[205] In spring 2022, Wikipedia lists about 75 such

202 D. Carson: "Environmental Storytelling."

203 C. Pearce: "Narrative Environments," p. 201.

204 Borries, Friedrich von, Steffen P. Walz, and Matthias Böttger: "Introduction," in: *Space Time Play: Computer Games, Architecture and Urbanism–The Next Level*, Basel: Birkhäuser 2007, pp. 10-13, here p. 11.

205 GODFATHER: THE GAME (Creative Materials 1991). The game "admirably recreates the gangster-filled streets of New York and Las Vegas with the same kind of muted

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games.[206] One of the most recent is HORIZON FORBIDDEN WEST.[207] It shows Las Vegas in ruins, reclaimed by nature, partly submerged under water: "[T]he true beauty of the long-forgotten city is revealed, with gorgeous holographic light displays showing a glimmer of what Las Vegas once was."[208] However, the Wikipedia listing still misses the title that best represents the close relationship between Las Vegas and digital games: GRAND THEFT AUTO SAN ANDREAS.[209] The 2004 game takes place twelve years earlier, in 1992, in Las Venturas, a virtual version of Las Vegas. But besides classic casino hotels like *Caligula's Palace* (i.e., *Caesar's Palace*) and *The Clown's Pocket* (i.e., *Circus Circus*), Las Venturas also offers resorts that were not yet built at that time, such as *Pirates in Men's Pants* (i.e., *Treasure Island* that only opened in October 1993). In creating Las Venturas, GRAND THEFT AUTO SAN ANDREAS made the material hyperreality of Las Vegas experienceable in virtual hyperrealism. Following the thoughts of Jean Baudrillard, Las Venturas is thus the simulacrum of a simulacrum of a simulacrum.[210]

The second significant change that Las Vegas heralded in the 1990s was a functional reconstruction of reality itself, or more precisely, the superimposition of virtuality on the material world. This trend of digital culture found its expression in a media utopia as well. In his 1992 novel *Snow Crash,* Neal Stephenson combined global digital networking—Gibson's *Cyberspace*—with a material experience of virtuality—Roddenberry's *Holodeck*—in his *Metaverse*.[211] The description of this virtual world of entertainment reads as if Stephenson modeled it on the Strip: The center of the Metaverse is a networked 3D boulevard called "The Street," 100 meters wide and over 60,000 kilometers long, that exists parallel to reality. But not only the Strip of the 1990s seemed to be a kind of betaverse—a

shades and period detail that went into the Oscar-winning movie." (Fox, Matt: *The Video Games Guide: 1,000+ Arcade, Console and Computer Games, 1962-2012*, Jefferson, N.C.: McFarland & Company, Inc., Publishers 2013, p. 125.)

206 N.N.: "Video Games Set in the Las Vegas Valley," *Wikipedia*, 2022, https://en.wikipedia.org/wiki/Category:Video_games_set_in_the_Las_Vegas_Valley

207 HORIZON FORBIDDEN WEST (Sony Interactive Entertainment 2022, O: Guerilla Games). I thank Benjamin Beil and Karen Bohlender for pointing me to the game.

208 Barnes, Jessica: "Horizon Forbidden West: How Stanley Chen's Impact on Las Vegas Opened the Door to Poseidon," *GameRant*, March 8, 2022, https://gamerant.com/horizon-forbidden-west-stanley-chen-impact-las-vegas-poseidon/

209 GRAND THEFT AUTO SAN ANDREAS (Rockstar Games 2004, O: Dan Houser et al.).

210 Baudrillard, Jean: *Simulacra and Simulation*, Ann Arbor: University of Michigan Press 1994 (*1981).

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beta version of the Metaverse. Parallel to the conversion of the Strip into a hyper-realistic material montage of fantastic and exotic locales, experiments began to realize Metaverse-like experiences in the realm of software.

Online 3D worlds emerged with meeting places, stores, educational and entertainment offerings, and even their own currencies. The first was CYBERTOWN in 1995,[212] the most successful SECOND LIFE, which opened in 2003 and had almost 65 million users in 2021.[213] At the same time, online games evolved into proto-Metaverses, rivaling in revenue Las Vegas casinos. WORLD OF WARCRAFT, for example, attracted at its peak in 2017 up to 46 million monthly players and produced around $10 billion in revenue.[214] MINECRAFT, which Microsoft bought in 2014 for $2.5 billion, is currently populated by over 140 million players every month.[215] However, as in Las Vegas, visitors to this and many other successful online worlds not only play (or gamble). They create new self-images—in the case of games, their avatars. They celebrate weddings and birthdays and organize company parties and school graduations. Millions also attend mass concerts of superstars like BTS, Ariana Grande, or Travis Scott.[216] At present, the most successful 3D game worlds include the online "experience" platform ROBLOX (2006), with 43 million daily users and a market value of $38 billion in 2021,[217] and FORTNITE

212 CYBERTOWN (IVN 1995, O: Hawk & SFX); see Robertson, Adi: "When the Virtual City of Cybertown Went Dark, Its Citizens Rebuilt It," *The Verge*, April, 2022, https://www.theverge.com/23032658/cybertown-revival-blaxxun-virtual-community-rebuilding-project

213 SECOND LIFE (Linden Lab 2003, O: Philip Rosedale), see Greener, Rory: "Second Life Storefront User Traffic Jumps 35 Percent in 2021," *XR Today*, January 12, 2022, https://www.xrtoday.com/virtual-reality/second-life-user-traffic-jumps-35-percent-in-2021/

214 WORLD OF WARCRAFT (Blizzard Entertainment 2004, O: Jeff Kaplan, Rob Pardo, Tom Chilton); see Galov, Nick: "15 Facts About The WoW Player Count in 2022," *Web Tribunal*, April 6, 2022, https://webtribunal.net/blog/wow-player-count/#gref

215 MINECRAFT (Mojang Studios 2011, O:Markus Perrsson); see K, Branko: "15+ Mind-boggling Minecraft Statistics for the Dedicated Gamer," ibid., https://webtribunal.net/blog/minecraft-statistics/#gref

216 For example, the most successful live music concert in MINECRAFT, the *Fire Festival* in January 2019, attracted 87 000 fans. (N.N.: "Largest Live Music Concert Performed in Minecraft," *Guinness World Records*, 2022, https://www.guinnessworldrecords.com/world-records/466539-largest-live-music-concert-performed-in-minecraft

217 ROBLOX (Roblox Corporation 2006, O: Roblox Corporation); see Wise, Jason: "Roblox Statistics 2022: How Many People Play Roblox?" April 22, 2022,

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(2017), with over 350 million registered users.[218] Its developer Epic Games explicitly wants to bring about the Metaverse[219] and offers a "MetaHuma Creator" that allows players to create their hyper-realistic doppelgangers.[220]

Compared to the media of the analog past, these virtual game worlds possess a unique quality: They have transformed from escapist entertainment, to which one retreats for a few hours, to living environments that—like Las Vegas—exist parallel to and entirely on an equal footing with everyday reality. Under the conditions of cultural digitalization, media utopias become social utopias, utopias of new hybrid life forms that survive partly in materiality and partly in virtuality. David J. Chalmers calls such a hybrid reality "Reality+."[221] He posits that virtual realities are "genuine realities"[222] and that we can enjoy "a fully meaningful life" in other realities than the physical one.[223] This assertion of a "virtual realism"[224] seems to contradict the material foundation of enlightenment and modernity, but it fits into the paradigm of postmodernity, its playful anything-goes culture. The Metaverse, as Neal Stephenson designed it and powerful high-tech corporations of our time want to realize it, is insofar also a wager on new 'ultimate questions,' a new metaphysics. Decades ago, these contemporary challenges of advanced virtualization to our understanding of material reality and physical life were anticipated, configured, and shaped aesthetically by Las Vegas's hyperrealities.

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https://earthweb.com/roblox-statistics/; see also Robertson, Adi: "Apple Said Roblox Developers Don't Make Games, and Now Roblox Agrees: The Word 'Game' Has Been Replaced by 'Experience' across Roblox's Website," *The Verge*, May 14, 2021, https://www.theverge.com/2021/5/14/22436014/apple-roblox-epic-fortnite-trial-what-is-game-name-change

218 FORTNITE (Epic Games 2017, O: Epic Games, People Can Fly); see Garton, Alex: "How many people play Fortnite? Player count in 2022," *Dexerto*, April 13, 2022, https://www.dexerto.com/fortnite/how-many-people-play-fortnite-player-count-1666278/

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221 Chalmers: *Reality+*.

222 Ibid., loc. 159.

223 Ibid., loc. 162.

224 Ibid., loc. 1807.

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# Augmenting Materialities

## A Case Study of MASCHINENKLANGWERK

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## INTRODUCTION

Augmented reality can be understood as an integration of the virtual into the real or augmentation thereof. This places augmented reality on the 'reality' side of the mixed reality continuum,[1] meaning that virtual elements usually exist as foreign bodies in a real space. While there are many possible applications for augmented reality, its potential for application in site-specific installations is undeniable. Augmented reality's proclivity for spatial immersion and interactivity makes it a natural fit with installation art, and digital games. The existence of augmented reality in the real and in the virtual situates it as an enticing point of inquiry for the study of materialities.

We recently created an innovative augmented reality installation that treads just such a line between augmented reality game and site-specific art installation: MASCHINENKLANGWERK. The objective of this paper, then, is twofold: analyze MASCHINENKLANGWERK as a media artifact and in so doing, examine the distinct materiality and mediality of augmented reality and discern its characteristics. To begin, we will introduce our project, MASCHI-NENKLANGWERK, an interactive sound and light installation which was exhibited at the Dropforge Hendrichs in Solingen, Germany, from March 12 to 19, 2022. We will discuss its inception and dive into some design concepts behind it, especially characterizing the installation as a 'ludification.' Next, we will re-approach the subject from an angle of aesthetic

1 See Milgram, Paul et al.: "Augmented Reality: A Class of Displays on the Reality-Virtuality Continuum," in: *Telemanipulator and Telepresence Technologies 2351,* December 21, 1995 for the concept of the mixed reality continuum.

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theory and dissect its material makeup while also discussing the medium of mixed and augmented reality and its materiality in more general terms. Finally, we will broaden the definition of augmented reality as a medial augmentation of the real by examining MASCHINENKLANGWERK from a media studies perspective, thus also expanding upon the unique materiality of the project and augmented reality as a medium. It is our intention and hope to set new precedents for augmented reality both as a technology and as an artistic medium; to reinvigorate and expand its scholarly discussion, and to inspire innovation in the creation of augmented reality artifacts.

## LUDIFYING MATERIALITIES

In late May 2021, our team participated in a game jam for the Dropforge Hendrichs museum in Solingen as part of the FUTUR21 festival. The goal was to create an AR gaming experience that addressed topics of energy, power consumption, and the future, as well as to capture the essence of the museum that thematically explores work during the industrialization in Germany. Going into the project, we already had a preset notion about many AR applications as gimmicky and redundant, so we definitely did not want to create the next typical gamified AR experience as we see a lot of issues with current approaches to AR applications—which we will elaborate on over the course of this paper.

As an industrial heritage site, the museum is already very captivating in its own right, so there was no need to overshadow the beautiful machines and the grime of the industrialization that is still sitting within its walls. To quickly set the scene: MASCHINENKLANGWERK was an interactive audiovisual installation that used the former factory's space to investigate the connection between man, machine, and energy. While exploring the installation, participants encountered an ever-changing sound- and lightscape depending on the number of participants in the museum and in each individual room. This very basic interaction invited participants to stay, explore and play around in the gritty past of industrialization and the possible future that is still to be negotiated.

For us, the most important part was to not put a layer on top of what was already there but rather to enhance the museal space, as Janet Murray said in a 2019 article:

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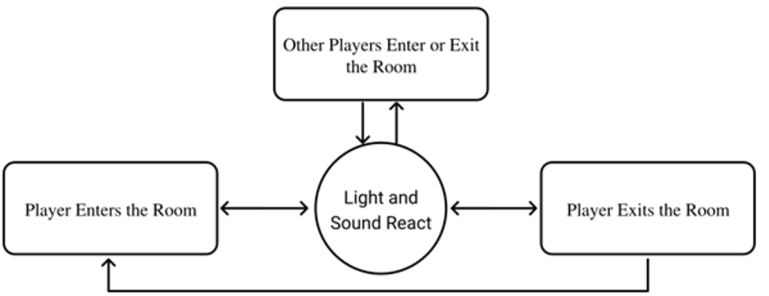
"Expanding human expressivity into new formats and genres is culturally valuable but difficult work. We are collectively engaged in making necessary mistakes, creating examples of what works and what doesn't work for one another to build on."[2]

Camera-based tracking would force participants to absorb their surroundings through their smartphone screens constantly. Instead, to track participants, we used the technology of Bluetooth beacons, which give off a Bluetooth signal at regular intervals. Based on the signal strength, smartphones can identify the relative distance to the nearest beacons and map them accordingly in a digital space. This digital space then opened up the opportunity to create an interactive sound- and light-scape that responded to the number of players within any given room of the exhibition space. The soundscape was individual to each visitor and was played back on their smartphones via headphones, while the lightscape was shared and physically integrated into the museum space using stage lights in key locations.

*Figure 1: MASCHINENKLANGWERK's Experience Loop*




Source: Figure by David Wildemann

Both were controlled by a central server and laid out within the digital version of the space. While at first, the soundscape imitated the machines in the museum quite literally, it slowly developed into musique-concrète-esque compositions—a machine sound apparatus (Maschinenklangwerk)—that brought the machines back to life in new and interesting ways.

2 Janet H. Murray: "Not a Film and Not an Empathy Machine, by Janet H. Murray," *Immerse*, March 27, 2019, https://immerse.news/not-a-film-and-not-an-empathy-machine-48b63b0eda93#.wh-k64qepp

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*Figure 2 and 3: Views of MASCHINENKLANGWERK*

Source: Photographs by David Wildemann and Isabel Grünberg

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When participants reached a certain threshold, the soundscape changed to reveal a related future version of each room that was not only negotiable but also constantly changing. So, on their way back, participants rediscovered previously explored rooms and gained a glimpse into the future while the sound- and light-scape playfully invited experimentation. Playfully inviting was exactly the thing we strived for. We believe that a good AR application does not force the participants to become players through gamification but rather invites them with smart uses of a ludified space. In this article, we would also like to make a more general case for the use of ludification instead of gamification.

"Gamification, I suggested, is primarily a practice of marketers and consultants who seek to construct and then exploit an opportunity for benefit. The opportunity in question is games, which remain a terrifying yet appealing medium for businesses. Terrifying because traditional organizations don't understand games and therefore fear them: for example, why do people spend so much time in such concentrated attention when playing video games, while they are so distracted or easily disengaged from other media? And appealing because there is some possibility that power can be harnessed for corporate benefit."[3]

Gamification is, per se, not an inherently bad thing, but it keeps us from developing the real potential of AR applications, and just like AR, gamification often feels redundant and unimaginative. The purpose of gamification is to make a boring or tedious task seem more fun and inviting by using gaming elements. Unfortunately, that doesn't translate that well into AR. AR is and can be fun on its own—there is no need to use the stereotypical mechanics (e.g., leaderboards and reward systems) of digital games for interactions when you can also create a reactive real world and develop new mechanics and approaches to AR. With that gamification often forces people to play, e.g., by collecting certain things and creating extrinsic motivations.

"Thus, one could say that a gamified structure and object are non-game structures and objects endowed with components and traits from the gaming regime; while ludified structures and objects are non-game story-structures and story-objects endowed with similar game components and traits whose focus, however, is not so much motivation, feedback, and

3 Bogost, Ian: "Gamification is Bullshit," in: Walz, Steffen P./Deterding, Sebastian (eds.), *The Gameful World: Approaches, Issues, Applications,* Cambridge, Mass.: The MIT Press 2014, p. 65.

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reward but, rather, ways of 'designing' and 'telling' stories in new and exciting, i.e. 'ludified' fashions."[4]

Ludification opens the room for play and playful interactivity but doesn't demand it in the way that gamification does.

Furthermore, augmented reality opened the opportunity to see the unbelievable or revive what is long gone. One of the key pieces of information we wanted to transport is that the museum is—contrary to what one would believe at first glance—not just an industrial museum of machines but also a museum about the people who worked those machines and were the undeniable motor of industrialization. The workers have left the museal space, but the machines still linger in the halls. With our approach of ludifying the space, we wanted the participants to become symbolic workers that bring back life to the factory and its dormant, grubby machines. Additionally, we wanted to create new context between industrialization and the always present climate crisis, repurposing the rooms and giving them new meaning.

When participants walked into the first room, which used to be a coal oven, they were greeted by a fiery lightscape with the sounds of a person shoveling coal into the oven. The more people joined the room, the faster and more intense the shoveling became and the louder the flames would crackle in the oven until finally, the sound- and lightscape escalated into a ferocious wildfire. If the participants caught a glimpse of their phone, they could read the Haiku "Es brodelt im Tief; Flammen Licht der Dunkelheit; Zurück bleibt die Leere" which roughly translates to: "It seethes in the deep; Flaming light of darkness; Emptiness remains." This haiku adds an additional, albeit optional, textual layer of interpretive reality to the installation as it recontextualizes the room to further imply that these natural catastrophes that are happening all around the globe are a direct response to not only the industrialization but also the mass production and exploitation of earth's natural resources. With these Haikus, we invite introspection and reflection. When returning to the same room in the future soundscape, the lights remained the same as in the past, but the sound recontextualized the room in a very different light. Now the participants are greeted with the serene sound of waves crashing on the beach. It's a peaceful but quiet place that opened the question of the survival of the human species. Together with the new Haiku: "Langer Reise Ziel; Anbruch eines neuen Tags; Meer der Vision" ("Long journey destination; Dawn of a new day; sea of

4 Walther, Bo Kampmann/Larsen, Lasse Juel: "Gamification and Beyond: The Case of Ludification," in: *Lecture Notes in Computer Science,* 2020, p. 125.

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vision"), the room invites the participants to reflect on their journey through the installation but also the journey of humanity towards the future.

*Figure 3 & 4: Views of MASCHINENKLANGWERK*

Source: Photographs by Isabel Grünberg

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All these elements were chosen to intensify the space and subliminally break its boundaries to contextualize it with the world in the here and now as well as the potential future and the past. We aimed to highlight the systems that have shaped the room and its materiality that are still at work today.

We did not want to deal in absolutes or show our explicit thoughts while designing but rather leave room for discussion and interpretation—to inspire people to think, share opinions and possibly even act on them. Another important element for us—the interpersonal interactions—originated in a desire to bring people together. While designing our installation, we were still in the middle of a pandemic where social isolation was the norm for many people, so we focused also on creating interaction between humans on a very basic level: simply existing in the same room. It was about becoming aware of oneself in the room, as well as the position of others not just in the real space but also in the abstracted virtual world and their position of impact on it. With that, we aspired to create a sense of community and belonging that would encourage participants to share their visions, hopes, and dreams for the future.

We strived to not only invite play with the material of the installation but also to encourage interaction with the other participants. Our way of interpreting and ludifying the space played into the materiality and history of the space, expanding it and making it more visible and experiential again. This is an extraordinary power that (especially) digital augmented reality holds, and this approach stands in contrast with more narrow gamifications. In ludifying the space using augmented reality, an entirely new materiality emerged. Next, we will discuss this distinct materiality of augmented reality and MASCHINENKLANGWERK in greater detail.

## MERGING MATERIALITIES

In 1994, Paul Milgram et al. laid the groundwork for categorizing kinds of mixed reality and understanding mixed reality as a reality-virtuality continuum.[5] When we consider a continuum of realms, of the virtual and the real, we must then also consider a continuum of converging materialities. This, of course, presupposes that virtuality brings with it its own distinct sense of materiality. While there are many avenues to take in understanding the virtual as material, from structural[6] to

5 P. Milgram et al.: "Augmented Reality."

6 Allen-Robertson, James: "The Materiality of Digital Media: The Hard Disk Drive, Phonograph, Magnetic Tape and Optical Media in Technical Close-Up," in: *New Media & Society,* Vol. 19, Issue 3, 2017.

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functional[7] approaches, it is most relevant for our work on MASCHINENKLANGWERK to think of virtual materiality as an aesthetic quality. While we can usually not touch or smell the virtual, its material properties can be evoked by the synesthetic effect of the other senses, the visual and the auditory. Through this, we each form our unique understanding of what the virtual feels like, what it is made of and how it will behave, its texture, viscosity, and weight, if you will. It is this synesthetic interpretability of the virtual that creates its distinct materiality.

Through this convergence of distinct realms and materialities, a new materiality emerges; somehow real and physical, and somehow virtual and ephemeral. It is this intersection that becomes a fascinating point of scholarly inquiry and an exciting space of possibility for art. Of the greatest interest are the tensions that exist at this intersection and between realms. While they are exciting indeed, they also bring many technical and creative challenges that are only reflected too well in the state of mixed reality as a medium. Let us examine then this intersection of materialities and these tensions. What happens when we merge the virtual with the real? How do their distinct materialities converge, entangle, and affect one another? And from a practical perspective: When integrating virtuality into a real place, how is that place's material character altered? What can be lost, and what can be gained? It seems clear that these questions cannot be universally answered but must be answered specifically for the purposes of this text, based primarily on our interactive installation, MASCHINENKLANGWERK.

On the virtuality-reality continuum, Milgram et al. place augmented reality close to the reality-end and augmented virtuality on the virtuality-end. When we talk about augmented reality, then, we should expect a merging of reality and virtuality in a way where the virtual elements are integrated into reality. Interestingly, Milgram et al. focus their efforts exclusively on screen-based applications of mixed reality. Here, they distinguish between see-through and opaque camera-based screens. In today's terms, we have see-through screens in Microsoft's HoloLens and Google Glasses. However, the use of opaque screens and camera-based mixed reality is much more abundant as it can be achieved with almost any smartphone or tablet. In fact, this singular focus on screen-based mixed reality betrays an alarming trend in the discussion surrounding it—the reduction of an infinitely variable medium to a single technology.[8] But what about other forms of

7 For a functional approach, see, e.g., Leonardi, Paul M.: "Digital Materiality? How Artifacts Without Matter, Matter," in: *First Monday,* 15(6), 2010, and cf. Chalmers, David J.: "The Virtual and the Real," in: *Disputatio*, April 16, 2017.

8 Cf. MacIntyre, Blair et al.: "Augmented Reality as a New Media Experience," in: *Proceedings IEEE and ACM International Symposium on Augmented Reality,*

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mixed reality that do not make use of a screen as the primary motor? Might other forms of mixed reality offer solutions to the problems facing the emerging medium, as criticized by Janet Murray, for example?[9]

When we want to create immersive experiences, the classical form of screen-based augmented reality can become a problem because there is a layer of glass separating you from what is supposed to immerse you. Two possible solutions come to mind: create an experience that truly works with the format and makes the intersection of realms its immersive focus or create an experience that circumvents the layer of glass entirely.

For MASCHINENKLANGWERK, the solution was a combination of both. We circumvented the screen by focusing on sound as a primary vehicle for the experience and focused especially on the tensions between the virtual soundscape and the real space. We deliberately created and resolved these tensions for dramatic effect. Sometimes the soundscape matches the real space, amplifying its existing materiality by restoring the sound of long silent machines. Sometimes the soundscape deviates from the real space by introducing new elements: sounds of nature as well as more explicitly musical elements. This juxtaposition created new and unexpected material experiences and a sense of wonder and enchantment. Janet Murray uses this term, enchantment, to describe the transformative quality of augmented reality. According to Murray, we desperately want to be enchanted by the magic of augmented reality, but this is also a double-edged sword. Relying purely on the novelty of this enchanting quality will surely hold back augmented reality as a medium. The way forward is through experiences that actively work with the format.[10] With MASCHINENKLANGWERK we worked to weave this enchantment into the core of the experience, also, again, by circumventing the traditional augmented reality screen and the disappointments that come with poorly integrated visual elements. When MASCHINENKLANGWERK transitions from literal sonic depictions of the real machines to a fantastically and musically altered version of the same soundscape, the machines do not disappear or are overshadowed. They shine in a new light—their being transformed into something not quite real and not quite virtual, but all the more magical.

When we merge materialities, we can create enchantment by enchanting one materiality with the other. In this way, we create new materialities that are distinctly

October 2001, and Yeon, Jung Ma/Choi, Jong Soo: "The Virtuality and Reality of Augmented Reality," in: *Journal of Multimedia* 2, No. 1, February 1, 2007.

9 Murray rightly criticizes the current state of AR for its reliance on novelty in her 2017 talk: "Thresholds of Reality: Creating Coherent Enchantment in AR."

10 Ibid.

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other. We can also enhance an already existing materiality by restoring aspects of its material character that have been lost or are not present. So instead of altering its character, we can enhance it. These seem to be the primary aesthetic possibilities of mixed reality: *alter* and *enhance*. But sound is not the only mode in which this is done in MASCHINENKLANGWERK. The light installation that accompanied the soundscape behaved similarly, only that it was fully integrated into the real space. Yet, its counterparts exist also in the same virtual space as the soundscape, where the lights are dynamically animated. This puts them in an interesting spot on the reality-virtuality continuum, existing fully in reality but also fully in virtuality. They are an augmentation of physical reality using physical means that are digitally controlled; they exist in a *superposition*.

Naturally, we must consider a third element in this—the digital game. While mixed reality allows for an audiovisual collage of the virtual and the real, it is often also a ludification of the real. With ludification come the aesthetic pleasures of interactivity or agency.[11] The impression that we can magically affect the real and virtual world through our ludic interaction with mixed reality is certainly intoxicating. Not only that, it also fundamentally changes our material experience of mixed reality. From a functionalist perspective, the ability to interact, to poke and prod at its substance, makes the experience all the more visceral. MASCHINENKLANGWERK, too, is a ludification of reality, albeit not an outright game. Through movement in the real space, one also traverses the virtual space of the installation, which is not visible but audible. Not just an exploration of spaces, though, the soundscape also adapts to one's presence and to the presence of others: it increases and decreases in intensity, it shifts and transforms. This creates a sort of invisible substance that one can experiment with by moving through it; entering and exiting certain rooms; going back and forth to explore how the substance reacts. The material is not static but pliable.

MASCHINENKLANGWERK is also a shared experience by all participants, yet each participant traverses their individual virtual space. The participants are connected by network code, and their virtual worlds are interdependent, but they are still separate, simply in that they exist on each individual device. This seems to be a key aspect of the materiality of this kind of augmented reality—its existence in a shared real space but individual virtual worlds that are somehow enmeshed. In fact, we make use of this specific point of tension in MASCHINENKLANGWERK. As participants traverse the installation and soundscape, they become transported into

11 See Murray, Janet H.: *Hamlet on the Holodeck, Updated Edition: The Future of Narrative in Cyberspace*, Cambridge, Mass.: The MIT Press 2017, p. 123 on agency as an aesthetic pleasure in digital artifacts.

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a futuristic version of the same soundscape that is entirely different. As they go back through the installation, they encounter participants that are still in the old soundscape—they become time travelers encountering their past selves.

This means that MASCHINENKLANGWERK is a participatory and procedural art piece—it cannot not exist without its participants, and its specifics are always different. In this sense, it defies traditional conceptions of sound installations and installation art. Drawing on Adorno, Juliane Rebentisch supposes:

> "In sound installation, there is usually no musical construction that could be 'composed along to while listening' because there is neither a composition nor a performance nor even the reproduction of one: there is only sound in space."[12]

But this is exactly what the transmediality of augmented reality allows for—and ludification and participatory culture call for: the open work of art as Eco understood it.[13] MASCHINENKLANGWERK's musical compositions were designed systematically and produced procedurally, as a digital game would be. The dynamic movement and necessary dramaturgy of the composition are suggested in its systems but are ultimately performed by the participants and at their discretion. The work is open both in its production and its reception. From the specific to the general then: mixed reality allows for the procedural production of its artistic material, as digital games do. This makes the material variable and pliable as opposed to fixed and thus never graspable as a single whole: as would be demanded by an objectivist view of art. This seems little revelatory in the context of digital games but is all the more so when these material characteristics of the digital game become merged with reality.

In examining MASCHINENKLANGWERK, we were able to discern some key characteristics of its materiality and the materiality of augmented and mixed reality in general: its enchanting quality to either enhance or alter; its pliability and variability resulting from its procedural and interactive nature; its otherness and superposition of existing simultaneously in virtual and real space. We have also discussed the medium of augmented reality in broader terms, its opportunities and challenges, especially when it comes to tensions created between realms and materialities. In the following chapter, we will continue this thought by examining mixed reality not just as an integration of the virtual into the real, or

12 Rebentisch, Juliane: *Aesthetics of Installation Art*, Berlin: Sternberg Press 2012, p. 211.

13 See Eco, Umberto: *The Open Work*, Cambridge: Harvard University Press 1989 (1962), e.g., p. 1, p. 4.

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vice versa, but by going into greater depth on its transmedial character and by positioning it also as an integration of different media into the real.

## DESIGNING MATERIALITIES

MASCHINENKLANGWERK is an augmented reality installation. A half-digital half-game, enchanting a very particular industrial heritage site. It is an installation fully concerned with and resulting from its host's materiality and its consequences. It shines a light on the material characteristics of the industrial site; it embeds its real players into a causal relation to the machine remains and each other, and it is overwhelmingly concerned with extrapolating the very real material consequences of humanity's machine-media-augmentations. As an AR play space juxtaposed with the backdrop of a late industrial age factory, it embraced the material realities of the museum through its own materialities. It could itself not escape the history and consequences of humanity's augmentations of the real. Is not the factory itself a relic of humanity's golden age of augmenting reality? Are not present and future generations faced with the anthropogenic consequences of this medial all-augmentation?

Now, Art, Media, the Real, and the Virtual are all terms that have been, and luckily will be, subject to a variety of different interpretations and extrapolations. This multitude of definitions makes it easy to create a viewpoint but impossible and undesirable to draw up a definitive conclusion on any term associated with it, including, of course, the term AR; augmented reality. For ease of discussion, reality will be considered as physical material reality throughout this chapter, while a different interpretation of the fundamental concept of the Real could lead to different insights into the topic. A supposition of two viewpoints on media might be fruitful in trying to re-approach the term AR, aside from its current interpretation as "[overlaying] digital content and information onto the physical world—as if they're actually there with you, in your own space."[14]

The McLuhanian school of thought would teach us to use the terms media and technology interchangeably, for media to McLuhan are technological extensions of the self and humanity; their true meaning being their acceleration of scale or pace or pattern of human affairs.[15] Thus, to McLuhan, all media is augmentative: augmentative of the individual, society, and our very senses, our perception and

14 Google, "Google AR & VR," 2020, https://arvr.google.com/ar/

15 McLuhan, Marshall: *Understanding Media: The Extensions of Man,* London/New York: Routledge 2010 (1964), p. 7-9.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

reality itself.[16] This view might be contrasted with a communication sciences approach, where we find Gadamer,[17] Eco,[18] and others,[19] seeing media and art as the encryption and transmission of meaning, shared narratives, and ideas, that are then decrypted by their recipient. Following the communication sciences strain of thought, we see a separation between what Gadamer calls the material "Kunstgebilde" and its transmitted effects.[20] As such, media and art exist in physical reality and a subjective sensual reality, resulting from the human interpretation of any media artifact.[21] Thus, any media artifact exists in mixed realities to begin with, its material merely being the anchor for a much more important ethereal reality it's often amorphous, subjective interpretation. However, that all media and art exist in mixed realities does not explain the need for a particular definition of augmented realities. What is special about augmented reality through medial means is the desire to integrate media within 'ordinary' reality, and 'ordinary' reality within media. This is a unique medial process, wherein an existing reality is integrated consciously into a transmedial work, albeit not in a particularly new process.

A great quotidian example shows both the ubiquity and importance of this medial practice and existing analog medial augmentations of reality: street and road signs. They embed a spatially contextualized layer of information into physical reality. While this information is transmitted via a physical form, road signs convey specific and critically important encoded messages. These messages are not only inherent to the signs' physical properties, but through an interpretative act by a reader within the social norms, rules, and laws that they reference. In short, street signs integrate references to a transcendent societal reality into material reality. Their message is incomprehensible to those not privy to the meaning and rules behind these signs. Physical reality is and continues to be augmented medially. The result of this integrative process, medializing reality's materiality, is a transmutation of the medial properties and materialities of its constituent 'real' and extra-real medial parts.

16 Ibid, p. 48-52.

17 Cf. Gadamer, Hans-Georg: *Die Aktualität des Schönen,* Stuttgart: Reclam 2012 (1977).

18 Cf. U. Eco: *The Open Work.*

19 See for example Pross, Harry: *Medienforschung: Film, Funk, Presse, Fernsehen,* Darmstadt: Carl Habel Verlagsbuchhandlung 1972, p. 127-129.

20 H. Gadamer: *Die Aktualität des Schönen*, p. 54-57.

21 Ibid.

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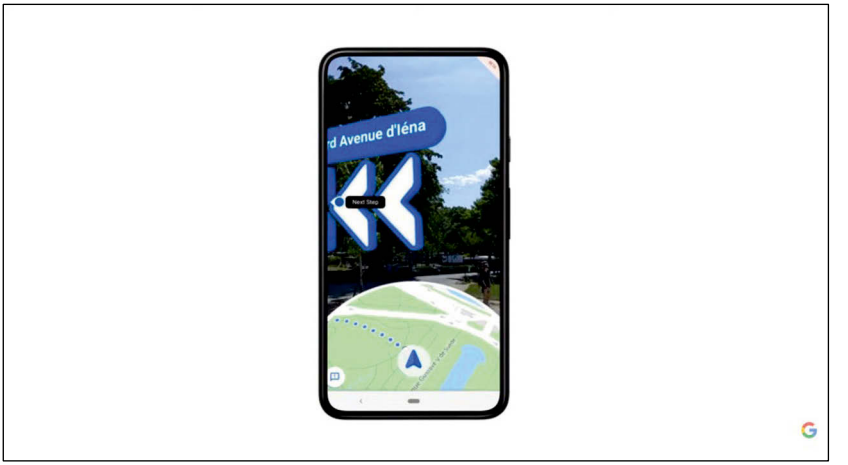
While this transmutation might be conducted through physical or digital artifacts, the digital computer medium offers unprecedented affordances, unattainable using analog means. Understandably, then, the new wave of medial augmentations utilizes these technological features to create artifacts of unprecedented material characteristics. Interestingly enough, in a step parallel to the first adaptation of board games, particularly Chess, to the computer medium,[22] the previously mentioned road signs and navigation systems have become an early application for Personal Display-based augmented reality applications such as *Maps AR* by Google.[23]

*Figure 5: Maps AR by Google*




Source: From the Google I/O 2021 Conference Maps Live View Presentation, 56:06

By comparing the two technological foundations for medial augmentations of reality—the road sign and its virtual counterpart—their different medial affordances and thus materialities become readily apparent. Where the street sign is ubiquitous and physical, the augmented reality navigation app is temporary and only accessible via specialized hardware. The street sign exists in a shared physical reality, whereas the augmented reality navigation app is an individualized virtual overlay. While the street sign is static and indifferent to its reader's destination, the

22 Donovan, Tristan: *Replay: The History of Video Games,* East Sussex: Yellow Ant 2010, p. 3-7.

23 https://io.google/2021/session/88b34a4e-6170-4f18-a321-4260fb559e60?lng=en at 56:06.

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augmented reality app can overlay encyclopedic real-time information relevant only to an individual user at any given time. Both, however, act to augment reality through medial means. As this small comparative example shows, the digital transmedium the computer behind digital AR experiences adds a unique set of medial affordances, which might explain the radical exclusion of analog media in contemporary discussions of augmented realities.[24] For Janet Murray, these "new" and unique medial affordances of the computerized digital medium are: encyclopedic, spatial, procedural, and participatory.[25] Depending on which medium and technology is used to augment reality, its affordances and resulting properties change, which makes augmented mediality, augmented materiality, a question of source material and the conscious design of the resulting material nature of any augmented reality artifact. The materiality of augmented reality is, therefore, inherently a combination of the medial properties and materialities of its constituent realities and medialities. Augmented reality is, of course, not just street signs or camera-based personal navigation systems but a transmedial practice and transmedium with flexible medial and material properties that can change with and be selected consciously for any given artifact. This new perspective on the transmedium augmented reality might help explain some shortcomings of contemporary digital augmented reality approaches.

In her 2017 *Thresholds of Reality* talk, Janet Murray offers an interesting first critique as to why current augmented reality applications, particularly in the museum space, fall short of their grand initial visions:

"1. Too much focus on the mobile augmented reality screen at the expense of the historical or natural site.
2. Too much distraction from augmented reality experience from liveliness of the actual world.
3. Too literal replication of legacy media formats—audio tours, pamphlet of text – with too little interaction."[26]

In short, augmented reality applications are suffering from a misguided realization of the unique materiality of augmented reality—its opportunities and risks. This misguided materialization of augmented reality applications might, in part, be traced back to the underlying technology used to create most spatialized interactive

24 Cf. B. MacIntyre et al.: "Augmented Reality as a New Media Experience."

25 Murray, Janet H.: *Inventing the Medium: Principles of Interaction Design as a Cultural Practice,* Cambridge, Mass.: The MIT Press 2012, p. 23.

26 J. H. Murray: "Thresholds of Reality."

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experiences—augmented reality camera tracking. So much in fact that, as has been discussed in the previous chapter, the technology has, for many researchers, become synonymous with augmented reality itself.[27] While a grand step towards integrating the digital medium into the physical space, this technology presents strict limitations on the possible interactions and interactive responses of the resulting augmented reality experiences. Camera tracking works based on information collected by (usually) a smartphone camera held by the user. That means the window to the digital side of any experience is also the main functional anchor of the experience. Users have to carefully move their smartphone to 'track' the space while also somehow interacting with something on the smartphone screen. The result is an uncomfortable dance between arm movements and finger presses, players looking into the physical space to suspect a response in the digital. It's akin to walking through a museum looking through binoculars while having to press something on one of the lenses from time to time. This kind of materiality is by no means bad, it is just a limited fit for most media artifacts. It can, for instance, in the case of POKÉMON GO, perfectly mesh with the narrative and gameplay of a virtual safari. For different intended experiences, it is therefore sensible to consider alternative foundations for intersecting realities, resulting in different material attributes, in turn allowing different interactions between the users and the media artifact.

MASCHINENKLANGWERK, emerged from a conscious game and media design process, designing for material meanings. As outlined in the preceding chapters, from the desire to augment the industrial heritage site with an artistic intent, arose the very particular combination of media that now constitutes this interactive installation. Stage lights directed by a networked game server let the space itself react to its players while a private soundscape morphs and enchants. Walking through the space becomes impactful to the players and their environment, fostering a playful discussion between players through symbolic play.

Since none of the digital technologies require active attention, the players are free to forget their smartphones and immerse themselves in the space and their impacts on it. MASCHINENKLANGWERK thus features carefully selected medial properties. Its players were augmented into the exhibition, and for them, their bodies in space became agents of impact; causes of the industrial past, and negotiators of the industrial future.

Creating MASCHINENKLANGWERK in a technology-agnostic way revealed the refreshing flexibility and originality of such an approach and is clearly reflected in the resulting experience. Interpreting augmented reality, not as a singular technology but as a medial practice, offers a beautiful multitude of possible medial

27 See ibid., p. 107.

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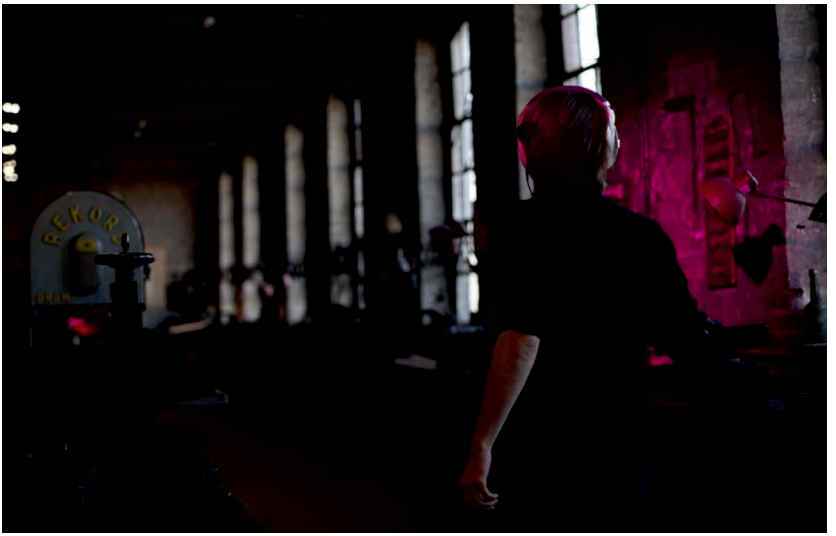
combinations, which itself constitute each artifact's material nature. This materiality can be purpose fit for each artifact's context, content, and intent, with the unifying goal of augmenting, enhancing, and enchanting reality through media and art. At present, the augmentative medium is reduced to technology-first implementations augmenting through a limited set of methods using the digital transmedium. The increasing standardization of the medium to primarily its camera tracking-based version should be questioned by scholars and practitioners. A single foundational technology—AR Camera Tracking—should not be conflated with the medium itself. For AR's unique potential to develop, technology should be seen as a means toward a core medial desire: altering and enchanting reality through media. To this end, any media might fit perfectly, depending on the specific way in which reality is to be altered.

*Figure 6: View of MASCHINENKLANGWERK*



Source: Photograph by David Wildemann

## CONCLUSION

In this paper, we examined the creative and artistic process and considerations behind our interactive augmented reality installation, MASCHINENKLANGWERK. Through this, we extrapolated insights into the materiality and mediality of augmented reality and discussed its state and potential as a medium. Naturally, we

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took different approaches, from reporting and analyzing our process and work to aesthetic theory and media theory.

In wanting to design MASCHINENKLANGWERK as an immersive experience, and dissatisfied with common approaches to augmented reality, we made a case for ludification over gamification—the invitation to play but not the enforcement of it. This allowed us room for ambiguity in its artistic content and narrative, and to play into the strengths of the space's existing materiality and—in turn—the hybrid materiality of augmented reality.

By dissecting the material characteristics of MASCHINENKLANGWERK, we have made a case for understanding augmented reality as possessing a distinct hybrid materiality of the real and the virtual. This hybrid materiality stands out in its enchanting quality to either enhance or alter; its pliability and variability resulting from its procedural and interactive nature that is rooted in digital games; as well as its otherness and superposition of existing simultaneously in virtual and real space. The procedural production of its artistic material makes MASCHINENKLANGWERK open both in its reception and production and allows it to fulfill the desire for a truly open work of art.

Examining the medial nature of augmented reality, we have positioned it not only as an augmentation of the real through the virtual (digital augmented reality) but also as a medial augmentation of the real which can be achieved by analog means as well, e.g., street signs (analog augmented reality). In juxtaposing the two, we discussed the unique medial affordances of digital augmented reality and its underlying and inherently flexible transmedium—the digital computer. We make the case that augmented reality is at its core the practice of augmenting reality medially. This shift in perspective invites the conscious selection of which media and medial combinations should be used to augment reality and by what means. Consequently, we make the case that AR should not be conflated with a single foundational sensory technology, camera tracking and screen overlays. It should ultimately be seen as a means toward the core medial desire of augmented reality: altering and enchanting reality.

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# Exhibits

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# Let's Play the Exhibition!

## Radiohead's KID A MNESIA EXHIBITION, Virtual Museums, and Games

ISABELLE HAMM

## INTRODUCTION: WHAT IS A MUSEUM EXPERIENCE?

In 1998, Ann Mintz stated:

"Media can deliver information; it cannot match the totality of the experience a museum provides. For this reason, a case can be made that there will never be a 'virtual museum' in the full sense of the word. High-resolution images, full-scale virtual reality, and rich links to other databases on the World Wide Web do not create a museum. A virtual visit to a museum is fundamentally a media experience, not a museum experience."[1]

"The museum experience is based on reality. This is the heart of the concept of museums. Monitors may be pleasantly hypnotic, but looking at a painting on a video screen is no substitute for the real thing. The real thing is more subtle, and more powerful. […] On a video screen, […] something is always lost when three dimensions are collapse into two."[2]

Mintz argues that the perception of the museum as a public place is lost in the digital realm, where staff and visitors interact spontaneously with one another, where proportions and colors cannot be depicted realistically, and where the eyes

1 Mintz, Ann: "Media and Museums: A Museum Perspective," in: Thomas, Selma/ Mintz, Ann (eds.), *The Virtual and the Real: Media in the Museum*, Washington, DC: American Association of Museums 1998, p. 28.

2 Ibid., p. 33.

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and brain process information differently in analog and digital space.[3] Werner Schweibenz discusses the quote by Mintz above against the background of the "real-virtual divide" thesis that emerged in the late 1990s.[4] Proponents of this argument attributed a special value to the museum and its objects for their material dimension, while they subordinated virtual media experiences to it.[5] This argument shaped debates for years, and prejudices against the use of digital media in museums persist to this day. Schweibenz questions whether experiencing an analog exhibit, which may not be touched, is necessarily superior to a digital exhibition. He points out that the analog object in its physical materiality and the digital object as an information carrier have different qualities. They are not in competition with each other but can complement each other.[6] Dennis Niewerth also argues against the "real-virtual divide" thesis and adds that objects do not stand on their own anyway but are opened up in exhibitions via the context created in each case and through "networking"—this is just as possible in the digital space.[7]

More than 20 years have passed since the "real-virtual divide" debate began. A lot has happened in the meantime. Today it can be said for sure that virtual exhibitions and museums exist and that they are here to stay. What exactly a virtual exhibition is, however, is still being discussed due to the lack of a specific terminology.[8] Thus, the terms virtual exhibition/virtual museum or synonyms such as online exhibition/online museum and digital exhibition/digital museum are used to label various offerings, including websites, online collections, digitorials, 360° tours, VR and AR applications, apps or screen projections.

In addition, the fundamental debate about what actually constitutes a museum is constantly ongoing, resulting in definitions being updated every few years. A globally recognized definition is provided by the International Council of Museums (ICOM), which last amended its version in 2007:

3 Ibid.

4 Schweibenz, Werner: "The Virtual Museum: An Overview of Its Origins, Concepts, and Terminology," *The Museum Review*, August 11, 2019, https://themuseumreview journal.wordpress.com/2019/08/02/tmr_vol4no1_schweibenz/; Schweibenz, Werner: "Wenn das Ding digital ist…," in: Andraschke, Udo/Wagner, Sarah (eds.), *Objekte im Netz*, Bielefeld: transcript 2020, pp. 18-19.

5 W. Schweibenz: "Wenn das Ding digital ist," pp. 18-19.

6 Ibid.

7 Niewerth, Dennis: "Verstaut, verzettelt, vernetzt," in: Andraschke, Udo/Wagner, Sarah (eds.), *Objekte im Netz*, Bielefeld: transcript 2020, p. 32.

8 W. Schweibenz: "The Virtual Museum."

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"A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment."[9]

Back in 2016, ICOM reopened the debate on a new version to review in the context of current developments in and demands on the museum. In 2019, a new proposal was drafted,[10] but it has been under discussion since then and has not yet replaced the 2007 definition.[11] Since a definition of a digital museum in terms of an extension or a rethinking of the analog museum will always be rooted in this museum's definition, we are left with different approximations for a definition of the virtual variant at the moment. A shorthand version of the Virtual MultiModal Museum (ViMM), in reference to the 2007 ICOM Museum Definition, reads:

9 ICOM: "Museum Definition," *icom.museum*, 2007, https://icom.museum/en/resources/standards-guidelines/museum-definition/

10 The ICOM Committee's 2019 Museum Definition, Prospects and Potentials (MDPP) redefinition proposal states: "Museums are democratising, inclusive and polyphonic spaces for critical dialogue about the pasts and the futures. Acknowledging and addressing the conflicts and challenges of the present, they hold artefacts and specimens in trust for society, safeguard diverse memories for future generations and guarantee equal rights and equal access to heritage for all people. Museums are not for profit. They are participatory and transparent, and work in active partnership with and for diverse communities to collect, preserve, research, interpret, exhibit, and enhance understandings of the world, aiming to contribute to human dignity and social justice, global equality and planetary wellbeing." (ICOM: "ICOM Announces the Alternative Museum Definition That Will Be Subject to a Vote," *icom.museum*, July 25, 2019, https://icom.museum/en/news/icom-announces-the-alternative-museum-definition-that-will-be-subject-to-a-vote/) The critical discussion of this proposal centers on the question of which aspects—including, in particular, the political demands—should be specified by definition and what of these should remain part of a mission statement. (Reifenscheidt, Beate: "Gegen Unverbindlichkeit und Politisierung: Zur Neudefinition der Museen," *Wissenschaftskommunikation*, November 11, 2019, https://www.wissenschaftskommunikation.de/gegen-unverbindlichkeit-und-politisierung-zur-neudefinition-der-museen-32389/)

11 ICOM: "Chronologie: Überarbeitung der Museumsdefinition," *icom.museum*, February 26, 2020, https://icom-deutschland.de/de/nachrichten/112-chronologie-ueberarbeitung-der-museumsdefinition.html

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"A virtual museum (VM) is a digital entity that draws on the characteristics of a museum, in order to complement, enhance, or augment the museum through personalization, interactivity, user experience and richness of content. […] Furthermore, a VM:

- can retrieve and deliver collections to end-users in limitless, simultaneous and remote locations.
- provide access to content that is otherwise inaccessible (in storage, lost, in private collections).
- combine objects across geographical distances from sister institutions or sites: *in situ* in remote locations, archaeological excavations, public sites and monuments.
- showcase objects that have no physical presence and are born digital."[12]

These days, then, what are the possibilities of a virtual exhibition? And what distinguishes it from a 'classic' exhibition? What kind of art is especially suitable for virtual exhibitions? These questions are investigated below based on the example of the KID A MNESIA EXHIBITION by the band Radiohead.

## THE KID A MNESIA EXHIBITION

To mark the 20th anniversary of their albums KID A (2000) and AMNESIAC (2001), the British rock band Radiohead released the KID A MNESIA EXHIBITION in 2021, a virtual exhibition that many players and critics compare to a video game. Since then, articles and reviews have been piling up on the Internet with titles like *Kid A Mnesia Exhibition Tests the Limits of Games in Fun, Simple Ways*[13] or *Radiohead's Interactive 'Exhibition' Pushes Music and Games Into New Territory*.[14] Reviewers have made statements like: "I can't wait to recommend this excellent

12 Polycarpou, Christiana: "The ViMM Definition of a Virtual Museum," *ViMM*, January 10, 2018, https://www.vi-mm.eu/2018/01/10/the-vimm-definition-of-a-virtual-museum/

13 Leone, Matt: "Kid A Mnesia Exhibition Tests the Limits of Games in Fun, Simple Ways," *Polygon*, November 20, 2021, https://www.polygon.com/22792342/radiohead-kid-a-mnesia-exhibition-not-a-game

14 Faber, Tom: "Radiohead's Interactive 'Exhibition' Pushes Music and Games into New Territory," *Financial Times*, November 23, 2021, https://www.ft.com/content/eb18c19a-d568-4436-991c-d4e302a3cdc0

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new art gallery—one that just so happens to bend the rules of time and space."[15] Or "[…] the *Kid A Mnesia Exhibition* is a really good example of how we could be experiencing traditional and impossible kinds of art exhibitions moving forward."[16] And "The Kid A Mnesia Exhibition argues that the next evolution of music could be gameplay."[17] Visitors seem excited. In the following, we will explore what makes this exhibition innovative and what it has in common with video games.

## Project Biography

Radiohead are known for their experimental approach to music and equally so for crossing musical boundaries. Founded in 1985, the band distinguished itself early on with creative marketing strategies. These include not only diverse merchandise but are also characterized by a great interest in new and digital media, which the band has known how to use for decades. For example, they built up an online presence back in 1997 at the time of the release of their album OK COMPUTER (1997) and reconstructed that webpage for the 20th anniversary of the album. In the course of the album releases of KID A (2000) and AMNESIAC (2001), Radiohead published short videos on the Internet and on television, which they called "blips." These mostly 10- to 30-second clips consisted of song excerpts and animated art designs of the albums. To accompany KID A, they also released a Java proto-app called "iBlip," which made it possible to pre-order and stream the album.[18] In 2007, they released their album IN RAINBOWS a few months before the regular sales launch exclusively via their own website according to the pay-what-you-want concept, which was still new in this context and thus anticipated platforms like Bandcamp.[19] A few years later, in 2014, the band partnered with Universal Everything to implement their first app, titled POLYFAUNA, based on the

15 McLevy, Alex: "Radiohead's Digital Kid A Mnesia Exhibition Is No game—It's an Experience" *A.V. Club*, November 19, 2021, https://www.avclub.com/radioheads-digital-kid-a-mnesia-exhibition-is-no-game-i-1848084577

16 Tran, Edmond: "Radiohead Are Turning the Playstation into a Gallery," *ArtsHub*, December 12, 2021, https://www.artshub.co.uk/news/features/radiohead-kid-a-mnesia-exhibition-for-ps5-is-an-uncanny-experience-2493794/

17 T. Faber: "Radiohead's Interactive 'Exhibition.'"

18 N.N.: "All Surprises: Radiohead and the Art of the Unconventional Album Release," *The Guardian*, May 2, 2016, https://www.theguardian.com/music/musicblog/2016/may/02/all-surprises-radiohead-and-art-of-unconventional-album-release

19 Ibid.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - 

sounds and imagery of the album KING OF LIMBS (2011). Front singer Thom Yorke described the atmospheric audio-visual experiment: "It comes from an interest in early computer life-experiments and the imagined creatures of our subconscious. Your screen is the window into an evolving world."[20] In 2020, a new version of the app was released titled POLY-FAUNA 2.

The following year, the band eventually made news with the KID A MNESIA EXHIBITION. Actually, the exhibition project was supposed to take place in London and afterward be shown as a traveling exhibition in several cities worldwide. Thom Yorke and the artist Stanley Donwood described their original idea as follows:

> "It was going to be a huge red construction made by welding shipping containers together, constructed so that it looked as if a brutalist spacecraft had crash-landed into the classical architecture of the Victoria & Albert Museum in Kensington. This astounding steel carapace would be inserted into the urban fabric of London like an ice pick into Trotsky. Jutting up into the grey English sky."[21]

After the exhibition concept initially failed to overcome architectural barriers at the Victoria & Albert Museum and then bureaucratic difficulties at the newly conceived exhibition venue, the Victoria Albert Hall, the outbreak of the Covid-19 pandemic seemed to seal the project's fate:[22] "Our dream was dead. Until we realised… It would be way better if it didn't actually exist. Because then it didn't have to conform to any normal rules of an exhibition. Or reality. Much better."[23]

Radiohead decided not to produce new material for their virtual exhibition but to use existing artifacts.[24] On display are newly arranged, partly alienated, or previously unpublished recordings and variations of selected songs from the albums KID A and AMNESIAC, as well as artistic works by Stanley Donwood created at the

20 Cooper, Leonie: "Radiohead Launch PolyFauna App," *NME*, February 11, 2014, https://www.nme.com/news/music/radiohead-145-1238154; N.N.: "Endlich Neues von Radiohead: die App 'Polyfauna,'" *Rollingstone*, February 11, 2014, https://www.rollingstone.de/endlich-neues-von-radiohead-die-app-polyfauna-363369/

21 Yorke, Thom/Donwood, Stanley: "Radiohead Explain the Story Behind the Creation of Its Kid A Mnesia Exhibition, Out Today on PS5," *Playstation Blog*, November 18, 2021, https://blog.playstation.com/2021/11/18/radiohead-explain-the-story-behind-the-creation-of-its-kid-a-mnesia-exhibition-out-today-on-ps5/

22 Ibid.

23 Ibid.

24 Ibid.

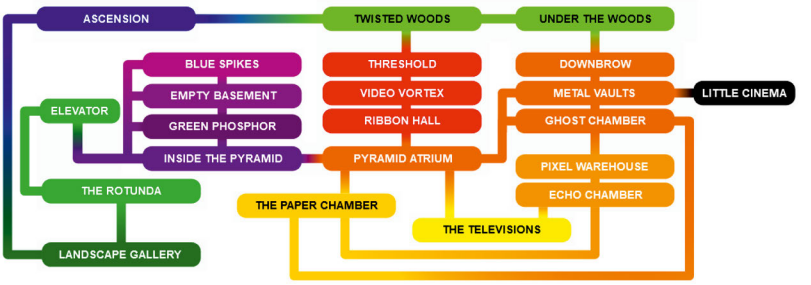
https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

time of the albums. The free downloadable exhibition or game world was created in collaboration with Namethemachine and Arbitrarily Good Productions under the editorship of Epic Games.

## Let's Play the Exhibition!

It's time for an exhibition visit (or playthrough) of the KID A MNESIA EXHIBITION. The following is a glimpse into the exhibition to show what Radiohead have brought to life through their project. The exhibition consists of 22 virtual rooms, which are not intended to depict concrete physical spaces. These spaces are almost continuously scored with sounds, music, or concrete songs as core exhibits presented alongside imagery or experimental visuals. The rooms are partly interconnected like in a labyrinth so that there is neither "the one" nor "the right" direction or route for a tour. We will visit selected rooms below with a particular focus on the topics of spatiality, interaction possibilities, and gaming mechanics.

*Figure 1: The map of the KID A MNESIA EXHIBITION*




Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*I start the game. The menu allows me to view and adjust typical gaming settings, such as sound, display, language, or controls. The movement options are simple: The exhibition can be navigated in first-person perspective (without a visible avatar) with the WASD keys and the computer mouse. Sprinting is possible; a right-click triggers a slight zoom function.*

*I find myself in a colorless forest; only a red light is visible in some distance. Once there, I have two options to continue: either I dive through a large hole into the root kingdom under the earth, or I enter a building that is barely visible from*

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*the outside through a plain metal door. I choose the door as my entrance and am greeted by a text on the wall of a small entry area:*

*"There are doors in doors / and there are trapdoors / there are doors that open themselves / there are sliding doors and secret doors / there are doors that let you in and out / but never open / and there are trapdoors / that you can't come back from / KID A MNESIA EXHIBITION / this is not a game / take your time / you are at the beginning / so there must be an end / some places will make sense / some will never make sense / see you later"*

*Figure 2: The entrance area*

Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*Instead of an in-game solution for displaying information, there is a QR code next to the text that, ironically, has to be scanned from the computer screen with a smartphone. The QR code directs me to a project website,*[25] *which displays a room plan and shows some links. From there, a download link for the exhibition in the Epic Game Store can be accessed, as well as a key to the audio environment in the exhibition, a link to a web store with merchandise specifically for the exhibition, a link to the soundtrack, and there is the option to sign up for a newsletter.*

*Back in the game, the small entrance area is followed by a dark, long corridor lined with colorful picture strips, each of which seems to flow from bottom to top in an infinitely wide space. Nevertheless, I can move off the path between the strips*

25 The site can be accessed at the address: https://kida-mnesia.com/

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

*of images without falling into the depths or being carried upwards. In the corridor, I meet black papier-mâché figures for the first time, which have something in common with the appearance of stick figures. Together with "modified bears" (Radiohead's trademark characters) and other creatures, they keep crossing my path during the course of the game. All of these creatures usually react to my presence with brief eye contact or terse sentences that they mumble to themselves (or to me?).*

*Figure 3: The introductory text and QR code for the exhibition*

Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*I find room titles and the titles of the exhibited songs on several room transitions next to doors on the wall, where I also encounter the QR code described above again and again. Soon I walk towards the "Pyramid Atrium," in the middle of which a narrow but very high pyramid rises into the air. Before I take a closer look at it, I turn off in the direction of a side room called "The Televisions." On the walls of this room are piles of old television sets, most of which are running different sequences. However, these sequences are synchronized in between, and then all temporarily show the same images. Of the song being played in this room, the drum track, bass track, and vocals have been filtered out. Entering a permeable orange "column" in the center of the room, I hear the song's 'drum n bass' track. In this room, I am also given the rare opportunity to interact with the environment by picking up a receiver in a phone box at the side of the room. Through*

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*the receiver, I hear the vocal track of an alienated but also desperate-sounding Thom Yorke, belonging to the song that is exhibited in this room.*

*Figure 4a/4b: Views from the room called "The Televisions"*

Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshots by I. Hamm

*Figure 5: The "Paper Chamber"*

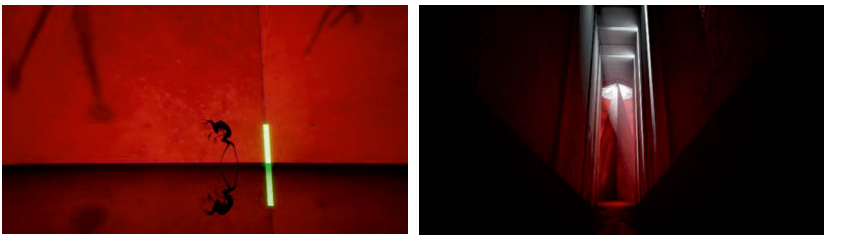
Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*Next, I visit the "Paper Chamber." In this large room, countless pieces of paper with drawings, sketches, and song lyrics flutter around. They hang on the walls and lie on the floor so that I have to walk over them to get to a floating circle of notes in the middle of the room. Suddenly a wind seems to blow through the room with its diffuse-looking walls. All the slips of paper from the floor, the walls, and the circle in the center of the room swirl around me, flying clenched into a corner of the room, only to return shortly thereafter to their former places in new*

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

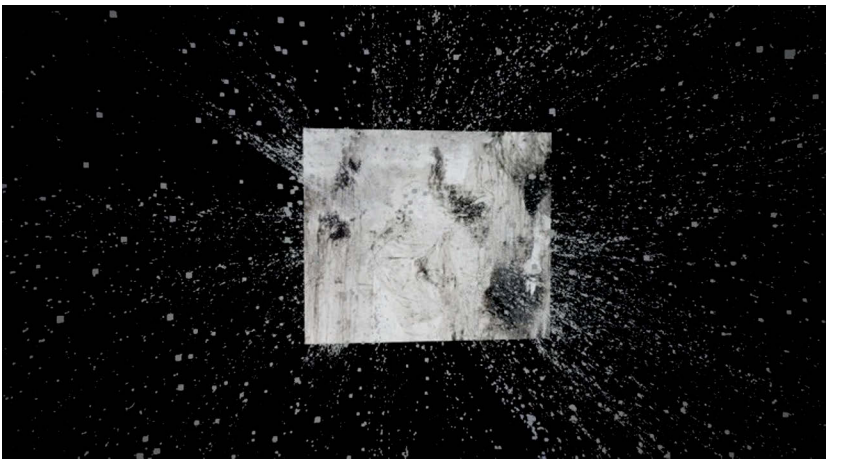
*arrangements and with new motifs. I stay for a while so I can always see new motifs and formatting of the slips of paper. However, I have no influence on the speed at which the next 'gust of wind' renews everything again, and I have to hurry when looking at the slips of paper if I want to see different ones during a rest period. I step back into the "Pyramid Atrium." I circle the pyramid, climb inside, and find myself in a room so large from the inside that it should not fit inside the pyramid at all, judging by the outside appearance. Projections flicker on the interior walls, showing individual creatures, plays of shapes and colors. A minotaur walks around in the middle of the room but pays no attention to me as I head for one of three bar-shaped, glowing doors across the vast space.*

*Figure 6a/6b: The pyramid from the outside and inside*



Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshots by I. Hamm

*Figure 7: Snapshot of the animated visuals for the song "How to Disappear Completely" in the room "Empty Basement"*



Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

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*Passing through a room titled "Green Phosphor," with glowing green lines of a song running along its black walls and floor like computer code, I enter the dark "Empty Basement." I walk along a corridor that seems to float in nothingness—and then, all of a sudden, I'm floating in the air myself. Three different songs are played in direct succession while I dive deeper and deeper into the three associated animated visuals or animated music videos. For the first and only time in the game, it is not possible for me to leave a room for several minutes.*

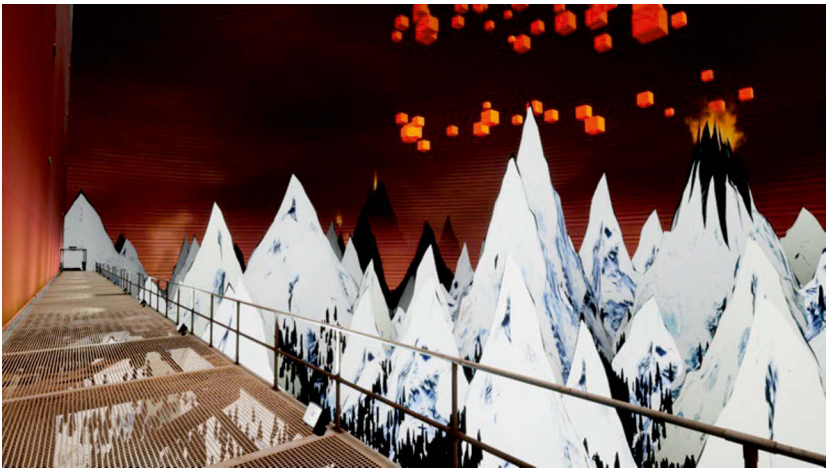
*Finally, I fly through a blue, tunnel-shaped mass back to "Inside the Pyramid" from where I came. Now it looks different here than before: an "Elevator" has appeared in the middle of the room. With it, I reach "The Rotunda," an exhibition space reminiscent of the Guggenheim Museum in New York. The circular gallery seems to wind endlessly up and down, while in the middle, some creatures fly towards the top. I follow the passage upward for some time and still see new paintings on the walls. After about five minutes, the images on the walls repeat, so I seem to have come to the end of a loop. I look around some more and discover that activating the zoom function with a right-click reveals additional information, namely the painting titles. Unlike in the "Empty Basement," an exit from this gallery is possible at any time. The corridor that later leads me to the next room opens again and again in the wall with every turn I make in "The Rotunda." Once in the "Landscape Gallery," I look at two panoramic paintings alongside some modified bears.*

*Figure 8: "The Rotunda"*

Source: Kid A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

*Figure 9: A section of the panoramic view in the room "Ascension"*



Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*As I step closer, the paintings seem to fold away backward in three dimensions, giving me a more vivid view of what's being depicted. Finally, I arrive in a room titled "Ascension." From a scaffold, I can view a large panorama. I'm walking along the scaffolding when suddenly—for the first and only time in this game—the perspective changes. Suddenly I'm no longer looking at the snowy peaks that were just in front of me, but at a wall of a large house, and I see myself from a bird's eye view. Although, up to this point, I seemed to have no body when I looked down at myself, I now realize that I am apparently not disembodied after all. From the bird's eye view and through the shadow that I cast on a wall, I discover that I am a minotaur. I run to the other side of the wall of the building, where part of the scaffolding lifts up and takes me to one of the upper floors.*

*Figure 10a/10b: The change of perspective and the shadow of the own avatar*

Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshots by I. Hamm

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

*Figure 11: A possible end of the exhibition visit*

Source: KID A MNESIA EXHIBITION, Arbitrarily Good Productions LLC, Namethemachine, LLC, 2021, screenshot by I. Hamm

*Again, I walk down a corridor; this time, there are names on the floor—the "credits" of the exhibition. At the end of the hallway, I get out into the open and find myself in the forest where the game began. A couple of modified bears stand in front of me to say goodbye and wave with a sign on which the QR code to the project page is once more displayed. I have arrived at a possible end of the game.*

## Spatiality

This tour with selected stations has shown the opportunities the virtual exhibition uses to create an immersive environment for Radiohead's music, to which it wants to provide a stage. In the beginning, the audience is told, "this is not a game,"[26] followed by "take your time,"[27] which suggests that this medium does not offer any typical game challenges. Nevertheless, certain mechanisms familiar through games are used. Gaming references include an options menu and the control system with a zoom function that can release additional information. Some of the exhibits can only be experienced in their entirety through interaction or are expanded in several dimensions. The routing is unconventional and similar to a

26 KID A MNESIA EXHIBITION (Epic Games 2021, O: Arbitrarily Good Productions LLC/Namethemachine, LLC)

27 Ibid.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

labyrinth. Finally, the visitors discover 'themselves' in the form of the minotaur-avatar and are thus inscribed in the universe through which they move.

Particular significance, however, is attached to the way in which spatiality is handled. The audience must unlock accesses to some rooms by walking other paths, such as "Inside the Pyramid." In the "Paper Chamber" or the "Empty Basement," rooms can dictate the amount of time the audience has to contemplate the exhibits on display. These spaces change and, in some cases, allow the audience to question the boundaries between outside and inside. Impossible dimensions manifest themselves, in particular, in the pyramid, which is larger on the inside than on the outside, or in "The Rotunda," which stretches ever upward and downward, displaying paintings repeatedly in a loop. In the "Empty Basement," artworks literally unfold and surround the audience, completely absorbing them.

During these moments of visiting the exhibition, players are taken away part of their control over the space surrounding them and their possibilities of movement within it. Hans-Joachim Backe points out that by the age of two, humans learn what object permanence means and that changes in objects are partly permanent. In this way, an understanding of the world is formed that allows a feeling of certainty about an individual's environment and the movement through it. If Euclidian rules are broken in games, this leads to a sense of destabilization.[28]

"Non-Euclidean spaces in digital games exhibit additional spatial multistability: in them, navigational paths are not isomorphic with the perceived environment, and the objects change when interacted with or even just looked at."[29]

"Non-Euclidean games […] undermine some of our most fundamental heuristics for meaning making, acquired in early childhood. They confront their players with environments that are not permanent, lack uniquely identifying traits, and thus make it difficult to even identify the starting position of the avatar, let alone to navigate through complex environments. Intentional movement becomes impaired, leading to a loss of agency. […] By confronting us with spaces that withhold our primary cognitive achievement, object permanence, we are left with trial and error […]."[30]

28 Backe, Hans-Joachim: "The Aesthetics of Non-Euclidean Game Spaces," in: Bonner, Marc (ed.), *Game | World | Architectonics*, Heidelberg: Heidelberg University Publishing 2021, p. 163.

29 Ibid., p. 160.

30 Ibid., p. 164.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

In the context of a virtual exhibition, the use of these spatial and movement elements may be surprising at first; however, these irritations contribute all the more to a sense of insecurity and anxiety that the songs on both albums and the artwork are also intended to express.[31]

Finally, in the context of spatiality, it is worth mentioning the use of the QR code, which appears several times in the exhibition. In a digital space, there would certainly have been simpler and more direct solutions for displaying information than a QR code. However, the use of the code on the walls or on signs mimics (or mocks) the experience of an analog visit to the exhibition, where the audience would naturally have had to scan the QR code. Using their smartphones, visitors can access the map to navigate the virtual exhibition first and then visit the museum gift shop later.

## Context: Games and Virtual Exhibitions

"[W]e've built… something. We aren't sure what it is,"[32] Yorke and Donwood write about their project. The question of what we are dealing with here and how the exhibition can be categorized is indeed not so easy to answer. This is due to the fact that there are few comparable games or exhibitions. Well-known titles in the field of music games are, to name just a few, SINGSTAR (2004-2017), GUITAR HERO (2005-2011), ROCK BAND (2007-2010), and BEAT SABER (2018), in which the goal is to play music, keep time, and play a rhythm. Looking for games that focus on specific musicians, the list already gets shorter. Games like BRÜTAL LEGEND (2009) or METAL: HELLSINGER (to be released in 2022) each feature a few selected musicians and bands, in this case from the metal genre. In the open-world action-adventure BRÜTAL LEGEND, the main character Eddie Riggs fights his way through a bizarre heavy metal world where he must save enslaved humanity from demons. For this, he is equipped with an ax, his guitar, and a car. During the game, heavy metal songs can be found and listened to. Celebrities like Jack Black, Lemmy Kilmister, Rob Halford, Ozzy Osbourne, Lita Ford, and Tim Curry have participated in the game and lent their voices to the characters.[33] METAL: HELLSINGER is a first-person shooter and rhythm game in which the player will fight in eight hells. In doing so, he or she will have to coordinate combat actions

31 Yorke, Thom/Donwood, Stanley: *Kid A Mnesia*, Edinburgh: Canongate Books Ltd 2021, pp. ix-xvi.

32 T. Yorke/S. Donwood: "Radiohead Explain the Story."

33 N.N.: "Brütal Legend," *Steam*, https://store.steampowered.com/app/225260/Brutal_Legend/

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as closely as possible to the music in order to amplify it and cause more damage. Music is being contributed by metal celebrities such as Randy Blythe, James Dorton, Matt Heafy, Dennis Lyxzén, Tatiana Shmailyuk, Mikael Stanne, Björn Strid, and Alissa White-Gluz.[34]

Artists who have created their own games or who are the focus of a game have so far been the exception rather than the rule. Björk's app game BIOPHILIA (2011) allowed players to interact and experiment with elements of the ten songs from the same-titled album in different ways. The visual implementation remained abstract; the music was displayed in the form of a galaxy in which each song was represented by a star.[35] A different approach is offered with LAST DAY OF JUNE (2017), a puzzle game whose origin and story can be traced back to a comic by Hajo Müller, which in turn inspired musician Steven Wilson to write a song and ultimately produce a music video with Jess Cope. Based on the story of the comic, song, and music video, players have to try to direct the events of one day from the perspective of different characters in order to prevent a fatal car accident. Steven Wilson's music inspired game director Massimo Guarini to initiate the game's development. However, it is used as a score rather than as an interactive game element.[36]

Looking at comparable examples from the perspective of visual art, the connection between artists, games, and virtual exhibitions seems downright contradictory. This applies especially to the field of media art or, even more specifically, to art games and game art. With the Covid-19 pandemic, the relevance and development of virtual exhibitions have once again increased within the museum scene as well as within the art market. König Galerie in Berlin, for example, featured two virtual exhibitions with gaming aspects as part of its 2020 program "The Artist is Online": Thomas Webb created EXERCISE IN HOPELESS NOSTALGIA (2020-2021), a virtual exhibition that was also a free-to-play online game. Users could explore a 1980s 8-bit-style world, 12 digital exhibits, and a story centered around

34 N.N.: "Metal: Hellsinger," *Steam*, https://store.steampowered.com/app/1061910/Metal_Hellsinger/

35 Schiesel, Seth: "Playing the New Bjork Album, and Playing Along, With Apps," *The New York Times*, October 24, 2011, https://www.nytimes.com/2011/10/25/arts/video-games/bjorks-biophilia-an-album-as-game.html

36 505 Games: "Making of Last Day of June: part 2—feat. Steven Wilson, Jess Cope & Hajo Müller (PEGI)," *YouTube*, September 12, 2017, https://www.youtube.com/watch?v=fBbyhpQlYz4

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

the König Gallery.[37] In this context, personalities such as the gallerist Johann König or the curator Anika Meier also appeared as characters in the game, with whose help players could investigate riddles and pursue quests. Meanwhile, Manuel Rossner's work SURPRISINGLY THIS RATHER WORKS (2020), playable as an app, made the gallery spaces available, including an additional integrated art installation of his own, through which visitors can navigate with an avatar.

Countless other examples could prove that art and digital media, including games, as closely interwoven entities at this point. As a result, it is difficult to draw boundaries between them. These games and experiences are all ultimately very different from KID A MNESIA EXHIBITION, ranging from the controls to the interaction options to the objectives. They also demonstrate how diverse the possibilities are these days for new forms of presenting music as well as intermedial virtual exhibitions.

## CONCLUSION: DIGITAL MATERIALITY

For Radiohead, an analog exhibition at the Victoria & Albert Museum or the Victoria Albert Hall would have certainly been a great success as well. However, music in particular, which has an ephemeral or digital and, in any case, atmospheric character, is almost predestined as a core exhibit for virtual exhibition formats. The KID A MNESIA EXHIBITION shows how digital components can be used not only to creatively exhibit soundtracks and make them accessible but also to bring to life a world of its own inspired by music. This is done in a way that would not have been possible under real-world conditions: Figurines of the universe of both albums are given form, language, and a place. Notes, sketches, and works of art of the Album Art find a new expression in the digital, which makes them interactive and surprising, free of the laws of physics. Music is embedded in a kind of installation art while simultaneously becoming an atmospheric experience through gaming mechanics.

As the definitions of museums are constantly renegotiated, the tasks and requirements of a virtual museum also change on this basis. In the context of digital transformation, the point is to recognize and embrace the possibilities offered by the development and application of information technologies in order to continually create new platforms, such as virtual exhibitions, that can encourage the

37 Prendes, Ana: "Insight: 'EXERCISE IN HOPELESS NOSTALGIA' and the virtual space KÖNIG DIGITAL," *Clot*, November 15, 2020, https://www.clotmag.com/news/insight-exercise-in-hopeless-nostalgia-and-the-virtual-space-konig-digital

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audience to engage with a topic. To achieve this, games offer optimal connecting points and a great potential for innovative and interdisciplinary formats. The KID A MNESIA EXHIBITION shows that precisely these kinds of synergy effects can lead to creative, new exhibition forms. Analog exhibitions and digital ones can do different things. One is different from the other—but in their coming together, something new can emerge that is and does not have to be either one or the other.

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# To Craft a Game Arts Curators Kit

## A Collective Record of How to Publicly Exhibit Video Games Around the Globe

RENE G. CEPEDA/CHAZ EVANS

> How can this field develop a more comprehensive understanding of art and technology without appropriate methods designed to bring it into relief? What would such methods consist of? What insights might emerge into the relationship between art, science, and technology?
> EDWARD SHANKEN[1]

Over the course of two Game Arts International Assembly (GAIA) symposia in 2019 and 2021, dozens of video game art curators and practitioners worked together to create the *Game Arts Curators Kit (GACK)*: a collectively authored document that represents roughly a decade of practical experience producing game art exhibitions and public programs at museums and other cultural venues. The contributors, writing from different parts of the world, offer different insights and perspectives on the international game curation and exhibition movement. However, in comparing our experiences, we found that similar models of how to support video games within local and regional communities have organically appeared in different places. The *GACK* is an attempt to document at least a portion of the collective experience of this group to share it broadly with other video game curators and organizers or those who may consider becoming video game curators and organizers.

1 Shanken, Edward: "Historicizing Art and Technology," in: Grau, Oliver (ed.), *MediaArtHistories*, Cambridge, Mass.: The MIT Press 2007, pp. 43-70, here p. 43.

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This chapter is an account of how the *GACK* came to be, a summary of the main themes contained in the document, a record of those who have participated in its creation, and perhaps most importantly, an explanation of the role this video game curation plays within the broader world of museums, galleries, and public programming in cultural venues of various kinds. As an index of a global movement, the *GACK* points to how video games, their non-digital corollaries, and related new media art are often not the disembodied flow of placeless, globalized media they appear to be in mass-market contexts but instead are the instrument of playfulness in the material reality of our cities and communities. Multinational corporate video game studios attend to the game consoles and proprietary downloading platforms that often define private, domestic forms of video game play, but it is the local video game art organization that serves the public's ability and drive to play together in common corporeal space.

## THE ASSEMBLY OF CONTRIBUTING VIDEO GAME CURATORS

The authors of this chapter traveled different paths to working in video game curation. Yet when we received the opportunity to co-lead the *GACK* together, we were excited to find we shared many of the same perspectives and goals for the field. Evans started curating video game artwork when he co-founded Chicago's Video Game Art (VGA) Gallery in Chicago with Jonathan Kinkley in 2013 and mounted its first exhibition in 2014. In his work with VGA, Evans was driven by the need for a public venue in Chicago that could support contemporary artists using video games as their medium as well as independent game studios or individual video game developers that were experimenting with aesthetics, subject matter, and mechanics that did not fit into commercial games contexts. As an organization, VGA mounted dozens of video game art exhibitions and events and maintained a brick-and-mortar space from 2017 to 2020.

The Chicago-based organization was a node in a not-yet-defined network of similar spaces being founded in other cities and countries over the 2010s, and Evans was intrigued when he learned about GAIA, founded by Jim Munroe and Maria Lujan Oulton, and was invited to its first symposium in Buenos Aires in the fall of 2019. It was there that Oulton and Chad Toprak proposed the idea of a Game Arts Curators Kit that could serve as an information-sharing resource for those already working in the field, as well as a guide for others who wish to join it. From there, an initial writing session took place between different GAIA participants where initial categories and prose were developed. Work was then paused

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by the global COVID-19 pandemic. In 2021 a second online GAIA symposium was organized by Munroe, Oulton, and Marie Claire LeBlanc Flanagan, and that organizing committee invited Evans to re-engage the project with Rene G. Cepeda.

Cepeda's work in video game curation began with his personal interest in gaming from a young age. After finishing his degree in information design, Cepeda proceeded to enroll in a museum studies degree where he would propose a merging of video game technologies with heritage preservation and exhibition. This was followed by a second master's in art history, where Cepeda joined the games as art discussion, and then a Ph.D. in curation and display of interactive new media art. This Ph.D. was a practice-based project that described the research, methodology, and creation of the *Manual for the Curation and Display of Interactive New Media Art*. Through this manual, Cepeda became involved with GAIN and eventually *GACK*; more specifically, while applying for GAIA 2021, the subject of Cepeda's experience with curatorial manuals came to light, and he was therefore invited as co-editor for the project.

It is through the GAIA symposia and the collaborative exercise of the *GACK* itself that Cepeda and Evans deduced that a global network of video game curators was not, in fact, aspirational but an established international movement in local public programming. Practically speaking, the *GACK* connected the work to over twenty practitioners representing over ten institutions and at least ten countries over four continents.[2]

2 The full list of collaborators on this project is as follows: Isabelle Arvers (curator, France), Jose Luis Pacheco Boscan (artist, Venezuela), Clare Brennan (Abertay University, UK), Zuraida Butler (curator, Netherlands), Jenna Caravello (UCLA, USA), Rene G. Cepeda (UNARTE and Header/Footer Gallery, Mexico), droqen (game developer, Canada), Chaz Evans (University of South Carolina and VGA Gallery, USA), Marie Claire LeBlanc Flanagan (artist, Canada), Tiffany Funk (University of Illinois at Chicago, USA), Mer Grazzini (artist, Argentina), Leland Heller (Museum of Art and Digital Entertainment, USA), Lauren Kolodkin (Smithsonian American Art Museum & Renwick Gallery, USA), Shalev Moran (game designer, Denmark), Jim Munroe (Game Arts International Network, Canada), Maria Lujan Oulton (Universidad de Palermo, Argentina, curator Spain/Argentina), Brice Puls (game developer, USA), Emelie Reed (curator, UK), Saraelena Cabrera Roldán (arts educator, Mexico), Jamie Sanchez (designer and organizer, USA), Eleanor Schichtel (designer and artist, USA), Jo Summers (Global Game Jam, UK), Chad Toprak (game designer and curator, Australia), John Wanamaker (Game Designer, USA), and Sagan Yee (animator, Canada).

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## A SNAPSHOT OF VIDEO GAME CURATION IN THE 2010S

The notion of video game curation may seem obscure to cultural patrons, or even practicing curators, who are only familiar with the practice of curation being applied to objects belonging to fields like the plastic arts, natural sciences, cultural anthropology, or antique books exhibited in spaces such as art museums or galleries, science museums, history museums, or archives. However, there have been curators handling the exhibition of video games since the 1980s.[3] Over the 2010s in particular, the practice has grown considerably to require the video game curating specialist. This is a development that parallels the growth in independent or artist-made video games along with not-for-profit organizations, festivals, conferences, co-working spaces, parties, and other regional public displays of gaming that also grew considerably over the last decade.[4]

Up to the time of writing, it is still rare for a long-running cultural institution to have an in-house specialist or department for handling the public presentation of video games, despite their ubiquitous presence in global media and cultural influence. There are very notable exceptions of more august institutions engaging with video games for specific exhibitions, such as the Smithsonian American Art Museum's 2012 exhibition *The Art of Video Games* curated by Chris Melissinos,[5] MoMA's initial acquisition of video games into its design collection led by Paola Antonelli in 2013,[6] and the Victoria and Albert Museum's *Design/Play/Disrupt* exhibition curated by Marie Foulston (also a GAIA participant) in 2018.[7] However, these examples represent one-off projects that are perceived as an anomaly within the history of these institutions' normal public programming and do not

3 For example, the Museum of Moving Image's 1989 exhibition *Hot Circuits: A Video Arcade.* For more information refer to: Slovin, Rochelle: "7 Hot Circuits: Reflections on the 1989 Video Game Exhibition of the American Museum of the Moving Image," in: Wolf, Mark J.P. (ed.), *The Medium of the Video Game*, Austin, Texas: University of Texas Press 2021, pp. 137-154.

4 Refer to: numerous mentions of the importance of festivals in developing and defining the category of independent video games in Juul, Jesper: *Handmade Pixels*, Cambridge, Mass.: The MIT Press 2019.

5 See Smithsonian American Art Museum: "The Art of Video Games," https://americanart.si.edu/exhibitions/games

6 See https://www.moma.org/explore/inside_out/2012/11/29/video-games-14-in-the-collection-for-starters/

7 See Victoria and Albert Museum: "Videogames: Design/Play/Disrupt," https://www.vam.ac.uk/exhibitions/videogames

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signal an ongoing commitment to preservation or cultural context-building, both of which are required by a medium that is rapidly growing, constantly changing, and expressed differently in specific localities.

Therefore the ongoing work of video game curation is much more visible in local cultural scenes that have produced many support structures for the public presentation of video games most visibly over the first part of the new millennium. In Argentina: there is the ongoing exhibition *Game On! El arte en juego* in Buenos Aires, and the Puerto Global space in Río Grande, Tierra del Fuego. In South Africa: the Super Friendship Arcade and Playtopia festival in Cape Town. In India: Mumbai's Eyemyth Festival. In Australia: Melbourne's Freeplay Independent Games Festival. In Japan: Kyoto's BitSummit conference. In South Korea: Out of Index Festival in Seoul. In Italy: the Milano Games Festival. In Germany: Berlin's long-running, landmark games and independent media festival A MAZE. In the Netherlands: Amsterdam's Playful Arts Fest and Utrect's Broeikas. In the United Kingdom: Now Play This and Wild Rumpus in London, and NEoN Digital Arts Festival in Dundee. In the United States: The Museum of Digital Art and Entertainment (MADE) in Oakland, New York City's Babycastles collective, BitBash festival and VGA Gallery in Chicago, and LikeLike gallery in Pittsburgh. In Canada: Toronto's Hand Eye Society. This is by no means a comprehensive list but illustrates that independent organizations locally supporting video games have developed piecemeal in every continent other than Antarctica.

While the world's output of local video game exhibitions is robust, much of this work is highly ephemeral. Live events are difficult to document. There is no central archive that can store such material even when it is captured, and the organic DIY nature of many of the events means that whole organizations often come and go in a matter of years or sometimes even months. Indeed artist-run, independent, and alternative spaces for exhibiting video game art and related new media are still every bit as precarious yet vital as when they were described by Beryl Graham and Sarah in their 2010 landmark overview of curating new media art in general.[8] A comprehensive archive of all these organizations, the events they presented, and the work they feature would be a project outside of the scope of the possible. However, a document capturing some of the working knowledge driving these endeavors can function as both a record of this field as well as a resource to inspire the generation that comes after.

8 Graham, Beryl/Cook, Sarah: *Rethinking Curating: Art after New Media,* Cambridge, Mass.: The MIT Press 2010, pp. 247-280.

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## Intentions Behind the *GACK*

Since the general concept was originally proposed in the 2019 GAIA symposium, the *GACK* was intended as a collective and collaborative effort to record knowledge from a variety of individuals involved in the game art scene. A subset of GAIA 2019 participants met online after the meeting in Buenos Aires and resolved that individual writers should be assigned individual topics in order to generate the first draft of prose, but the group should also act as a collective editing structure. That is to say, once one entry was written, it would be handed off to one or more other members of the group for feedback, edits, and even debate if necessary. The intention was to keep the document open to multiple or even contradictory perspectives as unvarnished documentation of a discourse being carried out in multiple cultures (much to the delight of the authors of the chapter and other members of the group, this affordance for diverging views was rarely needed and instead methods and perspectives harmonized far more than they diverged among participants). This initial meeting generated five entries before progress on the project was paused by the global COVID-19 pandemic.

After the GAIA organizers enlisted Cepeda and Evans to re-engage the project in 2021, more specific structures and values needed to be built on top of this initial groundwork. The main unresolved question going forward, especially working in an online context, was: who would be invited to participate and share their experience in the *GACK*? In consultation with GAIA organizers, the project co-leaders devised a simple two-part rule for entry into the process: "Do you have experience curating video games, and would you like to share that experience? If so, you are welcome to participate in writing and editing the *GACK*."

Given the emerging nature of the game curation as well as the DIY and extramural status of many game exhibition projects, it was important to adopt this approach that did not require any further qualifications to enter. This non-hierarchical value was deemed essential for gathering an accurate overview of the field. After this, a call was opened for artists, curators, game developers, event organizers, and others participating in or familiar with GAIA 2021 (which is itself open to the general web-viewing public) to continue the *GACK's* progress. Responses exceeded expectations, and the plan for the global group writing challenge was proposed in an online session on Friday, March 26, 2021.

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## STRUCTURE OF THE *GACK* WRITING PROCESS

The exercise began with the assignment of topics, and then the document was created over three phases:

- Phase 1, where assignees wrote first drafts over two weeks,
- Phase 2, where everyone switched roles and edited someone else's draft over two more weeks, and
- Phase 3, where for three weeks, the project co-leaders, GAIA organizers, and anyone else with additional thoughts were free to review and address outstanding needs.

Well over twenty individuals from across the world volunteered to participate in the writing exercise. The motivation behind this was to capture a broad selection of approaches to games curation where experience and knowledge came from a variety of sources rather than the more traditional approach where a single curator or curatorial team carries the vision.

The subjects chosen were meant to answer the questions why, what, who, where, when, and how to curate a video games exhibition. During registration, volunteers were asked which themes they would like to write about. We took these responses and generated a system that, to the best of our capabilities, assigned each author the subject of their choice. Not all subjects had the same degree of popularity, with diversity, permissions, and governance only getting one request each. While no formal reason was expressed, we believe contributors did not feel qualified to speak on the aforementioned subjects and thus refrained from volunteering to write these sections. To resolve this, it was necessary to recruit additional contributors with specific experience, so the less popular sections were still covered. Once subject assignments were finalized, the actual writing began. For this phase, authors were given free rein over their chapters and the structure they would use. While Evans and Cepeda had editorial oversight over the entire process, it was decided that volunteers had the qualifications necessary to negotiate the editing of their own sections, with Evans and Cepeda acting as a backup. Fortunately, no section required further editing after the contributors' editing passes.

It is also important to highlight the wiki nature of the manual itself. When it was first proposed, the *GACK* had no predetermined platform as the initial writing exercises were done in Google Docs. However, upon the arrival of Cepeda, he suggested the manual be hosted as a wiki. Wikis are collaborative hypertext publications where a community can collaboratively shape a text without depending

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on a central authority.[9] Cepeda recommended this after his own experience handling a collaborative live-document in his own manual. A wiki made editing and change tracking a much simpler process where any member could edit something, document that change, and have it reflected on the document's metadata, making it immediately and publicly visible. The advantages of the wiki structure make the *GACK* forward-compatible and able to evolve as technology and the field of game curation change. Whether or not the project continues will be discussed in the analysis section. After the process concluded, some contributors also shared that the wiki structure had drawbacks in the editing phase, stating that breaking into someone's writing in that format felt too public and final, and they preferred to exchange feedback and edits outside of the wiki.

## THE *GACK* IN SUMMARY

The manual is broken down into six sections named why, what, who, where, when, and how. This subdivision of themes was meant to answer the most common questions when curating an exhibition while at the same time creating something of a suggested workflow. Effectively, what this means is that if one were to move through the manual in the order present in the table of contents, it would be possible for the organizers of an exhibition to execute each step in order and, in the end, have a fairly detailed and encompassing exhibition proposal ready to be shopped around.

This suggested reading is not necessarily the definitive reading order, as the modularity of the manual also allows curators to peruse the sections relevant to their interest or current situation. A more experienced curator may not be as interested in the funding aspect of an exhibition as a novice curator who lacks a network of contacts and experience. Similarly, someone already versed in new media art curation may find some of the recommendations made in the manual familiar to their own methodologies.

Having explained the methodology of *GACK*, we'll turn to the underlying structure and contents of each section as well as highlight particularly interesting insights within them. Under the "Why" chapter, we can find the "Goals" section. Written by Evans, "Goals" was one of the original texts generated in the first curators' manual writing exercise in 2019 and lays down the many reasons a curator may want to curate a video game exhibition while avoiding being prescriptive; in

9 See Wikipedia: "Wiki," https://en.wikipedia.org/wiki/Wiki

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a way, it is more of a manifesto for the manual and its underlying spirit[10]. The next chapter, "What," attempts to answer the question: What is needed to make a video game exhibition? Sections under this chapter include "Themes," "Formats," "Selection," "Artworks," and "Accessibility." As such, this content deals with a lot of the practical part of curation, including the tone of the exhibition and its content. It also invites the curator to consider the practical implications of their work, or as Emilie Reed puts it:

"Determining the scope of the particular format you're working in and specific concerns and issues related to that format is an important step in planning the activity. Generally, formats are informed by what type of work you are presenting, the venue in which you are presenting it, your target audience, and the time period of the activity."[11]

This recommendation highlights the inherently interdisciplinary nature of video games and prepares the reader for further collaborative work in the workflow of an exhibition's curation and display.

Meanwhile, the "Who" chapter helps curators engage with the individuals surrounding videogame exhibitions. This includes sections on how to address diversity within the community, but more importantly, it addresses xissues of tokenism and performative inclusivity. "Creators" offers ideas on how to engage with game creators. Some insights presented by the game creator and author of this section, droqen, include reminders that not only the general public but also creators themselves often do not see their work as artistic, and this will require curators to adjust to their specific idiosyncrasies. Furthermore, it accounts for issues such as the collaborative and interdisciplinary nature of game making. Other interesting contributions to this chapter included audience breakdowns based on their interests and gaming literacy. "Teams" and "Partners" deal with the internal running of an exhibition. From the preparation and importance of front-of-house staff to finding and forming strategic alliances with other institutions.

"Where" covers questions of sites, virtual sites, and regions. Unlike most artforms, video games have very specific demands for sites, including internet access, power outlet availability, space for the public to queue, and low light levels. To account for all of this, Lujan Oulton and Rene G. Cepeda formatted this section as a checklist to be run through as an exhibition is planned in order to ensure none

10 Evans, Chaz: "Goals," in: *Game Arts Curators Kit*, 2021, https://gameartsinternational.network/gameartscuratorskit/doku.php/goals

11 Reed, Emilie: "Formats," in: *Game Arts Curators Kit*, 2021, https://gameartsinternational.network/gameartscuratorskit/doku.php/formats

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of these needs are overlooked.[12] "Online" addresses the different ways a video game exhibition can be designed for web distribution, including platform considerations, artwork suitability, and more. It also prepares curators for the costs and heightened challenges they will face should they decide to proceed with such an undertaking. Finally, "Regions," as its name indicates, covers regional differences. In a very astute turn, Jose Luis Pacheco Boscan clarifies that regions are not only geographical but also cultural and that these differences change the way video games are perceived and engaged with. Thus, care must be taken to not assume that what worked in one region will automatically succeed in another one.[13]

"When" is a short section covering concerts of duration and scheduling. As interactive artworks, video games are often best experienced when they are played live. Unfortunately, this places extra pressure on curators, teams, and spaces as queues may form, access to the playable versions is limited to the number of game stations available, and more importantly, depending on the game, its playtime may be beyond the scope of a museum exhibition. It also covers some of the more traditional logistics of an exhibition, including loan time, public outreach programming, and more. While those last few issues affect all exhibitions, it is important to cover them in a manual of video games both because the curator may not be familiar with traditional curatorial practice or the curator may be familiar with it but assume video games function differently.

The final section of the manual, "How," is concerned with the more practical considerations of a video game exhibition, including kiosking, exhibition design, legal requirements, funding, and issues of interactivity. They are discussed both in terms of the philosophy behind games being made playable or unplayable in an exhibition and in the context of how to engage with such interactivity in ways that do not exclude those interested in games but are unable to interact due to any number of reasons. This section also lays down ideas for codes of conduct and exhibition governance where things such as the exhibition's tone are taken into account, as well as ways to account for the problematic aspects of gaming culture such as homophobia, racism, and misogyny. It also helps curators consider how to protect minors and minorities as well as ways to enforce such actions.[14]

12 Oulton, Lujan/Cepeda, Rene G.: "Venues," in: *Game Arts Curators Kit*, 2021, https://gameartsinternational.network/gameartscuratorskit/doku.php/venues

13 Pacheco Boscan, Jose Luis: "Regions," in: *Game Arts Curators Kit,* 2021, https://gameartsinternational.network/gameartscuratorskit/doku.php/regions

14 Sanchez, Jamie: "Conduct," in: *Game Arts Curators Kit*, 2021, https://gameartsinternational.network/gameartscuratorskit/doku.php/conduct

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It is the hope of all who participated in creating the guide that following these sections will ideally result in an exhibition that treats video games with the respect and specificity they deserve. Additionally, following this program should ensure that said exhibitions embody values of accessibility and inclusivity in a way that meets the requirements set forth by Jon Ippolito's article "Death by Wall Label," where he describes the curatorial challenges inherent in new media art.[15]

## ANALYSIS AND THEMES OF THE *GACK*

Looking back at *GACK*, there are many observations that can be made. First, the resulting document reframes video game curation into a collaborative, multi-disciplinary process that is open to creativity and reinterpretation at both the curatorial and expositive levels. By splitting the writing into a main round of writing, followed by a round of volunteer editing/co-writing and a final round of editing by the GAIA staff, the manual underwent a form of peer review that enhanced the quality of the recommendations and writing. It is also worth mentioning that there were a variety of voices from Latin America, the United States and Canada, Europe, and Oceania. The other beneficial developments that came from this exercise were the creation of new relationships, both professional and personal, that continue to this day.

Were this experiment to continue, possible avenues for growth could include growing the list of contributors in order to encourage even broader co-authorship and more diverse editing rounds. Another potential improvement to the text could be the inclusion of new sections or the expansion of existing ones. For example, the online section could be expanded to address the use of emerging platforms currently drawing wide commercial speculation. It could be particularly important to draw on a group's experience for recommendations on how to incorporate high-quality VR headsets, as well as standards and for whether and how much this field should engage with blockchain technology.

In terms of what could have been improved, fostering a sense of community outside of shared group work and deadlines continues to be a high priority. This could be achieved through get-togethers, casual gatherings, round tables, and other systems of socialization. The use of Slack seemed to be a barrier to communication

15 Ippolito, Jon: "Death by Wall Label," in: Christiane Paul (ed.), *New Media in the White Cube and Beyond: Curatorial Models for Digital Art,* Berkeley, California: University of California Press 2008, pp. 106-130.

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for some, with not all participants being familiar with the software or ignoring it for weeks at a time.

Overall, this version of the *GACK* is now in a resolved and ready-to-use state and is also in the process of being designed and edited for a print edition. While there is room for improvement, the resulting manual is available for use at all levels of video game curation.

## CONCLUSION

It is not our aim that the *GACK* and the process that crafted it should stand as a permanent authority on the topic of video game curating. Instead, the most successful evaluation of the *GACK* would be if, after a new decade of this practice, hopefully even more robust and globally supported than the last ten years, another group would convene to share their own observations and themes from experience. Then those experiences could be encapsulated as a new end-of-2020s *GACK* to take the place of this one. However, in the short term, we would like to view the *GACK* experiment as a success through the new strength and definition it has provided to the assembly of video game curators it brought together.

Outside of the results of the process, the act of writing as a group functions as a second step in the evolution of a global video game curator infrastructure after the initiation of GAIA. The response the project received from the call for participation supports the notion that there is ample interest and need for projects such as these. We invite you to look at the lessons of this manual and apply them to your own efforts and perhaps create your own game art organization and continue to grow this important and relevant academic field. Or alternatively, if you are a reader without any inclination to curate a video exhibition of your own, we hope the existence of the *GACK* increases the visibility of video game exhibitions when you are deciding what to patronize within the cultural offerings in your particular corner of the globe.

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# On Chainsaws and Display Cases

## Exhibiting Video Games

BENJAMIN BEIL

## PROLOGUE: THE CHAINSAW CONTROLLER

The Chainsaw Controller is a strange artifact. Released in 2005, this merchandise item for Capcom's survival horror classic RESIDENT EVIL 4 (2005) is, as the name promises, shaped like a small chainsaw covered in blood splatter and, also as the name promises, actually a functional PlayStation 2 controller (Fig. 1).[1] The Chainsaw Controller can accordingly be used to play RESIDENT EVIL 4, a video game that, at first glance, seems to fulfill every cliché: It celebrates the brutal fight against hordes of zombies using genre-standard weapons, like a shotgun, a rocket launcher, and, of course, a chainsaw. At a second glance, however, RESIDENT EVIL 4 proves to be a rather subversive (art) work by placing numerous high culture artifacts in its generic game world, which are then used in elaborate, sometimes self-reflexive puzzles. Thomas Hensel has dedicated a small monograph[2] to RESIDENT EVIL 4's art historical references and reflections—from Sandro Botticelli's *Primavera* (late 1470s or early 1480s) to Raphael's *School of Athens* (1509-1511) and Cornelis Norbertus Gijsbrecht's Still Lifes (around 1660/1670).

1 The chainsaw controller was produced by NubyTech in two versions, a red one for the Playstation 2 and a yellow one for the Nintendo GameCube. Both versions were released in limited editions of 50,000 units each.

2 Hensel, Thomas: *Nature morte im Fadenkreuz. Bilderspiele mit dem Computerspiel*, Trier: Fachhochschule Trier 2011.

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*Figure 1: Resident Evil 4 Chainsaw Controller (2005)*

Source: Marx, Peter W./Neuhausen, Hubertus: *Schätze der Universität zu Köln*, Cologne: Greven Verlag, pp. 60-61

A certain self-reflexive quality also characterizes the Chainsaw Controller. The playful short-circuiting of the virtual chainsaw in RESIDENT EVIL 4 with a real chainsaw shape shows how unsuitable a chainsaw (or 'chainsaw') actually is for controlling a video game. The supposed increase in realism turns out to be a breach in the aesthetic illusion of the game world when the already comically exaggerated depiction of violence on screen is superimposed with the awkward swinging of a bizarre miniature toy chainsaw in front of the monitor. The integrated sound chip further amplifies this effect: When the chainsaw is activated in the game, the controller emits a pitiful engine noise.

The Chainsaw Controller has yet another level of meaning. It musealizes itself by squeezing into a (too) small display case. Display cases serve important functions in museums. In addition to protecting the exhibited artifact, they determine a certain way of showing and viewing:

"The space behind the transparent panel is [...] a showing space. In contrast to a perspective picture space, this space does not open up into the imaginary depth of the picture but is

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directed at the gaze of the viewer who stands in front of it. The space remains flat; it is delimited by a background against which the object is presented. The object itself is meant to enter the viewer's gaze; it is meant to show itself. [...] Behind the glass panel, it is given free space."[3]

Following Krzysztof Pomian's museological theory, the display case turns the Chainsaw Controller into a *semiophor*. Semiophores are "two-sided objects: they have a material and a semiotic aspect,"[4] they are "objects without usefulness [...] that represent the invisible, that is, that they are endowed with meaning."[5] Inside the display case, the controller is no longer usable as a controller. Its practical value as a technical artifact for controlling video games dwindles in favor of its function as a sign carrier. It stands for something, represents something.

However, what does the chainsaw controller represent? In Pomian's theory, the meaning of a sign carrier emerges primarily through the museum context and can thus vary considerably—for example, as a metaphorical construction in an art museum or as a synecdochic representation of other cultures in an ethnological museum.

"When situating games in the gallery or the museum, they are read through the context of those institutions. Shown as contemporary art, they are examined for their aesthetics and cultural engagement. If they are displayed within a science museum, there is a tendency to examine them as technological artefacts. When displayed in the context of galleries dedicated to the moving image, videogames are frequently seen through the lens of cinema, framed by knowledge of cinematic conventions."[6]

Admittedly, the question of the exhibition context seems nonsensical in the case of the Chainsaw Controller since the musealization is only pretended. The fact that the Chainsaw Controller actually became an exhibition object in museums several

3 Spies, Christian: "Vor Augen Stellen. Vitrinen und Schaufenster bei Edgar Degas, Eugène Atget, Damian Hirst und Louise Lawler," in: Boehm, Gottfried et al. (eds.), *Zeigen. Die Rhetorik des Sichtbaren*, Munich: Fink 2010, pp. 258-288, here p. 275, my translation.

4 Pomian, Krzysztof: *Der Ursprung des Museums: vom Sammeln*, Berlin: Wagenbach 1998, p. 84, my translation.

5 Ibid., p. 50, my translation.

6 Stuckey, Helen: *Play on Display. The Exhibition of Videogames in the Museum*, Master Thesis, Swinburne University of Technology 2010, p. 61.

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times is part of the irony of media history and will be addressed again at the end of this essay.

One last argumentative loop should suffice to conclude this introduction: It is, of course, an inadequate description that the Chainsaw Controller is an object in a display case. Rather, this is a fight between an object and a display case from which the saw blade has already forcibly made its way out. It almost seems as if the chainsaw is trying to free itself from its semiophoric status and reclaim its use value. However, this description does not apply either because it is not a chainsaw but a Playstation 2 controller… Preliminary conclusion: The Chainsaw Controller shows what it is and what it is not by pretending to be something else, a chainsaw and a musealized object.

The question of whether this makes the Chainsaw Controller a self-reflexive (art) work, a silly merchandise item, or simply a slightly dysfunctional Playstation 2 controller is one that each viewer/collector/gamer must answer for themselves. The semiophoric quality of the Chainsaw Controller that is of interest for this introduction is primarily its grotesque yet quite pointed representation of the difficult relationship between video games and museums—or simply: that video games (and their paratexts) seem uncomfortable being squeezed into display cases.

## DIGITAL MEDIA AT THE MUSEUM

Current approaches to museum practices as well as museum studies are increasingly characterized by questions of digitization. On the one hand, there is technological optimism. On the other, there is skepticism with regard to new digital media and a tendency to return to 'the original' and 'the material.' Digitization thus frequently leads to renegotiations of original and copy and of concepts such as aura and authenticity.[7]

These discourses revolve primarily around two aspects: the digitization of objects (or entire collections) and the presentation of these objects with the help of digital media in the museum space or in the form of virtual exhibitions.[8] Far less

7 Cf., e.g., Niewerth, Dennis: *Dinge—Nutzer—Netze: Von der Virtualisierung des Musealen zur Musealisierung des Virtuellen*, Bielefeld: transcript 2018, pp. 50-82.

8 Cf., e.g., Geipel, Andrea et al. (eds): *Das digitale Objekt zwischen Depot und Internet*, Munich: Deutsches Museum 2020; for a more extensive overview cf. Kohle, Hubertus: *Museen digital. Eine Gedächtnisinstitution sucht den Anschluss an die Zukunft*, Heidelberg: Heidelberg University Publishing 2018; Baur, Joachim (ed.): *Das*

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often, these discussions are about exhibiting and collecting digital—born-digital or natively-digital or digital-first—objects, i.e., objects that have not first been created by digitizing a 'material original,' e.g., video games. Admittedly, these somewhat clumsy conceptual differentiations already point to considerable problems of a more fundamental distinction between digital (or virtual?) and material objects. Further debates, however, cannot be elaborated on here.

Considering video games primarily as software (as program code), it can be argued that their content is transmedial, that is, to a certain extent, "detached from a specific material substrate."[9] Yet, video games are nevertheless not conceivable—and certainly not exhibitable—in an immaterial form. The question of the materiality of digital objects is thus at best shifted to the question of which *version*, which 'material incarnation' of a digital object is on display.

## Medium Exhibition

This essay, therefore, does not deal with (video) games or gamification as educational tools for museums but with video games as exhibition objects. How can the 'old' "medium exhibition"[10] be used to approach 'new' digital media? Such a question regards exhibitions first and foremost as a "medium of knowledge transfer."[11] This coincides with an "understanding of the medium exhibition that goes beyond the depiction of scientific knowledge to become a genuine medium of knowledge in its own right."[12] While exhibitions often tend to "let objects remain

*Museum der Zukunft: 43 neue Beiträge zur Diskussion über die Zukunft des Museums*, Bielefeld: transcript 2020; Mohr, Henning/Modarressi-Tehrani, Diana (eds.): *Museen der Zukunft. Trends und Herausforderungen eines innovationsorientierten Kulturmanagements*, Bielefeld: transcript 2022.

9 Schröter, Jens: "Das ur-intermediale Netzwerk und die (Neu-)Erfindung des Mediums im (digitalen) Modernismus. Ein Versuch," in: Paech, Joachim/Schröter, Jens (eds.), *Intermedialität analog/digital*, Munich: Fink 2008, pp. 579-601, here p. 586, my translation.

10 Lepp, Nicola: "Ungewissheiten—Wissens(v)ermittlung im Medium Ausstellung," in: Staupe, Gisela (ed.), *Das Museum als Lern- und Erfahrungsraum. Grundlagen und Praxisbeispiele*, Cologne/Vienna: Böhlau Verlag 2012, pp. 60-68.

11 Ibid., p. 61, my translation.

12 Lepp, Nicola: "Transdisziplinäres Ausstellen," in: ARGE schnittpunkt (ed.), *Handbuch Ausstellungstheorie und -praxis*, Cologne/Vienna: Böhlau Verlag 2013, pp. 193-194, here p. 193, my translation.

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in a mere coexistence,"[13] it is crucial to "develop a visual argument through composing and positioning objects in relation to each other."[14]

"Knowledge transfer is then no longer the presentation of an a priori truth, but an involving, performative act of questioning and exploring knowledge in and with things, which takes place in the exhibition space." [15]

Such a perspective on the medium exhibition even allows to draw further parallels between the spatial-medial functions of the museum and those of video games:

"'Virtual space' is not just the domain of video games and virtual reality applications. Rather, it is the model of thought we use […] to reify information. [...] This means that the conditions of digital knowledge transfer must be treated *architecturally* and the specific situations of knowledge transfer *curatorially*. This irony is inevitably part of the diagnosis of the state of the museum in a digital-technologized world: The museum fears for its future at a time when its expertise and competencies should be more valuable and in demand than ever." [16]

In recent years, video games have developed into a popular mass media phenomenon, yet the public perception of video games still fluctuates between skepticism and euphoria, *Killerspiel* and *Kulturgut*.[17] Accordingly, it seems all the more important that the exploration of video games takes place not only within sub- and expert cultures or in the academic ivory tower but also in other social spaces, such as museums. Even more, especially against the background of an unstable public perception of video games, exhibitions seem to be particularly

13 N. Lepp: "Ungewissheiten," p. 61, my translation.

14 Ibid., my translation.

15 Ibid., p. 64, my translation.

16 D. Niewerth: *Dinge—Nutzer—Netze*, p. 404-405, emphasis in original, my translation.

17 An inadequate, less catchy translation of this very German terminology would be: between 'violent games harmful to minors' and 'culturally valuable artifacts.' Cf. Wimmer, Jeffrey: *Massenphänomen Computerspiele: soziale, kulturelle und wirtschaftliche Aspekte*, Konstanz: UVK 2013; Beil, Benjamin: "Loading... Game Studies und Medienkulturwissenschaft," in: Bartholdy, Björn et al. (eds.), *Games studieren—was, wie, wo? Staatliche Studienangebote im Bereich digitaler Spiele*, Bielefeld 2018, pp. 53-70.

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suitable for this task, as "spaces of possibilities in which insights are generated, and new knowledge is investigated."[18]

## Video Game Exhibitions I: Beginnings

The cultural history of video game exhibitions presents itself as a confusing field, as there have been few cases of institutionalization (specialized museums etc.) so far. In most instances, video games find their way into museums in the form of (smaller, rarely larger) special exhibitions. As a result, research on video game exhibitions is similarly convoluted and still quite sparse. Besides James Newman's standard reference *Best Before: Videogames, Supersession and Obsolescence*,[19] which is primarily devoted to the preservation of video games, two monographs stand out: Raiford Guins' study on North American arcade history *Game After: A Cultural Study of Video Game Afterlife*[20] and Helen Stuckey's dissertation *Remembering Australian Videogames of the 1980s: What Museums Can Learn from Retro Gamer Communities About the Curation of Game History*.[21] While the two studies are similar regarding the time frame, they not only address different geographic areas but also pursue quite different epistemological goals, as Stuckey herself points out:

"Guins' focus on how museums treat the material history of the videogame is in contrast to my concern with the more intangible history of videogames. My core concern is to capture the history of videogames that is not represented by objects. I explore how videogames were experienced and shared as cultural objects, their meaning within particular communities, and the many distinct and individual stories they generate."[22]

18 N. Lepp: "Ungewissheiten," p. 63, my translation.

19 Newman, James: *Best Before: Videogames, Supersession and Obsolescence*, London: Routledge 2012.

20 Guins, Raiford: *Game After: A Cultural Study of Video Game Afterlife*, Cambridge, MA: MIT Press 2014.

21 Stuckey, Helen: *Remembering Australian Videogames of the 1980s: What Museums Can Learn from Retro Gamer Communities About the Curation of Game History*, Dissertation, Flinders University 2016.

22 Ibid., p. 8.

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Beyond these two more extensive studies, the history of video game exhibitions remains an academic patchwork and, in most cases, a research desideratum.[23]

The first video game exhibitions can be found as early as the late 1980s. In 1989, the American Museum of the Moving Image in New York City opened its *Hot Circuits* exhibition, which featured a collection of playable arcade machines,

> "presented not as historical artifact or technological advancement, but as living culture […] *Hot Circuits* retained many of the contextual elements that would have been present if encountering the games on display in an arcade. The cabinets were preserved in full, and visitors were given a set number of tokens (and could purchase more) to play the machines."[24]

A second historical milestone was the traveling exhibition *Videotopia*, launched in 1996, which was dedicated to the technological history of video games and later became part of the collection of The Strong National Museum of Play in Rochester, New York. It is only since 2009, however, that video games have become an independent collection area at The Strong through the founding of the International Center for the History of Electronic Games (ICHEG).[25]

In 1997, two major exhibition projects opened in Germany: *ZKM_Gameplay* at the Zentrum für Kunst und Medien in Karlsruhe (ZKM, Center for Art and

23 Cf. Schwingeler, Stephan: *Kunstwerk Computerspiel*, Bielefeld: transcript 2014; Giddings, Seth: "SimKnowledge. What Museums Can Learn from Video Games," in: Henning, Michelle (ed.), *The International Handbooks of Museum Studies: Museum Media Vol. 3*, London: Wiley Blackwell 2015, pp. 145-164; Naskali, Tiia et al.: "The Introduction of Computer and Video Games in Museums—Experiences and Possibilities," *HAL-Inria* (2017), https://hal.inria.fr/hal-0 1455255; Grace, Lindsay: "Heuristics from Curating and Exhibiting Game Art in the 21st Century," in: *Proceedings of Eighth International Conference on Digital Arts*, Artech 2017, pp. 101-108; Hensel, Thomas: "Kunst," in: Beil, Benjamin et al. (eds.), *Game Studies*, Wiesbaden: Springer VS 2018, pp. 379-387; Reed, Emilie M.: "Exhibition Strategies for Videogames in Art Institutions," in: *Transactions of the Digital Games Research Association* 4(2) (2018), pp. 103-135; Hawranke, Thomas: *Modding—Künstlerische Forschung in Computerspielen*, Dissertation, Bauhaus Universität Weimar 2018.

24 E. Reed: "Exhibition Strategies," p. 106; cf. Slovin, Rochelle: "Hot Circuits: Reflections on the 1989 Video Game Exhibition of the American Museum of the Moving Image," in: Wolf, Mark J. (ed.), *The Medium of the Video Game,* Austin: University of Texas Press 2001, pp. 137-154.

25 Cf. World Video Game Hall of Fame: *A History of Video Games in 64 Objects*, New York: Dey St. 2018.

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Media) and the Computerspielemuseum in Berlin (Computer Games Museum). While *ZKM_Gameplay* has undergone several relaunches and can still be visited in Karlsruhe today, the Computerspielemuseum had to close its doors in 2000 for eleven years and was only accessible online until its reopening in 2011. Several other European countries have also established smaller specialized museums, e.g., the Vigamus—Video Game Museum of Rome (since 2012) and The National Videogame Arcade in Nottingham (since 2015).

The first major, internationally visible exhibition project was the traveling exhibition *Game On*, which began in 2002 as a collaboration between the Barbican Centre in London and the National Museum of Scotland. The exhibition made (and is still making) an ambitious attempt to exhibit the complete history of computer games from the 1960s to the present in the form of 120 mostly playable artifacts.[26] *Game On* is a long-lived exhibition project that continues to tour the world. Thereby it is interesting to observe that the format of the traveling exhibition has changed not only the museum context but also the exhibition itself again and again:

> "Despite being developed as an art and design exhibition for the Barbican contemporary gallery spaces, as the tour developed *Game On* was embraced more by the science museum sector that not only had the galleries to accommodate such a vast exhibition but were also less daunted by the exhibition's technological demands. In this context the artwork became not only less relevant to the exhibition experience but often incongruous."[27]

Another breakthrough for video games as exhibition objects came ten years later. In 2012, the special exhibition *The Art of Video Games* opened at the Smithsonian American Art Museum in Washington, DC; also, in 2012, the Museum of Modern Art in New York began adding video games to its applied design collection.[28] This entry of video games into important museums continues, e.g., with the exhibition *Videogames: Design/ Play/Disrupt* at the Victoria & Albert Museum in London; in this case, however, again only as a temporary special exhibition (2018/2019).

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26 In a revised version of the exhibition entitled *Game On 2.0* (2010), the number of games even increased to 150.

27 H. Stuckey: *Play on Display*, p. 48.

28 Raiford Guins has undertaken two quite critical tours of the video game exhibitions at the Smithonian and the Museum of Modern Art: R. Guins: *Game After*, pp. 277-288; Ferranto, Matt: "No Paraphernalia, No Nostalgia: Decoding MoMA's New Video Game Galleries," in: *Design and Culture* 7(2) (2015), pp. 203-223.

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A first look at the various projects reveals two thematic focal points, two types of exhibitions: Most projects are general (or panoramic) exhibitions on the technological history of video games. Furthermore, several exhibitions function as museal nobilitations and canonizations of video games as works of art, albeit with sometimes very different perspectives:

"*The Art of Video Games* at the Smithsonian American Art Museum, e.g., emphasized visual effects and the creative use of new technologies, while the Museum of Modern Art focused primarily on the design of player behavior but also on the elegance of code."[29]

The two major long-lived video game exhibitions in Germany also illustrate these tendencies. The Computerspielemuseum focuses primarily on the technological history of video games as popular mass media by presenting an essentially chronological overview of video game hardware and software. *ZKM_Gameplay*, in contrast, emphasizes media-artistic works. The exhibition in Karlsruhe thus simultaneously points to the fluid boundaries of video games and media art—the other focal point of the ZKM's collection— as it includes many objects from the field of artgames and game art. Artgames are experimental, playable video games that are often not distributed commercially but created primarily or even exclusively for the presentation in museums and galleries or at festivals.[30] Game art refers to artworks derived from video games and artistically reflects motifs from popular commercial games. Game art is usually not playable (or interactive in any form).

## VIDEO GAME EXHIBITIONS II: DIFFERENTIATIONS (IN GERMANY)

Whereas the early days of computer game exhibitions were characterized by thematically broad (or fuzzy) "general exhibitions,"[31] in recent years, there has been a trend towards "more original and special theme exhibitions."[32] Thereby the

29 T. Hensel: "Kunst," p. 379, my translation.

30 Artgames can furthermore be distinguished between artists' games, i.e., games programmed by artists themselves, and artistic game mods, i.e., modifications of commercial games. Cf. S. Schwingeler: *Kunstwerk Computerspiel*; Sharp, John: *Works of Game. On the Aesthetics of Games and Art*, Cambridge, MA: MIT Press 2015; T. Hawranke: *Modding*.

31 T. Naskali et al.: "The Introduction," p. 236.

32 Ibid.

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number of exhibitions has grown significantly, which is why the following discussion focuses primarily on the German museum landscape of the last five to ten years. In addition to the permanent exhibitions in Karlsruhe and Berlin, more than half a dozen smaller and larger special (and traveling) exhibitions could be visited.

The exhibition *Rainbow Arcade* (2018/2019) at Schwules Museum in Berlin (Gay Museum) presented a queer history of video games; *Extralife* (2015) at the Kunsthaus Nürnberg (Art Gallery Nuremberg) focused on video game fandom; *Digital Games* (2017/2018) at the Ludwig Forum Aachen was dedicated to the field of indie games; the traveling exhibition *Game Masters* (2016/2017)[33] at the Museum für Kunst und Gewerbe in Hamburg (MK&G, Museum for Arts and Crafts) revolved around video game artists and designers; a similar thematic focus was offered by *Game Designers & Software Artists* (2019) at the Schriefers Design Collection of the University of Wuppertal.

Besides a thematic diversification, a tendency toward intermedial reflections could be observed, e.g., at *Film und Games: ein Wechselspiel* (2015/16, *Films and Games: Interactions*) at the Deutsches Filmmuseum in Frankfurt am Main (German Film Museum); the exhibition *Im Spielrausch*[34] (2017/18) at the Museum für Angewandte Kunst Köln (MAKK; Museum of Applied Arts Cologne) compared the worlds of video games and theater; *Bretter, die die Welt bedeuten*[35] (2018) at the Kölnisches Stadtmuseum positioned video games within the cultural and social history of board games; *Obumbro. SchattenKunst ComputerSpiel* (2018/19, *ShadowArt VideoGame*) at the Museum Ulm confronted video games along the leitmotif of the shadow with a whole range of other media, from literature to paintings to films and installations.

What seems striking is that all these projects still mainly understood themselves as introductory exhibitions, despite their concise and highly diverse themes.

33 Curated by the Australian Centre for the Moving Image in 2012.

34 A direct translation of the exhibition title is difficult, since the German word "Rausch" could be translated as frenzy, intoxication, rapture or rush. The title is an allusion to Roger Caillois' concept of Ilinx, which in German is associated with the term "Rausch." Ilinx is part of Caillois' famous four forms of play: Agon (competition), Alea (chance), Mimicry (mimesis or role playing), Ilinx (vertigo). Caillois, Roger: *Man, Play and Games*, Champaign, IL: University of Illinois Press 2001 (1958).

35 The exhibition title cannot simply be translated as "boards (or planks) that mean the world." "Bretter, die die Welt bedeuten" is a quote from Friedrich Schiller's poem *An die Freunde* (1803, *To the Friends*) and colloquially refers to the theater stage. Shakespeare's "All the world's a stage" would therefore be a suitable translation—though not for the play on words of the exhibition title.

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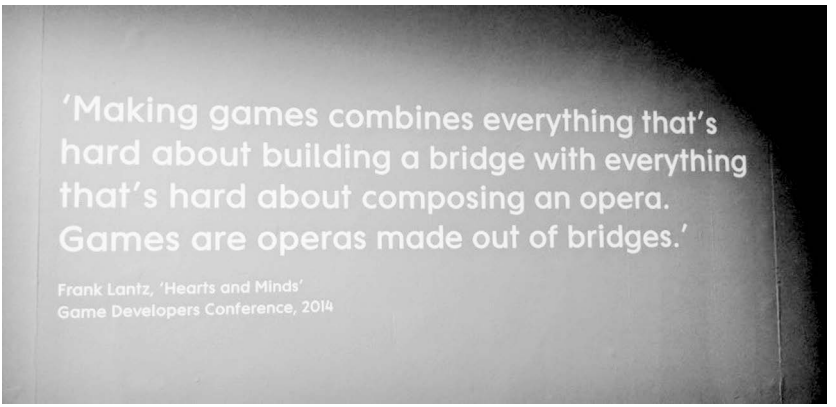
Even more so, they tended to preface their exhibition objects with various statements—ranging from justifications to apologies—as to why video games are now worthy of exhibition. However, this does not seem to be a peculiarity of German museums. The blockbuster exhibition *Videogames* at the Victoria & Albert Museum also greeted its visitors upon entering the exhibition space with a strange classification of the video game as a combination of bridges and operas—leaving unanswered where exactly bridges and operas are to be found on the spectrum of art and technology (Fig. 2).

*Figure 2: Videogames: Design/Play/Disrupt, Victoria & Albert Museum, London (2018/2019), entrance to the exhibition*




Source: Photo by B. Beil

Furthermore, the supposed focal points of the different exhibitions turned out to be quite broad categories upon closer inspection. Besides vague (and sometimes somewhat arbitrary) foci on older and newer video games, there were hardly any historical delimitations to be found. The *Rainbow Arcade* Exhibition, e.g., was titled *Queer Video Game History 1985-2018*.[36] In addition, no exhibition was dedicated to a single artist, even though the history of video games has already produced several prominent game designers and auteurs.[37] However, these findings

36 A counter-example is the exhibition *Game Designers & Software Artists. Inszenierung und Selbstverständnis der Künstler/innen bei Electronic Arts, 1983-1988* (Staging and Self-Image of Artists at Electronic Arts)—though its narrow focus on five years and on a very specific selection of games seems no less unusual.

37 On an international level, the only exception is the retrospective *The Game Worlds of Jason Rohrer*, which took place at the Davis Museum (Wellesley College) in 2016.

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are not entirely surprising in view of the comparatively young media history of the video game as an exhibition object.

## Video Game Exhibitions III: Challenges and Opportunities

More interesting than the differences of the individual exhibitions seem to be, in many cases, their similarities, which not only resulted from thematic settings but were significantly determined by practical aspects, especially by a certain resistance of video games as exhibition objects. Video games are an interactive mass medium, and therefore, people expect to be able to *play* a video game—even in a museum.[38] Thus, all of the exhibitions mentioned attempted to make at least some of their objects playable, although the numbers varied considerably: from a single playable artifact at the *Spielrausch* exhibition in Cologne to over 100 at *Game Masters* in Hamburg. However, such numbers ultimately reveal little of how successful a gaming experience was implemented in curatorial as well as practical terms.

In Cologne, the game Proun (2011) was exhibited, a game of skill with a simple set of rules and controls that can be learned quickly. In addition, the game was modified for the exhibition context to keep it always playable.[39] Proun's graphic design is heavily influenced by neoplasticistic shapes and colors, so it was no coincidence that the game monitor was placed between two Mondrian lithographs (Fig. 3).

By contrast, the playable objects at the *Game Masters* exhibition included numerous commercial games (e.g., System Shock [1994], Fig. 4), which offered much greater challenges, both practically and curatorially.

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Nevertheless, the category of the artist (or auteur) often plays an important role, especially in the art museum. Cf., eg., Baumgärtel, Tilmann: *Games: Computerspiele von KünstlerInnen. Ausstellung im Hartware-Medien-Kunst-Verein*, Frankfurt a.M.: Revolver 2003.

38 The popularity of the concept of the participatory museum is likely to reinforce such expectations. Cf. Simon, Nina: *The Participatory Museum*, Santa Cruz, CA: Museum 2.0 2010.

39 This was done, among other things, by locking configuration menus and by a regular automatic reset of the game progress.

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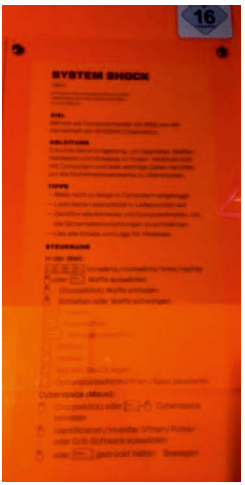
"Once you move past the era of the early arcade games, where most game interfaces are easily understood, players are almost inevitably faced with learning complex rule systems and the demands of mastering the game's interface."[40]

*Figure 3, 4, and 5: Im Spielrausch, Museum für Angewandte Kunst Köln (2017/2018); Game Masters, Museum für Kunst und Gewerbe, Hamburg (2016/2017)*




Source: Photos by B. Beil

40 H. Stuckey: *Play on Display*, p. 67.

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The *Game Masters* exhibition attempted to make its objects (more) accessible through a dedicated, enthusiastic staff, specially trained for this exhibition, and through detailed object labels, which explained the game objectives and rule sets, as well as the interface and controls, and in some cases provided additional tips and strategies (Fig. 5). Nevertheless, the appeal of many exhibition objects was likely to have been largely lost on most visitors if they were not already familiar with a game.

Moreover, the question arises whether a brief play session changes the experience (or appreciation) of a game as a museal object at all, even or especially if an exhibited game was already known to a visitor. Brendan Keogh, who visited *Game Masters* in 2012 at the Australian Centre for the Moving Image (ACMI) in Melbourne, recounts his rather ambivalent playing experience:

"I looked at the SYSTEM SHOCK machine and realized that, truly, there is nothing I could tell you about SYSTEM SHOCK that I could not have told you before I played it. […] It is undeniably great that anyone can walk into ACMI and play SYSTEM SHOCK. But is playing an old game enough? Especially if that game relies on a story or other systems that can't possibly be fully explored in five minutes of play? What is it that is culturally significant about games? How do we share that? How do we preserve it? […] You just can't comprehend a game like SHADOW OF THE COLOSSUS [2005], SYSTEM SHOCK or METAL GEAR SOLID 4 [2008] in a 5-minute go in a gallery. It's like trying to understand the significance of Moby Dick from reading a single page of it."[41]

The preceding paragraphs can by no means be reduced to the argument that the *Spielrausch* exhibition has handled the interactivity of video games better than the *Game Masters* exhibition—it has only made things much easier for itself regarding the selection of its exhibition objects. PROUN is a particularly accessible exhibition object, not only in terms of interactivity but equally because of its intermedial qualities, which are quite easy to convey curatorially. However, it represents only a tiny facet of video game culture.

Of course, this discussion is not at all unfamiliar to museum research. In science museums, much of the machinery on display cannot be actively operated by visitors, and in the exhibition spaces of film museums, usually, only short clips or even just still images are shown, and rarely full films. The argument made here is, therefore, not that video games confront museums with entirely new challenges. However, certain limitations in the sensory and interactive experience are

41 Keogh, Brendan: "Mastering Game Exhibits," *Unwinnable* (2012), https://unwinnable.com/2012/07/10/mastering-game-exhibits/#.U5U12vmSx8E

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particularly evident in this case, be it because video games are technically complex and extensive or simply because they are still unfamiliar exhibition objects for museum visitors.

This can even lead to a discouraging or frustrating experience in the exhibition space that counteracts the museal knowledge transfer, as Prax, Eklund, and Sjöblom discovered in interviews with visitors and the exhibition staff at *Game On 2.0* at the National Museum of Science and Technology in Stockholm (2013/2014):

> "An exhibition that relies on play as the central way to communicate about games requires gaming literacy on the side of the visitors. In other words, it does not communicate well with those who do not know how to play.
>
> '*Game On* is very confirming. If you are a computer gamer, you go in there and you see all the stuff you played and you can play. If you are not a gamer, you go there and you look at these games and it is very hard. You get confirmed in your view that this is hard and not for you.' (Interview with exhibition staff)
>
> As the quote shows, an exhibition that focuses on play runs the risk of losing the ability to open up games as a part of culture and their relevance for understanding life today to new demographics and groups who have not been gamers before. It might even re-affirm their prejudices of games not being for them."[42]

Against this background, it may be no coincidence that many current video game exhibitions deliberately problematize the aspect of interactivity—or more precisely, the lack of it—by intermedial comparisons that utilize the "epistemological potential of the medium exhibition."[43] A curatorial key point of the *Spielrausch* exhibition, e.g., was that not only video games, but also theater are ephemeral media. 'The theater' is not found in the written text of its performance, just as 'the video game' cannot be reduced to the lines of its program code. Therefore, the *Spielrausch* exhibition did not focus on theatrical performances and gameplay but rather on the popular culture and media-historical environment of both media as well as interconnections with other older and newer playful practices. Artifacts surrounding theater and video game cultures were exhibited, from masks and

42 Prax, Patrick et al.: "'More like an arcade'—The Limitations of Playable Games in Museum Exhibitions," *Museum & Society* 17(3) (2019), pp. 437-452.

43 N. Lepp: "Ungewissheiten," p. 63, my translation.

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puppets to playing fields and stage machinery to merchandise and artistic reflections.[44]

*Figure 6: Bretter, die die Welt bedeuten, Kölnisches Stadtmuseum (2018)*

Source: Photo by B. Beil

## Computer Game Exhibitions IV: Praise of the Display Case

While it seems quite common that many works of art must be protected from museum visitors by display cases, barriers, or the watchful gaze of the museum staff, there is seemingly nothing more depressing than a game (machine) behind a glass panel, whether it is a digital gaming platform or a pinball machine at the Kölnisches Stadtmuseum (Fig. 6). Of course, many game machines are protected by display cases or barriers for good reasons. After all, they are rare and fragile artifacts whose material existence is threatened by a steadily dwindling supply of

44 Cf. Beil, Benjamin et al. (eds.): *Im Spielrausch. Streifzüge durch die Welten des Theaters und des Computerspiels*, Glückstadt: vwh 2017.

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spare parts and technical expertise for repair and maintenance. Moreover, most (video) game platforms in museums were originally intended for private use and do not have the fundamental robustness for daily play in public spaces.[45] In this sense, the argumentation in the case of the 'imprisoned' pinball machine can also be turned around: By architecturally or curatorially preventing interaction with the pinball machine, the artifact (again) gains the attention, perhaps even the appreciation of museum visitors as an important object worth preserving.

*Figure 7: Computerspielemuseum Berlin (2017)*

Source: Photo by B. Beil

Looking at a PONG machine from 1972 at the Computerspielemuseum Berlin—behind a barrier (Fig. 7)—one might argue that a PONG machine is no longer needed to play PONG nowadays. PONG has been ported to countless systems and is therefore playable on almost every common computer hardware. Via a software

45 T. Naskali et al.: "The Introduction," p. 230.

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emulator,[46] even the 'original PONG' can be played—if one wants to reduce the digital artifact PONG to its program code. In this way, the digital object, just like the digitized one, evokes questions about its materiality. In many cases, an emulated version comes quite close to the original game but still does not achieve a gaming experience identical to the original. The graphics may look similar, but they are usually adapted to a new screen technology and resolution; the sound effects play from modern speakers, and the interface and control schemes are modified for the new platform.[47] In the context of a media nostalgia discourse, emulated games thus illustrate the motif of "the impossibility of mythical return"[48] in the sense of a never authentic reproduction of the original gaming experience. This effect may be much more evident with older artifacts such as the first PONG machines than with contemporary game consoles, but it is ultimately only a matter of time before current gaming hardware also achieves the status of a rare and fragile historical object.

In the museum context, the presentation of game hardware can become a form of historiography through the medium of exhibition. In her writing on the museum's media-cultural history, Michelle Henning asks the question: "Do television and computers make sense when removed from their living room and office habitats; or the newspaper from the cafe or the train?"[49] The answer, in this case, would be: Yes! By detaching an exhibition object from its everyday media environment—making it a semiophor—a form of historicity and especially a historical connection of hardware and software becomes visible.[50]

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46 Emulation is the execution of the original program code—in more or less unchanged form—with the help of a special program that simulates an (usually older) computer architecture on a (usually newer) hardware system.

47 Cf. Camper, Brett: "Retro Reflexivity. La-Mulana, an 8-Bit Period Piece," in: Perron, Bernard/Wolf, Mark J. P. (eds.), *The Video Game Theory Reader 2*, London: Routledge 2009, pp. 169-195.

48 Cf. Svetlana Boym's often-cited definition of nostalgia: "Modern Nostalgia is a mourning for the impossibility of mythical return, for the loss of an enchanted world with clear borders and values." (Boym, Svetlana: *The Future of Nostalgia*, New York, NY: Basic Books 2001, p. 8.)

49 Henning, Michelle: "Museum Media. An Introduction," in: Henning, Michelle (ed.): *The International Handbooks of Museum Studies: Museum Media Vol. 3*, Wiley Blackwell 2015, pp. xxvii-lx, here p. lv.

50 Noteworthy in this context is the special exhibition "Wie die digitalen Spiele in unser Leben traten" (2015, "How digital games entered our lives") at the Computerspielemuseum, which embedded historical arcade game machines and game consoles

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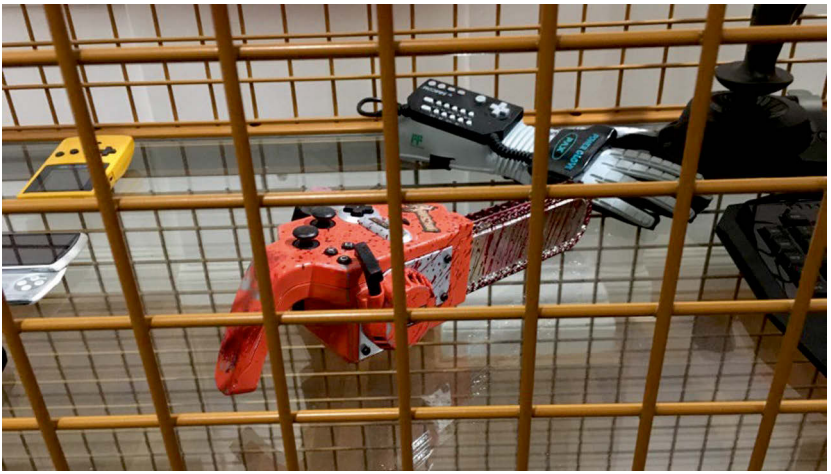
*Figures 8 and 9: Game Masters, Museum für Kunst und Gewerbe, Hamburg (2016/2017)*



Source: Photos by B. Beil

in various 'walk-in dioramas.' One part of the exhibition space was modeled after an arcade and hosted various machines from the 1970s and 1980s, another exhibition area resembled a hobby room from the 1980s, and a third a living room from the 1990s.

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## EPILOGUE: DISPLAY CASES, AGAIN

Back to the beginning: The Chainsaw Controller was on display in several museums, including the *Game Masters* exhibition in Hamburg and the *Spielrausch* exhibition in Cologne—interestingly, by using very different forms of presentation. In Hamburg, the controller was exhibited without its own display case. Unfortunately, it is not known whether this was a different version, or the display case was removed for the exhibition, or the collection piece was simply incomplete. The object's label did not reveal anything either; it simply read: "RESIDENT EVIL 4 Chainsaw Controller (J 2015)." However, the Chainsaw Controller did not have to present itself entirely without a display case. It was located on a narrow orange lattice shelf (Fig. 8), which in a way reflected the exhibition location: The Museum for Arts and Crafts, whose collection focuses on design and applied art. Art museums usually avoid display cases, and if a display case is necessary (for protection or conservation reasons), it is usually designed to be as plain and unobtrusive as possible—after all, "works of art [...] must present themselves [...] as aesthetic objects."[51] In contrast, the focus of the presentation at the *Game Masters* exhibition seemed to be on categorizing and grouping the objects on display (similar to a natural history museum). Indeed, the Chainsaw Controller is in good company: Right next to it, the infamous PAX Powerglove (Nintendo Entertainment System, 1989) is shown, and on an adjacent shelf, the Donkey Kong Bongos (Nintendo GameCube, 2003) are on display (Fig. 8 and Fig. 9, left in the background). This form of presentation places the Chainsaw Controller within a media history of quirky, often slightly dysfunctional input devices.[52] In this way, the absence of its own display case seems (perhaps) consequent.

In Cologne, the Chainsaw Controller was also on display in a museum for design and applied art, yet, the special exhibition *Im Spielrausch* more closely followed the traditions of an art museum. Most of the exhibition objects were presented as aesthetic objects. Classification and categorization mainly took place in the form of intermedial juxtapositions, as in the case of the above-mentioned PROUN-Mondrian combination. Thematically, the Chainsaw Controller was part of the last section of the *Spielrausch* exhibition with the focal point "Rausch,"[53] along with other artifacts, including PROUN and the absurd experimental game

51 C. Spies: "Vor Augen Stellen," p. 266, my translation.

52 Cf. Witzmann, Hannes: *Game Controller: vom Paddle zur gestenbasierten Steuerung*, Boizenburg: vwh 2007, p. 55-61; Strank Willem: "Plattform," in: Beil, Benjamin et al. (eds.), *Game Studies*, Wiesbaden: Springer VS 2018, pp. 173-200, here pp. 190-193.

53 Cf. footnote 34.

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GOAT SIMULATOR (2014), which was shown in the form of a montage of gameplay clips.[54] The Chainsaw Controller was located directly opposite the monitor on which PROUN could be played and was presented (with its own display case) in a display case made of plexiglass. This 'second' display case, like most of the other display cases at the *Spielrausch* exhibition, was unobtrusive in design. However, while the other display cases could more easily fulfill their task of creating a "space of showing"[55] by directing the visitors' gaze towards the works of art, the Chainsaw Controller's own display case inevitably drew attention (back) to the second display case. Thus, the double display case resulted in an exaggeration of the object's dysfunctionality (in the sense of a semiophoric removal of its use value)—or rather: the second display case completed the musealization that was already initiated by the Chainsaw Controller itself.

This comparison of two presentation forms does not intend to determine which way of exhibiting the chainsaw controller—and which semiophoric quality—seems more appropriate; rather, it seeks to demonstrate the variety of exhibiting strategies. Furthermore, it seems questionable whether a similar appreciation of the Chainsaw Controller within the exhibition space—that is, beyond this essay—was even accomplished by museum visitors. Perhaps, in Hamburg, the Chainsaw Controller was not even recognized as a Playstation 2 controller but simply mistaken for a miniature chainsaw. Perhaps, in Cologne, the artistic potential of its own display case was not valued because the double display case overemphasized the self-reflexive aspects of the artifact. Perhaps, in both cases, the associated gaming experience was simply missing, or at least a basic knowledge of what RESIDENT EVIL 4 is and how it might feel to control the game with a miniature chainsaw—neither in Hamburg nor in Cologne RESIDENT EVIL 4 part was of the exhibition. However, this criticism should not diminish the merit of the two exhibitions because this merit consists above all in continuing to write the media history of the Chainsaw Controller: "Museums add new moments to the biography of video games."[56]

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54 Cf. B. Beil et al.: *Im Spielrausch*, pp. 63-71.

55 C. Spies: "Vor Augen Stellen," p. 275, my translation.

56 M. Ferranto: "No Paraphernalia."

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## Gameography

Goat Simulator (Coffee Stain Studios 2014, O: Coffee Stain Studios)

Metal Gear Solid 4: Guns of the Patriots (Konami 2008, Kojima Productions

Proun (Joost van Dongen 2011, O: Joost van Dongen)

Resident Evil 4 (Capcom 2005, O: Capcom)

Shadow of the Colossus (Sony Computer Entertainment 2005, O: Japan Studio/Team Ico)

System Shock (Origin Systems 1994, O: LookingGlass)

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# Modifications

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# Unpacking the Blackbox of 'Normal Gaming'

## A Sociomaterial Approach to Video Game Controllers and 'Disability'

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## INTRODUCTION

"[I]nteractivity and, crucially, modes of input for interactivity, are the literal engine that drives all video gaming."[1] It comes as little surprise that the ludic feedback loop between players, software, and input devices has often been considered one of video games' central characteristics[2] and that "interactivity is one of the key conceptual apparatuses through which video games have been theorized thus far."[3] Furthermore, the concept is usually used as a marketing strategy by game console companies to highlight the physical and participatory role the users play in the event of gaming.[4] In digital gaming arrangements, interactivity is a specific

1 Murphy, Sheila: "Controllers," in: Wolf, Mark J. P. (ed.), *The Routledge Companion to* Video *Game Studies*, New York: Routledge 2014, pp. 19-24, here p. 19.

2 Wysocki, Matthew: "Introduction," in: Wysocki, Matthew (ed.), *Ctrl-Alt-Play: Essays on Control in Video Games*, Jefferson, NC: McFarland 2003, pp. 1-8, here p. 2.

3 Garite, Matt: "The Ideology of Interactivity (or Video Games and Taylorization of Leisure)," in: Copier, Marinka/Raessens, Joost (eds.), *DiGRA 03—Proceedings of the 2003 DiGRA International Conference: Level Up, Vol. 2*, 2003, http://www.digra.org/digital-library/publications/the-ideology-of-interactivity-or-video-games-and-taylorization-of-leisure/

4 During the 1980s and 1990s, commercials or cinematic depictions of digital gaming situations usually showed screaming and laughing children or young persons in front

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"interrelation"[5] practice that translates and mediates bodily, cognitive, discursive and technological, material and semiotic, human and non-human elements and actors.[6] In this process of "interfacing,"[7] the game controller plays an integral role as a "mediator."[8] Regardless of whether the mode of input is produced via a keyboard, mouse, joystick, trackball, paddles, steering wheel, lightgun, a Wii-Mote, or a standardized gamepad, the controller delegates the reciprocal relationships between input and output devices as well as the players and their (im)possible actions in the virtual space of the gaming situation. Input devices not only condition, enable or disable 'access' to the virtual and ludic space of video games.[9] By opening up a "semiotic and linguistic space" and translating the "player's concept of 'I' into the 'I' of the game language,"[10] they also enable the potential for the players' identification with the avatars and the subsequent involvement into the game's diegesis. In addition, controllers arrange and limit the non-diegetic,

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of a TV while holding and moving the controller in a most exaggerated manner to represent the physical involvement digital gaming requires from their users. With the introduction of the Nintendo Wii and the genre of Exergames, this trend toward an emphasis on the bodily aspect of gaming in marketing campaigns was revitalized and consequently also caught the attention of academic discourse.

5 Taylor, T.L.: "The Assemblage of Play," in: *Games and Culture* 4/4 (2009), pp. 331-339.

6 Cf. Giddings, Seth: "Events and Collusions. A Glossary for the Microethnog-raphy of Video Game play," in: *Games and Culture* 4/2 (2009), pp. 144-157.

7 Lipp, Benjamin: "Analytics of Interfacing. On the Materiality of Technological Interconnection Within the Prototypical Milieu of Roboticized Care," in: *BEHEMOTH A Journal on Civilisation* 10/1 (2017), pp. 107-129.

8 I use Bruno Latour's definition of the more flexible and fluid "mediator" in contrast to what he calls the more static "intermediaries," since this allows for conceptualizing controllers as nodes in sociotechnical arrangements that are capable of rearranging, delegating, transforming and translating the other actors and agencies in the course of gaming. Latour, Bruno: *Reassembling the Social. An Introduction to Actor-Network-Theory*, Oxford: Oxford UP 2005, here pp. 38-42.

9 Lipkin, Nadav: "Controller Controls: Haptics, Ergon, Teloi and the Production of Affect in the Video Game Text," in: Wysocki, Matthew (ed.), *Ctrl-Alt-Play: Essays on Control in Video Games*, Jefferson, NC: McFarland 2013, pp. 34-45, here p. 37.

10 McDonald, Peter: "On Couches and Controllers: Identification in the Video Game Apparatus," in: Wysocki, Matthew (ed.), *Ctrl-Alt-Play: Essays on Control in Video Games*, Jefferson, NC: McFarland, 2013, pp. 108-120, here p. 119.

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sociotechnical space in which hands, feet, or arms can or have to move[11] and thus condition, enable and delimit the "bodily techniques"[12] and modes of play the players can enact in the game event. Consequently, game-related Media and Cultural Studies research has frequently attributed game controllers with being (one of) the central technological enabler(s) of participation in digital gaming activities.[13]

However, researchers like David Parisi[14] pointed out that game controllers function as the physical gatekeepers of access to digital gaming. Their technological setup and the spatial regimes imposed on the players are highly exclusory for gamers whose bodily characteristics do not match the standardized design of controllers of the most popular contemporary game consoles. In these cases, game controllers become the locus of inaccessibility and disable playing the game. Nevertheless, this problem cannot be simply reduced to a dualistic ableist model of "normal gaming,"[15] able-bodied gamers, and so-called 'normal control' devices on the one side and 'disabled' or "incompatible"[16] gamers and peripherals and 'other gaming' on the other side.

11 Gazzard, Alison: "Standing in the Way of Control. Relationships between Gestural Interfaces and Game Spaces," in: Wysocki, Matthew (eds.), *Ctrl-Alt-Play: Essays on Control in Video Games*, Jefferson, NC: McFarland, 2013, pp. 121-132, here p. 127.

12 Parisi, David: "Game Interfaces as Bodily Techniques," in: Management Association, Information Resources (ed.), *Gaming and Simulations. Concepts, Methodologies, Tools and Applications*, IGI Global: Hershey, 2010, pp. 1033-1047.

13 E.g. P. McDonald, "On Couches and Controllers," Kirkpatrick, Graeme: "Controller, Hand, Screen. Aesthetic Form in the Computer Game," in*: Games and Culture* 4/2 (2009), pp. 127-143; Wolf, Mark J. P.: "Introduction," in: Wolf, Mark J. P. (ed.), *The Video Game Theory Reader*, Oxon: Routledge 2003, pp. 1-24; Shinkle, Eugénie (2008): "Video Games, Emotion and the Six Senses. Media," in: *Culture & Society* 30/6 (2008), pp. 907-915.

14 Parisi, David: "Game Interfaces as Disabling Infrastructures," in: *Analog Game Studies* 5/1 (2017), http://analoggamestudies.org/2017/05/compatibility-test-videogames-as-disabling-infrastructures/

15 Cf. Boluk, Stephanie/Patrick Lemieux: Metagaming: *Playing, Competing, Spectating, Cheating, Trading, Making, and Breaking Videogames*, Minneapolis/London: Minnesota UP 2017, here pp. 180-181; Spöhrer, Markus: "'Hear the Difference': Audio Game Prosumer Communities in a Post-Media Context," in: *AUGENBlick: Konstanzer Hefte zur Medienwissenschaft* 80 (2020), pp. 17-38, here pp. 18-19.

16 D. Parisi, "Game Interfaces," p. 3.

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Thus, this paper provides a relational, sociomaterial, and praxeological approach that lends from those branches of Game and Disability Studies that are informed by Science and Technology Studies (STS) and, most significantly, Actor-Network-Theory. Such an approach aims at describing controlling, enabling, and disabling or 'failing at'[17] digital gaming as *practices*—without presupposing the so-called "medical and the social models" as the premise of "the ordering and representation of disability."[18] By providing a contemporary example of adaptive game controlling, I will demonstrate how 'enabling' or 'disabling' gameplay is an effect of the situational interplay and functioning of a plethora of factors, practices, elements, and actors that reciprocally shape and translate each other. So rather than asking, "Which bodies are disabled?" or "Which devices make games inaccessible?" I will ask how specific and individual practices of access configure, arrange, act, and react upon the relationships between (non)human actors and en-/disable digital gaming. From this perspective, that which has been discursified as so-called 'normal gaming' is just one stabilized practice of access among many. In order to develop my argument, I will first focus on the black box of 'normal gaming' with game controllers and make an effort to 'unpack' it as a highly stabilized and practically invisible mode of playing that is based on ableist ideologies. In a second section, I will briefly explain how academic discourse on game controllers frequently resorts to these ideologies and to a priori dichotomies (abled/disabled). I will then present the alternative approach of 'en-/disabling' gaming practices, which, in a third section, will be discussed using the example of German gamer Dennis Winkens' gaming arrangement with the Microsoft Adaptive Controller.

## SILENCING THE CONTROLLER AND UNPACKING THE BLACKBOX OF 'NORMAL GAMING'

Academic discourse, especially from a Media or Cultural Studies perspective, has been treating peripheral devices such as game controllers as black boxes—as stabilized "intermediaries,"[19] which, when functioning correctly or as intended,

17 Cf. M. Wysocki, "Introduction," p. 2; P. McDonald, "On Couches and Controllers," p. 109; D. Parisi: "Game Interfaces," p. 3.

18 Galis, Vasillis: "Enacting Disability: How Can Science and Technology Studies Inform Disability Studies?" In: *Disability & Society* 26/7 (2011), pp. 825-838, here p. 825.

19 B. Latour: *Reassembling the Social*, p. 39.

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usually generate a certain, predictable output.[20] However, black boxes are not singular or detached objects but, in fact, clusters of relations in wider actor-networks. They are made of tight connections and translations between human and non-human actors and for the sake of being manageable, transportable, transferable, usable, conceptualizable, and describable, they "are made to act as one."[21] It seems that in academic game discourse, the logic is favored that all controllers work evenly predictable, are handled the same, and act upon the game in a fairly common sense—no matter whether the controller is handheld, operated with no hands, feet, or elbows or works via analog or digital mechanisms, touch sensors (tablets, smartphones), or mechanical principles (Atari 2600 Joysticks), motion capturing technologies (Xbox Kinect), gyroscopes (PS4 Controller), perpendicular consumer IR sensors (Broderbund U-Force), pressure sensors (Wii Balance Board), or a microphone (as in the Konami Laserscope Headset or various Alexa-controlled games). As long as the chain of "pings"[22] generated by the game's software is answered somehow, the mode of input—be it via human hands, a cat's paws, or a malfunctioning keyboard button—is considered irrelevant. Thus, with some notable exceptions,[23] video game research has not paid close attention to controllers' relation to narratives, aesthetics, gameplay elements, or sociopolitical discourse.[24] They are, to put it in Bruno Latour's words, "a silent and mute intermediary, taken for granted, completely determined by its function."[25] Hence, apart from techno-historical research,[26] game controllers are usually a blind spot of game research;

20 Ibid.

21 Latour, Bruno: S*cience in Action: How to Follow Scientists and Engineers Through Society*, Cambridge, MA: Harvard UP 1987, p. 131.

22 Pias, Claus: "The Game Player's Duty. The User as the Gestalt of the Ports," in: Huhtamo, Erkki/Parikka, Jussi (eds.), *Media Archaeology: Approaches, Applications, and Implications*, Los Angeles: University of California Press 2011, pp. 164-183.

23 E.g., D. Parisi: "Game Interfaces as Bodily Techniques," D. Parisi: "Game Interfaces as Disabling Infrastructures," P. McDonald: "On Couches and Controllers," G. Kirkpatrick: "Controller, Hand, Screen."

24 Cf. P. McDonald: "On Couches and Controllers," p. 110.

25 Latour, Bruno: "On Technical Mediation," in: *Common Knowledge* 4/2 (1994), pp. 29-64, here p. 36.

26 E.g., Lu, William: "Evolution of Video Game Controllers: How Simple Switches Lead to the Development of the Joystick and the Directional Pad," in: *How They Got Game* (2003), https://web.stanford.edu/group/htgg/cgi-bin/drupal/?q=node/843

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they are framed as "transparent"[27] and "repressed,"[28] silenced[29] , or as involved in "natural" processes[30] that create the effect of some kind of (paradoxical) "non-mediation."[31] However, black-boxing, ignoring, or even forgetting about the controller, be it from an academic, a journalistic (e.g., video game magazines), or everyday perspective is not only some sort of inadvertency. Rather, it is a (or even the) constitutive element of accessing and playing digital games as it enacts, mediates, and "construct[s] the boundary between ordinary experience and the illusion we enter when we relate to screen imagery and other game feedback 'as if' they constituted an environment or immersive world for play."[32] According to Peter McDonald, controllers and (in many cases) bodies "are being excluded from our conscious attention and we are distracted by the illusion that is the 'game.'"[33]

This stabilized, naturalized, and discoursified invisibility of the controller remarkably relates to the concept of 'normality': That which is 'normal' is usually presupposed as functioning, unthreatening, as not being noteworthy, and, thus, normal 'bodies,' 'abilities,' sensory capacities, or handling of technological objects are hardly reflected upon outside of academic discourse and, as a matter of fact, are usually not even perceived as such. Normality is "opaque,"[34] it is a black box that is tightly knit into everyday practices; it is "that which no longer needs to be considered, those things whose contents have become a matter of indifference."[35] In conjunction with this, these stabilized networks of sheer infinite relationships relate to the norm that defines and demarcates those sets of instances, situations, practices, objects, bodies, and behaviors that are 'abnormal,' 'disabled,' 'failing,' 'not functioning,' or are simply being different. Normality generates the 'other.' In turn, when the black box does not work as expected, when something in the stabilized and routinized chain of operations goes wrong, when the

27 P. McDonald: "On Couches and Controllers," p. 110.

28 Ibid.

29 G. Kirkpatrick: "Controller, Hand, Screen," p. 135.

30 A. Gazzard: "Standing in the Way of Control," p. 124.

31 P. McDonald: "On Couches and Controllers," p. 110.

32 G. Kirkpatrick: "Controller, Hands, Screen," p. 135.

33 P. McDonald: "On Couches and Controllers," p. 137.

34 B. Latour: "On Technical Mediation," p. 36.

35 Callon, Michel/Latour, Bruno: "Unscrewing the Big Leviathan; Or How Actors Macrostructure Reality and How Sociologists Help Them to Do So," in: Knorr-Cetina, Karin (ed.), *Advances in Social Theory and Methodology: Toward an Integration of Micro- and Macro-Sociologies*, London, UK: Routledge & Kegan Paul 1981, pp. 277-303, here pp. 284-285.

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interaction with the controller does not happen smoothly—be it as a consequence of interrupted circuits, stuck buttons, software incompatibilities, unplugged cables, cramps in the hand—, those elements that en- or disable the controller to function, instantly become the center of attention. The malfunctioning, the interruption, the "failure,"[36] the "spoilsport"[37]—and in our case: the being unable or 'disabled' to play—become hypervisible, either on the side of the technology or on the side of the human player. All of a sudden, the material, formal, bodily, and technological ties of game controllers become matters of relevance.

As I have formulated before, when the black boxes of normality break down, when actions of and with technical objects are

"unsuccessful or simply disturbed—abnormality (respectably: disability) becomes visible. While normality remains the stabilized, invisible black box, disability becomes visible in its instability and at the same time becomes a stabilizing factor for normality."[38]

To illustrate the workings of black boxes, Latour gives the famous example of the broken overhead projector that intermits any kind of meeting:

"The crisis reminds us of the projector's existence. As the repairmen swarm around it, adjusting this lens, tightening that bulb, we remember that the projector is made of several parts, each with its role and function and its relatively independent goals. Whereas a moment before, the projector scarcely existed, now even its parts have individual existence, each its own 'black box.' In an instant, our 'projector' grew from being composed of zero parts, to one, to many."[39]

36 M. Wysocki: "Introduction," p. 3.

37 Huizinga, Johan: *Homo Ludens. A Study of the Play-Element in Culture*, London: Routledge & Kegan Paul 1949 (1938), p. 11.

38 Spöhrer, Markus: "The (Re-)Socialization of Technical Objects in Patient Networks: The Case of the Cochlear Implant," in*: International Journal of Actor-Network Theory and Technological Innovation* 5/3 (2013), pp. 25-36, here p. 27. Such tendencies to discursify the 'abnormal' in relation to a perceived 'normality' were elaborately analysed in Alan Meades' book on counterplay. Here, Meades focuses on counterplay practices, in which the games' underlying and otherwise invisible structures and rule systems are unpacked and highlighted. Meades, Alan F.: *Understanding Counterplay in Video Games*, New York/London Routledge 2015.

39 B. Latour, "On Technical Mediation," p. 36.

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This example can be applied to those instances in which supposedly 'disabled' persons are not able to handle the controller, as its material qualities or design does not match their bodily configurations or vice versa. As with the overhead projector, the controller is working in relation to the handling, maintenance, and setup by human actors enrolled in the gaming situation. After all, the human actors are "the permanent organizer[s] of a society of technical objects which need him as much as musicians in an orchestra need a conductor."[40] There is no controlling without the relationships and the mutual shaping and adjustments between humans and non-humans.[41] As Peter McDonald notes, the (successful) handling of the controller is conditioned by "not paying attention to what our bodies are doing"[42] with the gaming arrangement. It is obvious that in situations in which controllers work as expected but bodies do not, the controller's normed design and technological make-up remain fairly silent, while the supposedly 'deficit' body becomes (or rather is constructed as) the 'trigger' for a perceived interference, a 'shattering'[43] of an otherwise supposedly 'smooth' operational chain. While during a 'successful' or 'flowing' gaming situation, bodies and peripherals are usually intended to shift to the background of perception, such "disabling practices"[44] can be considered "material-discursive boundary-making practices that produce 'objects' and 'subjects,' and other differences out of, and in terms of, a changing relationality." [45] In this respect, the interactions, translations, negotiations, and resistances between otherwise entangled human and non-human objects generate and stabilize differences between bodies and objects, between normal/abnormal, between success and failure, and thus fortify those bodies not matching the material designs of controllers as 'disabled,' when it comes to handling digital games.[46]

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40 Simondon, Gilbert: *On The Mode of Existence of Technical Objects*, Minneapolis, MN: Univocal 2017, p. 17, addition by M. Spöhrer.

41 Cf. Winance, Myriam: "Trying out the Wheelchair: Mutual Shaping and Adjustments Between People and Devices Through Adjustment," in: *Science, Technology, & Human Values* 31/1 (2006), pp. 52-72; cf. B. Latour: "On Technical Mediation," pp. 31 et seqq.

42 P. McDonald: "On Couches and Controllers," p. 137.

43 J. Huizinga: *Homo Ludens*, p. 11.

44 Schillmeier, Michael: "Dis/Abling Practices: Rethinking Disability," in: *Human Affairs* 17 (2007), pp. 195-208; Schillmeier, Michael: *Rethinking Disability: Bodies, Senses, and Things*, New York: Routledge 2012.

45 Barad, Karen: *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Durham: Duke University Press 2007, here pp. 92-93.

46 For the concepts of translations, negotiations, and resistance as used in this text see Callon, Michel: "Some Elements of a Sociology of Translation: Domestication of the

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However, enabling or disabling practices are not reduced to the specific configuration of bodies but also the way the body is used, practiced, and enacted in relation to the peripheral devices, which require a lot of practicing, learning, self-discipline, and body control.[47] These "bodily techniques"[48] are composed of a limited amount of relatively clearly defined movements and bodily parts. Thus, they are designed in mutual relationship to both digital gaming "ideologies"[49] that determine the formal and material configurations of controllers and a normative conceptualization of the morphological qualities of what is conceived to be a 'typical,' 'normal,' or 'healthy' body. So, both concepts and 'real-life' instances of human bodies, practices, discourses, and digital and material objects are entangled in a tight network of relations that form and hold together the black box that is 'normal gaming.' Since the 1970s (almost unbroken) success of video games in arcades and homes across the globe, video games' most popular and thus most profitable concept of how to play games in the "home console dispositive"[50] involves two hands and thumbs, a certain hand-eye-coordination, sensorimotor skills, a certain response time and the bimanual holding, balancing, or supporting of a game

Scallops and the Fishermen of St. Brieuc Bay," in: Law, John (ed.), *Power, Action and Belief: A New Sociology of Knowledge*, London: Routledge & Kegan Paul 1986, pp. 196-223.

47 Cf. D. Parisi: "Game Interfaces as Bodily Techniques;" also see G. Kirkpatrick, "Controller, Hand, Screen," p. 135.

48 D. Parisi: "Game Interfaces as Bodily Techniques."

49 M. Garite: "The Ideology of Interactivity (or Video Games and Taylorization of Leisure)."

50 When I describe the 'normative' gaming arrangements, I will refer to what Harald Waldrich describes as the "home console dispositive": A specific normate "sociotechnical arrangement" (ibid.) that usually consists of one or more able-bodied players, a bimanual controller as the input peripheral, and a display or TV screen as the audio-visual output device, which creates a distinct spatiotemporal configuration between players and gaming arrangement. Cf. Waldrich, Harald: The Socio-Technical Arrangement of Gaming," in: Spöhrer, Markus (ed.), *Analytical Frameworks, Applications, and Impacts of ICT and Actor-Network Theory*, Hershey, PA: IGI Global 2018, pp. 52-86. This, of course, is not the only type of gaming arrangement, especially considering the fact that a large portion of gamers plays games on smart devices or on home computers, which can require different sociotechnical configurations and bodily techniques, such as swiping or the handling of a computer keyboard or mouse. Nonetheless, though they are relatively flexible and can be adjusted individually, these setups are usually also fairly stable, normative, and ableist as it comes to the mutual affordances between players and peripherals.

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controller that is usually designed with the directional controls materially stabilized on the left and the action-buttons on the right side.[51] This "script,"[52] a set of relations and practices that has discursively been accepted as 'controlling digital games,' has been set and stabilized as the norm during the last decades of video game history. Practicing, handling, habitualizing,[53] and repeating these bodily techniques, as well as designing and producing technical objects (controllers) in relation to bodies over and over again, have fortified this specific material setup. Its 'proper' usage has been accepted and incorporated by players, developers, and designers worldwide as the invisible "industry standard"[54] that prescribes a "standard way of playing."[55] One can argue that knowing, practicing, and incorporating this script is the inevitable condition for digital gaming with mainstream gaming dispositives. Whoever can or will not adhere to this script that, as a result

51 Up until the introduction and popularization of the one-hand-controller of the Nintendo Wii, numerous other game controller scripts have existed: There are a variety of attempts at introducing alternative game controllers such as light guns (e.g., the NES Zapper), balance boards (e.g., Roll 'n Rocker), foot pedals or other single- or no-hands-controllers—concepts that had been previously established in arcades. However, such controllers usually could not survive the post-novelty stages and thus were considered passing fads or, at best, gimmicks to the bimanual controllers. They did not alter the predominance of the bimanual controller and its inscribed bodily techniques. Even Nintendo's popular concept of the one-hand-held Wii remote control was applicable to only some genres—mostly exergames or casual games—, and usually, the most popular titles, such as Mario Kart (Nintendo 2008), required the players to hold and use the controller in a horizontal position with two hands and thumbs. Furthermore, contemporary Nintendo consoles and handhelds, such as the Switch, have mainly returned to the bimanual control scheme.

52 Akrich, Madeleine: "The De-Scription of Technical Objects," in: Bijker, Wiebe /Law, John (eds.), *Shaping Technology / Building Society: Studies in Sociotechnical Change*, Cambridge: MIT Press 1992, pp. 205-224.

53 See Holmes, Steve: *The Rhetoric of Video Games as Embodied Practice: Procedural Habits*, New York/London: Routledge 2018.

54 Maggiorini, Dario et al.: "Evolution of Game Controllers: Toward the Support of Gamers with Physical Disabilities," in: Holzinger, Andreas/Plácido Silva, Hugo/Helfert, Markus (eds.), *Computer-Human Interaction Research and Applications*, Cham: Springer 2019, pp. 66-89, here p. 66.

55 Boluk, Stephanie/Patrick Lemieux: *Metagaming: Playing, Competing, Spectating, Cheating, Trading, Making, and Breaking Videogames*, Minneapolis/London: Minnesota UP 2017, p. 277.

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of its economic success, is mainly uncontested, will be unable to or disabled from playing these digital games. Nevertheless, from the perspective I will endorse in this paper and with a nod to Patrick Lemieux's and Stephanie Boluk's remarks about the "standard metagame," this very script is only one among many ways to play:

"In the same way male privilege (as well as white privilege, heteronormativity, ableism, etc.) has historically been produced largely through its ability to circulate as an unstated default subject position, so too does the standard metagame draw its power from the fact that it is easy to take for granted and easy to forget that it is only one metagame among many."[56]

The practice and effect of taking-for-granted and forgetting the normative script of how to play with a standard bimanual controller generate the well-known and widely criticized dichotomization of 'normal' subjects on the one side and 'disabled' or 'other' subjects on the other, that, for the most part, dominates game controller research as I will elaborate in the next section of this paper.

## CONTROLLER RESEARCH: FROM PROBLEMATIC A PRIORIS TO EN-/DISABLING PRACTICES

Game controller and accessibility research tend to favor locating functioning, success, disability, failure, or interruption either in the controller's materiality, design, and affordances or in the player's ('missing,' 'malfunctioning' or 'disabled') bodily qualities. On the one side (non-accessibility), game design research usually presupposes a normative conceptual 'able-bodiedness'[57] of their player peer groups, which in turn generates specific techno-material manifestations (marketable/profitable controllers and consoles) that function as the matching parts to these 'ideal body types'[58] and thus can easily be mutually adapted:

"This assumes, problematically, that the player's body is capable of such an adaptation on its own—that the machine was initially designed in such a way that it would not overwhelm

56 S. Boluk/P. Lemieux: *Metagaming*, p. 280.

57 Ellis, Katie/Kao, Kai-Ti: "Who Gets to Play? Disability, Open Literacy, Gaming. Cultural," in: *Science Journal* 11/1 (2019), pp. 111-125.

58 Cf. ibid., p. 119; D. Parisi: "Game Interfaces as Disabling Infrastructures."

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or 'overload' the body with commands that it was simply not equipped to respond to coherently."[59]

Thus, game research that is based on the theoretical implications of Disability Studies favoring a technodeterministic perspective or the "social model of disability" argues that "game interfaces embody and express ableist norms of bodily, sensory, and cognitive functioning"[60] and demand for alternative "solutions,"[61] designs, or adaptive technologies to grant access to digital gaming to any type of body, subject, or player respectively. Game controllers then are mainly framed as technical objects, "hard-coded with ableist assumptions,"[62] requiring optimization with regards to their usability, accessible properties, and inclusive design. In conjunction with the discussion of normality above, in the case of design research that targets an 'average' able-bodied peer group, the presupposed 'normal' bodily qualities of players are hardly discussed, as they are presupposed as the norm. This, again, then is a practice of invisibilizing and stabilizing 'normal' bodies, a preset mode of "hegemonic design."[63] On the other side, players with "limited mobility"[64] are usually constructed based on a logic of deficit by research areas that deal with game controller accessibility. Consequently, research on game-related design, therapy, or pedagogy frequently works on the premise that their test persons or player peer groups need to be framed a priori as "treatment-receiving objects"[65] to be able to provide the said technological 'solutions' to their sensory or bodily 'deficits.'

In this respect, the target peer groups are presupposed and produced as being able or unable to play; they are either framed and silenced as 'compatible' or

59 D. Parisi: "Game Interfaces as Disabling Infrastructures."

60 Ibid.

61 Grammenos, Dimitris/Savidis, Anthony/Stephanidis, Constantine: "Designing Universally Accessible Games," in: Stephanidis, Constantine (ed.), *The Universal Access Handbook*, Boca Raton/London/New York: CRC Press 2009, pp. 17/1-17/12.

62 D. Parisi: "Game Interfaces as Disabling Infrastructures."

63 Parisi, David: "A Counterrevolution in the Hands: The Console Controller as an Ergonomic Branding Mechanism," in: *Journal of Games Criticism* 2/1 (2015), http://gamescriticism.org/articles/parisi-2-1

64 Mangiron, Carme (2014): "Game Accessibility. Taking Inclusion to the Next Level," in: Antona, Margherita/Stephanidis, Constantine (eds.), *Universal Access in Human-Computer Interaction. Design Methods and User Experience. Part 1*, Cham, CH: Springer 2014, pp. 269-279, here p. 269.

65 K. Ellis/K.T. Kao: "Who Gets to Play," p. 13.

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constructed and highlighted as 'incompatible' subjects, which in the process of gaming either smoothly flow or collide and provoke agential cuts. Again, this is a matter of a priori distinctions, objectivations, and subjectivations that create a blind spot for the interrelation and interplays between the actors enrolled in actual gaming situations, the distributed agencies, and the resulting (re)actions: "But at worse, such distinctions deny the coconstitutional [sic!] nature of gameplay as intense, intimate, and cybernetic—as relations and transformations of speed, slowness, and affect between all part(icipant)s: They break the circuit."[66] As shown in the example of the black boxes, neither subjects nor objects are 'failing,' 'successful,' 'functioning,' or 'disabled' in isolation;[67] instead, such attributes are effects or outcomes of the feedback loop that is digital gaming. As I have elaborated elsewhere, there are analytical reasons for isolating actors as discrete objects or abstract and generalized persons.[68] However, in disability and accessibility contexts, an a priori framing of actors/objects does not 'solve' the supposed problem but instead adds to the issue by producing otherness and disability and fortifying ableist ideologies. Although the neglect of these relations appears to be the core problem of the ability/disability divide in digital gaming research, discourse, and everyday practice, they have rarely been addressed. Outside of game-related research, the praxeological, processual, and relational aspects of handling technologies in everyday life have been conducted by disability research that lends from Science and Technology Studies and specifically Actor-Network-Theory.[69] The theoretical premise of such approaches is to consider disability as something that is

66 Giddings, Seth: "Events and Collusions. A Glossary for the Microethnography of Video Game Play," in: *Games and culture* 4/2 (2009), pp. 144-157.

67 Sprenger, Florian: *Epistemologien des Umgebens: Zur Geschichte, Ökologie und Biopolitik künstlicher environments*, Bielefeld: transcript 2019, p. 9.

68 See Spöhrer, Markus: "The Neglected Gaming Situation: An Approach to the Mediality of Digital Gaming," in: Spöhrer, Markus/Waldrich, Harald (eds.), *Einspielungen: Prozesse und Situationen digitalen Spielens*, Wiesbaden: Springer VS, pp. 21-58, p. 54.

69 See M. Schillmeier: "Dis/Abling Practices;" M. Schillmeier: *Rethinking Disability*; Mol, Annemarie: *The Body Multiple: Ontology in Medical Practice*, Durham/ London: UP 2002; Moser, Ingunn: "Disability and the Promises of Technology: Technology, Subjectivity and Embodiment within an Order of the Normal," in: *Information, Communication and Society* 9/3 (2006), pp. 373-95; M. Winance, "Trying out the Wheelchair;" Galis, Vasillis: "Enacting Disability: How Can Science and Technology Studies Inform Disability Studies?" In: *Disability & Society* 26/7 (2011), pp. 825-838.

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not an essential category, state, attribute, or inherent quality that can be presupposed or predefined but needs to be considered as something that is enacted in the interplay of human and non-human actors. Furthermore, the same is true for the concept of 'game' that is replaced by the processual and situated concept of 'gaming.'[70]

A focus on the processes and reciprocal (re)actions "removes the focus from interpretative approaches of what disability is and shifts the sociological analysis to how disability is actively created through different interacting practices between the […] body, the built environment and policy-making."[71] Thus, describing the en-/disabling practices in digital gaming situations does neither require to fixate and presuppose subjects as deficit or disabled, nor does it predefine technological objects, such as game controllers, as necessarily inclusory, therapeutical, or as an instrument of "fixing a person with a disability by equipping him or her with an accommodation that fits the way the world is currently designed."[72] This, in turn, leads to a possible description of a plethora of heterogeneous ways to play, sociotechnical arrangements, modes of interfacing, strategies, counterplays, and various enabling practices that are not congruent with so-called 'normal gaming.' In fact, from the perspective of such an "indeterministic heuristic,"[73] any gaming situation can turn out to be successful, uninterrupted, or enabled—independent of the way we would discursively predefine their actors and events. In this respect, the script that is considered to be 'normal gaming' is merely one among countless possibilities of how to enact and enable a gaming situation. Also, such an approach does not require the researcher to a priori 'locate' the time, space, and action that creates the agential cuts and the 'disabling moments' in the sequence of events of a gaming situation. It rather allows us to observe those relations, negotiations, translational attempts, and successes as well possible resistances between actors that might not be presupposed or anticipated in advance. There are numerous reasons and outcomes why

70 M. Spöhrer: "The Neglected Gaming Situation," p. 24.

71 V. Galis: "Enacting Disability," p. 825.

72 Rosner, Lisa: *The Technological Fix. How People Use Technology to Create and Solve Problems*, New York: Routledge 2004, p. 55; also see Sterne, Jonathan/ Mills, Mara: "Dismediation: Three Proposals—Six Tactics," in: Ellcessor, Elizabeth/Kirkpatrick, Bill/Kirkpatrick, Milton William (eds.), *Disability Media Studies*, New York: UP 2017, pp. 365-378.

73 Schüttpelz, Erhard: "Der Punkt des Archimedes: Einige Schwierigkeiten des Denkens in Operationsketten," in: Kneer, Georg/Schroer, Markus/Schüttpelz, Erhard (eds.), *Bruno Latours Kollektive: Kontroversen zur Entgrenzung des Sozialen*, Frankfurt a.M.: Suhrkamp 2008, pp. 234-258, here p. 238.

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a gaming situation can turn out to be a disabling practice: The difficulty level does not match the player's skills and vice versa; the output devices are not configured according to the player's sensory characteristics; the game's button mapping does not correspond with the player's habituated muscle memory schemes; the distance to the output device is too low/high; the game's goals, mechanics or aesthetic structure is incomprehensible; the frequency of prompts or sensory signals is too high/low; the subtitles are missing or too small; there are no language options and various other reasons external to the hard- or software components of the gaming dispositive.

Most significantly, conceptualizing gaming situations in terms of en-/ disabling practices allows for observing practices in which otherwise (pre)supposed 'disabled' subjects would be anticipated to 'fail.' Finally, an indeterministic approach to digital gaming corresponds with its characteristic "open potentiality,"[74] "indeterminacy,"[75] and "uncertainty"[76] that has been a definitory element in even the earliest of game theories.[77] This basically means that a gaming situation with a fully predictable outcome is probably not even a gaming situation.

## INTERMEZZO: HACKING AND WORKING AROUND

One traditional example of an enabling practice are players with one hand who control a game with non-"time critical"[78] game mechanisms, such as point and click adventures like MANIAC MANSION (1990) for the Nintendo Entertainment System (NES). The game, like most games in the NES library, is intended to be played with the standard bimanual NES-controller by using the D-Pad to move the cursor on the screen with the left hand/thumb and executing an action by pushing the A- or B-button with the right hand/thumb. By placing the controller on a flat

74 Apperly, Tom: *Gaming Rhythms. Play and Counterplay from the Situated to the Global*, Amsterdam: Institute of Network Cultures 2010, p. 13.

75 Rheinberger, Hans-Jörg: "Wie spielt man mit Zufällen, Herr Rheinberger?" In: Rheinberger, Hans-Jörg (ed.), *Experimentalität: Hans-Jörg Rheinberger im Gespräch über Labor, Atelier und Archiv*, Berlin: Kadmos 2018, pp. 201-210.

76 Johnson, Mark. R.: *The Unpredictability of Gameplay*, New York: Bloomsbury 2019.

77 See Spöhrer, Markus: "Technische Dinge im Wechselspiel: Spielsituationen als Experimentalsysteme anhand einer autoethnographischen Studie zu Tetris 99," in: Wiedmann, Astrid et al. (eds.), *Wie forschen mit den "Science and Technology Studies"? Interdisziplinäre Perspektiven*, Bielefeld: transcript 2020, pp. 143-174.

78 Pias, Claus: *Computer Game Worlds*, Berlin: Diaphanes 2017.

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surface or holding it vertically, the D-Pad and the buttons can be pushed alternately with only one hand/thumb. A skilled player, who habituated this bodily technique, will be perfectly enabled to play the game and, in fact, is not produced a 'disabled subject' in this specific gaming situation. So, using an a priori definition of a single-handed person playing MANIAC MANSION in this manner as being disabled is at best a generalized statement that does not apply to every real-life-situations—especially not to this situation—and, at worst, is simply wrong and fueled with ableist ideologies:[79]

"As a result, twiddling dual thumbsticks with two thumbs; viewing the display straight on from a certain distance; and even progressing in the game by scrolling left to right, accumulating points, unlocking content, and reaching the credits are voluntary choices but have become tacitly understood as the 'normal' or 'correct' way to play. These standard forms of play not only disavow their status as a metagame, but, in doing so, inhibit the production of more diverse forms of play."[80]

In addition, such "work-arounds"[81] can be replaced or complemented by controller hacks that alter the controller's chip sets, wiring, circuiting or material shape, or moving buttons to different locations in order to generate enabling practices. In the case of the NES controller, online DIY-hacker communities developed, for example, the single-handheld controller or an inverse controller for left-handers (see fig. 1 and fig. 2).[82]

79 *Maniac Mansion* was originally released for home computers in 1987 and introduced the point and click mechanics to larger audiences. These mechanics were reworked, with some modifications, by many other contemporary graphic adventures. Originally it was intended to be played with a computer mouse, which, to strengthen my argument, is usually operated with one hand. Up to today, controlling adventure games and also strategy games with a computer mouse has been stabilized as the computer dispositive. So again, without presupposing a one-handed player as disabled, this can be considered an enabling practice.

80 S. Boluk//P. Lemiuex: *Metagaming*, p. 280-281.

81 See Ellcessor, Elizabeth: *Restricted Access: Media, Disability, and the Politics of Participation*, New York/London: New York UP 2016, p. 174.

82 This hack is a somewhat traditional one: Some joysticks for the Atari 2600 (1977-1985) were designed with only one fire button (on the left side) and thus made it hard for left-handed persons to play games, as it required them to cross their arms in order to play according to their incorporated everyday bodily techniques. As a result, quite similar to the NES customs, some players developed DIY-'hacks' and rewired their

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*Figures 1 and 2: One-hand NES controller with buttons on the bottom; Rewired and inverted left-hander controller*

Sources: Onefatsurfer, "Custom One-Handed NES Controller," *Imgur*, 2017, https://imgur.com/gallery/HDEHM; Day, Lewin: "Making a Left-Handed NES Controller," in: *Hacka day*, 2021, https://hackaday.com/2021/08/10/making-a-left-handed-nes-controller/

So, instead of fixating, producing, and othering 'disabled subjects' in advance who, in fact, in specific concrete situations, are thoroughly *enabled* to play games,

joysticks to functionalize them as left-hand-operated controllers. See Morgenstern, Steven: "Make Your Own Left-Handed Joystick," in: *Atari Age* 1/5/ (1983), p. 4.

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we should focus on those "diverse forms of play,"[83] the heterogeneous enabling configurations of sociotechnical arrangements and the heterogeneity of modes of play that are overshadowed by the script of 'normal' gaming as well as the standard video game dispositive. By elaborating on the modes of play of gamer Dennis Winkens and his sociotechnical configurations of his Adaptive Controller, I will give an example for such a description of enabling practices in the last section of this paper.

## MANY MODES OF PLAY: DENNIS WINKENS' ADAPTIVE CONTROL

In a series of testimonials on YouTube, his blog Wheely World, and Microsoft commercials, German gamer and blogger Dennis Winkens showcases some of his gaming setups and his individual modes of playing digital games. As a person with tetraplegia, who was paralyzed because of a mountain bike accident, he uses an assortment of technical devices, such as his wheelchair, which he operates with his mouth, his shoulders, and his elbows. A central element of his gaming equipment is the Microsoft Adaptive Controller (fig. 3), a "unified hub for devices that help make gaming more accessible."[84] The hub follows a modular approach by allowing for individually arranging and connecting over 20 different elements. Among the combinable elements provided by Microsoft are mounts, joysticks, buttons, and switches in various shapes, sizes, and colors that also differ in pressure sensitivity. However, as the hub's input system is based on standard USB and 3.5mm jacks (fig. 4), it can be combined with numerous other commercial or custom peripheral devices, such as pedals, voice controllers, motion sensors, gyroscopes, etc., and allows for customized button mapping. By introducing this adaptive system, Microsoft faced the "paradox of inclusivity and individuals, where designers must consider the collective needs of many and the exceptional needs of individuals"[85] that has been widely discussed in accessibility research.

83 S. Boluk/P. Lemieux: *Metagaming*, p. 281.

84 Microsoft: "XBOX Adaptive Controller," in: Microsoft.com, 2022, https://www.microsoft.com/en-gb/d/xbox-adaptive-controller/8nsdbhz1n3d8

85 McCauley, Lindsay/Frankel, Lois: "An Interdisciplinary Framework for Designing Adaptive Snowsports," in: Bucchianico, Giuseppe Di et al. (eds.), *Advances in Industrial Design*, Cham: Springer 2020, pp. 484-490, here p. 484.

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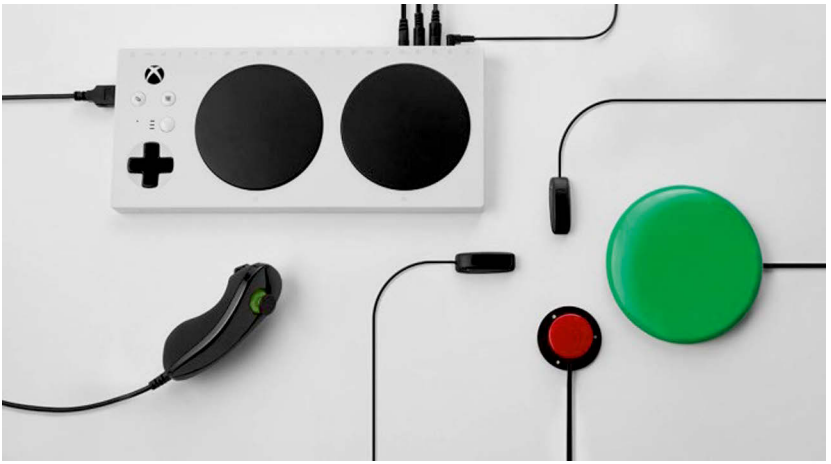
*Figures 3 and 4: Adaptive Controller and different buttons; USB ports and 3,5mm jacks*



Sources: Microsoft: "Barrierefreies Spielen mit dem Xbox Adaptive Controller," in: Microsoft.com, 2022, https://news.microsoft.com/wp-content/uploads/prod/sites/418/2018/07/Adaptive-Controller.jpg; Petzold, Sara: "Neuer Xbox One Adaptive Controller—Käufer können Verpackung mit den Zähnen öffnen," in: Gamestar, 2018, https://images.cgames.de/images/gamestar/226/xbox-adaptive-controller_6031514 .jpg

Instead of 'failing' to play in the course of disabling practices that adhere to the above-described script of normative gaming that materializes in bimanual game controllers, the Adaptive Controller allows for individual setups and control scripts. In a sense, it allows for disassembling the normative control schemes—both on a technological and a bodily level—and reassembling them in accordance

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with the individual and subjective needs, bodily configurations as well as the spatiotemporal properties and affordances of their gaming environments. By creatively and reciprocally configuring and adapting bodies, agendas, devices, and software, such sociotechnical (re)assemblages allow for the enactment of enabling practices.

Dennis Winkens narrates his personal gaming history as being a gamer who, before the accident, played and liked heterogeneous game genres, mechanics, and computer systems:

"It all started with a Game Boy when I was about five or six years old. Later, I added a Commodore 64 computer. I basically played all of the classic games: SUPER MARIO and THE LEGEND OF ZELDA on the Game Boy, and the WINTER GAMES on the Commodore—that one was a tough nut to crack. […] I mostly use my PC since my accident. I have played most games on my new computer that I purchased at the beginning of last year. Even though I also have a PlayStation 4 system, it is easier to start a game off my hard drive, since I am already on my PC."[86]

Winkens' examples of the gaming dispositives he used to enact—the computer dispositive, the handheld dispositive, and the home console dispositive—are, as far as control mechanisms are concerned, materializations of the scripts, modes of play, and ableist ideologies of 'normal gaming' as described above. Equivalent to playing MANIAC MANSION on the NES, most central to playing games, such as THE LEGEND OF ZELDA (1993) or SUPER MARIO LAND (1989), in the handheld dispositive of the Gameboy are the bimanual controls, corresponding motor skills, and bodily techniques as well as a certain sense of balance in order to handhold the handheld device in mid-air and in relation to the player's face. However, in contrast to MANIAC MANSION, such games are time-critical in nature, meaning that there are situations in which the player has to react to prompts in short time periods—often by pressing two or more buttons at the same time. In the case of older home consoles and computers such as the C64, the controllers are cable-bound, which creates a limited distance to the output devices, determines the player's position in relation to the screen, and limits the physical space of bodily movements. Additionally, operating the classic C64 joystick requires a nowadays archaic

86 Hofmann, Anne: "Gaming Tools: DIY Community," in: MEDICAlliance, Jan 3 2018, https://www.medicalliance.global/en/News_aus_den_Portalen_[online!]/Topic_of_the_Month/Topics_of_the_Month_2018/January_2018_Playfully_accessible_in_rehabilitation_and_leisure_time/Gaming_tools_DIY_community

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bodily technique, in which the controller is placed on a flat surface and operated with the left ('fire' buttons) and right hand (stick).

From the perspective elaborated above, before his accident, Dennis Winkens had internalized, incorporated, and adapted the script of 'normal gaming' as the dominant mode of play. In the course of practicing the prescribed bodily movements, arranging his gaming dispositives, and acquiring normed bodily techniques according to this script, he acquired gaming literacies and what one might call "skilled expertise"[87] in normative gaming. This "kinaesthetic training"[88] desensitized Dennis Winkens from the script's "disciplinary connotations"[89] and naturalized[90] his thoroughly sociotechnical embeddedness in the dispositive, thus 'silencing the controller' and shifting his attention away from what his body is doing. However, after the mountain bike accident and as a result of his tetraplegia, the relations and ties between Winkens' bodily and neurological characteristics and the incorporated modes of play were cut, changed, and disassembled. What used to be hardly reflected and transparent enabling practices were now enactments of disability: "There was a break, because there were no controllers on the market that I could operate,"[91] as Winkens puts it. And as most games required more than one button and most accessible controllers did not allow for more than one button, Winkens mainly resorted to point-and-click adventures—for the reasons described in the example of MANIAC MANSION. The single buttons Winkens had at his disposal were either operated with his head, his mouth, or his elbows, thus creating alternative modes of play as a means of enabling practices. Again, there is neither an essentialist incompatibility inherent in his body nor in the sociotechnical setup of the gaming arrangements. Rather, as Sky LaRell Anderson puts it, failing or success is a matter of relationality and processuality that emerges in the event of playing a digital game: "Game bodies will always be mutually constitutive beings given the interactive nature of gaming: games require bodies, and bodies create, play, and watch games."[92] Enacting digital play then "is a form of cyborgization—

87 Reeves, Stuart/Brown, Barry/Laurier, Eric: "Experts at Play. Understanding Skilled Expertise," in: *Games and Culture* 4/3 (2009), pp. 205-227.

88 N. Lipkin: "Controller Controls," p. 37.

89 G. Kirkpatrick: "Controller, Hand, Screen," p. 137.

90 A. Gazzard: "Standing in the Way of Control," p. 124.

91 Blogdot: "Tipps für ein Xbox Adaptive Controller-Set Up für Tetraplegiker," in: *Blogdottv*, August 30, 2019, https://www.blogdot.tv/tipps-fur-ein-xbox-adaptive-controller-set-up-fur-tetraplegiker/ (my translation)

92 Anderson, Sky LaRell: "The Corporeal Turn: At the Intersection of Rhetoric, Bodies, and Video Games," in: *Review of Communication* 17/1 (2017), pp. 18-36, here p. 31.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

the act of becoming a metaphorical cyborg through participation in cybernetic feedback loops."[93] It is in the course of this mutual negotiation between Winkens and his digital and material objects that his gaming situations were translated into disabling practices.

With the introduction and availability of the Microsoft Adaptive Controller, Winkens was provided with a toolkit that allowed him to reassemble and rearrange technical objects, his physical environments, and software components in mutual relation to his bodily configuration. This, in turn, allowed for an assortment of enabling practices according to different individual game mechanics and genres: "Instead of only playing easy point and click adventures, he now can play what he like before the accident: complex sports games that require skill and fast reactions."[94] Besides the Adaptive Controller's hub, the QuadStick (fig. 5) is central to Winkens' gaming arrangement and the main actor in his enabling practices:[95] "This controller, which was specifically developed for people with tetraplegia, can be used with the mouth. It consists of three input holes [with pressure sensors] that are operated by a sip/puff-control and can be configured with different setups for playing on consoles and personal computers,"[96] as Winkens puts it. Since the Adaptive Controller's hub allows for placing any possible action that is implemented in the game software's code onto an individual port, Winkens can arrange his mode of input so that any given action can be triggered by a corresponding sip/puff-input, either by activating a single hole (or more at the same time), which allows for "over 20 different combinations."[97] In this way, by, for example, configuring the middle hole of the Quadstick to trigger avatar movements, Winkens is able to move his avatar to the left or to the right by executing sip, puff and/or breathing techniques, respectively (fig. 6). Similar configurations and bodily techniques in relation to the games' mechanics or aesthetics can be used to separately control the camera perspective of, for example, a game with a central perspective.

93 Jansen, Dennis: "Ludic Cyborgism Game Studies, Cyborgization, and the Legacy of Military Simulation in Videogames," in: *Press Start* 6/1 (2020), pp. 36-53, here p. 36.

94 Lenßen, Sebastian: "F1 mit dem Mund," in: *YouTube*, August 23 2021, https://www.youtube.com/watch?v=QK-l_PET5W0

95 In some cases, but to a lesser extent, Winkens also uses eye-tracking controllers, which enable him to operate games with his eyes. Cf. Mainz, Marco: "Gaming ohne Grenzen: Dennis Winkens über Inklusion bei Spielen," in: *RP Online*, September 28 2020, https://rp-online.de/digitales/games/gaming-ohne-grenzen-dennis-winkens-ueber-inklusion-bei-spielen_aid-53615179

96 Blogdot: "Tipps," (my translation).

97 S. Lenßen: "F1 mit dem Mund."

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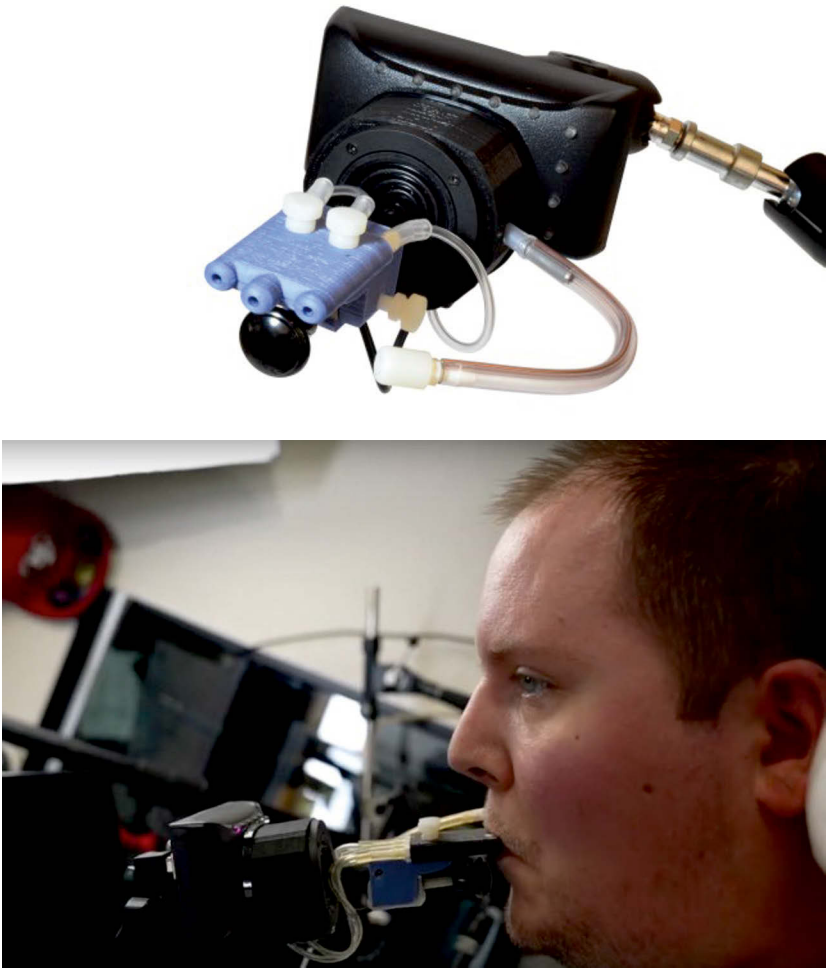
*Figure 5 and 6: The QuadStick with pressure sensors for mouth control; Dennis Winkens' mouth control technique*



Sources: Quadstick: "Quadstick: A Game Controller for Quadriplegics," 2020, https://www.quadstick.com/; Schienke, Lukas: "Barrierefreies Zocken ohne Hände," in: *EPD Video*, 2021, https://www.epd-video.de/themen/beitrag/barrierefreies-gaming-zocken-ohne-haende

Using Actor-Network-Theory's rhetoric, one might say that the well-defined, discrete, and usually materially sealed off 'standard' game controllers cannot be mobilized and enrolled in Winkens' sociotechnical "alliance" between human and

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non-human actors.[98] They can be considered "non-negotiable objects,"[99] as they are thoroughly resistant to translational efforts.[100] The bodily and sociotechnical control scheme that is inscribed in and prescribed by these controllers is relatively stable. In contrast, the extendable set of buttons in relation to the adaptive controller's adaptability and configurability renders this technological constellation an "open machine":[101] It is relatively 'open,' unresistant, and well-disposed to translations and, in fact, *requires* and *demands* active negotiation between the human player's body, skills, and senses and the techno-digital objects. In a sense, the Adaptive Controller's toolkit demands that players develop their own scheme of how to set up and design the "cybernetic feedback loop"[102] in which their bodies and skills are going to be embedded.

By being made to act by Winkens (and vice versa), the Adaptive Controller functions as a mediator of the gaming arrangement that redistributes roles, agencies, and "inter-related sets of actions"[103] between the "software and hardware components, between databases and software engines, user input and algorithmic processing of information and responses."[104] In the adaptive process between Winkens and his individual sociotechnical arrangement, compatibility, connectivity, and controllability are enabled between all the actors involved. However, this setup is "stable only for a certain location at a particular time"[105] and, one might add, for particular bodily characteristics and individual modes of play.

The enabling practices based on the connection between the QuadStick, the configurable ports of the Adaptive Controller, and Winkens' bodily techniques of mouth-control allow him to "play any game that is offered on the market,"[106] says Winkens. In relation to the situation's affordances, Winkens can develop his individual scripts and assemble both input and output devices according to the gameplay mechanics (games that afford a high frequency of reactions), the aesthetics (central perspective, side-scrolling aesthetics), the agonal nature of the situation (casual, relaxed, competitive), the duration of the situation and the sensory or cognitive attention the situation requires (single-player, intense multiplayer matches).

98 Cf. M. Callon: "Some Elements."

99 G. Kirkpatrick: "Controller, Hand, Screen," p. 147.

100 Cf. M. Callon: "Some Elements."

101 G. Simondon: "On the Mode of Existence," p. 17-18.

102 S. Giddings: "Events and Collusion," p. 145.

103 P. McDonald: "On Couches and Controllers," p. 110.

104 S. Giddings: "Events and Collusion," p. 148.

105 M. Callon: "Some Elements," p. 222.

106 Blogdot, "Tipps," (my translation).

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The same applies to the position of his body (horizontal or vertical) and the body parts he uses to operate the input devices (elbows or mouth only) based on the script that fits a particular situation. In contrast to the above-described gaming arrangements of MANIAC MANSION that require non-time-critical and low-frequency input, Winkens' setups with the QuadStick and the Adaptive Controller allow him to "flexibly control his avatar with fewest movements, minimal expenditure of energy in and with quick reactions."[107] According to the game's affordances, he switches between two main setups: (1) Sitting up straight or (2) lying down in the bed. The 'sitting setup' is supposed to be used for shorter play sessions that do not necessarily require a high level of concentration. For these, he is sitting in the wheelchair in front of a table on which a display is adjusted perfectly to his visual area of perception. Different modules such as the QuadStick and two to four smaller buttons are mounted to the table at a 45-degree angle by use of (flexible) ball-and-socket joints. In addition to this, he distributes different in-game actions to self-adhesive buttons, which are attached to his wheelchair or his elbows. The Micro Light Switch can be arranged and functionalized in such a manner, as it is a button with an extraordinary low resistance to pressure (only 0.4 ounces/10 grams of pressure are needed to activate it) and thus can be operated by minimal taps with his elbows or shoulders.

The second individual gaming arrangement, the 'lying-setup' is intended for playing "extensive multiplayer matches or longer race tracks such as in FORZA HORIZON."[108] FORZA HORIZON is a series of racing games for Microsoft systems (2014-2021, XBOX360, XBOX One, Windows) that features open-world/multiplayer mechanics. Comparable to other games with 3D graphics, the specific distance and position in relation to the visual output device are crucial in order to generate the effect of a central or point-of-view perspective that simulates sitting in a race car. As a result of the high frequency and pace of objects (other cars) appearing on the screen, the time-critical nature of the game (the goal is to finish the track in the lowest time possible), and the agonal multiplayer-setting, a sociotechnical gaming arrangement is required that allows for a high reaction time, a high degree of concentration and sensory alertness. In order to meet the game's requirement with regard to his technological 'availability'[109] and bodily characteristics, Winkens needs to distribute actions like hitting breaks, shifting gears, acceleration, or steering to the left/right to individual buttons that are distributed all over his wheelchair and in minimal distance to those body parts that operate

107 Ibid. (my translation).

108 Ibid. (my translation).

109 B. Lipp: "Analytics of Interfacing."

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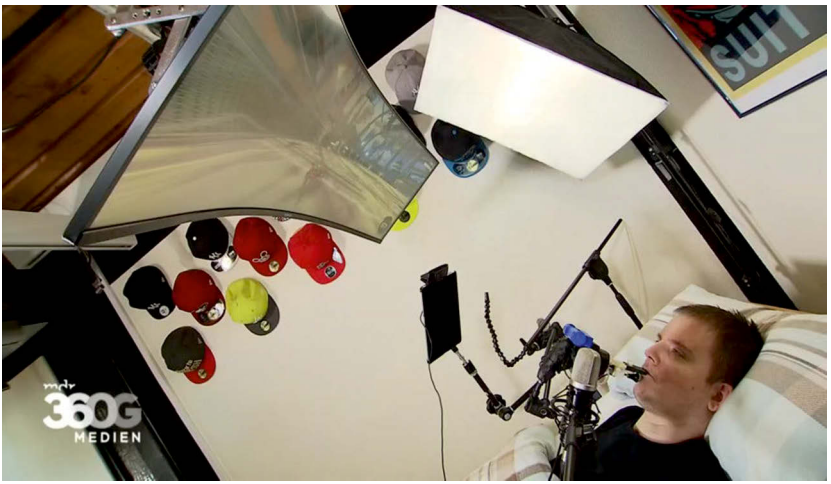
them. Depending on the menus or accessibility options provided by the game's software, the XBOX One or Microsoft Windows, Winkens then configures the digital connections between the game's possible input choices to his individual material input triggers. These "profiles,"[110] as he calls the digital configurations, are related in a reciprocal manner to specific bodily techniques he has developed and routinized (e.g., slightly moving the left shoulder/elbow to break or the right shoulder/elbow to accelerate): "For example, if I want to achieve course records in FORZA, I disable the automatic gears, switch to manual gear and change the gears via the buttons under my shoulders."[111]

*Figure 8: Dennis Winkens' horizontal mode of playing*




Source: Rünker, Maximilia/Kiesler, Johanna: "Gaming und Barrierefreiheit: Im Spiel werde ich einfach als Mensch wahrgenommen," in: *MDR Medien 360G*, 2019, https://www.mdr.de/medien360g/medienkultur/gaming-handicap-100.html

Also, as standard flat widescreens require the player to move their head, and since Dennis is lying almost horizontally, he mounted an adjustable curved ultra-wide display parallel to his room's ceiling in perfect relation to his head's position. The

110 Rünker, Maximilian/Kiesler, Johanna: "Gaming und Barrierefreiheit: 'Im Spiel werde ich einfach als Mensch wahrgenommen,'" in: *MDR Medien 360G*, September 3 2019, https://www.mdr.de/medien360g/medienkultur/gaming-handicap-100.html

111 XboxDACH: "So nutzt Dennis Winkens den Xbox Adaptive Controller," YouTube, August 30 2019, https://www.youtube.com/watch? v=doi7SdhhrTQ

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modes of play that can be enacted and enabled with this arrangement avoid bodily and cognitive exhaustion and provide a comfortable lying position (fig. 8).

In this setup, equivalent to the sitting setup, the Adaptive Controller delegates the Quadstick as the main mode of input, which "executes, depending on the game's affordances, various basic functions, such as steering and changing camera perspectives and thus replaces the classic navigation with two sticks."[112] This arrangement also allows for playing 3D-shooters such as APEX LEGENDS (2019), requiring maximum responsiveness from both player and input devices. In order to do so, Winkens connects two to four Specs Switches to the Adaptive Controller. In congruence and attuned to the Micro Light Switch, these round and sensitive 1,4-inch buttons allow him to quickly "dodge bullets and aim" at opponents.[113]

However, as lying on the hard plastic switches and operating them with the shoulders or elbows can be uncomfortable, Winkens cushions them with foam pads that guarantee maximum comfort. In case buttons or devices on the market do not correspond with his demands, Winkens also opts for customizing existing buttons or creating 3D-printed ones that are perfectly tuned to his modes of play.

## CONCLUSION

Playing digital games, or rather en-/disabling digital play, is, as any other form of interaction in sociotechnical arrangements, a "dance of agency."[114] Be it in the case of adaption of bodily techniques and routines, reacting to in-game-prompts or actively prompting in-game-actions, setting up the gaming arrangement, configuring the gameplay modes or the button mapping via the game, taking part in a gaming situation is a practice that "consists in the reciprocal tuning of machines and disciplined human performances:"[115]

"[T]he dance of agency, seen asymmetrically from the human end, thus takes the form of a dialectic of resistance and accommodation, where resistance denotes the failure to achieve an intended capture of agency [of an entity] in practice, and accommodation an active human strategy of response to resistance, which can include revisions to goals and intentions

112 Blogdot: "Tipps," (my translation).

113 Ibid. (my translation).

114 Pickering, Andrew: *The Mangle of Practice: Time, Agency, and Science*, Chicago/London: Chicago UP 1995, p. 20.

115 Ibid.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

as well as to the material form of the machine in question and to the human frame of gestures and social relations that surround it."[116]

In this respect, the grade of (in)stability of both human and non-human actors is crucial in the process of enabling or disabling gaming practices. Enabling gaming is closely related to the potential for the negotiation of reciprocal "making available."[117] Setting the perspective on the interplay and the process of configuring and arranging (non)humans allows for analyzing the (in)stabilization, resistance, translation, and "procedures of restabilization"[118] of gaming arrangements and gaming practices, in which, in any case, enabling and disabling are basic mechanisms of the processual and reciprocal being "in-play."[119]

Neither humans nor technical (or other) actors are indefinitely stable and thus open to adaptability, modification, and translation, and, in a sense, are required to adapt to each other in order to play together at all. Consequently, both game objects, gamers, and the situations are "part(icipant)s,"[120] "always in the process of becoming."[121] However, having said that, the material shape of 'standard' controllers tends to be relatively resistant. Thus, individually modifying and translating their usually hard, bolted-down plastic materials require engineering skills and sensorimotor dexterity that go well beyond the incorporated and learned practices of standard gaming, as demonstrated in the examples of controller hacks. In this respect, the adaptive or configurative approach embraced by the Microsoft Adaptive Controller appears to be a fruitful one—as it is a partially stabilized, pre-disassembled device that requires and allows the players to integrate individual

116 Ibid., p. 22

117 B. Lipp: "Analytics of Interfacing," p. 114 (my translation).

118 Ibid.

119 Huizinga: *Homo Ludens*, p. 11; cf. M. Spöhrer/H. Waldrich: "Introduction." Interestingly, the concept of resistance to translations also relates to Huizinga's concept of the "spoil-sport": "The spoil-sport, or cheat, on the other hand, as can be argued with reference to Michel Callon, refuses and resists being part of the in-play process, and cannot be translated into a mode of play. He therefore constitutes an 'other' outside of the game process: he or she 'shatters' the possibility of being a part(icipant) in the processes and situations of gaming. This also implies that gaming situations follow not only a binary logic of playing or not-playing." (Ibid., p. 11.)

120 S. Giddings: "Events and Collusions."

121 Malaby, Thomas M.: "Beyond Play. A New Approach to Games," in: *Games and Culture* 2/2 (2007), pp. 95-113.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

experimentation, assemblage, and configuration themselves.[122] Instead of having players face insuperable, highly stable, and untranslatable material chunks and forcing them to unpleasant or unfeasible bodily behaviors, they are requested to design their own modes of play.

In this respect, maybe comparable to trends such as Nintendo Labo,[123] the setting up of the gaming arrangements becomes an experimental mode of play, a "configurative practice" itself.[124] This does not mean that there is no work left for video game designers and developers. As Winkens states:

> "[o]verall in gaming, there are definitely situations where I, even with my controller, which can really do a lot, reach my limits. In FIFA, for example: Due to the variety of all possible combinations, of course, my repertoire of configurations is limited."[125]

However, Winkens elaborates that this is rather a problem of the resistance of software as the programs and coding sometimes do not provide enough flexibility and configurability for the Adaptive Controller to tap into its full potential.

As discussed in detail above, both the Adaptive Controller's approach to enabling practices, as well as the concept of en-/disabling gaming practices, do not require players to be conceptualized by use of a rhetoric or logic of deficit. Especially in cases in which the supposed bodily 'deficit' has no visible or recognizable influence on the progress and outcomes of the gaming situations, as both player, software and hardware are perfectly interplaying, leveling, and flowing. On the one hand, Winkens demonstrates this by referring to the reactions of fellow online

122 Setting up Dennis Winkens' gaming arrangement, however, is a practice that is not conducted by himself alone, but a cooperative practice in which he delegates his mother/assistive care givers to mount specific part(icipant)s according to his individual connection scheme.

123 See Schmidt, Hanns Christian: "Ludo Labo Literacy. Papphäuser, Bauhäuser und der Versuch einer medienpädagogischen Selbstentfaltung," in: *Navigationen—Zeitschrift für Medien- und Kulturwissenschaften. SPIEL|MATERIAL* 20/1 (2020), pp. 161-177.

124 Eskelinen, Markku: "The Gaming Situation," in: *Game Studies* 1/1 (2001), https://www.gamestudies.org/0101/eskelinen/. In many ways, the development of such configurations can be considered a form of experimentation, which, as I have elaborated elsewhere, has been described as a constitutive element of playing games throughout the history of (digital and analog) game theory, cf. M. Spöhrer: "Technische Dinge."

125 Schienke, Lukas: "Barrierefreies Zocken ohne Hände. EPD Video," in: *EPD Video*, 21st Octobre 2021, https://www.epd-video.de/themen/beitrag/barrierefreies-gaming-zocken-ohne-haende (my translation)

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players, who, after they learn that he played the game with his mouth, initially are surprised and believe that they are being fooled or pranked:[126]

"Usually, these people are really cool with it, support it and think it is great that I can keep up with them on such a level. […] It's all about the fun, and during gaming situations, I'm being perceived as a human being and not reduced to anything else. These are normal situations, the way everyone should treat each other. We're just having fun by gaming together, and that's the main focus."[127]

In these situations, his gaming skills, his bodily techniques, and his results are by no means inferior to standard gaming practices, which in fact, renders him an abled gamer (if this attribute is even necessary, as he is simply not a priori marked as 'the other' or disabled in these situations). Moreover, mocking the script of bimanual gaming, Winkens tauntingly asks: "Who needs hands anyway?"[128] Being asked by interviewer Marco Mainz whether he can keep up with competitive players, he answers:

"Definitely. At some games, I'm even better than them (laughing). But of course, this varies from game to game. But that is true for other gamers, too. Nobody is perfect in every game. But all in all, I would say that with my arrangement, I can easily keep up with the average player."[129]

So, skill and being enabled to play digital games is not necessarily a quality essential to bodies, but instead a matter of configuration and arrangement. Winkens impressively proved this at the Gamescom 2016, where he won the F1 (2016) racing time challenge against pro-gamer Sebastian Lenßen (PietSmiet).[130] Furthermore, being asked whether he could imagine himself a pro gamer, Winkens explains that this would be just a matter of extensive and intensive training, routinization, and time investment, which, of course, applies to any gamer who strives to reach this goal.[131] On the other hand, Winkens refers to flow moments in multiplayer online situations in which the constitutive forgetting and silencing of the

126 Cf. L. Schienke: "Barrierefreies Zocken," (my translation).

127 Ibid. (my translation).

128 Hyperbole: "FRAG EINEN GAMER: Dennis über's Zocken ohne Hände," September 3 2020, https://www.youtube.com/watch?v=XEmUAh6Qa4w

129 M. Mainz: "Gaming ohne Grenzen."

130 S. Lenßen: "F1 mit dem Mund."

131 Cf. Hyperbole: "Frag einen Gamer."

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controller, the "not paying attention to what our bodies are doing," and the effect of "non-mediation"[132] are enacted, which are, as described above, the results of enabling practices and usually attributed to that which has been called normal gaming:

"When I'm in an intensive session, when I'm playing together with other players, I have nothing but the game on my mind. I don't think anything except for; hopefully, I'm fast enough. What do I have to do? What does the situation require? In such situations, my handicap is entirely secondary, in fact, I hardly even think about it."[133]

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132 P. McDonald: "On Couches and Controllers," p. 10.

133 L. Schienke: "Barrierefreies Zocken," (my translation).

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# Being a Child Again Through Gameplay

## Playable Child Perspectives and the Sitting Simulator BACKSEAT

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## INTRODUCTION: (THE LACK OF) CHILD PERSPECTIVES IN VIDEO GAMES

There are surely many examples of relatable moments in books and movies, but interestingly enough, some left a deep impression on me without relating to my current adult life: Movies like BOYHOOD (2014) and FLORIDA PROJECT (2017) do not only tell a child's story but try telling it from the child's perspective. This can cause an emotional response that made me, as a game designer, wonder: What could a child perspective in a game do—a relatable playable child perspective?

While there are games with sensitively written characters able to move the player emotionally or give them an opportunity for meaningful decision making, a broad look at the video game industry will show that game characters seem to offer neither the same depth nor range that can be found in film and literature. Of course, there are some seemingly obvious explanations for this, including the lack of maturity of the medium and the economics of development processes, in which narration is usually not prioritized. Another reason can be found in the dominant share of game mechanics being of physical nature, overcoming material obstacles and exploring a material game world—mainly by running, jumping, fighting, shooting. Consequently, there is a superior number of game characters suitable for said physical tasks: strong and sporty young adults, often male and not uncommonly stereotypical hero figures. Usually, the physical abilities of these characters, as well as the tasks they must fulfill, exceed those of the average player by far; frequently, they are even supernatural. And while it is quite compelling to basically live a (power) fantasy through them, these characters or their narratives

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usually do not have much in common with the player and their life experiences. Therefore, the motivation for my research and practice preceding this essay was to diverge from more conventional player roles and investigate a type of protagonist that might contribute to the search for more relatable—yet different—player characters: a child.[1]

For not only watching the child protagonists of a movie like BOYHOOD—who are exposed to a violent family dinner with their stepfather—makes me suffer along, but also tiptoeing around a drunk father while playing young Chris in THE AWESOME ADVENTURES OF CAPTAIN SPIRIT (2018) makes me feel a past sensation of helplessness and childlike adjustment. And while my inner response to playing Chris appears completely reasonable, even natural, the concept of recalling childhood memories or even reverting to a child's perspective through gameplay seems somewhat unique.

In fact, examining 506 video games published between 2009 and 2019, Emma Reay found that only 45 featured significant, playable child characters, i.e., less than 9 percent.[2] Childhood relatability as a common ground for the majority of adult players, on the one hand, and the underrepresentation of credible child characters as game protagonists, on the other hand, constitute an opportunity: By putting the spotlight on a type of player character which is possibly more relatable than the typical strong heroic one, we can offer a different perspective to our current adult one. The implementation of a relatable child perspective also involves, as will be shown, various artistic and design challenges for the medium of the computer game, regarding its narrative as well as its aesthetic qualities.

Hence, in this essay, playable child perspectives are explored both theoretically and practically: After defining three overall approaches to a playable child perspective, I discuss potential means to a *relatable* child perspective for adult players and give respective examples. Finally, I present the game prototype BACKSEAT (2022)—my own implementation of a relatable playable child perspective.

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1 This essay summarizes and further develops some of the findings from my thesis *Being a Child Again Through Gameplay*, with which I obtained the degree of Master of Arts (M.A.) at the Cologne Game Lab of the Cologne University of Applied Science. Find my thesis online here: https://www.researchgate.net/publication/361085723_Being_a_Child_Again_Through_Gameplay

2 Reay, Emma: "The Child in Games: Representations of Children in Video Games (2009-2019)," in: *gamestudies.org* 21/1 (May 2021).

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## DARK, PLAYFUL, OR BLENDED— DIFFERENT APPROACHES TO PLAYING A CHILD

Games serving as examples and basis for my research and the following classification of approaches to a playable child perspective are compliant with the following three criteria: Firstly, there must be a playable child character[3] at some point within or throughout any considered game. For the character to be defined as a child, the game's fictional world must allow the definition of childhood as the preceding life phase to adolescence and adulthood, both also existent in the respective world, at least theoretically.[4] Secondly, playing as a child is absolutely relevant to the respective game or game segment. This means the playable character identifying as a child is of such significance that the narrative would not make sense, or the gameplay message would not come across if they were an adult or other non-childlike being.[5] And thirdly, games covered here are not solely made for children but have an adult target group. This criterion derives from the objective of investigating games putting adults into a child's perspective.

While games complying with the above criteria are comparatively rare, there are still more than can be covered in this essay. Thus, only a few representative ones are exemplarily mentioned. I suggest a classification of game approaches to a playable child perspective, categorizing them into three main types: Dark *Approach*, *Playful Approach,* and *Blended Approach*. The classification and categorization result from my assessment of the considered games and further games with similarities to the considered ones and are ambiguous in some cases. The

3 Within this work, a child character is understood to be a human or humanoid character that clearly is a child within the fictional world of the game. The character is required to be of an age and/or in a developmental stage corresponding to an older preschooler or school-aged child, before puberty, namely between about four and twelve years old.

4 The character may be a human being or any other conscious being with human-like personality embedded in a societal system with a generational structure similar to that of mankind. Thus, the non-human attributes of a character covered by this definition would be limited to their outer appearance and physical characteristics. An example for this would be the later referenced game A SHORT HIKE (2019).

5 A counter example to a significant child perspective can be found in the Jump'n'Run series COMMANDER KEEN (1990-1991). While the protagonist is a boy according to the background plot of the game, his identity as a child does not seem to affect the gameplay in any significant way. An almost identical game with an adult human or, for instance, dog named Commander Keen as playable character would be thinkable.

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respective portrayal of childhood and child characters as well as the depiction of adult characters and the game world, atmosphere, and narrative served as an orientation while assessing the games. As the three types of approaches express a predominant tendency, the level of manifestation of the respective type of approach can vary between games. However, any game compliant with the mentioned criteria falls into one of the three categories. The three categories—the Dark Approach presenting a predominantly negative child position, the Playful Approach painting a very positive picture of childhood, and the Blended Approach providing a more multifaceted experience—are briefly described in the following and further represented by respective game examples in the subsequent discussion of means to child perspective relatability.

The most frequent of the three approaches, the Dark Approach to a playable child perspective, is characterized by a dark depiction of childhood in general or of a specific childhood shown in the respective game. The main goal of playable child characters is either to break out of an unbearable situation or literally survive the game. Usually, they have no overblown purpose as known from more conventional game narratives but find themselves at the bottom of a power hierarchy, exposed to a hostile environment in which adults are cruel, indifferent, or incapable. Childhood in the sense of a protected and playful youth does not exist. Games with a Dark Approach often rank among the survival horror game genre dominated by stealth gameplay, as found in LITTLE NIGHTMARES (2017), LIMBO (2010), and INSIDE (2016).[6] More rare realizations of the Dark Approach include adventure or point-and-click games, for instance, THE WALKING DEAD: SEASON TWO (2013), FRAN BOW (2015), and LITTLE MISFORTUNE (2019).

The Playful Approach is all about capturing the lightness, carefreeness, playfulness, curiosity, vitality, and spirit of adventure that childhood can be to provide a wholesome game experience to the player. Burdensome themes play no or just a small part, and if they occur, they are presented in a hopeful, solvable way. Typical gameplay involves lively movement and exploration, reminiscent of the adventurous energy of playing children. Correspondingly, bright and colorful outside settings in friendly nature scenes are common. The playful exploration of these settings affords an easy access to a positive child perspective. Some examples of games with the

6 Emma Reay elaborates on two of these wordless games: Reay, Emma: "Secrets, Stealth, and Survival: The Silent Child in the Video Games Little Nightmares and INSIDE," in: *Barnboken* 43 (June 2020).

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Playful Approach that I looked at are ALBA: A WILDLIFE ADVENTURE (2020), DORDOGNE (in development), and A SHORT HIKE (2019).[7]

The Blended Approach to a playable child perspective shows both positive and negative sides of being a child, or better even, it does not employ a dyadic construct of two distinct sides but portrays diverse aspects from a spectrum of childhood facets ranging from devastating to joyful, whereas the Dark Approach and the Playful Approach tend to primarily cover aspects from the negative or positive end of this spectrum, respectively. The ratio between child perspective aspects involved varies between games. A versatile depiction of the child perspective is more representative of the average real-life childhood than an exclusively dark or overly playful one. This is often reflected by Blended Approach games being situated in everyday life settings rather than dystopian, idealized, or otherwise constructed ones. THE AWESOME ADVENTURES OF CAPTAIN SPIRIT (2018), KNIGHTS AND BIKES (2019), BEFORE YOUR EYES (2021), and BEAR WITH ME (2016) are four examples of games with the Blended Approach to a child perspective I explored in my research.

## POSITION, PERCEPTION, PROJECTION— MAKING PLAYABLE CHILD PERSPECTIVES RELATABLE

Besides classifying the approaches to a playable child character introduced above, I also tried to answer the following question: What turned, or would have turned, a playable child perspective into a *relatable* playable child perspective? And while there is no guaranteeing recipe for creating a playable child perspective that just any adult player can relate to—games are, after all, an art form and speak differently to different kinds of players—, gathering and analyzing design strategies that have been used so far could be a helpful undertaking for future game designers. Based on my findings in later mentioned game examples and standpoints in Game Studies literature, I draft the following supposition from a game design standpoint: For a playable child perspective to be relatable to adult players, some and ideally all these means must be conveyed, a *childlike positioning* within the diegetic game

7 Playfulness can also be a characteristic of games with playable child characters using the Dark or Blended Approach to a child perspective. Thus, the term Playful Approach refers to games in which childlike playfulness and imagination have priority over any non-playful and negative aspects of the childhood perspective in such a way that the game could be reduced to these predominant aspects of childlike playfulness and imagination without changing the core game idea.

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world, a *childlike comprehension and perception* of the game world, and a *projection* opportunity for the player. Optionally, *nostalgic and/or 'retro' sensations* can serve as relatable elements to raise associations with the player's own childhood. The three means are not always clearly distinguishable and often affect each other, e.g., both a well-conveyed child position and perception can create or enhance a projection surface.

Each of these means is outlined in the following, further illustrated by game examples from my research, and finally referenced in the description of my own game, BACKSEAT.

## Childlike Positioning

What defines a playable character as a child or childlike being is their position in the world and in relation to other (incl. non-childlike) characters within that world. The notion of *position* is used in a broader sense, encompassing the child's role in a social, cultural, and family structure. Sociologist Chris Jenks says about childhood and adulthood:

> "The 'known' difference between these two social locations directs us towards an understanding of the identity contained within each; the contents are marked by the boundaries. The child, therefore, cannot be imagined except in relation to a conception of the adult, but essentially it becomes impossible to generate a well-defined sense of the adult, and indeed adult society, without first positing the child."[8]

For instance, not having the liabilities and obligations of the adult members of their family or within their world, not having to self-acquire their vital resources, and being able to use most of their time freely, are qualities of a child's position in our western society that go hand in hand with the situation of having others—parents in a direct sense and society in a superordinate one—decide over a child's life circumstances. Not being seen as a full member of society and thus not being taken seriously are likely drawbacks of being a child, while the same can lead to a liberating acceptance of silliness, nonconformity, and missteps. As many adult players may remember the defining aspects of their childhood, a child position mirrored by the game design, mechanic, or narrative can be a crucial factor in creating a relatable playable child perspective. While the narrative is probably the most intuitive way to indicate the position of the playable character, e.g., via

8 Jenks, Chris: *Childhood*, London: Routledge 2005, p. 3.

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narrative setting or dialog, cues of a child's position can also be included in other game design aspects such as game visuals or game mechanics.

For instance, avatar agency can put emphasis on a childlike position: Rune Klevjer's model of the *avatarial prosthesis*[9] considers the avatar in its function as a *reflexive extension* to *simultaneously* being an interface/extension and an element of the diegetic game world. He points out that, since "[t]hrough the avatar, instrumental agency is replaced with fictional agency,"[10] this extension allows the consideration of fictional—diegetic—elements, such that narrative techniques can be integrated into the fictional agency. Regarding the inferior attributes of a child's position, Klevjer's concept of an *unreliable prosthesis* is particularly interesting. He states that "the unreliable prosthesis makes the avatarial relationship itself less coherent, less well-defined and more slippery."[11] And as Benjamin Beil believes the variations of an *unreliable prosthesis* to be exceedingly diverse,[12] this likely gives room to different opportunities to employ an unreliable prothesis as narrative means to making an adult player better relate to a playable child perspective. An exemplary scenario that comes to mind is taking away agency from the player, i.e., impeding controls, at the moment, the playable child character is trying to manage a task like carrying a heavy pile of fragile plates or pouring juice from a full pitcher. The risk of breaking a plate or spilling the juice is increased, and the child's motoric shortcoming or self-defeating nervousness and fear of failure (resulting in parental reproach) impedes communication between the player and the avatarial prosthesis, thus becoming an unreliable one. Likely, this results in an emotional tension or even an unpleasant slip-up that some adult players might remember from their childhood.

Furthermore, the choice of camera point of view (POV) can serve as a tool to illustrate a childlike position. Thereby, the POV best suitable for child character relatability is an individual consideration depending on several factors such as the game design, intent, genre, and player. I believe that the relation between POV and relatability is similar to the relation between POV and the often-discussed immersive effect. As Beil claims, the debate around the most immersive POV

9 Klevjer, Rune: "What is the Avatar? Fiction and Embodiment in Avatar-Based Singleplayer Computer Games," Dissertation, University of Bergen 2006, p. 64.

10 R. Klevjer: "What is the Avatar?" p. 130.

11 Ibid., p. 213.

12 Beil, Benjamin: "'You are Nothing but my Puppet!' Die 'unreliable prosthesis' als narrative Strategie des Computerspiels." In: *Navigationen—Zeitschrift für Medien- und Kulturwissenschaften*, Jg. 9, Nr. 1 [2009], pp. 73-89, p. 76.

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often neglects the context of game and representation modes.[13] Indeed, a child character played in first-person POV with a lower eye level, possibly symbolizing hierarchical inferiority, a more curious view of the world, or the feeling of being cared for on a parent's arm or shoulders, can afford a close experience of certain aspects of a childlike position as well as perception. But nevertheless, most of the child characters in the examined games being played in third-person POV does not seem to lessen their relatability but rather be attributed to well-considered design choices, some of them pointed out in upcoming examples.[14] In Daniel Black's words, "the player's relationship with the game character is not simply one of direct identification. If it was, third-person games would always be less involving than first-person games."[15] And thus, as for my research interest in enabling an adult to be, i.e., feel like being, a child again through gameplay, and the therein motivated sought for relatability, the player does not have to give up their own identity and believe they are the playable child character[16] (in any case not fully feasible) but take part in the "process of metacommunication, a double-consciousness,"[17] as Katie Salen and Eric Zimmermann framed it, to put themselves in the child's shoes and thereby remember how they used to be a child.

13 Beil, Benjamin: *First Person Perspectives. Point of View und figurenzentrierte Erzählformen im Film und im Computerspiel*, Münster: LIT 2010, pp. 93-94.

14 Laurie Taylor describes the main drawback of a first-person POV as follows: "The third-person point-of-view augments the limited information of the first-person point-of-view, and suggests another aspect of this problem: embodiment is not merely seeing more (i.e., peripherally), but seeing within a context [...]. Third-person games allow for the representation of other-than-visual perception, like often being able to sense entities behind and beside one's body and being able to see straight ahead, to the periphery, and down all at the same instance. Perception often includes the ability to sense when another presence moves right behind or next to a person. In first-person games, this is lost." (Taylor, Laurie N.: "Video Games: Perspective, Point-of-view, and Immersion," Dissertation, University of Florida 2002, p. 29.)

15 Black, Daniel: "Why Can I See My Avatar? Embodied Visual Engagement in the Third-Person Video Game," in: *Games and Culture* 12/2 (2017), pp. 179-199, here p. 189.

16 This refers to the plunging immersion defined in: Murray, Janet: *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, New York, NY: Free Press 1997, pp. 98-99.

17 Salen, Katie/Zimmerman, Eric: *Rules of Play: Game Design Fundamentals*, London: MIT Press 2004, p. 451.

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In the Dark Approach examples LIMBO, LITTLE NIGHTMARES, and INSIDE, several visual aspects convey each of the three playable child characters' mutual childlike position within their respective game worlds, defined by inferiority, hostility, vulnerability, and solitary: Observed from a third-person camera viewpoint that is positioned in parallel to and distant from the two-dimensional (or 2.5-dimensional) scene,[18] the child characters appear especially small in comparison to the screen dimensions and thus quite lost.[19] Seeing their body motion responding directly to the player's input will add to a sense of direct influence, consequential responsibility[20], and urgency. And repeatedly watching the child character's small body explicitly brutally destroyed can cause a magnitude of fear in the player. In fact, due to their third-person perspective, these games can be considered examples of what Bernard Perron defines as the "extended body genre" in which the body on screen "urges [the player] to act and feel through its presence, agency, and embodiment in the fictional world."[21] Furthermore, a sudden loss of control—conforming with the Rune Klevjer's concept of an *unreliable prosthesis* and Benjamin Beil's idea of narrative techniques integrated into the fictional agency—can be found in LIMBO as the player suddenly loses part of their control over the playable child character when a maggot-like entity attaches itself to the boy's head and forces him to keep walking ignoring the player's directional inputs.

In the Playful Approach example, ALBA: A WILDLIFE ADVENTURE, the exclusively positive childlike position of the playable child character Alba is also conveyed visually, both by the friendly environment[22] and her cheerful body

18 For these aspects to come across, a third-person POV is essential.

19 In LITTLE NIGHTMARES, the player character is exaggeratedly tiny in comparison to adult characters and objects, e.g. furniture and tools, as well.

20 While steering the playable child character, a potential feeling of torturing them could either put a distance between player and playable character or evoke an early life feeling of having to endure an other-directed situation with no other options.

21 Perron, Bernard: "The Survival Horror: The Extended Body Genre," in: Perron, Bernard (ed.), *Horror Video Games: Essays on the Fusion of Fear and Play*, McFarland Company 2009, pp. 121-143.

22 The three Playful Approach games share some characteristics in world design and narrative. They are set either in an especially pictoresque and idyllic region (Dordogne) or on a small island. Hence, the game world is a somewhat secluded or even naturally limited microcosm, segregated from a larger, unknown and thus possibly less friendly world, e.g. a city or the mainland. This allows the characters and their narrative to stay inside a bubble of peaceful and well-off living conditions, clearly not

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language. Watching Alba skipping through high grass and between trees, occasionally outstretching her arms like a gliding bird,[23] it is hard not to be overcome by a nostalgic feeling of freedom and liveliness and remember what the world once looked like on a long summer day before one was called home for dinner. In fact, all aforementioned Playful Approach examples being played in third-person POV allow the player to see the adorably animated playable child character's as a diegetic part of their wholesome surroundings and privileged situations: All three main characters seem to be on vacation or some kind of break, all of them staying with close relatives which are not their parents or their siblings. The latter facilitates a more harmonic and less conflict-prone relationship[24] with the respective adult guardian and thus a more harmonic and less conflict-prone childlike position. Overall, the in-game conditions around these game examples are blatantly ideal—to the point of them converging into one and the same stereotypical childhood fantasy: If asked for a somewhat viable situation to put one's inner child in good spirits and a more carefree and relaxed mood, coming up with a summer vacation on an island or in the countryside is probably not a far-fetched answer. And this answer conveys an exclusively favorable childlike position, reducing childhood to its playful, carefree aspects.

BEFORE YOUR EYES, a game I associate with the Blended Approach to a child perspective, demonstrates that the before-mentioned loss of perception through a first-person POV[25] can be a stylistic device aiding the game narrative and, here, in particular, portraying a rather passive and observant childlike position. This is further supported by game mechanics only allowing for head movement and occasional object interaction. The surrounding visual field includes areas that remain black, illustrating the fragmentariness of relived memories. The limitations of both visual field and player agency do not only emphasize the playable child's position

representative of average ones. This lucky location is usually complemented with friendly weather matching a warm season.

23 There's a mentionable parallel between Claire's little flying and gliding sprees (A SHORT HIKE) and Alba's pretend-flying—an easily accessible metaphor for undaunted childlike energy.

24 This is particularly true in the case of a temporary guardianship and a return home to the parents in near future, e.g., during a school break spent at a relative's. Said case pertains all three games.

25 L. Taylor: "Video Games," p. 29.

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in his family[26]—characterized by narrative themes such as distressed parents, parental conflicts, and high expectations—and as a spectator of his past memories, but the later also constitutes an example of an *unreliable prosthesis*: The sudden impossible control pace requirement the player is faced with during the playable child character's piano recital conveys stress-induced failure. A classic burden of a childlike position, i.e., having a path laid out by a parent, is thereby narrated through game mechanics.

Whether dependence and inferiority or carefreeness and privilege, showing these characteristics of the child position in distinction from the adult position can appeal to the player's memory of being a child and thus cause relatability.

### Childlike Perception/Comprehension

While communicating a childlike position as outlined above is aimed at relating to the child's stand in the context it is in, conveying a childlike perception and comprehension is about relating to a child's mind.

As they are in a different life phase and developmental stage—and due to their just discussed childlike position—children perceive and comprehend some things differently than adults. This difference can complicate making an adult player relate with a child character but can be used as a means to child perspective relatability. For if the game can manage to convey the child's comprehension and perception, the adult player might be able to project themselves into that child's perspective. Few exemplary strategies are given here to illustrate how this could be done. Surely these do not cover all possibilities of making childlike perception/comprehension accessible to an adult player.

*Grown-up Words:* For instance, when an adult character says a sentence that is contextually comprehensible to the adult player but not to the playable child character, the game would have to be designed in a way that suggests this discrepancy to the player in order to make them relate to the child. This is not an easy task as the player's intellect cannot be lowered. One possible way would be to make this sentence audibly incomprehensible to put both player and playable character on the same level. Another could be to slightly change the sentence in a way that suggests an incomprehension on the playable character's side. For instance, a sophisticated word could be substituted by an altered version that is slightly off, not an accurate word but easy to reconstruct. The player will still know what is

26 The child helplessly exposed to an adult-determined world is a scheme also found in the Dark Approach, however in vast contrast to that as the adults in BEFORE YOUR EYES are caring and well-intentioned.

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meant but be reminded of the child character being on a different level of comprehension. The same effect could be achieved by the child character wrongly reusing a sophisticated word, reacting confused, ignoring it, or checking back with another character to understand its meaning.

*Understanding Situations:* Differences in comprehension are not only linguistic. Also, an entire situation can be understood differently by a child than an adult, which does not necessarily mean that the child's understanding is less right. The playable child's understanding then has to be conveyed to the player. This can again be done in different ways, for instance, through dialog or audible/readable thoughts, visually or through the child's reaction in or after a respective situation.

*Imagination:* Children's view of the world is often more imaginative and naive than that of an adult. They are less likely to have been disappointed or disenchanted yet, ideally, live in a protected environment, are often raised with wholesome, naive, and fanciful narratives, and have fewer real experiences on which to base their view. This is, of course, a generalizing assumption but surely applicable enough. Therefore, making that view visible can be an effective approach to portraying a childlike perception.

Regardless of the means to close the gap between childlike and adult comprehension and perception, being aware of that gap is probably the more crucial aspect in creating a relatable child perspective. Some case examples will be pointed out in the discussion of game examples further below.

The Playful Approach example ALBA: A WILDLIFE ADVENTURE provides a childlike perception through the narrative of Alba's successful quest of actively solving an environmental issue, which is not frustrating to the point of hopelessness like global warming but more of an adventure than a catastrophe and thus approached with an optimistic drive, reminiscent of the image of environmentalism one might have had and felt passionate about as a child—being concerned about the well-being of cute animals and trash in the park.[27] Alba confidently saving the nature reserve, becoming a respected local hero, and finally having everyone on her side portrays a young child's idealistic view of their own efficacy as well as doubtless self-perception.

In the Blended Approach title THE AWESOME ADVENTURES OF CAPTAIN SPIRIT, it is the choices given to Chris that likely prompt the player to project themselves into the child character's position and comprehension.[28] The discrepancy between

27 This is not meant in a condescending way. Surely, at a young age, environmental pollution is easier to grasp on a small scale and in a local context.

28 For example, when one of two choices is to be honest or even provocative and confront the father with his shortcoming and wrongdoings and the other is to be careful,

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the relatable child character's choices and the player's adult perspective is exposed at several points during tense dialog with the father and becomes particularly clear when the player eventually tries to get rid of a concerned neighbor on behalf of the playable character even though from an adult perspective seeking help would be preferable. Here, the childlike position and comprehension have been well conveyed. [29] The game aspect constituting the Blended Approach of this game is the coexistence of the menacing situation with the father—feeling helpless, tiptoeing around him—on the one hand, and just an ordinary or at least playful childhood—getting lost in one's own limitless imagination—on the other hand.

*Figure 1: Chris sitting in his room, coming up with an adventure in THE AWESOME ADVENTURES OF CAPTAIN SPIRIT*

Source: THE AWESOME ADVENTURES OF CAPTAIN SPIRIT (Square Enix 2018, O: Dontnod Entertainment), https://square-enix-games.com/games/the-awesome-adventures-of-captain-spirit

soothing, or silent to avoid confrontation with the father's anger and preserve harmony, the player can not only find out what kind of child they would want to be but possibly reflect on what kind of child they once were.

29 Incidentally, understanding one's childhood behavioral patterns and coping mechanism only retrospectively, leads to an intriguing aspect of experiencing a child perspective as an adult player, also found in THE AWESOME ADVENTURES OF CAPTAIN SPIRIT: As the player, one realizes quite soon what is going on with Chris' Dad but it is not quite clear if Chris does, at least not to the whole extend, including the damaging situation he is in.

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For Chris, the playful and imaginative is a way of coping with the oppressive and the powerlessness, as he imagines himself as a supernatural strong hero to deal with his vulnerable position as the smallest and weakest person in his home. The player might remember coping in a similar manner as a child, when withdrawing to their room and assuming the biggest worry they had was what to play next would distract their minds from being helplessly subjected to a world ruled by grown-ups or, to give the most classic example, a moody or mean parent. Eventually, Chris gets so absorbed in his imagination that it comes alive not only to him but also to the player's perception, i.e., visually on screen. This allows the adult player an actual look at the imaginative childlike perception of the playable character.[30]

Dark Approach games like LIMBO and LITTLE NIGHTMARES convey a childlike perception/comprehension by making use of the menacing game experience inherent to their survival horror genre: Despite the player's negative childhood recollections obviously not matching the playable child character's excessive hardship, their personal childhood sorrows might have felt similarly desperate once, not from a rational adult perspective but from a child perspective. Thus, the shown horror scenario might depict a childlike perception/comprehension of frightening childhood situations, exemplified by the following two game aspects: While the average player most likely had contact with other children in their childhood and hopefully never was completely on their own in a miserable situation, it might have felt like that at times—each of the three child protagonist seemingly being the only young child within the respective game worlds might mirror that feeling.[31] Also, the antagonists in LIMBO represent things commonly dreaded by young children, such as spiders, mean older children, water, and darkness, providing a relatable object of fear. These actually being life-threatening in the game might be an 'exaggeration' expressing a childlike perception of rationally (i.e., from an adult perspective) mostly harmless confrontations.[32]

30 The effect of visualizing childlike imagination is found even stronger in KNIGHTS AND BIKES, another title with the Blended Approach to a playable child perspective. A third Blended Approach example of extensive visualized childlike imagination is BEAR WITH ME (2016) in which the better part of the game is an imaginary crime case.

31 Few temporary encounters (e.g., a childlike water creature in INSIDE) could be seen as small exceptions, however negligible as they are never on one level with the playable child character.

32 In LITTLE NIGHTMARES, adult antagonists are depicted as huge, deformed, obese, creepy and grotesque looking monsters seeking to devour the playable child character. They are savage and instinct-driven and appear a human satire, with their urge to eat

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To exemplify some possible difficulties in apprehending a childlike comprehension: In FRAN BOW, another game of the Dark Approach, the playable child character's demeanor, wisdom, and humor, being quite mature at times, might aggravate a relatable childlike comprehension. In the Little Red Riding Hood-reminiscent Dark Approach title LITTLE MISFORTUNE, the player might find themselves occasionally shaking their head or laughing about the overly naïve and clumsy playable child character Misfortune and thereby, perspectively, taking a seat next to adult antagonist Mr. Voice while tragic Misfortune herself somewhat degenerates to a delightful element of entertainment and comic relief. Or, putting it in terms of the here discussed means, as the childlike position is conveyed rather from an adult viewpoint, the childlike perception is hard to grasp.

## Projection Surface vs. Individual Experience

To aid adult players in recalling their personal childhood memories, a method standing to reason is providing a projection surface to them, possibly achievable both by creating relatable circumstances and leaving room in the overall game design for their own interpretations and personal memories. By finding known concepts in the game, e.g., common and familiar childhood scenarios like a family dinner, a children's birthday party, or a parent argument, players can project their own memories onto the game, which lets their mind return to that past reality. Then, by comparing the experience made during gameplay to their individual one made in a past situation, the players can find detailed similarities and differences. On that basis, the players may reflect on that piece of their childhood or rediscover their younger self's emotions. In other words, a balanced synergy of a familiar context as a projection surface and an individual content making for a unique and credible experience is expected to be a promising approach to designing a game able to put its players into a child perspective and personal retrospective.

The idea of a given, i.e., written, designed, and programmed, content and the player's projection adding up to a unique and individual experience can be regarded as analogous to Wolfgang Iser's concept of narrative *gaps* in literature.[33] These gaps, resulting from the distinctness of colliding schematized views, introduce a scope of interpretation of the correlation between aspects presented in these

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the child character likely constituting a metaphor on a sick inter-generational dynamic within an aetonormative society

33 Iser, Wolfgang: "Die Appellstruktur der Texte: Unbestimmtheit als Wirkungsbedingung literarischer Prosa," in: Warning, Rainer (ed.), *Rezeptionsästhetik: Theorie und Praxis*, Munich: Fink, pp. 228-252.

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views.[34] According to Iser, it is the reader who fills these gaps and thereby completes the literary work:

"[...] the literary work has two poles, which we might call the artistic and the aesthetic: the artistic refers to the text created by the author, and the aesthetic to the realization accomplished by the reader. From this polarity it follows that the literary work cannot be completely identical with the text, or with the realization of the text, but in fact must lie halfway between the two. [...] The convergence of text and reader brings the literary work into existence, and this convergence can never be precisely pinpointed, but must always remain virtual, as it is not to be identified either with the reality of the text or with the individual disposition of the reader."[35]

Analogously, the convergence of the game as artistic pole and the player's interaction with and response to it as aesthetic pole generates the true game story and experience,[36] which ideally—in the case of the pursuit of my research—includes personal childhood associations.

Blended Approach games tend to be situated in everyday life settings rather than dystopian, idealized, or otherwise constructed ones, allowing us to project our own real-life experiences onto them. For instance, playing as ten-year-old Chris in THE AWESOME ADVENTURES OF CAPTAIN SPIRIT—spending a snowy Saturday morning roaming the home and garden, playing, finishing some chores, and trying to handle life with his alcohol-addicted father—constitutes a relatable projection opportunity. That is, the game mirrors, in an amplified case, the diverse nature of being a child within an imperfect family dynamic and fallible social system. So regardless of whether their own life story involves an addicted parent, the essential feel of this might be rediscovered in an individual adult player's childhood. Similarly, biking around the neighborhood and thinking up adventures to fight small-town boredom and escape family problems in KNIGHTS AND BIKES likely provides a projection opportunity for players that experienced comparable childhood phases.

34 Ibid., p. 235.

35 Iser, Wolfgang: "The Reading Process: A Phenomenological Approach," in: *New Literary History* 3/2 (1972), pp. 279-299, here p. 279.

36 A similar notion is contributed by Katie Salen and Eric Zimmermann: "Game design is a second-order design problem. A game designer designs the rules of the game directly but designs the player's experience only indirectly." (K. Salen/ E. Zimmerman: *Rules of Play*, p. 171.)

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The Dark Approach to a playable child perspective almost exclusively concentrates on negative aspects of childhood. It often does this in a way that requires some translation into the real world for its parallels to one's own individual childhood to become apparent, meaning such projections can be indirect[37] and figurative.[38] The design challenge is providing a projection surface through the child protagonist, i.e., a child perspective, without their vulnerability—the defining character trait for most of the Dark Approach examples—pushing the player into the role of a protector, i.e., a parent-like perspective. If this balancing act can be accomplished, its strength lies in providing an extensive projection surface for the player's childhood fears and sorrows, especially potently staged by the horror survival games LIMBO and LITTLE NIGHTMARES, likely evoking primal fears.

The before-mentioned Playful Approach examples create projection opportunities by depicting situations of childlike playfulness and the spirit of adventure. Stress-free key game mechanics like exploring or collecting, e.g., exploring the island nature, spotting and photographing various animals in ALBA: A WILDLIFE ADVENTURE, are typical childlike diversions that might remind the player of either exploring their neighborhood or their collection of stickers, game cards or whatever trinkets were popular in their youth.

## Nostalgia and Retro

Talking about the idea of games providing a retrospect on childhood suggests at least a short consideration of the feeling of *nostalgia*, a certain aesthetic style referred to as *retro,* and the roles they both play when providing today's adults a child perspective.

Nostalgia, as a bittersweet emotion, as well as retro as a design choice, are ways of referencing the past, both differing and affecting each other. Nostalgia describes the longing for past circumstances that are remembered positively or even idealistically and cannot be restored. Or, as theorist Svetlana Boym puts it, nostalgia is "a longing for a home that no longer exists or has never existed. Nostalgia is a sentiment of loss and displacement, but it is also a romance with one's

37 Particularly, the point-and-click games FRAN BOW and LITTLE MISFORTUNE seems more suitable for interpretation than identification, encouraging thinking rather than feeling.

38 Similarly, even though the topic of family tragedy in BEAR WITH ME (Blended Approach) is too extreme and unique to provide projection surface in itself, when understood figuratively, it might encourage the player to reflect on one's own way to deal with hard to grasp situations or strong negative feelings as a child.

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own fantasy."[39] Helpful for sensible use of nostalgia in digital games seems to be Boym's distinction between *restorative* and *reflective* nostalgia. While the first is a collective striving to reconstruct a lost time, home, or order, the latter does not strive for change but endures, even savors, a personal longing for past moments within one's individual narrative.

In the context of digital games reminiscent of childhood, nostalgia can be assigned to the second type, reflective nostalgia. According to Boym, this variant "can be ironic and humorous […] reveal[ing] that longing and critical thinking are not opposed to one another, as affective memories do not absolve one from compassion, judgment or critical reflection."[40] While possible idealization should be considered when regarding nostalgia as a means of creating a child perspective in a player's mind, reflective nostalgia could indeed help to offer the player a nuanced look at their childhood, i.e., depending on the game's intention, causing nostalgia can be still, or even more so, desirable.

However, regardless of its effects, unless a dark/horror approach is pursued, nostalgia is difficult to evade when designing a game that puts the player back into a relatable childlike position. Music journalist Simon Reynolds links nostalgia to childhood, stating that a "component of nostalgia can actually be a hankering for a time before time: the perpetual present of childhood. [...]" and lists childhood as the first one of the "golden periods" in his life that "all share this quality of total immersion in the now."[41]

As an emotion, nostalgia is not a conscious choice, whereas using a retro artifact is an active, rational decision. While during a creative process, nostalgia can be an incentive to a retro approach and perceiving or experiencing a retro artifact can induce nostalgia, they are different in their nature. Regardless of how one might evaluate the retro trend in audiovisual media,[42] its relation to a relatively recent past can benefit the objective of creating a relatable child perspective for adults.[43] Finding, for instance, a typical 1980s toy within the diegetic game

39 Boym, Svetlana: *The Future of Nostalgia*, New York, NY: Basic Books 2001, p. 19.

40 Ibid., pp. 150-151.

41 Reynolds, Simon: *Retromania: Pop Culture's Addiction to Its Own Past*, London: Faber & Faber 2012, p. xxviii.

42 Simon Reynolds argues, while retro "in its strict sense tends to be the preserve of aesthetes, connoisseurs and collectors [...] the word has come to be used in a much more vague way to describe pretty much anything that relates to the relatively recent past of popular culture." (Ibid., pp. xii–xiii.)

43 Furthermore, Reynolds claims that retro "tends neither to idealise nor sentimentalise the past but seeks to be amused and charmed by it. [And its approach is] ironic and

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environment might both hint at the temporal setting and speak to players familiar with it. Generally, retro as reference to a (pop-) cultural past and nostalgia as an emotion directed at a personal past are independent of each other. They can, however, stand in connection: Retro is a tool linking a contemporary medium to the past. Nostalgia is one potential emotional response to it, linking the (cultural) past perceived in that medium to a personal past, evoking individual experiences and feelings.

While a retro element is a clear reference to probably most players, the nostalgic effect a game might have on a player depends on that player's individual memories. For instance, KNIGHTS AND BIKES, set on a fictional British island in the 1980s, provides an example for evoking nostalgia as the following personal game experience described by Stuart MacKay, host of *Get Indie Gaming*, shows:

"Having spent much of my youth living on Guernsey in the Channel Island I quite honestly can't look at the game's quaintly British Cornish Island setting of Penfurzy without self-referencing the look and feel of my experiences of my childhood. Just like the two girls featured here, me and my sister and our friends spent much of the weekend and our school holidays dreaming up and acting out our own adventures [...]. Over the years all these battles and escapades were also fully aided by the bikes we had and, as children, the relative freedom living on a small and reasonable safe island in the middle of the English Channel affords."[44]

Even though MacKay does not literally mention nostalgia, one can sense it from his talk of childhood "adventures" and "freedom." His statement also reveals triggers of his nostalgic collection, such as the setting of a British island in the 1980s and the bikes—playing a significant role in the game as well as MacKay's childhood. Playful materials like these bikes, as well as the look and feel of KNIGHTS AND BIKES, especially the player characters' free time activities, are certainly powerful devices to create a retro atmosphere. Hereby, an exemplary relation between nostalgia and retro is shown.

eclectic." (Ibid., pp. xxx–xxxi.) Retro could thus serve as a counterbalance to a possibly too idealizing nostalgia or assist the more critical reflective nostalgia suggested by Boym.

44 Get Indie Gaming: "Knights and Bikes PS4 Review—Indie Insights," https://youtu.be/DcYVbvzaIfY?t=40

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## Approaches and Relatability

For games of the Dark Approach, especially for silent survival horror realizations, on the surface, their extreme nightmarish settings seem unrelatable to almost any adult player. However, when understood as a metaphor for primal fears in a child's mind not yet repressed by mature rationalism, they can provide access to these past sensations. As a metaphor for truly or subjectively being alone, feeling helpless, vulnerable, and lost in or overcharged by an adult world—because an adult world, hostile to children, is clearly what their game worlds represent—the games could be either an unpleasant reminder or a cathartic journey. Overall, realizations of the Dark Approach have a tendency to feel a bit heavy-handed. Though confronting one's childhood fears and anxieties can be considered valuable, these often cruel games are trapped in the black-and-white construct they create—of innocence vs. evil, child vs. world—which does not allow them to provide a multifaceted perspective on adults, child-adult-relationships, or childhood but can only cover a one-sided segment of possible child experiences. Conclusively, the biggest drawback of their relatability is the lack of positive aspects and playfulness involved in the childhood they depict.

The relatability of the Playful Approach often sets in through the atmosphere, with its carefree happiness being a common denominator most players find in at least some of their childhood memories. However, while it provides a good approximation of a likely setting of particularly positive childhood memories, one happy summer vacation does not represent an entire childhood. Thus, as the Playful Approach manages to reduce childhood to its playful, carefree aspects and evade possible problem sources, it provides the player with many impulses to remember their individual happy and playful moments as a child while typical childhood sorrows like parental conflicts, demanding expectations, social pressure, or loneliness find no room within the playable child perspective, depriving it of a more-dimensional projection and relatability.

Compared to examples of the Dark and the Playful Approach, titles with a Blended Approach, such as THE AWESOME ADVENTURES OF CAPTAIN SPIRIT and KNIGHTS AND BIKES, put the player into a rather relatable world: the everyday life. The playable characters are neither on vacation nor in a life-threatening nightmare. The settings do not seem too far from the world the player knows (or knew), and the portrayed childhood joys and sorrows are coexisting and co-relevant—the core of the Blended Approach—and moreover, they are somewhat familiar and, therefore, potentially relatable. The child perspective of the Blended Approach will never provide the player with a solely joyful or solely upsetting experience—

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because usually, neither does life. I see both great potential and prospective opportunities for less tragic realizations in this approach.

## BACKSEAT—SITTING SIMULATOR WITH CHILD PERSPECTIVE

Parallel to my dive into various games with playable child characters, I set myself the task of prototyping my own idea of a relatable playable child perspective. Searching for a relatable setting allowing for both positive and negative childhood associations while being both manageable—compared to a more complex situation like a school day or birthday party—and not too restricted temporally and narratively—compared to a family dinner—a car ride soon came to mind, and the idea of BACKSEAT was born. As a reoccurring scenario in many childhoods since the mid-20th century, sitting in the back seat and being both self-determined in small actions within a small radius and restricted—even other-directed—on a grander scale seemed a childhood analogy worth exploring. Furthermore, the resulting game concept, which I like to term *sitting simulator*,[45] relies on the examination of, interaction with, and communication about surrounding virtual playful materials much more than bodily action and space-consuming physical conquest. Selected game objects conveying both a relatable narrative and child perspective to the player and thereby serving as playful materials might contribute an interesting aspect to the overall topic of this book.

BACKSEAT is a small first-person game in which one plays a child sitting in the backseat of a car on a long car ride with their family while talking to family members, interacting with objects, and playing mini-games. On the one hand, the car ride can be spent playfully in a way one might remember from childhood: interacting with toys taken along, making up stories, firing questions at the front seats, munching cookies, waving at vehicles, or just watching the passing landscape. On the other hand, the player as a child will experience the parents' authority and be confronted with conflicts between and with them while being trapped both literally, in the car, and figuratively, as a dependent and vulnerable child in their family. Accordingly, the game idea aims at realizing the Blended Approach to a playable child perspective as previously introduced.

45 The term *sitting simulator* is introduced here to describe a variation of the narrative exploration game (sometimes dismissively referred to as walking simulator) which reduces the usually already relatively basic movement of said genre even further to a mere head movement around a fixed sitting position.

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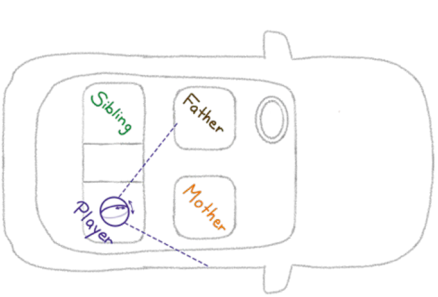
*Figures 2 and 3: Early sketches of BACKSEAT game idea.; View on parents in front seats in BACKSEAT*



Sources: Development phase of BACKSEAT (Cordula Heithausen 2022); Screenshot of BACKSEAT prototype (Cordula Heithausen 2022)

The objective of the narrative sitting simulator BACKSEAT is to offer a virtual environment to its adult player that may throw them back into a familiar childhood situation which might trigger sweet memories of playfulness and a once innocent view of the world as well as unpleasant feelings of being patronized, helpless, confused, or scared. At the least, the player hopefully will find themselves grinning about a memorable moment in their parents' car, excited for the journey ahead. Ideally, an emotional ambivalence can be caused, making the player recall both happy and difficult aspects of their childhood through the child perspective of the playable character.

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## Plot Structure

The entire game takes place during the car ride and is split into two acts, the first happening during daylight and the second after dark, with the player's character's nap functioning as a cesura in-between.[46] Besides the player character, there are four non-player characters present in the car, the player character's father, their mother, their sibling, and their stuffed toy tortoise Tony. The player character can communicate with the other family members, look around the car while remaining in their seat, and pick up and interact with various objects found in the middle seat. When talking to the other characters, the player can choose from a selection of topics dependent on previous conversations and already examined objects. Conversations are either started by the playable character clicking on a family member (or Tony) or—if certain conditions and time-dependent random variables are true—by another family member and are at times joined by other family members present in the car. The narrative of the game is advanced by trigger points both in conversation and object interaction. While the first act mostly comprises playful diversion and regular talking with occasional squabbling, a parental conflict about to boil up is hardly perceptible yet.[47] The second act lets the player character awake from their nap to still soft but assertive front-seat voices. Soon they find themselves exposed to the parents' loud and furious dispute. Attempts to intervene may be ignored or backfire but will not solve the situation. The player character can try various ways to distract themselves from the upsetting situation, however, an oppressive atmosphere remains throughout the second act.[48]

46 Before the first act, there is a short prolog, composed of ambient audio and written dialog, describing the chaotic departure of the family onto the road. An epilog narrates the family's arrival, upon which a consoling atmosphere is suggested (through dialog), and the sleepy playable child character is carried off to bed. Both prolog and epilog are non-interactive and intended to frame the playable part of the game, showing top-down view still images of the middle back seat prior to and after the car journey.

47 However, diverse child perspective facets of the Blended Approach are already present during the first act with negative aspects appearing during sibling arguments and parental authority.

48 A certain combination of interactions—comforting the sibling and finding distraction from the parents argument—will eventually calm the player character down enough to fall asleep again and thereby end the second act.

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## Aiming for Relatability

Several design aspects of BACKSEAT aim at promoting child character relatability; some are outlined in the following. The back seat symbolizes and displays the child's position within the family, sitting comfortably while being 'steered' by their parents. The restricted player agency could be understood as an accentuation of the playable child character's lack of agency on the car ride and beyond. The first-person camera view is intended to help assimilate the playable child character's visual perception.[49] Furthermore, it can likely mirror the spatially—as well as figuratively—narrowing situation better than a third-person camera view.

Both comprehension and imagination are conveyed throughout the game, mostly by dialog, for instance, when a lack of knowledge is revealed in a conversation with other family members or when talking to and being answered by the player character's toy. When the mother eventually reacts to the siblings' loud quarrel by posing an empty thread—"You Two Can Get Off The Car Now If You Don't Stop Yelling."—one can experience childlike comprehension as the playable character takes their mother's warning seriously.

All perceivable design aspects of BACKSEAT are intended to provide a projection surface[50] to the adult player, aiding them in recalling personal childhood memories. By putting the player into the likely familiar childhood situation of sitting in the back of a family car, surrounding them with the corresponding sounds of roaring engines and noisy radio music and leaving some room for mental expansion in the visualization of the non-player characters,[51] said intention is supported.

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49 While a first-person view is typically associated with an avatar rather than a playable character according to the typology by Egenfeldt-Nielsen et al., the child one controls in BACKSEAT is further referred to as player character or playable (child) as their narrative as well as their identification as a child makes them more than "a non-intrusive representation of" the adult player. Cf. Egenfeldt-Nielsen, Simon, Heide Smith, Jonas, and Pajares Tosca, Susana (eds.), *Understanding Video Games: The Essential Introduction*, New York, NY: Routledge 2016, p. 210.

50 Creating a projection surface is limited by and dependent on the individual story being told. In the case of BACKSEAT, the family constellation, the parents' and sibling's personality traits and dialog topics are only some of the specifics the player can put in contrast to their own experiences.

51 The game characters, visualized through assembled two-dimensional images positioned within the three-dimensional car interior, are designed in an anonymous style, not showing more than a back or oblique from behind view of their heads. This

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BACKSEAT is set in the 1990s. This does not only avoid the problem of a child possibly spending a larger time of a car ride on their smartphone but may also strengthen a potential feeling of nostalgia by being closer to the childhood reality of adult players. Retro elements like a Game Boy, animal-shaped cookies, and a cheap plastic slide puzzle can serve to both indicate the 90s setting and help create a familiar atmosphere of the past or even evoke memories within that past.

## Mini-Games and More—Playful Materialities in BACKSEAT

Next, I would like to point out some specific playful features with potential for child perspective relatability gain. While BACKSEAT as a spatially very limited sitting simulator denies the player the urge to navigate through and explore a material diegetic world—substantial to so many games—players are all the more encouraged to interact with the possibilities inherent in any object in reach. The virtual materials fulfill a threefold purpose: (1) contributing to an object-oriented narrative, (2) conveying—and coming alive through—a childlike perspective, and (3) raising personal childhood associations. These three effects vary in proportion. While some virtual objects carry the game-progressing narrative, others embellish it, allude to certain childhood sensations, or serve as an end in itself, compliant with the aspect of a childlike pastime. In all cases, the player's physical and conceptual interaction—and ideally self-reflexive engagement—is required to activate the virtual materials within the condensed game world of BACKSEAT and transform them into playful materials. Hence, my objective for BACKSEAT was to provide a framework that turns the adult player's playful input into a relatable childlike perspective. In total, four mini-games and other additional game design features are employed to meet this objective:

As a variant of the car game *I Packed My Bag* that is about remembering a sequence of words, the *Cookie Zoo* mini-game combines a memory game idea with eating cookies. The player character and their sibling take turns drawing animal-shaped cookies from a cookie box[52] and must name all previously drawn

supports the idea of offering the player a projection surface to remember real persons of their childhood, namely close family members. For the same reason, the sibling character's outer appearance does not distinctly imply a gender, nor does the character's name "Lu," which can likely be an abbreviation or diminutive for both a male or female first name.

52 The cookie box has to be handed out by the mother previously, which requires both compromise (finishing one's sandwich) and persuasiveness.

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cookies each time until one of them makes a mistake.[53] This mini-game cannot only evoke memories of childhood snacks but reveals a childlike playfulness in approaching mundane activities, such as eating, lost on, or even frowned upon by most adults.

A few rounds of the well-known car game *I Spy* ("I spy with my little eye, something beginning with...") in which one must guess what the other person is looking at by asking yes-no-questions can be played with the player character's sibling as well. Besides serving as a representative car ride pastime, this mini-game yields some childlike communication traits, such as kindergarten humor, immature logic, and 'endless' yes-no-sibling-quarrel.

As a solitary mini-game, BACKSEAT includes a classic 8-piece slide puzzle. This simple toy, probably remembered and loathed by many, can be found on the middle seat and tried to be solved. Furthermore, it leads to new parent-child dialog options that can be seen as a brief comment on expectations and self-assessment.

In contrast to the performance-driven puzzle, another mini-game, *Tony's Adventure*, is all about imagination and boundless play. Toy tortoise Tony, the player character's best buddy, can "jump"[54] in the backseat window while the passing landscape, e.g., the roadside pillars re-interpreted as "sharks," serves as a side-scrolling platformer level. But unlike an actual platformer, this experience has no fail state, just free submersion in childlike imagination.[55]

Despite having some crucial object-dependent plot points, the game narrative allows for further creative extensions in the form of either new playful materialities (narrative objects, mini-games, associations) or further exploration of existing ones. Thinking beyond the prototype of BACKSEAT, many additional features, either providing the player with more choices of playful amusement and diversion from car-ride boredom or enriching the narrative with further facets, come to my mind. Some ideas are introduced in the more extensive discussion of my research and prototype found online.[56]

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53 For the sibling's memory to fail eventually a randomized algorithm, which increases the probability to fail logarithmically with the length of the animal sequence, was implemented.

54 Tony is moved up and down in the player character's hand (not visible) which in the child's notion is Tony jumping.

55 While the playable child character could surely play Tony's fail, no outer bounds or rule set control the experience.

56 Heithausen, Cordula: *Being a Child Again Through Gameplay*, M.A. Thesis, TH Köln—University of Applied Sciences 2022, https://www.researchgate.net/publication/361085723_Being_a_Child_Again_Through_Gameplay

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## CONCLUDING THOUGHTS

The objective of my theoretical research was to explore games regarding their realization of a playable child perspective and evaluate their relatability. A supposition on how a relatable child perspective for adult players can be achieved was formed—namely by establishing a childlike position, a childlike comprehension/perception, a projection surface, and optionally the sensations of nostalgia and/or retro—and I proposed a threefold classification of approaches to a playable child perspective: the Dark Approach, the Playable Approach, and the Blended Approach. The Dark Approach paints a threatening scenario in which mostly negative characteristics are appointed to adults and childhood seems deprived of playfulness and lightness, while the Playful Approach appears to be overly wholesome, soothing, and often-times optimistic. The Blended Approach, however, positions itself somewhere between the Dark and the Playful Approach. By merging the negative and positive aspects of childhood into one multifaceted, often melancholic game, it can get closer to a realistic and more universal portrayal of the child perspective than the other two approaches. [57] Games with this approach usually emphasize narrative and include themes like childlike imagination and family issues. Though given examples involve severe strokes of fate,[58] the Blended Approach would likely work with low-key narratives also as its strength is illustrating the diverse experience of a child's everyday life. I believe that versatile relatability is most likely achievable through the Blended Approach.

In conclusion, while interesting and inspiring playable child perspectives exist, the selection and variety are comparably limited and leave room for novel realizations. Depending on the approach, the players' association and memories of childhood can be excited in different ways, all of which are appropriate depending on the game intention and player expectation.

To engage with the topic of playable child perspective through hands-on practice, I developed BACKSEAT, a sitting simulator prototype with a playable child perspective of the Blended Approach. Within a very limited but expressive diegetic environment, I created an interactive narrative putting a strong emphasis on varying playful materials, intra-family dialog, and the connection of both. I integrated several mini-games and other pastime features, while many more formed in my mind.

57 This refers to childhood in western culture.

58 For example, an abusive and addiction-strained parent-child relationship or the tragic loss of a parent (THE AWESOME ADVENTURES OF CAPTAIN SPIRIT, KNIGHTS AND BIKES) ground the gameworld with a sense of realism.

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Retrospectively, developing the BACKSEAT prototype was an enriching experience. It taught me both the limits of a very restricted diegetic setting and all the opportunities arising out of them. Overall—and although BACKSEAT remains at this point just an imperfect prototype waiting to become more—it strengthened my initial hunch that games do not always need vast spaces, extraordinary characters, dramatic stories, or even complex agency to interactively, creatively, and credibly narrate a worthy story and involving ambiance. All it takes is the right means—playful material(ities) that invite the player to interact and convey a narrative perspective in return.

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CAVE (Cordula Heithausen/Olivier Haas 2018)

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DORDOGNE (Un Je Ne Sais Quoi/Umanimation 2022, in developpment)

FRAN BOW (Killmonday Games 2015, O: Killmonday Games)

INSIDE (Playdead 2016, O: Playdead)

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LIMBO (Playdead 2010, O: Playdead)

LITTLE MISFORTUNE (Killmonday Games 2019, O: Killmonday Games)

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THE LAST OF US (Sony Interactive 2013, O: Naughty Dog)

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# Lego Level Up

## Game Literacy and Playful Materialities

HANNS CHRISTIAN SCHMIDT

## INTRODUCTION: HOW TO READ A GAME?

Computer games constantly generate texts for us. A game like TUNIC (2022) draws its appeal from the exploration of the unknown. This exploration also includes the interpretation of a language that should give us clues about the world but ultimately cannot be deciphered. In BABA IS YOU (2019), we play with in-game text as if it were a programming language. Here, the goal is to move blocks of text within 'if-then' chains of commands in order to solve logic puzzles. In UNPACKING (2021), we interact with objects we clear out of moving boxes. Many of these objects have a narrative meaning attached—when placing these fragments in chronological order, a story unfolds in our minds.

When we speak of texts in computer games, we are not only referring to the numerous literal text passages—dialogs and descriptions— that can be found in many contemporary computer games (and sometimes fill entire in-game-libraries in the form of diegetic artifacts). We are also not necessarily talking about the hundreds to millions of lines of code hidden at the 'bottom' of the digital image[1] of contemporary games, concealed from us by a graphical interface.

On a more fundamental level, the concept of text in computer games is both much more general and, at the same time, much more complex: just like literary works and the paintings of fine art, the audiovisual moving images of film and computer games produce a semiotic fabric that must be sensually perceived and cognitively 'understood.'

1 Nake, Frieder: "Das doppelte Bild," in: *Digitale Form: Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritik* 3, no. 2 (2005), pp. 40-50, here p. 46.

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*Figures 1-3: TUNIC (Finji 2022, O: Finji); BABA IS YOU (Hempuli 2019, O: Hempuli); UNPACKING (Witch Beam 2021, O: Witch Beam)*

Sources: Screenshots by Ethan Webb, https://screenrant.com/tunic-unlock-magic-dagger-location-guide/Screenshot; James Sheppard, https://www.indiegamewebsite.com/2019/03/20/baba-is-you-review/; HC Schmidt

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Only when we have learned to 'read' the text of the computer game—as a sequence of images, sounds, and language signs—and have internalized the conventions of its rules and input devices, we can interact with the medium in an effective way, thus becoming able to actually *play* the game. These interactions, in turn, enable us to perceive games as artifacts that 'have something to say'—and therefore not only to read them but to interpret them in a way that, just a few decades ago, was largely reserved for the nobilitized genres of our cultural canon.

According to such an understanding, the computer game is a medium of textuality and carries cultural meanings. Games are mediators through which statements are made, messages are expressed, and content is communicated in aesthetic, narrative, or procedural ways. As such, they demand a certain literacy from us. Such an ability to read digital games—a game literacy—is, therefore, a crucial condition for a productive, meaningful, and competent engagement with computer games. The media scholar and game designer Ian Bogost sums up the importance of such reading competence in the following way:

"The kind of technology literacy that procedural rhetoric offers is becoming increasingly necessary for kids and adults alike. As more of our cultural attention moves from linear media like books and film to procedural, random-access media like software and video games, we need to become better critics of the latter kind."[2]

Although Bogost's appeal to a technology literacy was made almost exactly 15 years ago, it is no less suitable today. On the contrary: The need for a literacy in procedural software and games clearly deserves our attention at a time when morally questionable design decisions, so-called dark (design) patterns,[3] of browser, social, and mobile games encourage countless players to engage in problematic consumption behaviors that are difficult to manage; when blockchain technologies and NFTs break open the distinction between voluntary play and rigorous exploitative employment;[4] and radicalized online communities of

2 Bogost, Ian: "The Rhetoric of Video Games," in: Salen, Katie (ed.): *The Ecology of Games: Connecting Youth, Games, and Learning*, Cambridge, MA: The MIT Press 2008, pp.117-140, here p. 136.

3 Zagal, José P./Björk, Staffan/Lewis, Chris: "Dark Patterns in the Design of Games," paper presented at the *Proceedings of the 8th International Conference on the Foundations of Digital Games* (FDG 2013), Chania, Greece, 2013.

4 Winkie, Luke: "Play-to-Earn Gaming Sounds too Good to be True. It probably is," *Vox* (2022), https://www.vox.com/the-goods/23074931/play-to-earn-video-games-blockchain-web-3 w

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gaming servers impact the everyday life of the social space.[5] Thus, the unfolding of the meaning of the text 'in itself' also expands to the meaning of the cultural context in which it is read.

If we follow this four-step approach to a developing game literacy—from (1) the sensual perception of the game's audiovisual repertoire of signs, to a (2) functional readability in order to be able to interact with the game, to a (3) textual interpretation that exposes the explicit and implicit levels of meaning and can (4) unfold its significance within a cultural context and have a social impact—finally, one important question arises: How can such a literacy be mediated or taught successfully? This contribution tries to collect some approaches to a possible answer. After a brief theoretical underpinning that will lead us from a model to learn how to read computer game images to a short digression of two practical school projects, our own approach will show how children can become 'brickcoleurs' of their own computer game worlds by incorporating a playful materiality—literally brick by brick. After that, the prototype we developed in our research project—the editor game software A MAZE IN TILES and our augmented reality game literacy arcade cabinet DARIO'S BOX will be discussed. At the end of this contribution, I will outline some perspectives which seem to be important for the further development of the game literacy approach.

## PANOFSKY IN THE POST-APOCALYPSE: GAME LITERACY MODELS IN FORMAL LEARNING ENVIRONMENTS

If we ask how games unfold their effects, which reading competencies they require, and how the teaching of such literacies can take place, we can draw on several models that have been developed for didactic and pedagogical use in formal and informal educational settings. Not surprisingly, nearly all publications dealing with the topic of game literacy begin by attempting a kind of ontological definition: If games are readable artifacts, then what are the properties that define the text? Which elements make a game readable in what regard? Again, it comes as no surprise that different scholars from different fields suggest different approaches. Let us have a look at three examples from German academia:

5 Romano, Aja: "What e Still Haven't Learned from Gamergate," *Vox* (2021), https://www.vox.com/culture/2020/1/20/20808875/gamergate-lessons-cultural-impact-changes-harassment-laws

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The educational scholars Johannes Fromme and Christopher Könitz transfer the classical image analysis model of the art historian Erwin Panofsky[6] to computer games.[7] According to Panofsky's well-known three-step model, images can be effectively interpreted by first making a pre-iconographic description: What can we recognize in the depiction on a phenomenological level? Do we see a bearded man with a hammer, for example? Afterward, in an iconographic analysis, we will assign the contents of the picture according to the conventions of the depicted subject and the identifications of the persons: Can the bearded man read as Thor, the Norse god of thunder, identified by his attribute, the hammer Mjölnir? Finally, Panofsky proposes to engage in an act of iconological interpretation and uncover the so-called "document sense of a representation, the actual meaning or content" of the work, which finally lets the viewers become the educated exegetes of the "'unknowable[s]'—today we would say unconscious[s] attitudes," which "have entered the picture, which are hidden behind the superficial level of interpretation of the represented, which the iconologist can make visible again."[8] This would raise the question, for example, of whether the iconographic representation of a character like Thor in the computer game GOD OF WAR: RAGNARÖK (2022) was deliberately designed to create a counter-image to the contemporary representation of the character in the immensely popular motion pictures of the Marvel Cinematic Universe. In terms of the required literacy gained from these steps, Kopp-Schmidt summarizes as follows:

"the iconologist generally assumes that an image is 'readable' like a text. If it cannot be understood spontaneously, then it must be interpreted with the help of [other] texts. What Warburg, Panofsky, and other art historians of the iconological school do, then, is to try to interpret images that prove resistant to conventional iconography-tested sources and remain unintelligible, with the help of new, previously unconsidered material."[9]

6 Panofsky, Erwin: "Ikonographie und Ikonologie," in: Kaemmerling, Ekkehard (ed.), *Bildende Kunst als Zeichensystem. Ikonographie und Ikonologie. Band 1: Theorien—Entwicklung—Probleme*, Cologne: DuMont 1994, p. 207-225.

7 Fromme, Johannes/Könitz, Christopher: "Bildungspotenziale von Computerspielen—Überlegungen zur Analyse und bildungstheoretischen Einschätzung eines hybriden Medienphänomens," in: Marotzki, Winfried/Meder, Norbert (eds.), *Perspektiven der Medienbildung*, Wiesbaden: Springer 2014, p. 235-286.

8 Kopp-Schmidt, Gabriele: *Ikonographie und Ikonologie: eine Einführung*, Cologne: Deubner 2004, p. 57, my translation.

9 Ibid, p. 58, my translation.

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Fromme and Könitz apply this model to games in a very similar way. However, they make the attempt to include not only the depiction of the pictural qualities of digital games but almost *all* conceivable game characteristics for the question of its educational potential. In addition to naming the game's characters, classifying the "typical or basic objects," and the "tasks and objectives,"[10] the two authors show how games can draw on an "extensive repertoire of culturally shaped signs and conventions that points beyond pre-iconographic understanding"[11]—from image content as well as gameplay mechanics, to sound design, to interface design, and so-called "interaction indicators,"[12] which direct us to possible points of action in the game world. Although Fromme and Könitz, in this extraordinarily broad taxonomy, are quite explicitly "not concerned with embedding [game images] in art-historical contexts [through which] Panofsky elaborates the actual content of a picture,"[13] Panofksy's model is already quite suitable for representing certain levels of meaning in relation to a game's readability and interpretability.

An example: With the help of the context of American art history, the epilogue from the enormously popular (and by many critics scolded)[14] THE LAST OF US PART II (2020) could no longer be read as an additional depressing moment in an almost endless sequence of depressing events, but (also) as an artistic reference that holds a key to the interpretation of the game. By comparing the depiction of the game to the one of a popular painting—a female back figure within a strikingly similar farm landscape—we are prompted to read the game scene as a reference to artist Andrew Wyeth's painting CHRISTINA'S WORLD (1948).

10 J. Fromme/C. Könitz: "Bildungspotenziale von Computerspielen," p. 255, my translation.

11 Ibid, p. 257, my translation.

12 Ibid, p. 268, my translation.

13 Ibid, p. 273, my translation.

14 "THE LAST OF US PART 2 depicts individual people who are instead ruthless, capable, yet self-absorbed, and whose perception of violence is limited to how it affects them and their chosen family members. They are almost unbelievably unable to see the bigger picture. PART 2 ends up feeling needlessly bleak, at a time when a nihilistic worldview has perhaps never been less attractive. Its characters are surviving, but they're not learning, and they're certainly not making anything better. Maybe the most surprising thing that THE LAST OF US PART 2 offered me was the certainty that, while the game was made with great skill and craft, we are actually much, much better than Naughty Dog thinks we are." Myers, Maddy: "The Last of Us Part 2 Review," *Polygon* (2020), https://www.polygon.com/reviews/2020/6/12/21288535/the-last-of-us-part-2-review-ps4-naughty-dog-ellie-joel-violence

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*Figures 4 and 5: CHRISTINA'S WORLD (Andrew Wyeth, 1948) and THE LAST OF US PART II (Naughty Dog 2020, O: Sony Computer Entertainment)*

Sources: Museum of Modern Art, https://www.moma.org/collection/works/78455; Screenshot by HC Schmidt

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According to the Museum of Modern Art, Wyeth was concerned with depicting the autonomy of the painting's polio-stricken protagonist—Christina, "do[ing] justice to her extraordinary conquest of a life which most people would consider hopeless."[15]

The composition of the image and the choice of subject matter suggest a pictorial line of tradition that supports an intertextual reading of the game in terms of self-determination, the attainment of autonomy under one's own, self-chosen conditions in the face of the sheer overwhelming forces of illness, trauma, and death. Panofsky's model thus unfolds a relevance for understanding digital games not only as media with playable action (both narrative and interactive) but also for analyzing them as visual media and interpreting them for their expressive power.

Such a readability, which sharpens the eye for intertextual and intermedial levels of meaning, could unquestionably be taught within formal educational settings. This has been shown by several publications: Instead of borrowing a model from art history, Danny Kringiel, for example, suggests in this context applying a kind of 'toolbox' of different perspectival lenses that would enable close readings of computer games in the school classroom.[16] In addition to a ludological perspective, which decidedly examines questions about the effects of game mechanics, Kringiel considers (1) a perspective of film analysis, (2) a 'cyberdramatic' perspective of theatrical character representation, (3) a narrative perspective as well as (4) an architectural perspective of the game world and level design as useful to analyze games—in his case the third-person shooter MAX PAYNE 2: THE FALL OF MAX PAYNE (2003)—as highly stylized and intermedially strongly overformed artifacts in the classroom and to examine them for their own means of expression. It must be noted that a case study such as MAX PAYNE 2, in particular, demonstrates the extent to which games are not closed individual works but rather 'living' works that are often updated on the software side and prepared for new playful contexts and technologies. For example, the first MAX PAYNE (2001) has been playable as a mobile game adaptation on smartphones and tablets for several years now, which required a fundamental rethinking of the access requirements (for example, with regard to control via touchscreen).

In addition to such a breakdown of the readable features of games that make them analyzable, linguistically accessible, and interpretable as texts, another promising approach lies in designing games themselves and thus providing

15 "Andrew Wyeth: Christina's World," https://www.moma.org/collection/works/78455

16 Kringiel, Danny: "Learning to Play: Video Game Literacy in the Classroom," in: Fromme, Johannes/Unger, Alexander (eds.), *Computer Games and New Media Cultures*, Dordrecht: Springer 2012, p. 633-646.

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learners with a deeper understanding of the language of games—their formal design and the resulting aesthetic effects. The ability to read games would thus be complemented by the ability to express oneself with and through the media-specific means of games. This corresponds with James Paul Gee's definition of an active learning process: "The learner needs to learn [...] how to think about the domain at a 'meta' level as a complex system of interrelated parts [...]—how to produce meanings that, while recognizable, are seen as somehow novel or unpredictable."[17] Being able to use game design to express meanings might be considered a more advanced form of game literacy. Teaching such an ability might, at first glance, seem way too ambitious for regular classroom use; however, Kristina Jonas and Marten Fütterer did exactly that with their 2012 research project *My Video Game. Constructionist Experiential Learning in School*.[18] In their studies, they describe how a constructionist approach to education based on Seymour Papert's learning philosophy[19] and Herbert Gudjon's project method[20] can be used fruitfully in several subjects. Using comparatively simple editing and authoring tools such as GAME MAKER or the adventure editor software VISIONAIRE, schoolchildren become game designers themselves, with individual building blocks of the game being developed in subjects such as German (narration and character development), art (asset design), or music (sound design).

Of particular interest for this approach is a footnote in Jonas and Fütterer's text, in which the authors elaborate on Papert's philosophical approach to education. They quote Papert as follows:

"Here I use the concept of bricolage to serve as a source of ideas and models for improving the skill of making and fixing and improving mental constructions. I maintain that it is possible to work systematically toward becoming a better bricoleur. [...] The basic tenets of bricolage as a methodology for intellectual activity are: Use what you've got, improvise, make do."[21]

17 Gee, James Paul: *What Video Games Have to Teach Us About Learning and Literacy*, New York: Palgrave Macmillan 2007, p. 23.

18 My translation.

19 Papert, Seymour: *The Children's Machine: Rethinking School in the Age ot the Computer*, New York: Basic Books 1993.

20 Gudjons, Herbert: *Handlungsorientiert lehren und lernen*, Bad Heilbrunn: Klinkhardt 2008.

21 S. Papert: *The Children's Machine*, p. 144, quoted in: Jonas, Kristina/Jonas, Marten: "My Video Game—Erstellung Digitaler Spiele in der Schule unter Berücksichtigung partizipativer Produktionsströmungen," in: Biermann, Ralf/ Fromme,

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Transferred to their project *My Video Game,* this means for the two authors:

"to fall back on precisely that knowledge one has so far, and to deal with it so freely that new insights and/or horizons of meaning can be opened up from it. These then count in turn to the stock of knowledge [Verfügungswissen], so that this constantly grows (but is also corrected, revised, and transformed) and thus always enables new views of the world and self [Orientierungswissen], as well as a fundamental ability to act in the world."[22]

However, Seymour Papert is not 'only' considered the authoritative founder of the constructionist approach to education but was also responsible at the time for the conception of a popular Lego model series that was intended to teach children robotics and programming skills through the use of a playful materiality: Lego MINDSTORMS. Thus, there are various intersections between the concept of bricolage and Lego bricks, not only in the sense of a play on words but also in a conceptual way in the context of newer media literacy models. In this sense, the interlocking plastic bricks represent a material analog of mental construction processes—a kind of constructionist building substance. The metaphor of mental models, which can be built up, modularized, expanded, recombined, and iteratively repaired again and again through constructionist processes, transforms into a playful, tangible equivalent, a physical manifestation. Mental models and actual models come together here—and enable children to acquire knowledge about processes through their own experiential learning, which is normally shielded from the outside world as black boxes and takes place in secret.

This was also an initial starting idea for the *Game Literacy* project of the Cologne Game Lab (TH Köln) and the Institute for Media Culture and Theater (University of Cologne), funded by the RheinEnergie Foundation in 2018-2021. The goal of the project was to develop a workshop that complements the approaches described above by incorporating an even lower-threshold tool away from the operation of software, coding, and authoring tools, thus taking advantage of the playful materiality of the interlocking brick system. At the same time, we experimented with new technologies that opened up a transition between analog and digital processes—resulting in a hybrid, post-digital approach. In the following,

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Johannes/Verständig, Dan (eds.): *Partizipative Medienkulturen*, Wiesbaden: Springer 2014, pp. 233-259, here p. 239.

22 Jonas, Kristina/Fütterer, Marten: *My Video Game: konstruktionistisches Erfahrungslernen in der Schule; die Entwicklung von Computerspielen als Projektpraxis*, Magdeburger Schriftenreihe zur Medienbildung, Stuttgart: Ibidem 2012, p. 239; my translation.

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we will introduce both the workshop concept and our tool, the editor game software A MAZE IN TILES, as well as the accompanying AR hardware that later became DARIO'S BOX.

## THE LEGO LEVEL UP WORKSHOPS

The workshop *Lego Level Up!* is the practical part of the research project *Literacy of Games/Literacy of Play: Playful Mediation of Media Literacy in the Field of Analog, Digital, and Hybrid Games* (*Literalität des Spiel(en)s*). As outlined above, the project aimed to identify central theoretical foundations of a literacy of digital as well as analog and hybrid game(s) and to design a workshop series that could be carried out with a different number of participants and different age groups. Also, this was intended to take into account the frequently articulated public desire for media competence in the sense of games competence.

The core of the workshop concept was a material two-step process that led from analog to digital game design and was framed by several rounds of reflection and feedback with our participants. The workshops, which were designed for a period of one or two days of four hours each, began with a moderated "get-to-know-you" phase in which the participants exchanged their own gaming experiences and shared their knowledge about games with others. This initial phase led to a first practical part, in which the participants were asked to record their expectations of a 'typical' game with pen and paper. This step served, on the one hand, as a warm-up exercise and to map the current status quo of interests and preferences within the group. On the other hand, it established a connection to the children's imaginative worlds—by which we hoped to gain insight into the children's cognitive concepts and the 'dispositional knowledge' mentioned above via a means of expression that was not purely linguistic. In response to the open-ended request "Draw what you like to play!" we got very different results—besides the expected answers about current games like FORNITE (2017) and MINECRAFT (2009), we also got pictures of sports activities (from soccer to judo), musical instruments like piano, and games that actually belong exclusively to the adult world—like poker. This grounded, open-ended approach showed that studies investigating game and play literacy needs to be much broader than we had originally assumed.

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## Focus 1: Storytelling, Games, Game Mechanics

The first focus within our workshop was on the relationship between storytelling and rule-based play. In keeping with our low-threshold approach, however, our workshops were not about academic or design theory arguments about the infamous "debate that never took place"[23] or the alleged "blood feud" between narratologists and ludologists, respectively.[24] Nor was it about conveying certain preconceived answers to predefined questions. Instead, the children were to be sensitized to the different effects of narration and gameplay. The anchor point was the mythical figure of the Minotaur: The question of whether and from where the children knew the famous hybrid creature from Greek mythology was aimed at finding out how mental models and processes of understanding manifest themselves in our minds across generations via transmedially mediated figures that have been an integral part of Western culture for several thousand years—whether as a literary figure or ornament on an ancient artifact, as a book illustration, feature film or cartoon character, or as a character in a computer game.

The question of transmedial (game) figures like the Minotaur finally led to questions about how to adapt the narrative text into a game text and, thus, into spatial concepts of playing—a topic that we treated with the motif of the labyrinth. As "media of decision making,"[25] labyrinths are particularly well suited for investigating the effects of designing readable game spaces—which in turn provided the link to the construction toy Lego. In this way, the children were able to experience how brick constructions can be transformed into spatial options for action and play architectures. The extent to which a narrative leitmotif and plot element—escape from a labyrinth against the backdrop of the threat of a mythical

23 Frasca, Gonzalo: "Ludologists Love Stories, too: Notes from a Debate That Never Took Place," in: *DiGRA 03—Proceedings of the 2003 DiGRA International Conference: Level Up*, http://www.digra.org/digital-library/publications/ludologists-love-stories-too-notes-from-a-debate-that-never-took-place/

24 Jenkins, Henry: "Game Design as Narrative Architecture," in: Wardrip-Fruin, Noah/Harrigan Pat/Crumpton, Michael (eds.), *First person: New media as story, performance, and game,* Cambridge: Mass, The MIT Press, 2004, pp.118-130, here p. 118.

25 Nohr, Rolf F.: "The Labyrinth. Digital Games as Media of Decision-Making," in: Bonner, Marc (ed.), Game | World | Architectonics: Transdisciplinary Approaches on Structures and Mechanics, Levels and Spaces, Aesthetics and Perception, Heidelberg: Heidelberg University Publishing 2021, pp. 133-149.

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monster—can be translated into a game mechanic is demonstrated by the board game LEGO MINOTAUR.

Officially licensed by the Danish toy company, LEGO MINOTAUR is reminiscent of the classic German board game MENSCH, ÄRGERE DICH NICHT. Here, players must try to reach the exit of the labyrinth without getting caught by the creature. The special feature of the board game: the labyrinth, the figures, and the dice can be easily modified to suit the children's own wishes, as the entire game is made of interlocking bricks. Hence, the children were given a separate work assignment: They were to come up with a new rule for the board if they got a certain result on the dice. Such modifications could represent, for example, doubling the number value per dice roll, which sped up the game enormously, or collecting power-ups to gain the ability to jump over certain structures. By applying these changes and inventing new rules, the children themselves became (analog) game designers, which fostered their understanding of the effects and meanings of their creations and helped them acquire a sensitivity for 'producing meaning in the semiotic domain of games.' Such prototyping is a popular exercise among professional game designers (mostly done with paper and cardboard) because it trains to balance the mechanics with varying degrees of influence on the game experience; here, in addition to the interplay of board architecture and the game rules. This exercise also focuses attention on components of social interaction (articulation skills to explain abstract rules, agreement on a 'good' rule change, renegotiation when game rules are not clearly defined, and so on).

## Focus 2: From the Analog to the Digital Labyrinth

With this knowledge of the textual, game-mechanical translation of a narrative leitmotif through a free construction toy, we moved from the analog board game labyrinth to the digital labyrinth in the third workshop unit. Here we used our own software and hardware prototype.

The prototype initially developed by Dario D'Ambra (and later improved by Cordula Heithausen) was intended to enable players to build their own level architecture and to define their own game objectives by choosing the corresponding brick color. When a brick of a certain color is placed on a tile of the base plate and recognized by the webcam, certain objects with specific functions are created in the game world: Black bricks build walls, blue bricks create water, red bricks create lava, and the gray tiles represent the walkable base area. In addition, start and finish portals can be applied. The constructions were scanned with a simple, self-made device for image recognition via webcam and the Unity plug-in Open CV and then transferred in real-time to the game world based on the Unity game engine.

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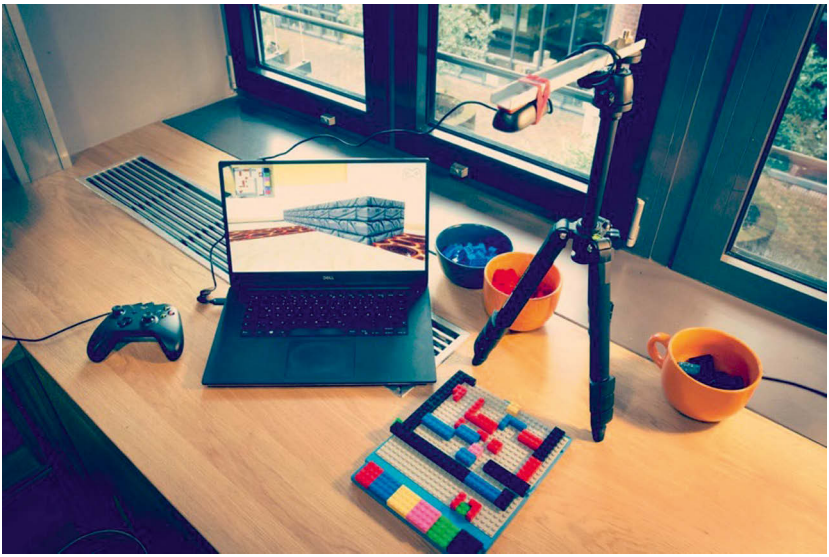
*Figure 6: the augmented reality prototype A MAZE IN TILES (Dario D'Ambra)*



Source: Photo by H. Fischer/TH Köln

Here, the children were put in teams to play the roles of the Greek master architect Daidalos and his son, Ikaros, to build a new labyrinth using the AR Editor Game and try out how fast to find the exit. This was preceded by a brief explanation: What exactly does Augmented Reality mean? What's the deal with the Lego plate made by the 3D printer? How does the image recognition via webcam and the color-coded bricks work? Can the bricks be understood as a visualized 'code'?

At this point, we talked about the similarities and differences between the board game and the digital game. The digital game space generated by our prototype is no longer explored from the allocentric map view from above—as in the MINOTAUR board game—but from the egocentric view, the first-person perspective, which requires a much more complex need for orientation and a cognitive readaptation to the controls. The level could also be changed dynamically during the course of the game: New elements could be added spontaneously, and children were able to repeatedly twist the nine tiles to be built. This not only created a strong physical involvement through the haptic experience of the Lego bricks but also an additional dynamic in the gameplay as well as the need for social agreements beyond the code of the digital game.

After completing the construction, the teams rotated to the other stations set up in the workshop to face the challenges of the other participants. Afterward, they

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reflected on the characteristics of each level in a short feedback session: What worked particularly well? What didn't work well? Where was potential for frustration?

Although the prototype worked relatively well 'under laboratory conditions,' it proved to be highly susceptible to interference and errors 'in the field.' Since image processing takes place in real-time and relies on good, uniform lighting conditions as well as precise alignment with the Lego base plate/tripod-webcam-construction, it was very sensitive to vibrations and disturbances. This was especially notable during our 'rehearsal' before the first workshop with children, at the visit to the A MAZE festival in Berlin 2019: At the game festival, we were given the opportunity to present the prototype to the walk-in audience in a casual atmosphere—unaware that we would be dealing with light from pink fluorescent tubes as the only light source. Since our webcam could not use manual white balancing for color correction, we had to make do with additional light sources at short notice. The fact that the presentation took place next to a DJ booth with stroboscopic lighting (as well as various dancing feet that shook the tripod) also made a flawless presentation visibly more difficult.

In order to solve the problem of vibration and light sensitivity, we had to include software-side improvements in addition to more stable hardware; for example, an auto-warping feature developed by Cordula Heithausen that automatically brings an image of the Lego board back into the correct position. But even after some short-term improvements to the prototype were added, it became clear in the first workshops shortly after the A MAZE festival that the children were much more exploratory than we had originally anticipated. Instead of relying on our instructions and designing game worlds within the given framework, they were much more likely to play with the technology itself—which in places led to involuntary mistakes. For example, the vibration-sensitive tripod and the webcam, which was responsible for the image recognition of the Lego board, were repeatedly moved during the construction process. Also, in response to our efforts to calibrate and readjust the image recognition software, the children quickly got into the backend of the software application on their own. Here, they tried out changing certain input values (such as color and light sensitivity) and 'hacking' them, so to speak. Playing with the technology was enormously appealing to the children but did not lead to a smoother process—neither within the application nor during the workshop phases. In this way, it became clear to us that, despite the improvements made, there was still much to be done.

After the third workshop phase, in which all teams were able to try out the respective levels and compare and improve them in free collaboration with each other, the supervisors and the participants met for a final feedback discussion to

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exchange ideas about the workshop process. The material differences between physical and virtual construction were pointed out again, and the quality of the experience with the different tools was evaluated. Finally, the participants received a certificate and, as a small gift, some Lego tape that converts any surface to a Lego board. The certificate emphasized that they had done a great service to science with their participation in the workshop.

## Findings from the Workshop I: Gender

The workshops that took place before the outbreak of the Covid-19 pandemic revealed several interesting findings. However, a first observation can be described even before the workshops took place. This concerns a gender aspect: Media psychological research already suggests that a larger proportion of gamers are male (as it is described as the so-called "gender gap" in media psychological game research)[26] , and media-critical studies show that Lego as a construction toy was marketed primarily to boys in recent past.[27] However, we were surprised to find that there was not a single girl among the registered participants of the first workshop. This aspect can possibly be attributed to gender stereotyping in education. However, we were also able to determine that this circumstance could be counteracted by opening up the program and waiving prior registration. Not only did we discover a passionate A MAZE IN TILES player in a six-year-old girl who was accompanied to the event by her father, who motivated her in a supportive way. The effect of building something physically and seeing it turned digital via augmented reality also exerts a considerable appeal beyond stereotypical, possibly uninviting gaming situations for the 'un-initiated,' arguably breaking down barriers and arousing curiosity to engage with new technologies in a playful, more welcoming way.

## Findings from the Workshop II: Game Diversity and Media Literacy

Secondly, a closer look at the answers collected in the preliminary interviews and the pictures taken suggests that a culturally critical assumption about the supposed

26 Reineke, Leonard/Klein, Sina A.: "Game Studies und Medienpsychologie," in: Thon, Jan-Noël/Sachs-Hombach; Klaus (eds.): *Game Studies: Aktuelle Ansätze der Computerspielforschung*, Cologne: Herbert von Halem Verlag 2015, pp. 210-251.

27 Sarkeesian, Anita: "LEGO & Gender Part 1: Lego Friends/Lego & Gender Part 2: The Boys Club, " 2012, https://feministfrequency.com/tag/lego-friends/

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dominance of digital games in children's rooms cannot be confirmed. On the contrary: Although computer games were mentioned, again and again, not only numerous board and card games were found alongside them, but also various types of sports. Furthermore, some children displayed a differentiated pattern of argumentation, which already suggests a very distinctive game literacy: When one participant was asked about the violent content of the game FORTNITE, he spoke placatingly about the fact that there was no killing at all in the game, but that the virtual avatar was "only shot back into the lobby" to wait for a new game round. This observation shows the extent to which ludic framing and diegetic in-game narration colors one's own gaming experience (as a competitive play between avatarial substitutes), and also demonstrates that a form of media criticism can already be pronounced at the age of 12—legitimizing one's own media use in front of supposed authority figures.

## Findings from the Workshop III: The Role of the Game Material

In our feedback round, the children often reflected on the fact that building with your "hands, not with mouse and keyboard" presents direct haptic feedback, as opposed to "something digital that always works." Thus, a form of tacit knowledge about construction processes inscribes itself into the material experience, an implicit literacy for the possibility of the materials. In addition, we repeatedly observed the children experimenting with the hardware setup itself, trying to readjust the webcam as well as pushing the limits of image recognition. Interlocking bricks, as a constructionist building substance, provide a promising material foundation on which to build further, both literally and theoretically: Not only are the bricks intuitively graspable and immediately invite constructive play, but their geometric form and simple colorfulness make them quite suitable for prototyping game spaces as well as digital image recognition procedures. The interplay of material affordances, the intuitive invitation to play (something that, with Fromme and Könitz above, can also be understood as 'interaction-indicating potential' that only needs to be activated), as well as their possibility to merge with digital play worlds—all this points in many different promising directions that can be further explored both theoretically and empirically.

### DARIO'S BOX

Since the Covid-19 virus outbreak prevented workshops from taking place during the project's 2020 run, we focused on implementing the idea of a protective casing

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for our prototype during the initial stages of the pandemic, which always guaranteed consistent lighting conditions. It was designed by Kjell Wistoff and named DARIO'S BOX—in memory of our project collaborator, game designer, and programmer Dario D'Ambra, who passed away in 2020. Kjell Wistoff designed two boxes for us that echo the iconic design of classic arcade game cabinets—a reference to the formative early period of computer game culture.

Besides the design, two special features of the box are worth highlighting. Whereas conventional arcade cabinets only consist of a computing unit, a screen, a control unit, and a housing, DARIO'S BOX uses two screens. This makes it possible to bring two players into the game at the same time in two different roles: As a level architect and as a challenged player who has to find the exit of the maze (and, if agreed upon, achieve the highest possible high score by collecting collectibles). A child stands behind the box, constructs the maze on a Lego board, and then slides it into the box on a kind of 'disk' that resembles the module of an old game console.

Through the webcam inside the box, the software recognizes the building blocks and the arUco markers added by our programmer Cordula Heithausen. These markers made it possible to generate further power-ups in the game world. Again, this resembles the semiotic 'code' of the game, making the game space a readable artifact, a physical space manifesting itself in digital space on a materially assignable disk in the hands of the playing child. The textuality of the game is thus both on the level of architecture and the level of game mechanics, prompting the participants to learn to articulate themselves with the means of the game. Pressing the red button on the front of the box switches from building to playing mode, and the exploration of the labyrinth can begin.

It must be added, however, that at this point, the approach of using DARIO'S BOX, on the one hand, represents a considerable gain for the success of the workshops, but on the other hand, also entails a curtailment of another potential of the prototype. DARIO'S BOX is also a black box in the literal sense—and as such, it also prevents access to the configuration menu that the children had found by themselves in the previous version of the setup. While we can aim at a playful mediation of certain aspects of game literacy and are now able to ensure a more seamless course of the program, the application of the box, however, eliminates a dimension of meaning that can be brought to the notion of "gaming literacy" by Eric Zimmerman.

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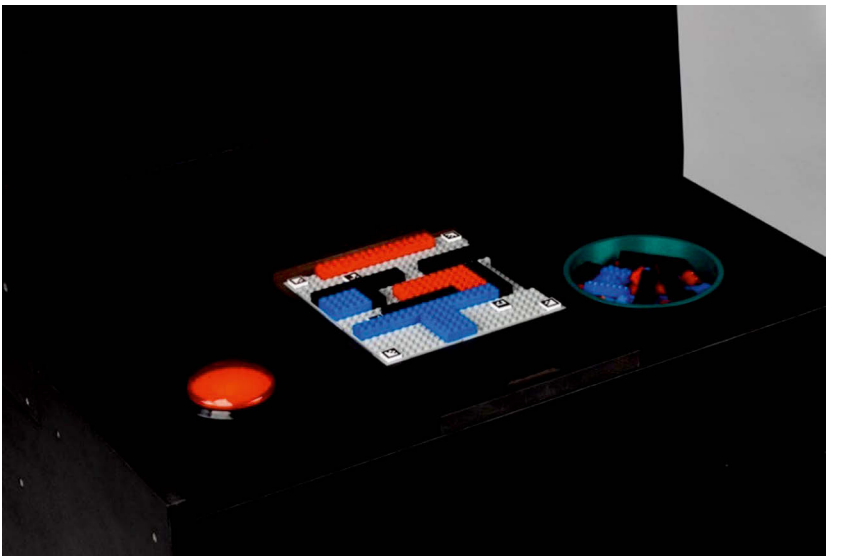
*Figures 7 and 8: Front and back of DARIO'S BOX. Design: Kjell Wistoff; DARIO'S BOX (detail)*



Source: Photos by H. Freres

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Here, Zimmerman is already playing a game on the level of the terminology itself: He uses the two notions to denote a view behind systemic processes and their appropriation through play. By focusing not on game literacy but on gaming the particular systemic literacies that shape our modern lives, he describes gaming literacy as the act of

"exploiting or taking clever advantage of something. Gaming a system, means finding hidden shortcuts and cheats, and bending and modifying rules in order to move through the system more efficiently—perhaps to misbehave, perhaps to change that system for the better."[28]

In order to maintain this experimental, open dimension of playing with systemic processes in the game itself, it would be conceivable to use two hardware setups in future workshops—the tripod design described above as well as the closed solution with DARIO'S BOX.

## OUTLOOK: POSTDIGITAL BUILDING BLOCKS OF GAME LITERACIES—IN THE DISTORTION MIRROR OF PARTICIPATORY CULTURE

Felix Cramer describes the term "postdigital" ("a term that sucks but is useful")[29] as:

"either a contemporary disenchantment with digital information systems and media gadgets, or [as] a period in which our fascination with these systems and gadgets has become historical—just like the dot-com age ultimately became historical in the 2013 novels of Thomas Pynchon and Dave Eggers."[30]

Cramer's diagnosis that a post-digital mindset fundamentally rejects the idea of digital technologies as an "all-purpose form of information processing"[31] finds

28 Zimmerman, Eric: "Gaming Literacy. Game Design as a Model for Literacy in the Twenty-First Century," in: Bernard; Wolf Perron, Mark J. P. (eds.): *The Video Game Theory Reader 2*, New York: Routledge 2008, pp. 23-31; here p. 25.

29 Cramer, Florian: "What Is 'Post-Digital'?" *APRJA* 3, no. 1 (2014), pp. 10-24, here p. 12.

30 Ibid.

31 Ibid, p. 16.

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articulation in our workshop concept and our AR prototype: It is not exclusively about digital game design but also about how analog building blocks of a playful, haptic construction activity merge with digital building blocks to reveal tangible insights.

However, with the results brought to light here, we are admittedly only scratching the surface of a project that needs to be much broader and more broadly defined to bring together the dense interlockings of materiality, literacy, text, and context in a transdisciplinary investigation. For example, contexts mentioned in the introduction, which have a particular impact on the readability of (Dark) Design Patterns, could not (yet) be considered within the duration of our project. Further follow-up questions also refer to aspects of performativity—after all, computer games are not static artifacts that, like literary works on bookshelves, patiently wait for the knowledgeable exegete to reveal their meaning in an eloquent hermeneutic act but are rather 'living' texts—not only on the level of interpretation and interpretative context but also on the level of playful access and constantly updated software, which is often continued and monetized by DLCs or within serial seasons as a prolonged service.[32]

Last but not least, the aspect of game literacy as the key competence described by Bogost must be emphasized once again. This concerns, above all, the ability to recognize ludic patterns and ludic structures in areas that are not labeled as games per se. Different game literacies are, once again, important building blocks in media education not only because the complexity and diversity of the subject matter present us with interpretive challenges and raise aesthetic and theoretical questions but also because a form of hyperliteracy on the part of certain actors enables forms

32 The three examples from the beginning of the text could be supplemented here: A game like ELDEN RING (2022) develops its own design language within the game text itself, which must be painfully learned to read in order to successfully advance. Within its particular context, it has formed an elitist, rather non-inclusionary culture of veteran players. However, a look at the career of the enormously popular online player "Let Me Solo Her," who has made it his task to support other players in defeating a particularly difficult boss enemy (while only being dressed in nothing but a jug on his head), shows that it would be too short-sighted to consider only the 'readability' of a plain textual level of a game as the sole and universal key to the unfolding of a game's meaning. Winslow, Jeremy: "True Elden Ring Lord Let Me Solo Her Kills Malenia 1,000 Times," Kotaku (2022), https://kotaku.com/elden-ring-let-me-solo-her-klein-tsuboi-1000-malenia-yo-1848911945. For other important preconditions about player's performability and the interplay of accessibility and disability, see Markus Spöhrer's contribution within this volume.

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of participation that can have (sometimes serious) consequences for less literate individuals and populations. Thus, specialized literacies of games (and types of play, for that matter) can also be read as catalysts for certain forms of participatory culture that encourage and drive perplexing, sometimes questionable, and even toxic behaviors. This is reflected not only in (playful) conspiracies to manipulate stock market trades on Reddit (WallstreetBets)[33] and to drive the prices within cryptocurrency trades but also in communities that engage in political play with anti-democratic tendencies (such as the mentioned GamerGate movement, which is often interpreted as a petri dish for fascist movements.)

These developments undoubtedly have ludic structures but have long since moved beyond the semi-permeable—if not porous—confines of the metaphorical magic circle of game spaces into other areas of our culture. Game literacy is also a form of cultural participation—and sometimes unfolds in a distortion mirror, which will continue to confront us not only with playful phenomena but also with social challenges.

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# Pieces

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# Beyond Pawns and Meeples

## Material Meanings of Analog Game Figures

PETER PODREZ

> As if a damning curse had been cast unto things, they remain asleep like the servants of some enchanted castle. Yet, as soon as they are freed from the spell, they start shuddering, stretching, and muttering. They begin to swarm in all directions, shaking the other human actors, waking them out of their dogmatic sleep.
> BRUNO LATOUR[1]

## INTRODUCTION: WHY ANALOG GAME FIGURES?

We encounter figures in a wide variety of media and arts: They are described in literature, painted in the visual arts, and embodied in theater. In comics, we see them as static; in film, as audiovisual and moving images; in analog and digital games, we are able to control them. In the words of Rainer Leschke, figures can be understood as forms that circulate in the media system,[2] taking on other shapes and functions under the respective media-specific circumstances. Thus, it is not surprising that they have given rise to intensive research. In game studies, there is

1 Latour, Bruno: *Reassembling the Social. An Introduction to Actor-Network-Theory*, New York: Oxford University Press 2005, p. 73.

2 Cf. Leschke, Rainer: "Einleitung. Zur transmedialen Logik der Figur," in: Leschke, Rainer (ed.), *Formen der Figur. Figurenkonzepte in Künsten und Medien*, Konstanz: UVK 2010, pp. 11-26, here p. 12.

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elaborate research on the theory and analysis of game figures, especially avatars.[3] In contrast, there are very few approaches as soon as analog game figures come into play, which is due to a general marginalization of analog games by media and cultural studies on the one hand and the fact that the existing analog game research is not that prominent on the other hand.[4]

Because of disciplinary traditions, ethnographic, anthropological, archaeological, and historical approaches dominate the research on analog games. From these perspectives alone, it quickly becomes clear that when dealing with analog games, a preoccupation with game figures is imperative because they turn out to be essential game elements that have been used for millennia in all cultural areas of the world, appearing in remarkable variety.[5]

However, this article will argue for an examination of game figures beyond an exclusively historicizing level since game figures represent—at least in most board and tabletop games—one of the constitutive conditions of play: Without setting, moving, and capturing figures, play cannot take place, and in some cases assembling, modifying or designing figures is also part of the act of playing. Moreover, game figures not only possess ludic qualities, they also represent cultural and ideological meanings, and they enable players to have various aisthetic experiences. In all these aspects, their concrete material dimensions—that is, their substances, their colors and shapes, their auditory, haptic and olfactory, and in some cases even gustatory properties—are essential. Against this background, this article poses the question of what forms, functions, and meanings game figures[6] can assume for the act of playing and for the players. It quickly becomes clear that the spectrum of game figures is vast, ranging from natural materials like stones or

3 For example, cf. Beil, Benjamin: *Avatarbilder. Zur Bildlichkeit des zeitgenössischen Computerspiels*, Bielefeld: transcript 2012; Schröter, Felix: *Spiel|Figur. Theorie und Ästhetik der Computerspielfigur*, Marburg: Schüren 2021.

4 Best-known are *Board Game Studies*, *Analog Game Studies* and *Boardgame Historian*: https://sciendo.com/journal/BGS; https://analoggamestudies.org; https:// bghistorian.hypotheses.org/

5 For a richly illustrated overview, cf. Kobbert, Max J.: *Kulturgut Spiel*, Petersberg: Michael Imhof 2018.

6 While in German the term ‘Spielsteine’ refers to abstract forms, ‘Spielfiguren’ can refer to figural forms but is also used in the sense of an overall category in which abstract and figural forms can be subsumed. In English, the term ‘game pieces’ designates abstract forms and ‘game figures’ designates figurative forms. In this article, in analogy to German, I will speak of ‘game figures,’ and thus include both abstract and concrete-figurative forms.

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shells used in ludic contexts to the iconic pawns or meeples of games such as CHINESE CHECKERS or CARCASSONNE (2000), to the miniatures of tabletop games such as the WARHAMMER-series (1983), to all sorts of objects functionalized as game figures: dice (DAS SPIEL, 1979), tea lights (WALDSCHATTENSPIEL, 1985) or ice cubes (COOL RUNNINGS, 2018). Thus, game figures do not exist a priori but are *made* into game figures through their functional use in rule-based ludic systems. This also distinguishes them from toy and action figures, which can be used without the framework of rules.

## ACTORS, AGENCY, AFFORDANCES: GAME FIGURES IN LUDIC NETWORKS

In order to develop the necessary theoretical backgrounds, this article will turn to actor-network and affordance theories and combine them with approaches from game studies. Despite its prominence in media studies, actor-network theory (ANT) is rarely chosen as an approach to analyze games.[7] As is well known, ANT, in recourse to Michael Callon, John Law, or Bruno Latour, assumes that the social world consists of network-like actor constellations. Networks are complex and unfinished assemblies of heterogeneous elements that emerge around a given situation, with said elements assuming actorial status during this process. Networks are thus constituted only through the interaction of their parts, and actors do not exist a priori. They form their identity and agency only within networks.[8] Network formation is successful when the heterogeneous elements that come together are linked and made coherent,[9] which occurs when actors take on the roles ascribed to them by other actors. However, networks are not stable; they must be

7 For exceptions, cf. Beil, Benjamin/Hensel, Thomas (eds.), *Navigationen: Game Laboratory Studies* 11/2 (2011); Schumacher, Heidemarie/Korbel, Leonhard: "Game Studies und Agency: Ein Forschungsbericht zu ihrem Verhältnis und ein Vorschlag zu einer neuen Forschungsperspektive," in: Thimm, Caja (ed.), *Das Spiel. Muster und Metapher der Mediengesellschaft*, Wiesbaden: VS 2010, pp. 55-78.

8 Cf. Grampp, Sven: *Medienwissenschaft*, Konstanz/München: UVK 2016, p. 217. It should be emphasized that actors themselves also consist of network-like associations. Their analysis, however, would make it necessary to consider the processes of design and production, the materials and media technologies required, the economic and juridical frameworks, etc. Since this is not feasible in this article, game figures will not be differentiated into further networks.

9 Cf. S. Grampp: *Medienwissenschaft*, p. 224.

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consolidated permanently, as not only the relationships between the actors and the different programs of action transform continuously. The actors themselves are also subject to constant change.[10] Actors can be human or non-human—ultimately, in ANT, any entity to which agency can be attributed is considered an actor. This postulate of symmetry decenters an anthropocentric perspective on the world and valorizes non-human (plants, animals), material (technologies, objects), and immaterial entities (laws, natural processes) as actors. In this way, it also undermines the distinction between active subject and passive object positions. This does not mean, however, that people are objectified, or things are anthropomorphized. Nor are asymmetries of power denied: Not every actor has the same relevance in a network—but every actor can influence other actors and thus the entire network.[11] For this, at the core of ANT is the notion of actors and agency: Actors are all those elements to which agency can be attributed—and actors have agency when their participation in processes within the network is so strong that it makes a relevant difference:[12] "*[A]ny thing* that does modify a state of affairs by making a difference is an actor. [...] Thus, the questions to ask about any agent are simply the following: Does it make a difference in the course of some other agent's action or not?"[13] Actors make differences when they cause other actors (not) to do something that they would (not) do alone, whereby the actors transform themselves through such entanglement. And this, in turn, generates new forms of agency, meaning that agency is not an inherent characteristic of actors but a variable phenomenon that emerges from interactions with other actors. In this context, non-human actors can influence other non-human actors, but they can also shape the perceptions, behaviors, communications, or (inter-)actions of human actors, which act back in turn on other actors. It should be emphasized in this context that non-human actors do not determine actions but suggest them as possibilities: "[T]hings might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on."[14] This will become important later.

10 Cf. Schulz-Schaeffer, Ingo: "Akteur-Netzwerk-Theorie: Zur Koevolution von Gesellschaft, Natur und Technik," in: Weyer Johannes (ed.), *Soziale Netzwerke: Konzepte und Methoden der sozialwissenschaftlichen Netzwerkforschung*, München: Oldenbourg 2011, pp. 275-300, here p. 287.

11 Cf. Latour, Bruno: *Reassembling the Social*, p. 69.

12 Cf. S. Grampp: *Medienwissenschaft*, p. 219.

13 B. Latour: *Reassembling the Social*, p. 71.

14 Ibid., p. 72.

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What does this mean when transferred to games? The metaphor of play as a *magic circle*, despite all criticism, has been common since Johan Huizinga.[15] But instead of a circle, play(ing) can also be understood as a *ludic network*. This change of perspective constitutes a new topology of play, as it makes clear that in play, human (players) and material as well as immaterial non-human actors (balls, cards, figures, sets of rules, tables, playing fields, etc.) interact with each other. In this context, the condition of the network depends on the people playing, the type of game played, the materials used, the space for playing, etc. These heterogeneous elements, with their different programs of action, are kept coherent by the common purpose of playing, and the ludic network is thus stabilized—even though it can be expanded, interrupted, or destroyed at any time. But what role do game figures have in ludic networks?

First of all, most board and tabletop games cannot be played without game figures. However, inversely, a game does not play itself, which means that game figures must come together with players so that both of them can be given meaning and agency. Play(ing) only comes into being through joint actions, in which players and figures actualize temporary and constantly renewing entanglements, thus becoming hybrid ludic actors who are empowered with ludic agency. At this point, two aspects are important: First, other actors in the game are also involved in the aforementioned entanglements, and second, figures and players do not have the same agency—players can usually deal with figures at will, which is rather improbable the other way around. But nevertheless, game figures can influence players and change their perceptions or ways of acting. Thus, game figures have agency, but this agency can be located on different levels.

A look into game studies is helpful for a differentiation: With regard to video games, Benjamin Beil and Andreas Rauscher, referring to Rune Klevjer, distinguish between *fictional* and *instrumental agency*, which manifests itself in the avatar.[16] Accordingly, the avatar is provided with fictional agency because, perspectivized as a narrative character, it can influence diegetic elements and narrative progressions of the game. The avatar possesses instrumental agency because, understood as the player's tool, it can manipulate the game world within the options for action defined by the rules. This distinction can be transferred to analog game figures. Accordingly, fictional agency refers to the agency of game figures located on the level of the diegetic world—if such a world exists. Here, game figures as

15 Cf. Huizinga, Johan: *Homo Ludens. A Study of the Play-Element in Culture*, London: Routledge & Kegan Paul Ltd. 1949.

16 Cf. Beil, Benjamin/Rauscher, Andreas: "Avatar," in: Beil, Benjamin et al. (eds.), *Game Studies*, Wiesbaden: Springer 2018, pp. 201-217, here p. 207.

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fictional characters, in connection with the players' decisions, can interact with elements of the narrated world, e.g., establish relationships with other characters, trigger events in the narration, etc. Instrumental agency, on the other hand, refers to agency localized at the level of game mechanics. Accordingly, game figures, in connection with the players' moves, function as crystallization points of game-mechanical actions, for example, by executing movements on a board, attacking other figures, or the like. Here, however, another form of agency can gain importance. On the one hand, there are games in which the instrumental agency is more independent of the materiality of figures: For example, in NINE MEN'S MORRIS, it makes no decisive difference whether one plays with stones, coins, or buttons, as long as one's own figures can be differentiated from those of the other player. On the other hand, specific forms of materiality can facilitate the game (and hence establish the instrumental agency of game figures) in the first place. For example, a game based on the principle of magnetic attraction can only be played with magnetic figures. This form of agency, which is responsible for the formation of the ludic network in the first place, will be referred to as *ludo-material agency.*

Against the backdrop of these different forms of agency, the final question is on what basis game figures and players assemble in order to achieve agency. Here, the concept of *affordance* can be helpful. Although this concept is not only compatible with ANT but is also mentioned by Latour himself,[17] the two theoretical perspectives have rarely been combined.[18]

While there are various theories of affordance,[19] the term usually refers to the offerings of material objects in relation to humans or non-human life forms in a given environment: "The *affordances* of the environment are what it *offers* [...], what it *provides* or *furnishes*, either for good or ill."[20] However, it must be kept in

17 Cf. B. Latour: *Reassembling the Social*, p. 72.

18 As an exception from a cultural studies perspective, cf. Bareither, Christoph: "Affordanz," in: Heimerdinger, Timo/Tauschek, Markus (eds.), *Kulturtheoretisch argumentieren. Ein Arbeitsbuch*, Münster: Waxmann 2020, pp. 32-55; from a game studies perspective, cf. Clüver, Claudius: "Würfel, Karten und Bretter. Materielle Elemente von Spielen und der Begriff der Spielform," in: GamesCoop (eds.), *Navigationen: Spiel|Material* 20/1 (2020), pp. 35-52, here p. 45.

19 E.g., cf. Gibson, James J.: *The Ecological Approach to Visual Perception*, Hillsdale: Erlbaum 1986; Norman, Don: *The Design of Everyday Things*, New York: Basic Books 2013; Hutchby, Ian: "Technologies, Texts and Affordances," in: *Sociology* 35/2 (2001), pp. 441-456.

20 J. Gibson: *The Ecological Approach to Visual Perception*, p. 127.

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mind that possibilities for actions are not only opened up by objects but also restricted. Affordances result from the specific properties of objects such as color, texture, size, weight, shape, material, etc. They do not determine actions, but they do not make them arbitrary, either; instead, affordances "*frame* […] the possibilities for agentic action in relation to an object."[21] Objects thus make certain behaviors more likely than others. However, these possibilities are never located exclusively on the side of the objects but are always related to the users: "An affordance is a *relationship* between the properties of an object and the capabilities of the agent."[22] It is also important to take cultural conventions into account because affordances do not arise solely in the course of subjective perception but in the linkage of object, user, and cultural context.[23] It is only against this background that users can actualize the virtually possible actions afforded by objects. Through this actualization, the objects transform their properties and thus their affordances in turn, which leads to new practices of use, and so on.

These features of affordance theories can be applied well to the previous thoughts on game figures: Affordances exist between game figures and players, which are based on the materialities of the figures as well as on the perceptions of the players, the social conventions of playing and the rules of specific games; in the following, I will limit myself to the first aspect for reasons of clarity. The shape, color, or material of game figures thus afford persons to (inter-)act with them, or more precisely: The superior affordance of game figures is 'playing,' they are, following James J. Gibson, 'play-with-able.'[24] This affordance is superior because, depending on the design of the figures, it is accompanied by further fundamental affordances that serve as conditions of play: In the vast majority of cases, this is the affordance of 'grasping' in order to interact with the figures, occasionally it is a more specific affordance, like 'plugging together,' 'stacking,' etc. Either way, playing with game figures generally involves tactile-haptic interaction with them; this will become important later.

21 I. Hutchby, "Technologies, Texts and Affordances," p. 444, emphasis added.

22 D. Norman: *The Design of Everyday Things*, p. 11, emphasis added.

23 Cf. ibid.

24 Cf. J. Gibson: *The Ecological Approach to Visual Perception*, p. 128, where he refers to a chair as "sit-on-able." Depending on the context, figures can take on other affordances, such as 'collecting' or 'exhibiting' in museums; cf. Boch, Lukas: "That Belongs to a Museum—moderne analoge Spiele als Exponate in musealen Ausstellungen," in: Boch, Lukas et al. (eds.), *Mehr als nur Zeitvertreib? Wissenschaftliche Perspektiven auf analoge Spiele. Eine Publikation anläßlich der SPIEL 2021*, Münster: WWU Münster 2022, pp. 207-217.

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With regard to a linkage of actor-network and affordance theories, it can be summarized as follows: When figures and persons meet, the former—in conjunction with other objects, cultural conventions, etc.—develop the affordance of 'playing' for the latter. When persons actualize this affordance, they firstly become players, and the figures firstly become game figures. In addition, players and game figures become hybrid actors within a ludic network that they produce and maintain by actualizing the affordance of 'playing.' In this network, they ascribe different forms of agency to each other and thus influence each other to varying degrees. Thus, the question articulated at the beginning of this article can now be made more precise: In the following, I will describe what materially grounded forms, functions, and meanings are attributed to game figures *in ludic networks* and what *constellations of agency* and *affordances* can be observed within these processes.

## THE STUFF THAT GAMES ARE MADE OF: MATERIALITY AS PREREQUISITE OF PLAY

As mentioned, the instrumental and ludo-material agency of game figures can be more or less interrelated. At one end of this spectrum between autonomy and dependence, figures need to meet only a few conditions to be effective in ludic networks. For instance, historical games such as MANCALA or SENET can be understood as rule systems largely uninfluenced by narration, textuality, or audiovisual traditions,[25] and they can be played with different figures. All that matters is that the figures are available, that one's own figures are distinguishable from those of the other players, that the figures are proportional to the board, and that they can be used with little effort by the players. Therefore, they are mostly small, light objects that are easily available, such as pebbles, shells, bones, etc.[26]

At the other end of the spectrum, often, the materiality of game figures is not interchangeable but constitutive for various affordances and dimensions of instrumental agency. In many cases, the *shape* of the figure is central to the fact that ludo-material agency can or cannot develop. Looking at ancient games, they often have spherical figures that would make playing impossible on today's boards. In earlier cultural formations, however, games were often played on areas carved into

25 Cf. Raczkowski, Felix: "Papier und Polygon. Theming und Materialität in Game Studies und Game Design," in: GamesCoop (eds.), *Navigationen: Spiel|Material* 1/20 (2020), pp. 21-34, here p. 25.

26 Cf. C. Clüver: "Würfel, Karten und Bretter," p. 44.

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the ground or drawn in the sand, where spherical figures could be placed stably.[27] But the shape of game figures is often a necessary condition for playing today, too. In FANG DEN HUT (1927), for example, players can, when moving to the same square, 'trap' figures by placing their own figure over the opponent's. The 'trapping' is implemented—and made possible at all—by the fact that the figures have the shape of hollow conical cylinders (which symbolize 'caps,' cf. Fig. 1).

*Figure 1: Shape as a Prerequisite of Play. 'Caps' in FANG DEN HUT*

Source: FANG DEN HUT (Ravensburger, 1927). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

In many cases, the *colors* also lead to the formation of ludic networks. In the vast majority of games for several players, it is essential to distinguish the figures. If all of them looked the same, there would be no orderly game. This distinguishability can be constituted by shapes but is more often marked by colors, e.g., in many classic board games like NINE MEN'S MORRIS or CHINESE CHECKERS. Colors can also exhibit different forms of instrumental agency and afford players in different ways. For example, the choice of a color may not only be about the subjective preferences of players but also about the ludic agency assigned to a color,

27 Cf. Kobbert: *Kulturgut Spiel*, p. 15.

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which determines entire game strategies, such as the 'white begins' paradigms of CHESS or CHECKERS.[28]

The *size* of game figures can also be important for their ludo-material agency, influencing not only how but also where a game can be played. Small figures allow players to take the game to other places, while large figures make it location-bound. One might think of a travel CHESS set with centimeter-sized figures on the one hand and an outdoor CHESS with figures one meter high, such as can be found in city parks, on the other. From a certain point on—which is different for each player—a scaling of the size leads to a dysfunctionality of the affordance 'playing.' This can happen by overriding the affordance 'grasping' because figures are too small to interact with them,[29] as in the case of micro CHESS editions. But it can also happen when the affordance 'playing' requires great strength or endurance for very large figures, which can exclude individuals from the ludic network due to their physical constitution.

Furthermore, the *weight* of game figures can promote or prevent the formation of ludic networks. For example, figures that are too light are unstable and can lose their place on the board due to movement, wind, or the like. Too heavy figures, on the other hand, can damage other game materials or, as mentioned above, lose their affordance 'playing' if they cannot be moved by players. GRAWORIE (2001) shows how the weight of game figures is functionally implemented in a ludic network. The game is based on the players' visual and haptic memory. The figures are 18 aluminum cubes, six of which have an identical weight, while different symbols are engraved in them. The combination of weight and symbol results in nine pairs that have to be found by sight, touch, and memory. The affordance of the game figures here is thus not only 'grasping' but also 'weighing in the hand.'

Further, game figures are made of various *materials* that can account for their ludo-material agency. Tim Ingold criticizes theories of materiality for often losing themselves in abstraction while neglecting the concrete materials of objects. Ingold, therefore, pleads for a return "from the materiality of objects to the properties of materials,"[30] whereby he understands materials as "the stuff that things are made of,"[31] be it glass, iron, gold, stone, wood, fabric, ivory, plastic, etc. He

28 On the agency of colors, cf. Young, Diana: "The Colours of Things," in: Tilley, Chris et al. (eds.), *Handbook of Material Culture*, London: SAGE 2006, pp. 173-185.

29 On the anatomy of grasping, cf. Aicher, Otl/Kuhn, Robert: *Greifen und Griffe*, Köln: König 1995, p. 18.

30 Ingold, Tim: "Materials Against Materiality," in: *Archaeological Dialogues* 14/1 (2007), pp. 1-16, here p. 9.

31 Ibid., p. 1.

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ascribes to all of them—although not in the sense of ANT but certainly compatible with it—the ability to "act back,"[32] i.e., to influence elements in their environment. This is based on the fact that every material is specific in terms of texture, resilience, elasticity, etc., and it is precisely these properties of the material that can constitute its ludo-material agency. It has been mentioned already that all games based on the principle of magnetic attraction can only be played with magnetic figures; otherwise, no ludic network can be created.

*Figure 2: Material as Prerequisite of Play. Ice Cubes in* COOL RUNNINGS

Source: COOL RUNNINGS (Ravensburger, 2018). Roy: "Cool Runnings," in *BoardgameMonkeys*, 24.12.2018, https://www.boardgamemonkeys.com/2018/12/cool-runnings.html [edited]

For a more unusual example that connects the ludo-material agency and affordance of the figures with different aggregate states of their material, consider the game COOL RUNNINGS. In it, the game figures are ice cubes that have to be brought over the finish line in colorful 'transport boxes' before they melt (cf. Fig. 2). The (low) durability of the material determines the duration of the game and can be influenced by the other players, as action cards activate the ice cube-related affordances 'rubbing,' 'breathing on' and others, so that the ludic network is

32 Ibid., p. 11.

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formed in permanent interaction between the players and the ice cubes, which gradually become puddles of water.

*Figure 3: Media Technology as Prerequisite of Play: The Smartphone as Pirate Ship in WORLD OF YO-HO*

Source: WORLD OF YO-HO (IELLO/Volumique, 2016), http://yoho.io/german/index.html [edited]

Finally, game figures can take on ludo-material agency by incorporating *technological elements* into themselves or even by being *(media) technologies* themselves. In this case, the boundaries between materiality and immateriality, mechanics and electronics, analog and digital become blurred. This field is wide and can only be touched upon here, but it includes, for example, those figures that are electrically powered—mostly by batteries—in order to act as random generators (MAGOR DER ZAUBERER, 1993) or to perform movements autonomously from the players (KAKERLAKAK, 2013). In these cases, the affordance of the game figures is not just 'playing' or 'grasping,' but first and foremost 'turning on'—the motto is 'no power, no play.' Games in which the figures are themselves media technologies also fall into this domain. In HUI SPINNE (1999), this is a small radio in the shape of a spider that broadcasts programs that have to be integrated into the course of the game. But it can also be, in a current variant of "playful hybrid

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products,"[33] a smartphone, as in WORLD OF YO-HO (2016). In this game with a pirate setting, after installing the accompanying app, the smartphone is used as a game figure, namely as a ship that can be moved on the game board representing a sea chart. The smartphone's display overlaps with the board (cf. Fig. 3). At the same time, however, the smartphone serves as an interface for commands such as selecting missions, firing cannons, and so on. In this way, it generates different affordances ('moving,' 'operating by touchscreen,' etc.) and establishes a hybrid ludic network in which analog and digital elements interact synchronously and interdependently.[34]

## THE POLITICS OF MATERIALITY: CULTURAL DIMENSIONS OF GAME FIGURES

In ludic networks, game figures not only merge into functional contexts. Due to their materiality, they also acquire cultural meanings, which are linked in various ways with forms of agency and affordances. This is because materiality is never ideologically neutral but always charged with—culturally and historically dynamic—social, political, economic, etc., discourses. These discourses crystallize in game figures. To take only one example, I will discuss the *ecological discourses* concerning the material.

While plastic figures were celebrated for their variety of designs when they first appeared in the second third of the 20th century, the ecological footprint of plastic today causes ambivalence for many players. The affordance 'playing' of plastic figures can, therefore, depending on the ecological attitude of players, become an "anti-affordance:"[35] 'not playing'/'avoiding.' In contrast, wooden figures are often seen as more 'natural' and sustainable today—regardless of their potentially problematic production conditions. SPIRIT ISLAND (2017) reflects these discourses regarding materials on the thematic, narrative, and ludic levels. The game is about the colonization of an idyllic island by human aggressors.[36] Players take

33 Tyni, Heikki/Kultima, Annakaisa/Mäyrä, Frans: "Dimensions of Hybrid in Playful Products," in: Lugmayr, Artur et al. (eds.), *AcademicMindTrek'13 Proceedings of the International Conference on Making Sense of Converging Media*, 2013, pp. 237-244, here p. 237, https://dl.acm.org/doi/proceedings/10.1145/2523429

34 On synchronicity and dependence as aspects of hybrid play, cf. ibid.

35 D. Norman: *The Design of Everyday Things*, p. 11.

36 On colonialism in board games, cf. Knäble, Philip: "Leere Inseln—Europäische Expansion im modernen Brettspiel," in: Boch, Lukas et al. (eds.), *Mehr als nur*

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control of nature spirits and associated indigenous people to fend off attacks on the ecological balance of the island. The nature spirits manifest themselves on the board as 'presences' in the form of round, colorful wooden figures, and they have the instrumental and narrative agency to defend territories on the island. This is also done by the indigenous people, who are represented by round wooden game figures, too (cf. Fig. 4).

*Figure 4: Ideologies of Wood and Plastic in SPIRIT ISLAND*

Source: SPIRIT ISLAND (Pegasus Spiele, 2018). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

Here, nature, conservation, and wood as a natural and positively connoted material are amalgamated. The colonialists stand in sharp contrast to this. Their figures, which represent soldiers, villages, and cities, are made of gray plastic and have

*Zeitvertreib? Wissenschaftliche Perspektiven auf analoge Spiele. Eine Publikation anläßlich der SPIEL 2021*, Münster: WWU Münster 2022, pp. 40-50; on (anti-)colonialism in SPIRIT ISLAND, cf. Bassermann, Markus: "Antikolonialer Widerstand und stumme Indigene: Vorstellung und Diskussion von Spirit Island," in: Boch, Lukas et al. (eds.), *Mehr als nur Zeitvertreib? Wissenschaftliche Perspektiven auf analoge Spiele. Eine Publikation anläßlich der SPIEL 2021*, Münster: WWU Münster 2022, pp. 51-68.

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many jags and edges. Their instrumental and narrative agency consists in covering the island with settlements but also with wasteland, which is symbolized by stone slabs, also made of gray plastic (cf. Fig. 4). Plastic is thus assigned to the sphere of the man-made and artificial, but also of the aggressive, since in SPIRIT ISLAND expansion goes hand in hand with the destruction of nature. Nor is the materiality of figures ever ideologically neutral because—again: dynamic—discourses regarding identity politics are inscribed into the design of the figures. Game figures are always symbolic representations of something or someone. Therefore, the classic critical cultural studies questions have to be asked: How do game figures construct gender, ethnicity, class, age, (dis-)ability, species, etc.? What dominant patterns are formed, and what stereotypes are (re-) produced and possibly subverted in this process? However, following the argumentation of this article, it is also important to link such identity constructions with the affordances and forms of agency of the respective game figures.

*Figure 5: Anthropocentrism in the Design of Pawns and Meeples*

Source: Pawns taken from HALMA (Franz Schmidt Nürnberg, unknown); meeples taken from CARCASSONNE (Schmidt Spiele, 2005). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

As far as the *shape* of game figures is concerned, since their historical beginnings, more concrete-figurative or more geometric-abstract designs can be identified,

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various transitional forms also being conceivable.[37] But even shapes that tend to be abstracted, such as the pawns common in many games, exhibit clear identity attributions. The shape of pawns demonstrates the tendency to *anthropomorphize* game figures—here by a stylized head on a body. In the case of the likewise widespread meeples, the phenomenon becomes even more apparent due to their design that symbolizes a human figure with head and limbs (cf. Fig. 5). This points to the fact that, although figures of real and fantastic non-human species were already used in ancient games,[38] game figures have had an inherent anthropocentric tendency for millennia.

This tendency can take on other political meanings and forms of agency through further design strategies. In BLACKS & WHITES (1970), this occurs through the use of the eponymous *colors*, which are associated with *ethnic, social, and economic power relations*. Following the principle of MONOPOLY (1935), the aim of the game is to acquire real estate and accumulate wealth. However, at the beginning, players must decide whether they want to act as whites or blacks. The representative white and black pawns have different forms of narrative and instrumental agency: Players with white pawns start with $1,000,000 of capital and may acquire property in any zone of the board. In contrast, players with black figures start with $10,000 of capital and are, among other things, excluded from the 'suburb'-zone; they also draw from a separate deck of cards, where they encounter events such as: "Draft call. Roll dice. [...] If you roll an even number, you are drafted and sent to Vietnam—sell all properties to highest bidder or to Treasury for half price." The unequal distribution of agency to figures in the game thus reflects the unequal power relations of people in U.S. society.[39] Colors are used to "constitute social relations"[40] while "producing and reproducing power."[41]

An iconic example of game figures that can be located on the threshold between concretion and abstraction, and in which the connection between *class* and instrumental agency is reflected, are the Staunton CHESS figures canonized in Western culture since the 19th century.[42] A common interpretation of CHESS is that

37 Cf. M. Kobbert: *Kulturgut Spiel*, p. 15.

38 Cf. ibid., p. 14.

39 Pointing out that this inequality was not unique to the 1960s/1970s, BLACKS & WHITES: 50TH ANNIVERSARY EDITION was released in 2021.

40 D. Young: "The Colours of Things," p. 173.

41 Ibid., p. 180.

42 Throughout its history, CHESS has exhibited a huge range of figures representing various materialities and ideologies. For examples, cf. Mackett-Beeson, Alfred E.J.:

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of a battle involving figures from different classes, roughly: peasants, soldiers, clergy, and nobility. When the Staunton figures of one color are lined up next to each other (cf. Fig. 6), it becomes clear that their size already expresses social hierarchies. If one adds to this the frequency of the figures, the picture emerges of many small peasants being drawn into battle to protect the few higher-ranking soldiers, clerics, and nobles. This, in turn, can be linked to assignments of instrumental agency since the pawns have the smallest and most inflexible range of movement in the game; moreover, they are 'in the front line,' serve as 'pawn sacrifices,' etc. Conversely, the queen, for example, has the greatest ability to move and attack and is therefore usually considered the most powerful figure.

*Figure 6: Social Hierarchies in Staunton CHESS Figures*

Source: CHESS (Ravensburger, 1983). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

Representations of identity are found most conspicuously in concretely designed figures, for example, in detailed miniatures. In TALISMAN: REVISED 4TH EDITION (2007), players choose their protagonist from 14 different figures in order to find the eponymous artifact in a fantasy world. A brief quantitative analysis is worthwhile here since the patterns that emerge are representative of most analog game figures. First, almost all protagonists, ten in number, are human, which reinforces the aforementioned anthropocentrism of game figures. Second, with regard to gender, eleven figures have male connotations, two have female connotations, and one has no clear gender affiliation. Such a dominance of masculine figures is genre-typical for fantasy but can also (still) be ascertained for analog (board) games per se. Third, two figures can be assigned to an advanced age group, while childlike figures do not exist at all, which is also typical for the dominance of—

*Chessmen*, London: Weidenfeld & Nicolson 1968; Greygoose, Frank: *Chessmen*, Newton Abbot: David & Charles 1979.

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very roughly speaking—middle-aged game figures.[43] And fourth, none of the figures shows any physical impairment, which points to a general norm of ableness in analog (board) games.[44] A closer look at one exemplary figure, the Sorceress, reveals further insights (cf. Fig. 7).

*Figure 7: Stereotyped Femininity in TALISMAN: REVISED 4TH EDITION*

Source: TALISMAN: DIE MAGISCHE SUCHE. 4. EDITION (Various, 2008). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

The miniatures in TALISMAN: REVISED 4TH EDITION are complemented by cards that show an illustration of the respective character and list narrative backgrounds and ludic abilities. Accordingly, the Sorceress has six skill points, which are distributed in a gender-stereotypical manner between low instrumental agency in terms of strength and high instrumental agency in terms of talent (in this case: magic power). At the same time, the Sorceress is classified as a malevolent

43 The exception are children's games, in which kids—and animals—often take on the main roles.

44 A rare exception, also located in the fantasy genre, is the Combat Wheelchair discourse; e.g. cf. Davis, Sally: "Play with Us However You Roll: Combat Wheelchair Rules for D&D 5e," in: *PAXSims* (2020), https://paxsims.wordpress.com/2020/09/20/play-with-us-however-you-roll-combat-wheelchair-rules-for-dd-5e/

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character coming from a graveyard. Thus, the motif of the evil witch is taken up, though not in the form of an old, physiognomically deformed woman, but in the shape of a youthful and sexualized one. The figure's facial features, especially on the card, are modeled after Western ideals of beauty, as are the flowing hair and slim body, which are also visible on the miniature. The clothing is revealing, emphasizing the figure's breasts and thus fitting into the classical paradigm of objectifying the female body. Or, to put it another way: An affordance of the figure is 'looking at'—with erotic connotations.

These and many other designs of game figures go hand in hand with various (anti-)affordances since players can consciously decide for or against playing with the respective figures precisely because of their ideological dimensions. Thus, a figure charged with sexist, racist, etc., tendencies may lead players to exclude it from the ludic network by banishing it back into the game box. In extreme cases, such anti-affordances of 'not playing' can lead to refusing the entire game or to designing other figures that meet the criteria desired by the players—more on this in a later section. But conversely, a figure may be brought into the ludic network precisely because of its identity representation and/or related narrative and instrumental agency. Either way, game figures can affect the players and their actions through their identity-related design.

## WHAT DOES A CHOCOLATE KNIGHT TASTE LIKE? AISTHETIC EXPERIENCES WITH GAME FIGURES

Beyond their functionality and cultural significance, game figures are also relevant on the sensual level. Affordances are always grounded in perceptual processes that are physical and sensorial.[45] The superior affordance of the game figure 'playing' can thus only be actualized in the context of the embodied perception of the figures on the part of the players. All of a figure's sensual qualities can contribute to this, such as its appearance, its tactile-haptic dimension, its sonic aspects, its smell, or even its taste.

If one follows the etymology of the term *aisthesis*,[46] which denotes sensual perception, players gather aisthetic experiences when dealing with game figures. In this context, what Erika Fischer-Lichte explains in relation to the subject of a theater play can be transferred to games. According to her, human perception

45 Cf. J. Gibson: *The Ecological Approach to Visual Perception*, p. 79.

46 Cf. Zirfas, Jörg: "Die Künste und die Sinne," in: Bockhorst, Hildegard et al. (eds.): *Handbuch Kulturelle Bildung*, München: Kopaed 2012, pp. 168-173, here p. 168.

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constantly oscillates between two levels: a meaning-giving level, on which the specific signs of what is perceived are interpreted in semiotic (analysis) processes, and a sensual level, which turns to the phenomenal 'being-as-it-is' of what is perceived and focuses on its concrete appearance and effect from a phenomenological point of view.[47] Based on this premise, the aisthetic experience of game figures will also be described in the following as oscillating between the poles of meaning and phenomenal 'being-as-it-is.' That is, players not only perceive figures in their functional and symbolic dimensions but are also sensually affected by them. This happens with regard to all the classic five senses of the human being: seeing, hearing, touching, smelling, and tasting. These senses are in constant interplay with each other and are treated separately only for a better overview.

*Seeing* game figures is usually a prerequisite for interacting with them. It can mean observing their (strategically important) distribution on the board or interpreting their visually conveyed ideological messages. But seeing figures can also mean looking at them for their own sake. Their visual attraction may be the result of a singular creation that can give figures a special aura, as Walter Benjamin described regarding works of art,[48] or it may be the result of strategies deliberately calculated in industrial mass production in order to draw customers.[49] Either way, the visual attraction can be understood as a reinforcement of the game figures' affordance 'looking at,' as an invitation to the players to let their gaze linger more attentively and longer on the figure.

In the millennia-old tradition of the production of visually attractive game figures, CHESS figures play a particularly prominent role. Here, a 19th-century Chinese king and queen are used as an example (cf. Fig. 8). This makes it clear that the gaze of the players can be directed to a specific cultural symbolism or can try to decipher the techniques of craftsmanship in the production. But it can also lose itself in the abundance of fine details, for example, in the curved patterns of the robes, thus making the viewer feel impressed by their filigree quality; it can perceive a harmonic overall picture due to the predominantly rounded forms; it can let the rich red color scheme take effect on the viewer; etc.

47 Cf. Fischer-Lichte, Erika: *Ästhetische Erfahrung. Das Semiotische und das Performative*, Tübingen: Francke 2001.

48 Cf. Benjamin, Walter: "Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit," in: Benjamin, Walter: *Gesammelte Schriften*, Bd. 1, Frankfurt a.M.: Suhrkamp 1972, pp. 471-508.

49 Cf. Clüver, Claudius et al.: "Spiel|Material. Zur Einführung," in: GamesCoop (eds.), Navigationen: *Spiel|Material* 20/1 (2020), pp. 7-20, here p. 9.

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*Figure 8: Seeing Game Figures: King and Queen in CHINESE CHESS Set as Visual Attractions*

Source: CHESS (unknown, early 19th century). Greygoose: *Chessmen*, Newton Abbot: David & Charles 1979, p. 112

*Hearing* game figures is rarely relevant from a ludic-functional point of view, but nevertheless, there are examples in which one of the affordances of figures is 'listening to.' In ZAPP ZERAPP (2000), whose story is about the journey to an enchanted mountain, players link rolling the dice with auditory interactions. At the center of the board, there are painted wooden containers semanticized as 'barrels' and filled with varying numbers of metal beads. The rolled number must be matched with the number of beads in a 'barrel' in order to make a move. To achieve this, the players must shake the barrels and listen to their sounds. In the sense of ludic progress, the act of listening can focus on guessing the correct number of beads. But players can also perceive the rattling in its phenomenal 'being-as-it-is,' find it pleasant or unpleasant due to its pitch, try to influence its volume and frequency by shaking the barrels more vigorously or faster, etc. All in all, games like ZAPP ZERAPP are exceptions. But beyond such rule-based functionalizations of the sense of hearing, players can hear figures in almost all games and

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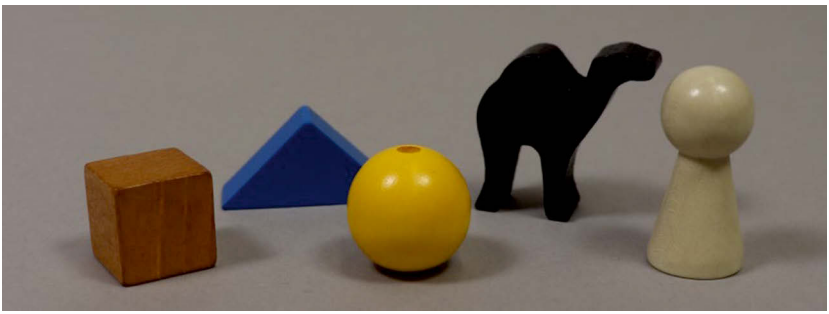
almost all actions in the ludic network: Every time figures are placed and moved on the board, every time they are hit, the clacking of wood on wood, the shuffling of plastic on felt and many other sounds occur. Even if these are not consciously perceived, on the one hand, they refer to the character of the material, and on the other hand, they can be sensed as quiet, intrusive, and so on.

In today's Western culture, the 'distant senses' of seeing and hearing are considered superior, while the 'near senses' of touching, smelling, and tasting are considered subordinate.[50] This hierarchy, which has developed over the course of cultural history,[51] is somewhat reversed with regard to game figures because, on the one hand, hearing figures recedes into the background, and on the other hand, *touching*—along with seeing—becomes a central sense in the formation of ludic networks. As already emphasized, a fundamental affordance of game figures is 'grasping,' which means that players and figures generally only come together through the act of touching.

*Figure 9: Touching Game Figures: Shapes to Be Felt in DSCHAMÁL*



Source: DSCHAMÁL (Zoch, 2005). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

Touching and grasping are thus indispensable for almost all processes of play(ing), but besides their pure—usually unconsciously perceived—functionality, they can also become central for their own sake. Then, figures can be explored haptically in terms of their sense and sensuality. 'Touch games' focus on the first dimension. In DSCHAMÁL (2005), for example, the players have to draw matching figures out

50 Cf. Howes, David: "Scent, Sound and Synaesthesia. Intersensoriality and Material Culture Theory," in: Tilley, Chris et al. (eds.), *Handbook of Material Culture*, London: SAGE 2006, pp. 161-172, here p. 164.

51 Cf. J. Zirfas: "Die Künste und die Sinne," p. 169.

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of a small bag. In doing so, they need to distinguish different shapes by means of touch, including triangles, cubes, spheres, pawns, but also a camel (cf. Fig. 9). Beyond the recognition of shapes, the touching of figures—in DSCHAMÁL as in all other games—can also concentrate on their phenomenal 'being-as-it-is.' Then, the weight, contours, or texture of plastic, glass, cardboard, or wood can be perceived as heavy or light, round or angular, rough or smooth, warm or cool, etc.

In contrast to touching, *smelling* game figures is rarely important in a ludic network. One unusual example is SMELLORY (1984), in which pairs consisting of a motif card on the one hand and the scent from a flacon, which functions as a game figure, on the other hand, must be found according to the memory principle. The cylindrical yellow flacons contain fragrance stones impregnated with 32 (artificial) aromas, including eucalyptus, spruce, almond, vanilla, lemon, etc. Players can direct their olfactory perception toward identifying the respective scent. But they may also perceive the specific characteristics of the scent in their phenomenal 'being-as-it-is:' floral, spicy, tart, fruity, etc. Besides, since the fragrances are chemically produced, irritation can be experienced through odors perceived as penetrating, or an allergic reaction may even occur, which the game instructions themselves warn against. The example of SMELLORY is exceptional; usually, the 'smellability' of figures is hardly linked to their ludo-material agency. Nevertheless, the affordance of 'smelling' does exist casually in the context of game figures because some materials have olfactory qualities that are intensified or even actualized by the touch of the players. This is the case with iron, for example; its smell is the result of a chemical-physical process that only takes place when an iron object comes into contact with human skin, which leads to the typical 'iron smell' that many people find unpleasant.[52]

The sense most rarely used in connection with game figures is *tasting*. If it does not have to be used in a rule-based manner in the ludic network, it is not usually used at all because probably only very few players who have outgrown the oral (toddler) phase put figures in their mouths to explore their taste. However, the number of game figures that operationalize the sense of taste ludically is also small. This is the case with drinking games, for example, which consist of filling figures in the form of (shot) glasses with—mostly alcoholic—beverages and emptying them as a reward or punishment. Or it is the case with edible variants of well-known games, in which the board is usually made of non-consumable material, while the figures, imitating the familiar shapes, are made of edible material; one example are chocolate versions of CHESS, e.g., by the German confectionery

52 Cf. Than, Kher: "Coins Don't Smell, You Do," in *Live Science* (2006), https://www.livescience.com/4233-coins-smell.html

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manufacturer Hussel. This can be dismissed as a mere marketing gag of the food industry, shifting the affordance of the figures from 'playing' to 'eating.' However, the affordances can also be combined with the instrumental agency of the figures, namely playing in order to eat. In the case of CHESS, for instance, a rule negotiated between the players may be that figures that have been captured can (or must) be eaten. But the phenomenal 'being-as-it-is' of the figures in the act of eating can also play a role if the taste of the figures conventionally consisting of white and dark chocolate is perceived as (too) sweet, (too) tart, or the like.

## DESTRUCTIONS AND CREATIONS: TRANSFORMATIONS OF GAME FIGURES

Although game figures in all my previous considerations provided for various constellations of ludic networks in a dynamic way, they themselves appeared to be comparatively static. In fact, however, they are highly transformative entities—not only in the sense that the status of characters can evolve in the course of a narrative or figures can accumulate points, thereby changing their fictional or instrumental agency, but also in terms of their materiality.[53] This materiality is in constant flux on various levels, actualizing new affordances and forms of agency.

Occasionally, after acquiring a new game, the game figures need to be brought into a ludic functional form before the first round is played. If they do not have to be created from scratch, as in cases like COOL RUNNINGS, they often exist initially as sets of elements that need to be plugged together, glued on, etc. The affordance of such 'not-yet-figures' is thus 'making,' or more precisely: 'assembling.' The act of assembling is usually governed by instructions,[54] as in SPACE CRUSADE (1990, cf. Fig. 10). The example makes clear that different figures can be assembled by equipping the basic models with various weapons. It also makes clear that the act of assembling, which varies in complexity depending on the kit, can assume precarious status. Significantly, the instructions repeatedly use the phrase "carefully:" "Carefully twist the Space Marines from the red, yellow and blue sprues [...] Carefully twist the Chaos Space Marines from the dark blue sprue [...]." After all, fragile plastic parts can break off, which may disturb the players'

53 On the dynamics of material, cf. T. Ingold: "Materials Against Materiality."

54 Of course, there are possibilities to design the models in other ways, e.g. by using components differently or not at all, which does not necessarily detract from the ludic functionality of the figures.

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aesthetic feelings, but can also lead to ludic dysfunctionality if the figure can no longer be used properly afterward.

This means that the assembly of a figure can satisfy the players' aesthetic needs, for example, in many tabletop games with complex figure construction sets. But the assembly of the figures can also relate to the game rules, as in SPACE CRUSADE: Once the figures have been put together, parts such as the base or the backpack usually remain constant; the weapons, though, remain changeable, depending on the players' preferred strategy, because they have different ludic specifications: "The dice you must roll [for firing] will depend upon which weapon you are using."[55] This way, different figures with different forms of instrumental agency can be assembled in each round.

In other cases, the whole game principle is based on the constant transformation of the figures. GET BIT! (2007) is about saving swimming pirates[56] from a shark. By discarding cards, the pirates overtake each other as they flee, so the figures are placed in different orders. The shark snaps once in each round and bites off a body part from the last pirate. This is realized not only symbolically but also materially because the pirate figures, which are made of plastic parts, can have their hands, arms, feet, and legs removed (cf. Fig. 11). A figure with arms and legs bitten off is no longer able to 'swim' and is eliminated from the game. Firstly, therefore, the materiality of the figures serves the bloodless execution of a symbolically communicated brutal action; secondly, it functions as an affordance to the players ('removing body part'), and thirdly it deprives the affected figure of instrumental agency with each loss, which simultaneously indicates the progress of the game.

The abovementioned transformations of the game figures have been intentional. However, materiality is always involved in processes of "dematerialization:"[57] "Plaster can crumble and ink can fade. Experienced as degradation, corrosion or wear and tear [...] these changes [...] are typically attributed to the phase of use [...] [N]o object lasts forever."[58] The manifestations and speeds of these changes depend very much on the type of material. Precious metals or glass, for example, are more durable than cardboard, but over longer periods of time, even such materials are subject to processes of transformation through decay.

55 SPACE CRUSADE *Rule Book*, https://i.4pcdn.org/tg/1436188627543.pdf, p. 10.

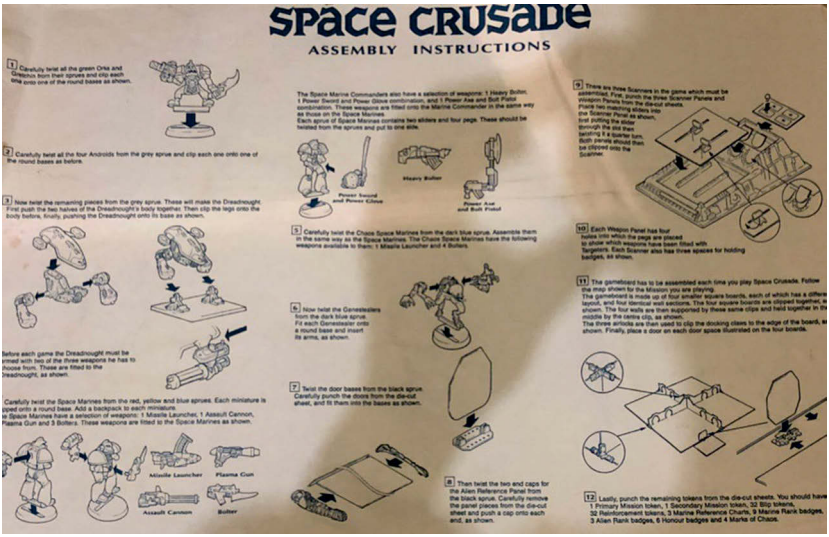
56 These initially appear as 'doll figures' and can be pasted with stickers before the first game to construct figures with concrete genders, ethnicities, etc.

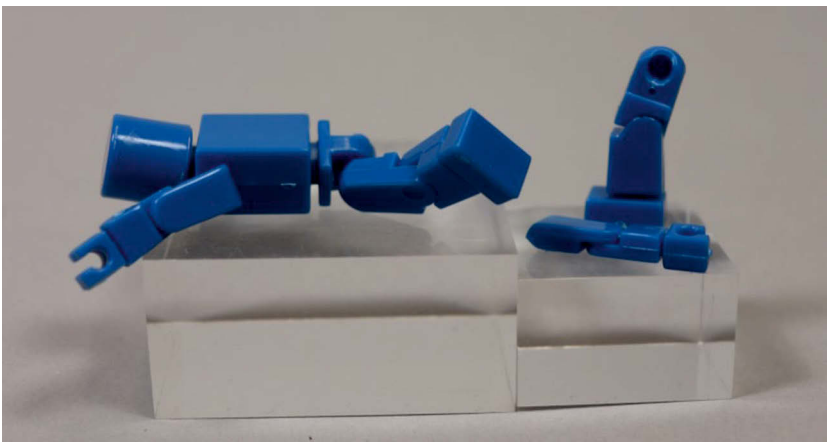
57 T. Ingold: "Materials Against Materiality," p. 9.

58 Ibid.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

*Figures 10 and 11: Assembly Instructions for Game Figures in SPACE CRUSADE; Game Figure with Removable Body Parts in GET BIT!*



Sources: SPACE CRUSADE (unknown). Cayde6sBeautifulBeautifulHorn: "40k Nostalgia Goodness. Feat Space Crusade," in: *imgur* (2018), https://imgur.com/gallery/OSdch [edited]; HAI-ALARM! (Asmodee, 2013). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg

These transformations, which are to a large extent conditioned by the players' use, can be purely on the aesthetic level but can also lead to loss of instrumental agency and ludic dysfunctionality. The degrees of loss of agency through demateria-

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lization can be illustrated using the example of figures in TIPP-KICK (since 1921, cf. Fig. 12).

*Figure 12: Dematerialization of Game Figures in TIPP-KICK*

Source: Various TIPP-KICK editions (Mieg, unknown). Photo by P. Podrez, with friendly support of Deutsches Spielearchiv Nürnberg.

The eponymous principle of this table soccer game is based on 'tapping' a button on the head of the figure to make its leg swing and 'kick' the ball in the direction of the goal. The figures, historically made of sheet metal first, then of lead, and today mainly of zinc, are relatively robust in terms of game mechanics. Age-related flaking of the thin layer of paint is a phenomenon with a purely aesthetic effect. However, pressing the button too often or too hard can cause it to break off. In principle, the figure is then still functional because it is possible to press the iron wire sticking out of the head to move the leg.

However, this not only requires more skill, it can also become painful, thus influencing the actions of the players. The figure becomes completely dysfunctional when the leg 'wears out' due to the deterioration of the metallic joint and thus performs crooked movements, making aiming impossible, or completely breaks off, making it impossible to trigger a shot at all. In terms of their instrumental agency, game figures thus have a certain lifespan, which results from their material and their use by the players.

If such phenomena can be interpreted as transformations towards *destruction*, then in a final step, transformations should also be considered whose starting point is in the *creation* of figures. This does not refer to the aforementioned

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assembly of prefabricated elements but to the creative (re-)designing of figures, which has less ludic than aesthetic or ideological motivations.

The extent to which such processes take place depends on the intentions of human actors, but also on the figures, or more precisely: on their affordance '(re-)designing.' This affordance is all the stronger, the more blank spaces the figures leave open, inviting to be filled. One such blank space is the color scheme. In particular, detailed but monochrome miniatures, such as those found in fantasy, horror, or science fiction scenarios, invite the player to paint them. In this context, entire communities exist,[59] which exchange tips on the use of colors or the application of various painting techniques, and in which the presentation of design results and subsequent discussions are also important.

Taking a look at such designed results on the ideological level, it is striking that remarkably stable conservative conventions of *gender*, *race*, *class*, *age*, *dis/ability,* or *species* are inscribed into them. Although the underlying models already display strong conservative prescriptions through predefined aspects such as body shape, clothing, facial features, etc., subversive moments could theoretically arise through creative design processes. Here, it would be obvious to establish different ethnicities through the use of various painting colors as skin colors, the queer appropriation of gender-connotated features such as make-up, or the like. De facto, however, the design is dominated by classical hegemonic patterns, as an exemplary look at one figure from WARHAMMER 40.000 shows (cf. Fig. 13). The (hand-designed) bearer of an (industrially produced) banner can be seen. The painting of the figure emphasizes the futuristic armor with its powerful elements suggesting the great strength of the arms and the sharp-edged, masculine connotated face of a white man, distorted to a martial scream, framed by a beard, marked by wounds. This way, a typically militaristic image of white masculinity is (re-)produced in the design of the figure, which is not only representative of WARHAMMER 40.000 but of many board and tabletop games. However, exceptions can be found, and these can even appear as complete figural redesigns. In such cases, the original figure establishes the affordance of 'transforming,' which can be realized in an analog way through working with modeling material as well as digitally through technologies like 3D printing. A counter-example to the conservative figure discussed, for example, is represented by a queer WARHAMMER 40.000 figure (cf. Fig. 14). This figure is modeled to fly a flag painted in rainbow colors as a symbol of the Pride movement; its pole adorned with a small heart. The Pride symbol is also reflected in a shoulder element of the figure, while the rest of the armor is painted pink. In addition, the figure has been modeled to give a

59 For an example cf. http://www.coolminiornot.com/forums/

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thumbs-up as a positive commentary on the Pride theme. Finally, the use of a model in which the face is obscured by a visor allows for the reading that a figure with diverse gender identities may be concealed beneath the armor.

*Figure 13 and 14: Transformed WARHAMMER 40.000 Figures. Martial Masculinity and Diversity*

Sources: Unknown parts of the WARHAMMER-series. u/AllThatJazz85: "Standard Bearer for the XIIIth raising the banner high," *reddit* (2021), https://www.reddit.com/r/Warhammer30k/comments/kz8yj9/standard_bearer_for_the_xiiith_raising_the_banner/[edited]; u/yoruma: "Mytake on the Pride Marine," *reddit* (2021), https://www.reddit.com/r/Warhammer/comments/o7nv09/my_take_on_the_pride_ marine [edited]

## CONCLUSION: WHY NOT ANALOG AND DIGITAL GAME FIGURES?

This article sought to gain some insights into the playfulness of materialities by taking a closer look at analog game figures. To conclude, this approach will be discussed in relation to the playfulness of game research.

Although efforts to deal with analog games have been made in recent years in the fields of game studies and media studies,[60] they are (still?) exceptions. There

60 From a media studies perspective cf. Booth, Paul: *Board Games as Media*, New York: Bloomsbury 2021; from a game studies perspective cf. Clüver: "Würfel, Karten und

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is a gap between game studies, in which games are generally synonymous with digital games, and analog game research, which, as mentioned at the beginning, is less visible and, moreover, characterized by conceptual and theoretical ambiguity. However, both research directions could be set into productive dialogue with each other if one were to draw on a holistic concept of games, which understands them as nomadic media[61] that can manifest in a wide variety of forms and which also approaches the specific elements of digital and analog games in equal measure.

In the course of their history, analog and digital games have constantly remediated each other.[62] Analog games such as NIM or CHESS served as models for digital adaptations as early as the 1950s, and if one looks at today's games landscape, one can find innumerable examples of digitalized board games, ranging from classic games like SENET (2022) to role-playing games like GLOOMHAVEN (2021). Intermedial adaptations[63] also occur in the opposite direction. This becomes clear when taking a look at the board game adaptations of canonical arcade games that appeared in the 1980s, such as PAC-MAN (1982) or FROGGER (1981), but also by focusing on the more complex and narrative adaptations of games from various genres since the 2000s, from ANNO 1701: DAS BRETTSPIEL (2007) to THIS WAR OF MINE: THE BOARD GAME (2017). All of these adaptations raise questions about the media-specific transformations that inevitably accompany them.

In addition to adaptations, numerous intermedial references[64] between analog and digital games can be observed, breaking away from concrete models and dealing instead with individual motifs, aesthetics, and structures of games. The palette is extensive, ranging from the integration of dice and card game elements into digital (role-playing) games to video games-oriented, level-based design in board games such as LOONY QUEST (2015). Finally, on the object level, one can also cite games that establish ludic networks in hybrid constellations when analog elements are required to interact with digital devices, e.g., the aforementioned WORLD OF

Bretter;" Freyermuth, Gundolf S.: *Games—Game Design—Game Studies. An Introduction*, Bielefeld: transcript 2015; Schmidt, Hanns Christian: "Ludo Labo Literacy. Papphäuser, Bauhäuser und der Versuch einer medienpädagogischen Selbstentfaltung," in: GamesCoop (eds.), *Navigationen: Spiel|Material* 1/20 (2020), pp. 161-178.

61 Rautzenberg, Markus: "Spiel," in: Beil, Benjamin et al. (eds.), *Game Studies*, Wiesbaden: Springer 2018, pp. 267-281, here p. 267.

62 Cf. Bolter, Jay David/Grusin, Richard: *Remediation. Unterstanding New Media*, Cambridge, Mass.: MIT Press 2001.

63 Cf. Rajewsky, Irina O.: *Intermedialität*, Tübingen: Francke 2002, p. 16.

64 Cf. ibid., p. 16.

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YO-HO or XCOM: THE BOARD GAME (2015), an analog video game adaptation that requires a smartphone app in order to play it.

Analog-digital intersections are also numerous on the theoretical level. Following this article, one can continue to focus on theories of materiality and agency-based approaches such as ANT or affordance theories. After all, not only analog games with their players and game materials ranging from boards, cards, and dice to balls, throwing objects, and the like can be understood as ludic networks. Digital games also constitute ludic networks, which, in addition to the players, involve a variety of media technologies such as PCs, consoles, screens, controllers, or the respective game software, as well as the images and sounds generated by them, etc. All these media technologies are materially based, which is why technological-materialistic approaches like platform studies would be highly compatible with the analysis of digital ludic networks. The aspect of materiality, however, is not only found in hardware but also on the level of aesthetic representation. In game worlds, the material characteristics of landscapes, objects, figures, and the like are made as tangible as possible, for example, by simulating surfaces and textures or by evoking haptic, olfactory, or gustatory qualities.

Finally, game figures could function as an intersection on an analytical level. Most video games are just as figure-based as most analog (board) games. This means, for example, that certain questions raised in this article—for example, regarding aisthetic or cultural aspects—could also be asked in relation to digital game figures. Conversely, approaches to figure analysis[65] could be adapted and made useful for understanding analog game figures. Moreover, comparative approaches are conceivable. For example, the abovementioned remediations of analog and digital games also affect figures to a considerable extent. What does it mean in terms of its affordances when, for instance, Pac-Man is transformed from a collection of pixels on the screen of an arcade machine into a plastic figure with a mechanically hinged mouth? And vice versa: If the static poses of miniatures from tabletop games are transformed into audiovisually opulent movements and actions, what types of agency do the figures gain or lose? Furthermore, how can game figures that establish hybrid ludic networks be analyzed? Nintendo's amiibo figures, e.g., are material figures that are able to interact with specific (Nintendo) hardware and software and, after being scanned, unlock functions in games that would not be accessible without them.

65 Cf. F. Schröter: *Spiel|Figur*, pp. 147-178.

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These are just a few examples that show that figures are highly interesting research objects of holistic game research:[66] They offer the opportunity to rethink a media theory of play(ing) and to observe different figural forms, functions, and meanings in an analytical way. From a historical perspective, game figures allow us to reconstruct their millennia-old lines of evolution spanning all cultural areas, from the ancient bone to the avatar of the 21st century. Focusing on cultural studies or ideology critique, game figures can be understood as representations of images of identity. These and many other perspectives show that game figures are more than just playful material: They are theoretically, historically, aesthetically, and politically significant.

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66 For the following, cf. Podrez, Peter: "Mehr als nur Spielsteine—Medienkulturwissenschaftliche Perspektiven auf Spielfiguren," in: Boch, Lukas et al. (eds.), *Mehr als nur Zeitvertreib? Wissenschaftliche Perspektiven auf analoge Spiele. Eine Publikation anläßlich der SPIEL 2021*, Münster: WWU Münster 2022, pp. 240-250.

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# Have We Left the Paperverse Yet?

## Maps, Boxes, and other Paper Objects as Imaginative Devices of Unfulfilled Desires in Early Gaming

MICHAEL A. CONRAD

## AT THE END OF THE PAPERVERSE?

What you saw was not always what you got in the days of early gaming. Disappointment was a common experience for gamers whenever the flashy depictions of game contents as presented in adverts and the limitations of early computer graphics clashed on screen. One of the most striking examples for this was the infamous debacle of E.T. THE EXTRA-TERRESTRIAL (1982). Frequently deemed the worst game ever made and responsible for Atari's decline and the subsequent video game crisis of 1983, this questionable status has been somewhat vindicated in recent years.[1] The realities of non-intuitive gameplay, glitches, awkward controls, and other badly executed aspects aside, one reason for the game's disputed reputation certainly was the large divide between players' expectations, who had seen Steven Spielberg's blockbuster, and the technological limitations of game consoles that did not allow for a similarly captivating and immersive experience. However, such shortcomings alone do not suffice to explain the commercial failure since all early games were restricted by the same technological limitations,

1 Harris, John: "Review Roundup: Was E.T. Really the 'Worst Game Ever'?" in: *Game History Foundation,* https://gamehistory.org/et-atari-reviews-worst-game-ever/, collects several reviews from magazines of the time, concluding that *E.T.* was not considered the worst game of the era, not even of the month of its release, "but with its high licensing cost and failure to perform at the market, it was an easy scapegoat for a console game industry in decline." (Ibid.)

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especially when it came to computer graphics that would be reduced to strongly pixelated graphics for a long time. Players usually coped with 'looking past' limitations and filling in the gaps left by limited visual presentations with their own imagination.

Additional materials and media, therefore, were very much sought-after for enriching and invigorating gameplay experience. In this regard, the packaging itself could be very relevant. The cardboard boxes of 'bookcase games,' with their origins in tabletop games, would frequently serve as canvases to paint upon what technological restrictions left to desire. Moreover, they are proof of how much early gaming was imbued in the paper world it had been born into. Notorious publishers, such as Infocom, who will be discussed in more detail further below, met demands for richer experiences by not only offering colorful and artful boxes and manuals but also 'feelies'—tangible objects to expand and enhance sensory dimensions, including patches, brochures, buttons, scratch-and-sniff-cards, and others, many of which, were made of paper.

Contrary to media histories that tend to organize time in clear-cut periods, the introduction of computers did not immediately end the dominance of paper. That is why in his cultural history of paper, Lothar Müller aims to correct Marshall McLuhan's simplifying evaluation of the relevance of paper only in its subservience to the printing press. Manuscript culture did not vaporize in thin air after Gutenberg's revolutionary invention; in fact, it still lives on in niches within our societies.[2] The diachronous linear historical narrative of successive replacement needs more distinction, especially with respect to transition periods like ours, which is why Müller turns back to Harold Innis, who had inspired McLuhan to his central ideas. Innis had defined stone and clay tablets as well as parchment as "heavy" media, while he called paper a "light" medium, as it enables widespread, horizontal communication and thus controlling large territories. In paper, the circulation function supervenes the conservation function, and it, therefore, was extremely important for the rise of modern life; modernity is unthinkable without the introduction of paper in the late Middle Ages:[3]

2 McLuhan, Marshall: *The Gutenberg Galaxy: The Making of Typographic Man*, Toronto, Canada: University of Toronto Press 2002 (1962). Müller, Lothar: *Weisse Magie. Die Epoche des Papiers*, Munich: Carl Hanser 2012, p. 99.

3 Innis, Harold: "Die Eule der Minerva (*Minerva's Owl, 1947*)," in: Barck, Karlheinz (ed.), *Harold A. Innis, Kreuzwege der Kommunikation. Ausgewählte Texte*, Vienna/New York: Springer 1997, pp. 69-94, here p. 87; Havelock, Eric A.: "Harold A. Innis – der Geschichtsphilosoph. Eine Gedenkschrift," in: Barck, Karlheinz (ed.), *Harold A. Innis, Kreuzwege der Kommunikation. Ausgewählte Texte*, Vienna/New York:

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"Because everything that matters to us happens on paper. Without paper, we are nothing. We are born, and issued with a birth certificate. We collect more of these certificates at school, and yet another when we marry, and another when we divorce, and buy a house, and when we die. We are born human, but are forever becoming paper, as paper becomes us, our artificial skin. Everything we are is paper: it is the ground of activity, the partner to all our enterprises, the key to our understanding of the past."[4]

Paper is a material foundation of modern life. Following the perspective of material theory, paper and digital media will be foremost discussed in terms of artifacts as material objects. This paves the way for analyzing how games intermediate and organize the interrelationship of human and non-human agents that inform our culture and thus also are necessary preconditions of ludic experiences.[5]

Of course, paper artifacts might feel like they have fallen out of time. Indeed, paper is becoming a rare sight in public life. And so, it is little surprise that paper objects are met with nostalgia, an emotion commercially exploited for the sale of paper toys, paper sculptures, or cut-out sheets for grown-ups. What seems like the "auratic" quality of paper marks the moment of its increasing disappearance.[6] This is no contradiction to what has been said, as media nostalgia is the effect of *perceived* loss, not necessarily of real loss. We may be reminded of the paper-laden

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Springer 1997, pp. 14-30. Miodownik, Mark: *Stuff Matters. The Strange Stories of the Marvelous Materials That Shape Our Man-Made World*, New York, NY/London: Penguin 2014, pp. 32-63. As is well-known, Marshall McLuhan had been heavily inspired by Innis's work, and even his famous theorem that "the medium is the message" had been prefigured by the latter's writings. Cf. McLuhan, Marshall: *Understanding Media: The Extensions of Man*, New York/Toronto/London: McGraw-Hill 1964, p. 8.

4 Sansom, Ian: *Paper: An Elegy*, London: Forth Estate 2012, p. xix.

5 Hodder, Ian: *Entangled: An Archaeology of the Relationships between Humans and Things*. Malden, Mass.: Wiley-Blackwell 2012. Latour, Bruno: "On Recalling ANT," in: John Law, John Hassard (eds.), *Actor Network Theory and After*, Oxford: Blackwell 1999, pp. 15-25; Latour, Bruno: *We Have Never Been Modern*, Cambridge, Mass.: Harvard University Press 2002; Latour, Bruno: *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford: Oxford University Press 2005; Barad, Karen: *Meeting the Universe Halfway. Quantum Physics and the Entanglement of Matter and Meaning*, Durham/London: Duke University Press 2007; Haraway, Donna J.: *Staying with the Trouble. Making Kin in the Chthulucene*, Durham and London: Duke University Press, 2016.

6 Benjamin, Walter: *The Work of Art in the Age of Mechanical Reproduction*, London: Penguin, 2008.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

days of our childhoods, while paper might still be an essential building stone of our everyday lives.

However, there are more positive, more utopian narratives of this loss to tell. For the reduction of paper production and usage has also been propagated as an important global goal for decades in correspondence with the UN Sustainable Development Goals (SDGs), especially "responsible consumption and production."[7] As paper production requires cellulose harvested from trees, the reduction of paper helps to prevent deforestation so that the loss of paper can be framed as something desirable. In fact, the idealized concept of a 'paperless office,' an idea that was already proposed as early as 1975,[8] stems from the desire to create more sustainable work environments by supplementing paper-based methods with digital ones. Given that we mostly use emails for communication today, work with digital documents and try to avoid printing, it is justified to say that we have taken a great leap forward. Mobile photography, electronic paper, speech recognition, and speech synthesis are increasingly replacing the drafting and noting function of paper as well.[9] What is more, there are informational advantages: printed information can become outdated, while computer information can be constantly updated. Also, digital data can be managed within the same environment, whereas printed information requires external means of organization.

Public discourse on digitalization, however, has its blind spots. A still common notion is to perceive digital media as immaterial and digitalization as a process of de-materialization, a view characteristic of the 1990s. Sociologist Volker Grassmuck, for example, demonstrates this tendency when he describes digitalization in terms of loss and absence, of "increasing abstraction and decreasing dimensionality."[10] Referring to Vilém Flusser (1920-1991), he populates the fully digitalized Turing Galaxy with "timeless bodies," "surfaces without depth," and "points

7 United Nations Foundation: "Sustainable Development Goals," https://unfoundation.org/what-we-do/issues/sustainable-development-goals

8 Giuliano, V.E.: "The Office of the Future," in: *Business Week*, June 30, 1975, pp. 48-84.

9 Conrad, Michael A.: "Papierlose Notizen: Zum Gebrauch von Handyfotografie als Mnemotechnik des Alltags," in: Lobin, Henning et al. (eds.), *Lesen, Schreiben, Erzählen. Kommunikative Erzähltechniken im digitalen Zeitalter*, Frankfurt a.M./New York: Campus Verlag 2013, pp. 83-106.

10 Grassmuck, Volker: "Die Turing-Galaxis. Das Universal-Medium als Weltsimulation," in: *Lettre International* 28, 1995, pp. 48-55; my translation, German original: "zunehmender Abstraktion und abnehmender Dimensionalität."

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without lines,"[11] a description that finds its climax with the problematic assumption of a "zero-dimensionality of bits."[12]

Yet even though they are not visible to the human eye, bits and bytes are by no means without dimension; they indeed are *res extensa* and, as such, material. The unavoidable material dimension of digital media is exactly the reason why today's public has been discussing more vividly the possible effects the Internet might have on energy consumption and, thereby, on CO2 emissions and climate change. In its Tracking Report for 2021, "Data Centers and Data Transmission Networks," the International Energy Agency IEA states that the need for data services is rising exponentially and that data centers today already account for approximately 1% of global electricity demand. It is thanks to increased energy efficiency that this number is not much higher. In this regard, gaming and streaming services have been identified as the main drivers for boosting the demand for data centers and network services. It is estimated that they will be responsible for up to 87% of consumer Internet traffic in 2022.[13] In their pioneering study entitled "Taming the Energy Use of Gaming Computers,"[14] father-and-son team Evan and Nathaniel Mills have analyzed the global energy consumption by gaming, and it has been estimated that about 75 billion kilowatt-hours of electricity are required for gaming alone worldwide, while U.S. American gamers emit about 12 million tons of carbon dioxide annually.

Energy issues aside, the different devices needed for working with digital media—monitors, batteries, computer mice, data cables, storage media, etc.—are no less physical and must be produced. What makes this worse is that the production is part of large global supply chains, and like all microelectronics, many elements of computers and notebooks require Rare Earth Elements (REE), which are often

11 Ibid.; my translation, German originals: "zeitlosen Körpern," "tiefenlosen Flächen," "linienlosen Punkten."

12 Ibid.

13 International Energy Agency (IEA), George Kamiya: "Data Centers and Data Transmission Networks," Tracking Report Nov 2021, https://www.iea.org/reports/data-centres-and-data-transmission-networks. The often-cited example, according to which each Internet research has a footprint of 0.2g $CO_2$ is not likely to be correct anymore, since Google has made its search engine more energy-efficient by using renewable energy and carbon offsetting, see Griffiths, Sarah: "Smart Guide to Climate Change," https://www.bbc.com/future/article/20200305-why-your-internet-habits-are-not-as-clean-as-you-think

14 Mills, Evan/Mills, Nathaniel: "Taming the Energy Use of Gaming Computers," in: *Energy Efficiency* 9/2, June 2015, pp. 1-18.

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mined in countries with very low environmental and social standards. Human rights violations, deforestation, and contamination of land and water, therefore, are side-effects of their mining.[15] Moreover, the handling of electronic waste causes great ecological problems, which is why there have been calls for more eco-friendly recycling. That is why green computing has become an important topic in recent years.[16] Considering the physicality of ICT infrastructure, it thus becomes clear how much gaming does indeed *matter*, not only in the sense of social discourse but very much in ecological terms as well. The possible outcomes of the Anthropocene, therefore, also lie in the responsibilities of gamers. All negative effects notwithstanding, the move toward a more digital world is generally regarded as an important next step away from overbearing resource consumption and waste production, making digitalization a key technology of social transformation.

What one, therefore, must bear in mind is that gaming—also and necessarily—is a *material practice*, a point to be analyzed in more detail with the following examples, which also highlight the interdependency of paper and digitality in early gaming from the 1980s till the early 1990s. More than that, they clarify how deeply computer technology and gaming are rooted in paper culture. Far from proposing any linear model, it will show how paper is becoming more and more obsolete for digital gaming, a point that will underscore how much the history of digitalization so far has also been told as a history of emancipation from its overbearing forefather, paper.

The concentration on material practice and the relationships between humans and non-human actors prompts basing the analysis on Bruno Latour's Actor-Network-Theory (ANT) and other posthumanist theories, such as those offered by Donna Haraway or Karen Barad, as well as Ian Hodder's entanglement concept.[17] Yet a central leading thought comes again from Grassmuck, who ascertained that

15 Barros, Óscar et al.: "Recovery of Rare Earth Elements from Wastewater Towards a Circular Economy," in: *Molecules* 24/6, March 13, 2019, p. 1005. Rim, Kyung Take/Koo, Kwon Ho/Park, Jung Sun: "Toxicological Evaluations of Rare Earths and Their Health Impacts to Workers: A Literature Review," in: *Safety and Health at Work* 4/1, 2013, pp. 12-26.

16 Considerations of the ecological impact of computing actually has a longer history already, starting in the late 1980s, but the issue certainly has created more public awareness in recent years. See, e.g., Ahmad, Ishfag/Ranka, Sanjay: *Handbook of Energy-Aware and Green Computing,* Boca Raton, FL: CRC Press 2012.

17 I. Hodder: Entangled. D. Harraway: *Staying with the Trouble*; B. Latour: *We Have Never Been Modern*.

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the materiality of (storage) media is capable of prescribing their usage: "Every phase of media rests on specific basic elements, the sign material, and its materiality, which itself enables characteristic operation, e.g., forms of storage or of making connections."[18] In assemblages of paper and computer technology, as they are of interest here, this implies that they can both similarly prescribe gaming experience. Instead of pretending that material and digital worlds belong to separate storylines, it is necessary to stress that they share a common history in which they pose as collaborative and co-creative partners. Focusing on paper will allow us to surpass media histories that assume strong breaks and will instead offer a sensitivity for longer cultural developments in which the appearance of computer games finds itself enmeshed. In turn, the enormous historic significance of paper for enabling new games and toys, as well as new ways of play, will become much clearer.

To focus on materiality does not mean to imply that there aren't, in fact, aspects of games—both analog and digital—that could be described as immaterial. Rules, for instance, are something that is usually considered essential for anything that is to pass as a game. Even in spite of Ludwig Wittgenstein's important assessment that the plethora of phenomena we tend to subsume under the linguistic label of 'games' is basically inexhaustible and can therefore not be given any general definition to cover all, the existence of a set of rules is something that even he presupposed as the lowest common denominator, although one can, of course, debate how crucial they really are for games and if we could actually think of games without rules. What can be agreed upon, though, is that in games, rules do not always have to be defined explicitly to be in effect.[19] But while rules may have material correlations, they share a widely media-independent existence and can thus be expressed in different medial forms. What is more, the verbalization of rules alone is usually not sufficient to convey their meaning; instead, we often need assemblages of different media to explain rules to others, often with a blend of 'show and tell,' words, gestures, and physical demonstrations:

18 V. Grassmuck: "Die Turing-Galaxis," p. 48; my translation, German original: "Jede Phase der Medien beruht auf bestimmten Grundelementen, dem Zeichenmaterial und seiner Materialität, die wiederum charakteristische Operationen, z. B. Formen der Speicherung oder Verknüpfung, zulassen."

19 Wittgenstein, Ludwig: *Philosophische Untersuchungen*, Frankfurt am Main: Suhrkamp 1977, esp. §66; Macho, Thomas: "'Es schaut uns doch an'. Zur physiognomischen Metaphorik in Wittgensteins Aufzeichnungen," in: Arnswald, Ulrich/Kertscher, Jens/ Kroß, Matthias (eds.), *Wittgenstein und die Metapher*, Berlin: Parerga 2004, pp. 253-268.

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"The code of a computer game is not the exact same thing as its rules. The computer code is part of the medium that embodies the game, just like the written-out rules of Chutes and Ladders are embodied in the medium of printed ink on paper. But as with the rules of a non-digital game, in which aspects of the rules can be hidden 'under the hood' on the constitutive level, or pass unspoken on the implicit level, the rules of a digital game take a number of different forms. This means that although there is some overlap between the code of a game program and the rules of the game that the program makes possible, there is not a one-to-one correspondence between them."[20]

Given its crucial role as a building block of modernity, in the following, I will explore in more detail the diachronous history of paper and gaming. For that purpose, I will first turn to the Middle Ages, when paper was first introduced to Europe, and so the paper world we know today was formed. It is also here that we are going to find the first alliances of games and paper, a connection that then becomes similarly important for early computer technology that, as a short analysis of Alan Turing's ideas on the universal machine will show, was not only born into a paper world but grew out of it and stayed attached to it for the longest time of its existence. The drafting function of paper, for which the blank sheet has literally become a synonym for the process of brainstorming (and an empty, impartial mind), is no less still crucial for game design as the brief analysis of the history of the creation and aesthetics of accompanying materials of MYSTERY HOUSE by Roberta Williams will show, which today is often considered the first graphic adventure. Paper and computer remained co-creative allies for quite some time, which the examples of the (now mostly lost) cultural technique of hand-drawn computer maps and the supplement of paper objects to give early games additional sensory qualities demonstrate. Altogether, the various examples show how much we should consider the medial identity of early games as open and fluid, material-immaterial hybrids—a point returned to and elaborated more a last time in the conclusion.

## THE DEVELOPMENT OF THE FIRST PAPER GAMES IN THE LATE MIDDLE AGES

The use of paper for gaming purposes more or less coincides with its increasing presence in Europe. It seems that, time and again, the appearance of new media

20 Salen, Katie/Zimmermann, Eric: *The Rules of Play. Game Design Fundamentals*, Cambridge/London: MIT Press 2004, p. 142.

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quickly spurs impulses to explore how it could be used for games. A reason certainly lies in the proximity between research and gaming itself, as both are actions devoted to the exploration of the possible. In turn, this might help explain why the game industry can be a driver of innovation, which is true not only for the age of the computer but also for the age of paper.

We cannot determine with absolute precision when exactly the first paper mills were established in Europe, but they are already testified for medieval Andalusia. What is more, the increased mention and appearance of playing cards, which belong to the first game objects made from paper we know, coincides with the intensification of paper production in Europe during the first half of the 14th century. Since most relevant records on the early history of card games are, in fact, prohibitions in legal codes of Italian cities, it seems justified to assume that they had already existed for a while before they became a public nuisance.[21] Like with other games, prohibitions had little effect on the demand for playing cards, which was constantly high and made the development of new production technologies necessary, with one result being the improvement of woodcut print. This meant it was no longer required to handcraft and hand-paint cards; from now on, it was possible to mass-produce them mechanically, so that within a short time, cards ranged among the most frequently produced printed commodities in all of Europe.

Another printed game-like good in German-speaking regions were the so-called *Losbücher*, divinatory books created for entertainment purposes, or at least that was what their, often anonymous, authors claimed. The books offered collections of short prophecies, usually in rhymes, that readers could pick by applying a method of sortilege, usually the casting of dice or the picking of cards to determine the valid forecast. The application of game objects was quite common, which is why some books use dice or cards as a system to order their prophecies. The integration of principles of chance turned these books into an interactive experience. At least in one case, the anonymous *Tierlosbuch* (which translates as *The Animal Book of Lots*) printed by publisher Martin Flach in Basel in 1485, the book came with its own integrated randomization device: A volvelle, a small paper disk that could be spun like a roulette wheel.[22] It was segmented, with each segment

21 Conrad, Michael A.: "Randomization in Paper: Shuffling as a Material Practice with Moral Implications in the Late Middle Ages and Early Modern World," in: Classen, Albrecht (ed.), *Pleasure and Leisure in the Middle Ages and Early Modern Age*, Berlin/Boston: De Gruyter 2019, pp. 539-582.

22 Crupi, Gianfranco: "Volvelles of Knowledge. Origin and Development of an Instrument of Scientific Imagination (13th-17th centuries)," in: *JLIS—Italian Journal of Library, Archives and Information Science* 10/2, 2019, pp. 1-27.

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carrying the name of an animal that referred to one of the divinatory poems. The animal chosen by the wheel revealed the right poem to look up in the book.[23]

The connection between rotary motion and luck, and thus of life in general, has a long history. Its most famous manifestation certainly is the trope of the Wheel of Fortune, the *rota fortunae*, as portrayed by Boethius (ca. 477-524) in his dialogue with Goddess Fortuna in *De consolatione pilosophiae* (523 AD). The most famous depiction certainly is from the *Carmina Burana* manuscript at Bayerische Staatsbibliothek in Munich. However, the trope of a cyclical form of contingency persists until today—not just in roulette but also in board games such as GAME OF LIFE: With each turn of an integrated wheel of fortune, players follow the stages of an idealized western life from graduation till pension, with the—very obviously capitalist—goal of trying to accumulate as much money as possible. The game was based on a much earlier one called THE CHECKERED GAME OF LIFE developed by the company's namesake, the lithographer Milton Bradley, who modeled it after the traditional GAME OF THE GOOSE.[24] The paper technology of the medieval volvelle has been continued as well and re-employed for coding and decoding. One famous example is the code wheel ("Dial-A-Pirate") for THE SECRET OF MONKEY ISLAND, intended as DRM and copy protection. The game could only be played when users replicated a combination on the screen with the code wheel and entered the resulting code. However, this protection method was far from perfect since users could xerox the original and thus tinker together their own code wheel copies.[25]

## ENDLESS PAPER: ALAN TURING AND THE COMPUTER

Yet the relationship between paper and digital media goes much deeper than these few examples of game design techniques might suggest. First conceptualized by Alan Turing (1912-1954), the idea of the computer as a universal machine is deeply rooted in paper technology. One must bear in mind, though, that this universal machine, as described in *On Computable Numbers* (1936), is, first of all, a

23 Conrad, Michael A. (ed.): "Tierlosbuch," in: Heiles, Marco/Reich, Björn/Standke, Matthias (ed.), *Gedruckte deutsche Losbücher des 15. und 16. Jahrhunderts*, Stuttgart: Hirzel 2021, pp. 31-86.

24 Strouhal, Ernst: "Die Welt im Spiel—Panoramablick," in: Strouhal, Ernst, *Die Welt im Spiel. Atlas der spielbaren Landkarten*, Vienna: Brandstätter 2015, pp. 7-15.

25 As, for instance, mentioned by user "drym" on January 24, 2021, in a forum about vintage games, https://www.kultboy.com/index.php?site=t&id=2573&s=1&st=3

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thought experiment and cannot be actually built.[26] Whereas its main faculty consists in being able to perform all possible types of calculations, its basic mechanism is astonishingly simple: a read/write head moves along an infinite "tape (the analog of paper)" that is segmented into an equally infinite number of sections ("squares"). Each of these squares carries either a symbol taken from a defined set of symbols or is empty. The machine can only scan one square at a time. At any given time, it has one of a finite set of internal states. A table (its 'program') tells the machine what it must do when it finds a certain symbol on the tape while having a certain internal state. The actions of the machine are limited to moving one square left or right, writing a symbol onto the tape, shifting into a different internal state, or halting. Yet by these simple means, any kind of computational operation can be performed.

Turing is very clear in emphasizing that his main point of comparison are humans that, at his time, performed computational acts which, as he notes, were "normally done by writing certain symbols on paper." Employing human computers for doing complex calculations was, back then, still a widespread profession. But even more interesting is that Turing explicitly introduces paper as the material reference point of his thought experiment, even though he, at an early stage in his essay, clarifies that this tape does not have to be proper paper but "the analogue of paper." The operations he describes, therefore, are, at least to some extent, media-independent. Accordingly, he continues:

> "We may suppose this paper is divided into squares like a child's arithmetic book. In elementary arithmetic the two-dimensional character of the paper is sometimes used. But such a use is always avoidable, and I think that it will be agreed that the two-dimensional character of paper is no essential of computation. I assume then that the computation is carried out on one-dimensional paper, i.e. on a tape divided into squares."[27]

While admitting that computation was usually carried out on the flat surface of paper, Turing hastens to add that he does not regard this as a quality essential for the correct performance of arithmetic operations. A "one-dimensional" paper, he says, would suffice. Yet on closer inspection, this is something quite unimaginable and, in fact, even paradoxical since a square necessarily lives in the realm of two-dimensionality. To make things worse, real paper is actually three-dimensional,

26 Turing, Alan M.: "On Computable Numbers, with an Application to the Entscheidungsproblem," in: *Proceedings of the London Mathematical Society* 2, 1937 (received 1936), pp. 230-265.

27 A. Turing: "On Computable Numbers," p. 251.

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so any talk of two-dimensional paper is a mere abstraction. But since his universal machine is an abstract idea, it is absolutely clear why Turing does not need to assume the properties of concrete paper, neither its feel nor its color or transience (which brings us back to recycling and temporal cyclicity). And still, the mere idea of a writeable surface cannot be completely detached from the properties of paper or the conventions of its use. By relating back to the haptics of pen and paper, Turing designs his universal machine as something more than just an abstract-mathematical object.[28] Naturally, this does not affect the general objective of his argumentation of wanting to demonstrate that no machine can be constructed that could prove with certainty that any proposition *A* is provable.[29] Moreover, it does not need any further debate that infinity cannot be realized within the restrictions of finite resources, and so the infinite tape or paper stripe it would need to construct a true Turing machine can never be implemented, not even in silicon, since even all the sand in the world is, in the end, limited. Therefore, any existing computer can be nothing more than an approximation of Turing's ideal.

As a person of his time, Turing lived within a very vivid paperverse, a world wherein paper was a key facilitator of life, which is why the idea of a paper tape as the carrier of information came so naturally to him. The ubiquity of paper as a resource is also reflected in that punched paper was an early means for recording and storing data for microcomputers, such as the *Altair 8800* (MITS, 1974), when datasets and floppy disks were already around. Punched cards based on stiffened paper—which was, by the way, already in use in the late Middle Ages for the creation of paper cards—represented digital data by the presence or absence of punched holes. The technology was rooted in much older ones developed in the 18th century for conserving and transferring information for controlling looms (and weave patterns). While Basile Bouchon is credited as one of the first to have automatized a loom by punching holes in paper tape, it was Herman Hollerith (1860-1929) who used this technology for recording data that could be read by a

28 Dotzler, Bernhard J.: "A.M.T. (1936): Husserl, Wittgenstein, Musil, Fleck und Turing," in: Dotzler, Bernhard J., *Diskurs und Medium III. Philologische Untersuchungen: Medien und Wissen in literaturgeschichtlichen Beispielen*, Munich: Wilhelm Fink 2011, pp. 249-261, here p. 254; Warnke, Martin: *Das Medium in Turings Maschine,* in: Warnke, Martin/Coy, Wolfgang/Tholen, Georg Christoph (eds.), *HyperKult. Geschichte, Theorie und Kontext digitaler Medien*, Basel/Frankfurt a.M.: Stroemfeld 1997, pp. 69-82.

29 Enzensberger, Hand Magnus: "A.M.T. (1912-1954)," in: Enzensberger, Hans Magnus, *Mausoleum. Siebenunddreißig Balladen aus der Geschichte des Fortschritts*, Frankfurt a.M.: Suhrkamp 1975, p. 113.

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tabulating machine.[30] Yet even in a more general sense, the organization and storage of data in computers have tight ties to paper technologies, especially file cabinets and index cards as invented by Carl Linnaeus (1707-1778) in ca. 1760. If seen in the light of Turing's abstract ideas, the central functionalities of paper have never really left the computer. Even today, algorithms consist of written lines in a formalized language saved as text files—and we are not even considering here the notes and drafts a programmer might pen down on paper to design his program.

## PAPER PROTOTYPES IN GAME DESIGN

But the paperverse not only informs computer games on this very fundamental level. Paper is still an indispensable intermediary for drafting and designing games. A famous case is MYSTERY HOUSE, developed by game design pioneer Roberta Williams (*1953) and today credited as the first graphic adventure game. Williams had been inspired to create her game after having played COLOSSAL CAVE ADVENTURE, the world's first text adventure game, which she had found underwhelming, as well as Agatha Christie's murder mystery novel *And Then There Were None* and the board game CLUE, which helped her to break away from the narrative linearity of the novel. And so, she decided to create *Mystery House* as an interactive murder mystery: while in the beginning, players search for jewels hidden in a Victorian house, throughout the game, they discover the corpses of several persons and therefore have to find out which one of the guests is the murderer before they become their next victim.

For the implementation of the project, Roberta collaborated with her husband, Ken Williams (*1954), who took care of the coding. Given what they perceived as the flaws of text adventures, the couple decided to integrate graphical scenes that would make the game more engaging. For this purpose, Roberta Williams drew seventy scenes, first onto paper, which were then converted to digital images by means of a contraption for the Apple II called a VersaWriter. This tablet allowed for hand-tracing paper drawings with an optical arm. A resulting problem, however, was storage size since the seventy images would not fit into a regular 5¼-inch floppy disk. Ken solved this issue by converting the images into coordinates and coding instructions so that the computer would redraw the scenes in action, which is something players can still observe on-screen: every image is built up in real-time, line for line.

30 Krajewski, Markus: *Paper Machines. About Cards & Catalogs, 1548-1929*, Cambridge, MA/London: The MIT Press 2011.

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Together with her husband, Roberta had founded On-Line Systems (1979), which, after its rebranding as Sierra On-Line, would become one of the most important and influential studios for early computer games, with important releases including the KING'S QUEST (1983-1998), POLICE QUEST (1987-1998), SPACE QUEST (1986-1995), and LEISURE SUIT LARRY series (1987-ca. 2008).[31] MYSTERY HOUSE itself would become part of a series of six adventures called *Hi-Res Adventures* that were published between 1980 and 1982. In 1996, Sierra was bought by CUC International and dissolved in 2008. Roberta retired from the game industry soon after, in 1999.[32] That is, until recently. For on March 22, 2022, during the annual Game Developers Conference held in San Francisco, Roberta and her husband announced that being isolated at home because of the Covid-19 pandemic, they had become so bored that they decided to create and publish a new game—called COLOSSAL GAME ADVENTURE 3-D, based on the aforementioned game of the same name to which they owed much of their career.[33]

While it might seem little surprising that Roberta first drew the rooms of MYSTERY HOUSE out on paper, this is a recommended practice for game design even today. A textbook from 2012 still suggests the use of paper for creating game prototypes, even in spite of today's achievements in software and hardware technology, in fact, because of them, since "software prototypes are relatively slow and expensive to create."[34] In their now classic seminal book on game design, *The Rules of Play*, Katie Salen and Eric Zimmerman similarly refer to paper as an

31 The LEISURE SUIT LARRY series is being continued still, even after Sierra was shut down in 2008.

32 Fish, Charlie: *The History of Video Games*, Barnsley, South Yorkshire, UK/Havertown, PA: Pen and Sword Books 2021, pp. 44-46. Levy, Steven: "The Wizard and the Princess," in: Levy, Steven, *Hackers: Heroes of the Computer Revolution —25th Anniversary Edition*, Sebastopol, CA: O'Reilly 2010, pp. 241-260. See also Roberta Williams's homepage at https://www.sierragamers.com/roberta-williams

33 Andy Chalk, "Sierra founders got 'bored' in lockdown so they're making their first new game in more than 20 years," in: PC Gamer, March 21, 2022, https://www.pcgamer.com/sierra-founders-got-bored-in-lockdown-so-theyre-making-their-first-new-game-in-more-than-20-years/. Also see the video of an interview with both during the GDC 2022, https://www.youtube.com/watch?v=25U6B4lupNM

34 Adams, Ernest/Dormans, Joris: "Paper Prototyping," in: Adams, Ernest/Dormans, Joris, *Game Mechanics. Advanced Game Design*, Berkeley, CA: New Riders Games 2012, pp. 17-19, here p. 17. Exercises in Moore, Michael: *Basics of Game Design*, Boca Raton, FL: CRC Press 2016, pp. 83-86, also make mention of the use of paper for prototyping or pinning down the draft of a game.

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important medium for creators to draft or test their ideas: "Early prototypes are not pretty. They might be paper versions of a digital game, a single-player version of a networked experience, hand-scrawled board and pieces for a strategy war-game, or a butt-ugly interactive mock-up with placeholder artwork."[35] This is possible because "some game mechanics are media-independent," just as much as the execution of the infinite tape in Turing's machine does not necessarily depend on the properties of real paper. Comparably, ludic structures have a life of their own and do not under all circumstances require a digital environment to prosper. This does not imply immateriality but simply that the physical specifics are, at least in many cases, secondary.

Advantages of paper prototyping are that it is cheap, can be implemented rather quickly since it does not need additional coding, and is "inherently customizable."[36] Moreover, with a simple paper prototype, the impact of rule changes can be explored in the process of gaming itself.[37] That said, with it come disadvantages, too: "It is more difficult to involve test players, and not all mechanics translate to board games easily." What is more, a computerized game system also takes care of a lot of the game management needed to turn the game into a smooth and continuous experience, for instance, the updating of points or the spawning of enemies. While some of these mechanics could, at least in general, be executed on paper, the gaming experience can become cumbersome—a point that is also interesting to reflect as it marks the fluent border where the thrill of gameplay might turn into tedious work; which might also be part of the reason why very complex board games tend to be unpopular. Computer games, on the other hand, allow for more complexity since a great part of the menial management is automated and takes place 'under the hood,' thus not directly interfering with the experience.[38]

## THE LIMITATIONS OF EXPERIENCE AND MOORE'S LAW

While paper has always been a crucial means to conserve and transmit knowledge—in the form of manuscripts, books, post-its, and even for early computing—it was also a medium to surpass the modal restraints of early computer games,

35 K. Salen, E. Zimmermann: *The Rules of Play*, pp. 12, 16.

36 See the chapter "Paper Prototyping," in: E. Adams, J. Dormans, *Game Mechanics*, pp. 17-19, esp. p. 18.

37 Ibid., p. 19.

38 K. Salen/E. Zimmermann: *The Rules of Play*, p. 142.

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especially in terms of graphics. To illustrate these limitations, it is helpful to remember that datasets could not store more than 100 KB each, and the Memorex 650, an early floppy disk, about 175 KB. By 1987, however, the newly released 5¼-inch minifloppy was already capable of storing about 1 million bytes (not the exact equivalent of 1 MB). Lastly, the CD-ROM, when its technical standard was introduced in 1983 by Philips and Sony, offered the then mind-blowing capacity of 553 MB.

In parallel, the processing power grew enormously, in beat with what has been called "Moore's Law," a misleading term since it is actually little more than a predictive extrapolation based on past trends introduced by Gordon Moore (*1929), co-founder of Fairchild Semiconductors and later CEO of Intel, stating that the number of transistors in a dense integrated circuit would double every two years.[39] This prediction has guided the semiconductor industry as an ideal goal ever since, although the process has been slowing down recently, with today's transistor counts ranging between 39.54 and 57 billion. Accordingly, the Apple II (introduced in 1977), onto which Roberta and Ken Williams had programmed MYSTERY HOUSE, possessed a RAM of only 4 kB that could be extended up to 64 kB—the capacity with which the Commodore 64 (1982) was already equipped when it left the factories, while today's standard of working memories lies between 16 and 32 GB.

Hence, the possibilities to offer players highly immersive experiences in the 1980s were still very limited. But necessity is the mother of invention, and so both players and producers sought strategies to compensate for what they felt games were lacking, and, again, it was paper that saved the day. Cover art was one way to offer users more than what they could see on screen. While it is, of course, true that cover art is a marketing tool, it was, then, also a way to give game worlds more (visual) detail, more flavor than was possible on screen. To illustrate this, we may again tend to MYSTERY HOUSE and the cover art for its re-release in 1982, which is often found on Internet pages discussing the game, even though it is not the original cover art. The image was printed onto a black sleeve that accompanied the floppy disk and is much more detailed than the cover art of earlier releases of the game.

At first glance, the style reminds of pulp magazines or the covers of 1960s exploitation magazines. The scene is set at night and dominated by a Victorian House, the main site of the game.

39 Moore, Gordon: "Cramming More Components onto Integrated Circuits," in: *Electronics* 38/8, 1965, pp. 114-117. Moore corrected this early prediction again in 1975.

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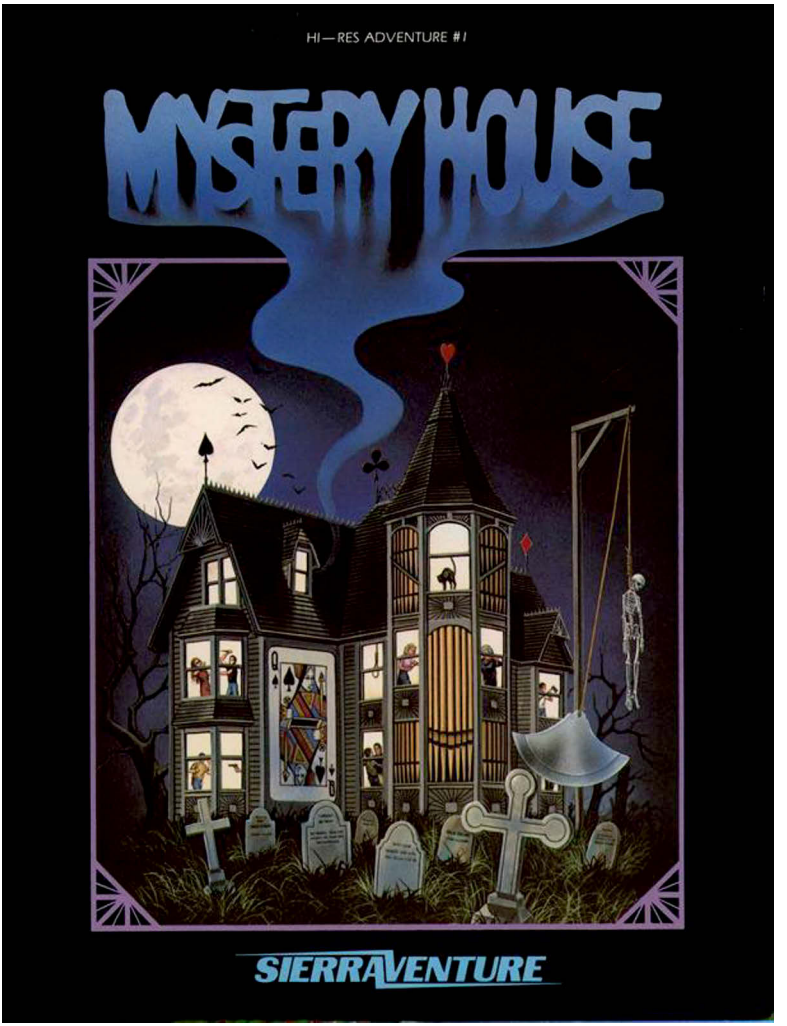
*Figure 1: The Cover Art for the Re-Release of MYSTERY HOUSE (1982)*




Source: Wikimedia

The four suit symbols of playing cards (hearts, diamonds, clubs, spades) decorate the rooftops, and there is a large Queen of Spades fixed onto one wall. The reference to playing cards might be considered an allusion to games in general, but also to the mystery atmosphere (a murderer who hides his identity behind a poker face). There are also Halloween clichés: a flock of flying bats against a full moon, a graveyard in front of the house with eight light-colored gravestones

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in high grass, with six of them carrying unreadable texts—this, of course, a reference to the murders happening in the house. To the right, there are gallows with a hanging skeleton and a razor-sharp swinging blade, the latter obviously an allusion to the murderous torture instrument of Edgar Allan Poe's *The Pit and the Pendulum* (1842). It might indeed be late autumn since the trees surrounding the house are all bare, with their branches pointing upwards like bony fingers. There even are acoustic markers: organ pipes are on display as wall elements, with the deeply droning instrument belonging to the regular repertoire of mystery movie stereotypes. That said, within the lighted windows, we see different scenes of violence, including a rogue hanging from the ceiling, a man in a black shirt ready to stab a woman, a gun being pointed at a person in a yellow shirt, and people wrestling. Lastly, in one window, we see a black cat arching its back—again a symbol of danger, mystery, even madness and magic, to intensify the gloomy atmosphere.

For the first release of the game, Roberta and Ken Williams had added only a green flyer on light blue paper to the floppy disk that advertised the game starting, a bit nerdy, with a dictionary definition of 'adventure':

> "What is an adventure game? According to the dictionary, an adventure is a hazardous or daring enterprise; to risk, hazard, to venture on. One who goes on an adventure is a venturer. A seeker of fortune in daring enterprises; a speculator. In essence, an adventure game is a fantasy world where you are transported, via your computer. You are the key character of the fantasy as you travel through a land the likes of which you will find in books that take you, through your imagination, to the world it is creating."

The text then sets forth by explaining what players of this particular game are to expect: to solve a murder mystery in which "your friends are being murdered one by one," which is why you must find the killer before he finds you. For the second release, they included a flyer of green paper with the black print of a detailed Victorian House next to a barren tree, but without all the other flashy details. The texts are mostly the same, albeit with a few modifications. By the time of the game's re-release in 1982, the authors apparently felt they no longer needed to give lengthy explanations of the concept of graphic adventure games. Instead, they included a more atmospheric flavor text in the present tense that throws players/readers right into the action to build suspense: "As you near the front yard of the large, old Victorian house, you feel an unexplainable tension […]."[40]

Reading accompanying texts or manuals for games is, of course, no mandatory action, and one reason for the frustrations experienced by players of E.T. had been

40 Scans of all cover art are available at http://sierrachest.com

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that they had not. Had they read the instructions, they might have better understood what the confusing symbols on-screen meant and how they helped to master the game. Today, it is regarded as a standard that games have an onboarding strategy or offer in-game tutorials to make sure that players will understand all mechanics. Early games such as MYSTERY HOUSE came without tutorials, which is why the inclusion of printed materials was much more important, as printed texts and images would compensate for the absence of rich details in the game. Handbooks, manuals, and other forms of accompanying objects, therefore, should not be regarded as something external but as partners of a co-creative experience within a multi-modal and multi-medial network. However, there is one important distinction to be made: while official images and texts (and other props, for that matter) help authors and producers control reception, players are not bound to these suggestions and can explore the possibilities of a game world more freely, for instance by creating fan fiction on paper (although fan communities might still decide on what is to be considered canonical and what not).

## NO GAME IS AN ISLAND: MAPPING

Maps belong to the group of paper artifacts that demonstrate how much individual appropriation and adaptation can overlap. Mapping by hand was an indispensable method in early gaming since games did not come with in-game maps or minimaps on a shared screen as they do today. Especially text adventures, such as COLOSSAL CAVE ADVENTURE, or graphic adventures that included labyrinths, such as QUEST FOR GLORY II, required players to map out the alignment of rooms since it was otherwise impossible to keep track and find your way. One of the few alternatives was to hope that in an upcoming issue of a gaming magazine, a map would be provided for the game played that was either offered by the editors or players from members of the reader's community.

As such, self-drawn maps are mnemonic devices that not only help players to orient themselves spatially but also offer a canvas for portraying how they want to remember their experience, which is why some of these maps do not chart the game world accurately but are instead crafted to fit the player's own expectations and desires. To put it differently: Individualized maps constitute ways to reconnect with a past and therefore do not always require accuracy as much as they require *authenticity*. In this regard, they are historical documents that cannot only tell us something about DIY culture in the digital age but also about how players experience game worlds and what they hope to find within.

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With today's in-game maps, the practice of mapping, of course, has become mostly obsolete. However, there has been a small revival recently, with pages on the Internet dedicated to self-drawn game maps, mostly for reasons of nostalgia. On his blog, blogger Jeremy Parish, for example, revisited the old practice and applied it himself, thereby noting that after having drawn every detail in the rooms of METAL GEAR, he can now "glance at a section of map and recall precisely what's in that space and how to slip through it." He expresses how much more he feels connected to the game world than he did before, "in a way that doesn't happen a lot with games that feature an auto-map."[41] What stands out in his description is that the practice made him slow down gameplay and look at the rooms more consciously. While he would have otherwise just passed through great sections of the game, he now experiences a much more intimate relation to the virtual spaces provided.

To turn visuality into manual movement apparently is a way to raise awareness of visual events and memorize them. *Ex negativo*, the general absence of manual mapping indicates just how often rooms in computer games are nowadays encountered as mere transitional spaces not intended to be remembered. To make memorable spaces is the exception, not the rule. Oblivion seems more the standard mode in which space is experienced in games, especially in action-rich first-person shooters, where there is high time pressure. There are some exceptions to be found in those well-elaborated spaces that invite players to take their time for exploration and long stays or are part of impressive cut scenes. The repetitive hallway of P.T. comes to mind, or the elaborate designs of some of the awe-inspiring rooms in the relaunched WOLFENSTEIN series with their weird dystopic nostalgia. These spaces are memorable, especially for their emotional values, resulting in more intimate attachment.[42] In comparison, while redrawing game visuals today might seem more like an unnecessary medial 'detour' that breaks with immersion and flow, it also is a practice of making a game world one's own, of anchoring it more steadily in one's identity. The manual practice of drawing turns visuality into a more holistic, bodily experience, into embodied knowledge. That is not to say that gaming is not always—also—a bodily experience, which it is, of course. But it does imply that the transfer into a different modality allows for a more

41 Parish, Jeremy: "Rediscovering the (Mostly) Lost Art of Mapping," in: *RETRONAUTS,* https://retronauts.com/article/437/rediscovering-the-mostly-lost-art-of-mapping

42 Norman, Donald A.: *Emotional Design: Why We Love (Or Hate) Everyday Things*, New York: Basic Books 2004.

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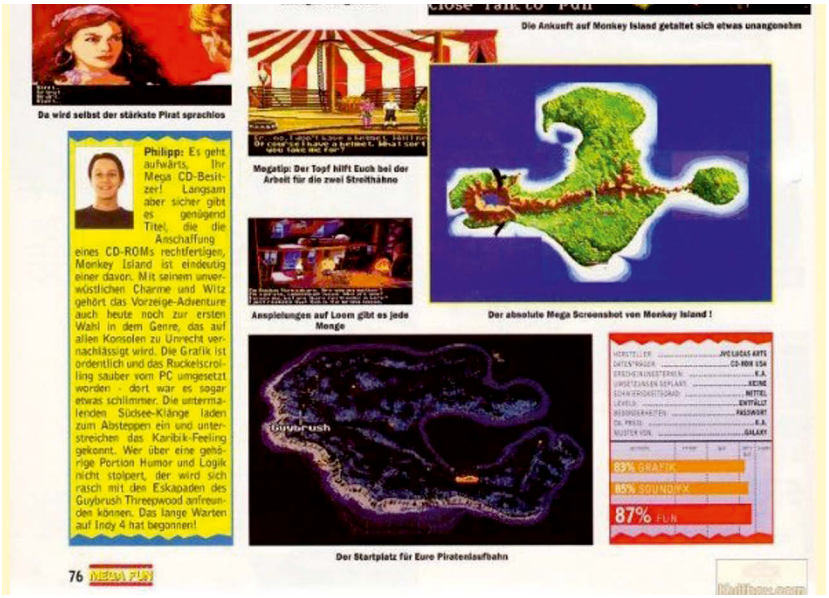
intimate and conscious connection by employing the anthropologically important axis of eye and hand, instead of images just rushing by like adrenaline streams.[43]

*Figure 2: Screenshots of Islands from THE SECRET OF MONKEY ISLAND (1990)*




Source: Weidner, Martin/Noak, Philipp: "The Secret of Monkey Island," in: *Mega Fun 2*, 1994, p. 76.

Since every act of individual imitation comes with divergence, with the creation of difference, any act of appropriation is always also an act of adaptation. That said, any hand-drawn map will show at least some kind of difference in comparison to the original. But it can, of course, be a much more conscious choice to diverge from the original and offer a unique interpretation. The island maps of the MONKEY ISLAND series belong to game images that have seemingly occupied the imagination of many players, not least since these games belong to the most popular and successful of their generation.[44] And the saga does not seem to end, given that another game, RETURN TO MONKEY ISLAND, has been announced for 2022.

43 Polanyi, Michael: *The Tacit Dimension*, Chicago, IL: University of Chicago Press 2013.

44 THE SECRET OF MONKEY ISLAND, MONKEY ISLAND 2: LECHUCK'S REVENGE (LucasArts 1991, O: Shelley Day), THE CURSE OF MONKEY ISLAND (LucasArts 1997, O:

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These maps are also noteworthy because they enabled the transition between different rooms, which, apparently, seemed a remarkable innovation back then; judging from that it is explicitly highlighted in several reviews of contemporary game magazines.[45] However, this mechanic did not age very well, given that the sluggishness of protagonist Guybrush Ulysses Threepwood trudging along the islands can become a very unnerving experience for today's players. While browsing through Google's image search, several examples of self-drawn maps from *Monkey Island* can be found. A map of Melee Island, a main site of THE SECRET OF MONKEY ISLAND, is, for instance, displayed on *Mapstalgia*, an online project curated by Josh Millard, for which people were asked to contribute drawings of game maps from their memory.[46] According to his own statement, the author of this particular map had not revisited the original before pinning down his very detailed map, which makes the result all the more impressive, although he admits that he did portray the island as angled in the opposite direction to the original.

Another example, a very lavish drawing of a "Skull Island," is inspired by game maps in general and does indeed show the outline of a skull, along with different locations. The series' third installment, THE CURSE OF MONKEY ISLAND (1997), does, in fact, include an island of that same name, but it does not convey the sites mentioned in the imaginary map; moreover, its outline does not resemble a skull. Still, even imaginary maps like this one evidence how much pirate movie clichés have become a common part of collective memory, as has the MONKEY ISLAND series itself.[47]

Map design furthermore lies at the heart of any game design, as it establishes the general framework for all other elements, especially the alignment and content of levels. This way, the map preconditions for any actions that can possibly occur within the world; the visuals also set the game's overall tone. That does not mean

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Larry Aheim and Jonathan Ackley), ESCAPE FROM MONKEY ISLAND (LucasArts 2000, O: Sean Clark and Michael Stemmle), TALES OF MONKEY ISLAND (Telltale Games 2009, O: Mark Darin, Mike Stemmle, Chuck Jordan et al.).

45 Weidner, Martin/Noak, Philipp: "The Secret of Monkey Island," in: *Mega Fun* 2, 1994, p. 76; Lenhardt, Heinrich: "The Secret of Monkey Island," in: *Power Play* 1, 1991, pp. 42-43.

46 Millard, Josh: "Mapstalgia: Video Game Maps Drawn from Memory," https://mapstalgia.tumblr.com/page/48

47 Lindström, Pär: "Skull Island," "Mapping Worlds. Maps of Imaginary Worlds," https://mappingworlds.wordpress.com/2014/04/08/volcano-island Ekaputra, Hans: "Map of Skull Island," https://hansekaputra.artstation.com/projects/xoP2

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that the relationship between map and experience is a one-way road. Maps do not determine all action in a strict sense, but their designs do rule what *affordances* will exist within a game environment, that is, what actions are possible within. Action possibilities within an environment directly stem from the relation between user and object, and the design of a space structures this relationship.[48]

*Figure 3: Hans Ekaputra, "Skull Island."*

Source: https://hansekaputra.artstation.com/projects/xoP2

## THE INFOCOM ERA OF "FEELIES"

The example of Intercom's game boxes is intended to furthermore illustrate how paper objects and other props were consciously introduced to enrich the overall experience in early gaming. Infocom was a software company founded by MIT students on June 22, 1979, and is mostly known for its high-quality and award-winning text adventures, but the company also tried to branch out to business applications with a relational database for MS-DOS called *Cornerstone* (1985), i.e.,

48 Gibson, James J.: *The Ecological Approach to Visual Perception*, Boston, MA: Houghton Mifflin 1979, esp. pp. 127-137, here p. 127.

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a database that was able to store data in tabular form. Although well-received by critics, *Cornerstone* turned out to be a commercial flop. Financial difficulties then forced the company to agree to a merger with Activision in 1986, which shut Infocom down for good in 1989.

Like Roberta Williams, Infocom game designers Marc Blank and Dave Lebling had been inspired by the COLOSSAL CAVE ADVENTURE. Their efforts resulted in ZORK, which was to become the starting point for a games series, with an original trilogy (ZORK II: THE Wizard OF FROBOZZ 1981, ZORK III: THE DUNGEON MASTER 1982) and later additions (BEYOND ZORK: THE COCONUT OF QUENDOR, 1987, ZORK ZERO: THE REVENGE OF MEGABOZ, 1988). ZORK: THE UNDISCOVERED UNDERGROUND was released way after the company's dissolvement, in 1997.[49] In contrast to other text adventures, Infocom's parser was more sophisticated and able to process longer sentences and sequences. The early games used a derivative of the programing language MDL (Model Development Language), which, too, had been developed at MIT and called ZIL (Zork Implementation Language). ZIL ran on a virtual machine named the Z-machine. Throughout its existence, Infocom would manage to develop more than 40 games, many of them very successful.

Maybe little surprising for a text-based game, Infocom's largest target group consisted of people who liked to read, which was a major reason why their games were also sold at bookstores; also, their main audience tended to possess expensive computer systems and thus belonged to a social segment that was willing to pay more for a good game.[50] What made their products so appealing were their marketing strategies, the vivid storytelling, and the addition of 'feelies,' which was the name they had given props they added to the well-designed game boxes. These feelies usually followed the games' themes, thereby adding to their attractivity. For instance, Infocom's game version of Douglas Adams's THE HITCHHIKER'S GUIDE TO THE GALAXY (1984) came with a special "No Panic!" button, "Microscopic Space Fleet," a piece of fluff, "Destruct orders for your home and planet" cards, and "Joo Janta 200 Super-Chromatic Peril-Sensitive Sunglasses," with which "you'll look cool and stay cool even when attending a Vogon poetry reading!"[51]

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49 For more information on *Zork I*, see Mott, Tony: *1001 Video Games You Must Play Before You Die*, London: Quintessence 2011.

50 See the interview with the two developers, Joel Berez and Marc Blank: Ferrell, Keith: "Interactive Text in an Animated Age: Infocom Faces the Challenge," in: *Compute!* January, 1988, pp. 17-20, here p. 17.

51 See the accompanying booklet to the game box. Briceño, Hector et al.: "Down From the Top of Its Game: The Story of Infocom, Inc.," http://web.mit.edu/6.933/www/Fall 2000/infocom/; Keller, Daniel: "Reading and Playing: What Makes Interactive

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*Figure 4: Examples of Gadgets from Infocom's THE HITCHHIKER'S GUIDE TO THE GALAXY (1984)*

Source: The Infocom Gallery, https://gallery.guetech.org/index.html

Apart from offering tongue-in-cheek gadgets that would build and intensify customer relations, a practical purpose of feelies was to serve as copy protection against copyright infringement. Some in-game puzzles could only be solved with them, but since they blended so well into the game world, they were not considered intrusive or disruptive. In fact, their haptic character extended the game world into the non-ludic reality. To make all elements fit the overall concept was a general artistic approach and trademark of Infocom. Therefore, in-game puzzles were similarly guided by the logics of storytelling and did not appear randomly. Mapping was an unavoidable necessity when playing Infocom games since the different rooms could only be accessed by writing compass directions into the command line (e.g., "Go West"). No visualization of the spatial dimensions was provided.

Paper could even star more prominently in Infocom's world. Their adventure TRINITY (Infocom 1985, O: Infocom) dealt with some of the darker and more serious matters of the time, reflecting the constant atmosphere of nuclear threat during the Cold War. Its title alludes to the infamous Trinity Site in New Mexico, where on July 16, 1945, the first detonation of a nuclear weapon took place as part

Fiction Unique," in: Williams, J. Patrick/Heide Smith, Jonas (eds.), *The Players' Realm: Studies on the Culture of Video Games and Gaming*, Jefferson, NC: McFarland 2006, pp. 276-298, esp. p. 281.

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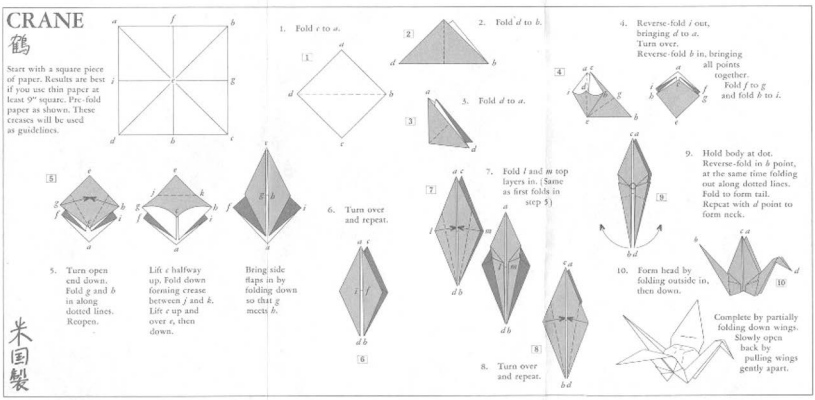
of the Manhattan Project. In the game, the protagonist flees London at the beginning of World War III, when Russian nuclear missiles are just about to hit the city, through a mysterious portal that transports him to different historical and fictional sites for creating and testing nuclear bombs. Being Infocom's most ambitious project, the game box contained a detailed manual, a short comic book called *The Illustrated Story of the Atom Bomb*, a cardboard sundial with symbols that represent the different sites to be visited in the game, as well as an instruction on how to fold an origami crane (*orizuro*) using the so-called Yoshizawa–Randlett diagramming system, along with a small piece of origami paper to create the origami crane.[52]

*Figure 5: Instruction for Folding Paper Cranes from TRINITY (1985)*




*Source: The Infocom Gallery, https://gallery.guetech.org/index.html*

The origami obviously is a reference to Sadako Sasaki (1943-1955), who had survived the atomic bombing of Hiroshima at the age of two and would live on for another ten years. Legend has it that during her short life, she folded more than one thousand origami cranes—a story that turned the paper object into a symbol of world peace in Japan.[53]

52 For the contents of *Trinity* and *Zork*, see Mott, Tony: *1001 Video Games You Must Play Before You Die*, London: Quintessence 2011.

53 See chapter "Infocom" in Wolf, Mark J. P.: *Encyclopedia of Video Games: The Culture, Technology, and Art of Gaming*, Santa Barbara: Greenwood 2021, pp. 511-514. For scans of the contents of Infocom's game boxes see the Infocom Gallery, https://gallery.guetech.org/index.html

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## CONCLUSION

All things considered, paper obviously was an indispensable, co-creative collaborator in early gaming. The significance of the three-partite human-paper-computer-relationship can only be overlooked if one feels seduced by a tendency that identifies the virtual and digital with the immaterial, a notion ensnared in the modernist trap that Bruno Latour, so poignantly, has described as "purification."[54] In practice, things are messier, and we cannot fully separate the digital world from the paperverse it was born into. Early gaming was a necessarily hybrid endeavor and based on a thing ecology that included paper as an important 'ally' of gaming experiences, as one of the "important element[s] for understanding affection and emotion" in gameplay;[55] a place it holds as the preferred matter of choice for mass-produced games and toys since the late Middle Ages.[56] In fact, paper and cardboard are still the most frequently used resources for creating tabletop games.[57] The identity of early games was thus open and fluid, as it would necessarily have to rely on non-digital media to offer users a more holistic and satisfying experience.

But what about now? Have we left the paperverse yet? Generally, there is little doubt that paper is receding. In Germany, the production of paper for printing and writing purposes has decreased by 32% within the last ten years.[58] A main reason for this decline is the computer, although the possibility to print anything anytime from any desk at first created a paradox: from 1980 to 2000, the worldwide use of office paper more than doubled, but has, since then, decreased. According to the US Environmental Protection Agency (EPA), in 2018, 67,390 U.S. tons of paper were generated (in 2000: 87,740 U.S. tons), with 45,970 U.S. tons being recycled (i.e., 68,21%).[59] Yet even more important for the perception of paper disappearing

54 B. Latour: *We Have Never Been Modern*.

55 Sicart, Miguel: *Play Matters*, Cambridge, MA/London: MIT Press 2014, p. 46.

56 Ibid., pp. 43-44. Ian Hodder makes a strong case for the relationships between humans and things and how they shape the dependency or constraints that are defining characteristics of contingent human experience, see I. Hodder: *Entangled.*

57 Conrad: "Randomization in Paper," Clüver: "Würfel, Karten und Bretter."

58 Statistisches Bundesamt (Federal Statistical Office of Germany): "Rohstoffe zur Papierherstellung im Jahr 2021 deutlich verteuert," press release N065, November 3, 2021, https://www.destatis.de/DE/Presse/Pressemitteilungen/2021/11/PD21_N065_51.html

59 U.S. Environmental Protection Agency (EPA): "Paper and Paperboard: Material-Specific Data," https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/paper-and-paperboard-material-specific-data

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from social life than the big picture is that within our personal work and domestic environments, paper is indeed becoming sparser and sparser. Instead of getting our information from books and newspapers, we visit digital versions of print media. With electronic paper becoming more common, even taking notes and sketching drafts is going to emancipate itself from paper and circulate within the same digital sphere as all other digital tools used for further processing, such as graphic and word processing software.

While this might primarily affect game design, gaming has also shifted towards a reality where it remains within the borders of the digital, without any need for integrating analog media into the meshes of its network. In the near future, there will be even fewer transitional points between the digital and non-digital, thus making gaming experiences more seamless and less disruptive. The introduction of video game digital distribution services, particularly Steam (Valve), in September 2003, was a real game-changer, as it allows its clients to download games and updates to their computer directly via the Internet, which became possible due to the improvement of bandwidth capabilities. Moreover, Steam provides community features and, with Steamworks, offers a built-in application programming interface (API) that developers can use to create and distribute user-created content. In an interview with the e-zine *Rock, Paper, Shotgun*, Gabe Newell, the president of Valve, described how digital distribution services have changed game creation as well: now, decision-makers can take higher risks since "we can put something up on Steam, deliver it to people all around the world, make changes." [60] The establishment of online communities also makes it easier to raise awareness for smaller games and distribute mods. Lastly, digital distribution has the potential to be more eco-friendly since it makes the resource-intensive creation of physical storage unnecessary and thereby reduces waste.[61]

However, digitalization is a double-edged sword. Privacy issues are one challenging aspect, as is guaranteeing format compatibility over long periods of time

60 Walker, John: "RPS Exclusive: Gabe Newell Interview," in: *Rock, Paper, Shotgun*, Nov 21, 2007, https://www.rockpapershotgun.com/rps-exclusive-gabe-newell-interview

61 Abraham, Benjamin J.: "The Carbon Footprint of Games Distribution," in: Benjamin J. Abraham, *Digital Games after Climate Change,* Cham, Switzerland: Palgrave Macmillan 2022, pp. 123-148; Kerr, Aphra: "The Circulation Games: Shifting Production Logics and Circulation Moments in the Digital Games Industry," in: Paul McDonald/Courtney Brannon Donoghue/Timothy Havens (eds.), *Digital Media Distribution. Portals, Platforms, Pipelines*, New York, NY: New York University Press 2021, pp. 107-125.

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so that data remains readable even when storage systems change, while digital storage cannot always ensure the same longevity as paper archives. Also, paper has different affordances than digital documents; the sound of pens scratching on the roughness of its surface, its inexhaustible practical potential—from folding it up to tearing it apart, the triggered combination of eye and hand—all of this might actually be quite crucial for the process of shaping new ideas.[62] Moreover, as has been pointed out in the discussion of Alan Turing, the central properties of paper are inevitably intertwined with the working of computers so that, in an abstract sense, paper will never leave the digital world and always stay its co-creative partner. And indeed, they both share a common world of flatness and superficiality. In the digital world, paper will live on, albeit without its material body.

While there are good reasons to assume that not all paper technologies and practices will ever vanish from public life completely, there might also be good reasons to assume that paper could be disappearing from gaming for good—with maybe the exceptions of conscious revisits and revivals of paper-computer-hybrid methods, for nostalgic or other reasons—gamers, not all, but certain groups thereof will continue to want to experience game worlds in material, more sensual forms, so that they may circulate and interact with other physical objects. At least in this regard, games will keep a medially open identity. As results of hybrid practices oscillating between the material and immaterial, reception and (re-)production, game-related paper artifacts will continue to represent externalized manifestations of their creators' desires and projections. An emerging danger of paper becoming more absent could be that gaming then becomes more superficial, less conscious, and even more short-lived, but perhaps exactly this would make a good case for the importance of scholarly reflection and the demand for more general education in games literacy?

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# Keep the Innovation Rolling

## A Modern Board Game Review of Dice Usages and their Mechanisms

MICAEL SOUSA

## INTRODUCTION: TOWARD A CULTURE OF DICE GAMES

Dice games are as old as human civilization itself.[1] Looking back at the history of games, we see that older dice appear in many shapes and forms—some of them do not resemble in any way those of today. These proto dice can result from carving bones while mixing seashells and sticks deliver similar experiences. Other dice derivatives appear as artificial and geometric-shaped objects.[2] Despite their different shapes, these objects (as game components) are a type of technology players can engage with, activating the game mechanics to generate a random outcome. The results are manifold but most often establish a controlled random effect (in the case of a D6 die, it varies from 1 to 6). Usually, this corresponds with an additional time effect: Results do not appear instantly; it takes some seconds at least, ensuring that players engage in a state of suspenseful anticipation. This phenomenon might seem magical, a distortion of time and space to those who watch dice rolling. The way how players lose track of time and focus on moving dice hints at a clear relationship to the concept of the magic circle developed by Huizinga.[3]

1 Dales, George F.: "Of Dice and Men," in: *Journal of the American Oriental Society* 88/1 (1968), pp. 14-23.

2 Schwartz, David G.: *Roll the Bones: The History of Gambling*, New York, NY: Gotham Books 2006.

3 Huizinga, Johan. *Homo Ludens*, New York, NY: Routledge 2014.

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Dice continue to fascinate humans also in other ways: "Rolling dice" expressions are used as a metaphor in popular culture, even as old as references like those attributed by Plutarch to Julius Caesar—"*The die has been cast*"—invoke powerful statements, showing that dice are not only something to interact with to generate a random outcome but that they also transport a feeling of fate. We find them almost anywhere in today's popular culture. The tabletop role-playing game DUNGEONS AND DRAGONS (D&D, 1974), for example, appears in TV shows like THE BIG BANG THEORY, COMMUNITY, and STRANGER THINGS which thus provide new dissemination channels for classic dice games, making them famous, and contributing to the relative triumph of geek culture. The effect of digital technology and the post-digital movement[4] is also important. These reactions result from the overwhelming and ever-present digital technologies in our lives and the rediscovered value of handmade things and objects.[5] Some players want to disconnect from digital and connect to material and social experiences, where they feel more in control.

This feeling of control may be attributed to narrative games like D&D, in which dice can be used in different formats to decide conflict and other game state changes. But the internationalization of Eurogames and the impact of a game like CATAN (1995) also shows that rolling D6 dice can generate strategic gameplay without being overcomplex. It became one of our days' most popular board games, played by casual players, families, and even hobby gamers. CATAN championships attract many participants, and newspapers like *The Guardian* have sections for board games,[6] while other media state that playing these new board games is a trend in top tech and finance elite communities.[7]

These observations raise many questions, one of which is: Are dice being used the same way as in historical and older games? After all, many modern tabletop games are challenging and transforming dice usage. No longer do dice need to be rolled for a tabletop game to function, as many alternatives to classic roll and move

4 Cramer, Florian: "What Is 'Post-Digital'?" in: Berry, David/Dieter, Michael (eds.): *Postdigital Aesthetics*, London: Palgrave Macmillan, pp. 12-26.

5 Sax, David: *The Revenge of Analog: Real Things and Why They Matter*, New York, NY: Public Affairs 2016.

6 http://www.theguardian.com/lifeandstyle/board-games

7 Tam, Ui-Wing: "An Old-School Board Game Goes Viral Among Silicon Valley's Techie Crowd," *The Wall Street Journal*, 2009, https://www.wsj.com/articles/SB126092289275692825; Ellwood, Mark: "Wall Street's Latest Secretive Trend? Board Game Nights," *Bloomberg*, 2018, https://www.bloomberg.com/news/articles/2018-04-26/wall-street-s-latest-trend-in-networking-board-game-nights

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mechanisms that have been developed in the last decades show. If mass-market games like MONOPOLY (1935) are still popular and being played today, the renaissance of modern board games might change some paradigms.[8] In a time of dominance of video games, dice games invoke traditional social associations that combine game design innovations. This interplay of playful materialities, mechanisms, and metaphors results in new ways of engaging players. Without player involvement, physical games would simply not work—machines can roll dice, but humans desire to roll them for playable experiences. To address these complex relationships, we need to approach dice materiality, game design traits, human motivations, the history, and the social effects of contemporary dice usages in modern board games to understand them. Identifying this change in the paradigm of dice usage helps to understand the evolution of tabletop games in the last decades and what drives players to play analog games with dice. In this chapter, we intend to find out what has changed.

This contribution addresses how dice are used in modern tabletop games, exploring ongoing innovations. It aims to cover the way dice relate to game mechanisms and innovative gameplay while keeping the materiality of handling dice. We propose a method to find different dice games and classify their aesthetics and the way they are combined with innovative game mechanisms. As we will see, making subtle changes may change player experiences, like allowing players to reroll and pick which dice to use. Other changes have a more radical effect, like changing the composition, assemblage, materials, and the ability to craft dice during gameplay. To achieve these objectives, we propose a framework to classify dice usage in contemporary tabletop and board games, considering the material, mechanical, and metaphors for dice usage. Our framework proposal results from analyzing available data from the hobbyist gaming community that deals with modern board games, where game design innovations are expected to occur.

Designing dice innovation is a permanently ongoing process. New games are constantly trying to use dice in innovative ways. Some depart from the traditional mechanisms of rolling to get controlled random outcomes. Other games go beyond this, using dice for many different mechanical and narrative purposes, profiting from the fascination of handling chunky, colorful, and customized dice. Effectively, we argue that dice usage in games will never be obsolete. Introducing dice components can be something that drives players to play a tabletop game, while the associated game mechanisms make the defining, crucial

8 Donovan, Tristan: *It's All a Game: The History of Board Games from Monopoly to Settlers of Catan*, New York, NY: Thomas Dunne Books 2017.

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difference in the playing experience. This assumption meets the efforts of game designers who are continuously exploring dice potentials to deliver engaging new experiences, mixing the traditional rolling with new game mechanisms that change gameplay. Arguably, mechanisms' innovation might be what kept dice popularity in hobby games.

## THE MATERIAL FASCINATION OF DICE

While for a holistic dice analysis, a mere focus on materiality would surely not be sufficient, looking at the physical dice dimensions can be an effective first step to explaining the dice's appeal in modern board games. The aesthetic, sensual experience of the players is a key factor here. Understanding how players deal, interact, and use dice can provide answers to the questions of why we enjoy handling dice—whether it is the sense of touch, the dynamic of rolling, the sound, or the uncertainty of the result that changes game states. Or, to look at the question from the other end: Would just rolling dice without meaningful and innovative mechanisms be enough to engage players?

Although game components may not determine game effectiveness, their quality helps enhance the experience of playing a tabletop game.[9] These effects are so important that some gamers invest considerable amounts of money tweaking their games with additional detailed components. Similarly, board games with a higher quality component can collect hundreds of thousands of dollars on KICKSTARTER.[10] Extreme cases like FROSTHAVEN (2022) surpass the twelve million dollars of funding from backers. The material aspect, the sense of touch, and the aesthetics play an important role. Together with additional aspects like the gameplay experience, the mechanisms, and narratives, this may explain the overall appeal.

Dice are simple from a material perspective—at least our contemporary standard dice, usually D6 dice, that are present in traditional, historic, mass-market, and even casino games. They are also part of pop culture: The iconography of dice is everywhere, evoking associations of 'randomness,' 'gambling,' or simply games. One paradigmatic example of these associated meanings can be found in western board games from the 19th-century. Most of these Victorian games were about

9 Rogerson, Melissa J./Gibbs, Martin/Smith, Wally: "'I Love All the Bits': The Materiality of Boardgames," in: *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 2016, pp. 3956-3969.

10 Werning, Stefan. "Conceptualizing Game Distribution: Kickstarter and the Board Game 'Renaissance,'" in: *La Valle Dell'Eden* 31 (2018), pp. 65-82.

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teaching morality. The creators of these games avoided using dice because they represented gambling, considered a severe vice at that time.[11] But these 19th-century games, not so different from the historical GAME OF THE GOOSE (16th century), used other randomization systems like spinners, like those seen in Milton Bradley's GAME OF LIFE versions.[12] These examples show that employing dice in the design of games could be avoided—at least in theory—but their effects continued to fascinate and fuel game dynamics.

Standard dice are designed to be rolled, and this motion is a way to determine a result. It is a physical process that depends on the materiality of the dice and the rolling surface. It is supposed to be a mechanical activity, a dynamic. Players feel a sense of control until the releasing moment; the fate in their hands, slipping through their fingers. The touch and the mechanical effect reinforce this metaphor. Dice roll during a variable time. When dice are rolling, players enter a trance-like state of anticipation, where time seems to stop because players do not know precisely when dice will halt and reveal the outcome. In this sense, dice can be understood as a door into the magic circle.[13] This uncertainty fascinates us humans, and it is a specific trait of games.[14]

But can rolling enormous quantities of dice also become tedious, transforming a game into a chore? It can be excessive when players spend more time rolling dice than using them to affect the game state and generate meaningful play. During WARHAMMER 40K (1987) battles, players might need to use dozens of dice simultaneously, but this process helps build the conflict experience and keep track of the narrative and tension.[15] Xu et al.[16] found that these chores can be fun and that introducing digital tools to remove dice can negatively impact the gameplay experience. When approaching hybrid games, using digital technology to reduce the

11 Crump, Justine: *The Perils of Play: Eighteenth-Century Ideas about Gambling*, Cambridge: Centre for History and Economics 2004.

12 T. Donovan: *It's All a Game;* Wardle, Heather: *Games Without Frontiers? Socio-Historical Perspectives at the Gaming/Gambling Intersection*, Cham: Palgrave Macmillan 2021.

13 J. Huizinga: *Homo Ludens*.

14 Costikyan, Greg: *Uncertainty in Games*, Cambridge, MA: The MIT Press 2013.

15 Carter, Marcus/Harrop, Mitchell/Gibbs, Martin: "The Roll of the Dice in Warhammer 40,000," in: *ToDigra* 1/3, 2014, http://todigra.org/index.php/todigra/article/view/20

16 Xu, Yan et al.: "Chores Are Fun: Understanding Social Play in Board Games for Digital Tabletop Game Design," *DiGRA*, 2011, http://www.digra.org/digital-library/publications/chores-are-fun-understanding-social-play-in-board-games-for-digital-tabletop-game-design/

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complexity, bookkeeping, and introducing a virtual game master can be positive, but replacing dice roll is not.[17] Hobby gamers tend to dislike using digital apps and tools in their games,[18] regardless of the success of some tabletop games like MANSION OF MADNESS, 2ND ED (2016). In this case, the App did not remove the dice from the game.

Another possible reason for the success of dice is the sense of permanence. Unlike digital games, analog games have a physical, enduring manifestation in the real world, opposing a fear of obsolescence.[19] Dice will always be there and do not require updates or another type of energy beyond human hands. And even if players lose some dice, replacements are easy to make.

From the findings collected above, a quite simple fact emerges: Players like the handling and rolling the experiences dice provide. People are drawn to roll dice when they interact with them.

However, dice demand a multilevel analysis, seeing them from multiple lenses, from game design to cultural studies. In what follows, we will analyze dice, focusing on the game material and how they relate to game mechanisms. First, we will propose a method to find modern board games and then explore their previously stated dimensions.

## FINDING INFORMATION ABOUT DICE GAMES

It might be surprising, but compared to other analog games like card games, literature about dice games is scarce.[20] The existing literature about dice, however, can be misleading: While the history of dice games in academic and scientific

17 Oliveira, Ana Patrícia et al.: "Towards a New Hybrid Game Model: Designing Tangible Experiences," in: *IEEE 8th International Conference on Serious Games and Applications for Health* (SeGAH), 2020.

18 Ibid.; Kosa, Mehmet/Spronck, Pieter: "What Tabletop Players Think about Augmented Tabletop Games: A Content Analysis," in: *Proceedings of the 13th International Conference on the Foundations of Digital Games*, 2018, pp. 1-8.

19 Rogerson, Melissa J./Sparrow, Lucy A./Gibbs, Martin R.: "More Than a Gimmick—Digital Tools for Boardgame Play," *Proceedings of the ACM on Human-Computer Interaction* 5 (2021), pp. 1-23.

20 D. Schwartz: *Roll the Bones*; G. Dales: "Of Dice and Men;" Parlett, David: *The Oxford History of Board Games*, Oxford: Oxford UP 1999.

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databases may diverge to mathematics,[21] research about game material and mechanical uses are even more difficult to find. Reiner Knizia's DICE GAMES PROPERLY EXPLAINED[22] is one of the most relevant books about historic dice games. But surprisingly, the book is mainly descriptive. Knizia, being one of the most prolific and successful contemporary game designers,[23] writes little about designing dice games in the book. It also does not approach recent dice games, particularly leaving out how materiality and new mechanisms are implemented.

Looking for such information about analog games leads almost necessarily to the BOARD GAME GEEK (BGG) website:[24] BGG gathers information about the hobby tabletop movement, collecting available information about analog games and the emergent associated culture since 2000.[25] BGG supported several academic and scientific publications as an information source and case studies to understand games and support new analog game-based projects.[26] BGG is a crowdsourcing online interactive database based on a Bayesian review system to control the evaluation bias. Games that have a low number of votes from users will not achieve higher classifications. Besides the overall evaluation, players can vote to define the game characteristics like player count, the duration, recommended age, and game complexity (1 to 5).

21 Voogt, Alex de/Epstein, Nathan/Sherman-Presser, Rachel: "The Role of the Dice in Board Games History," in: *Board Game Studies Journal* 9 (2015), pp. 1-7; Bennett, Deborah J.: *Randomness*, Cambridge: Harvard University Press 2009.

22 Knizia, Reiner: *Dice Games Properly Explained*, London: Blue Terrier Press 2010.

23 Knizia, Reiner: "Knizia Games," 2022, https://www.knizia.de/

24 www.boardgamegeek.com

25 Konieczny, Piotr: "Golden Age of Tabletop Gaming: Creation of the Social Capital and Rise of Third Spaces for Tabletop Gaming in the 21ˢ Century," in: *Polish Sociological Review*, No. 2 (2019), pp. 199-215; Woods, Steward: *Eurogames: The Design, Culture and Play of Modern European Board Games*, Jefferson, NC: McFarland 2012.

26 Sousa, Micael: "Defining the Mechanisms for Engagement Design Protocol Towards the Development of Analogue and Hybrid Serious Games: Learning from FlavourGame," in *Joint International Conference on Serious Games*, 2021, pp. 31-46; Kritz, Joshua/Mangeli, Eduardo/Xexéo, Geraldo: "Building an Ontology of Boardgame Mechanics Based on the BoardGame Geek Database and the MDA Framework," in: *XVI Brazilian Symposium on Computer Games and Digital Entertainment*, 2017, pp. 182-91; Mesentier Silva, Fernando de et al.: "AI as Evaluator: Search Driven Playtesting of Modern Board Games," in: *AAAI Workshops,* 2017.

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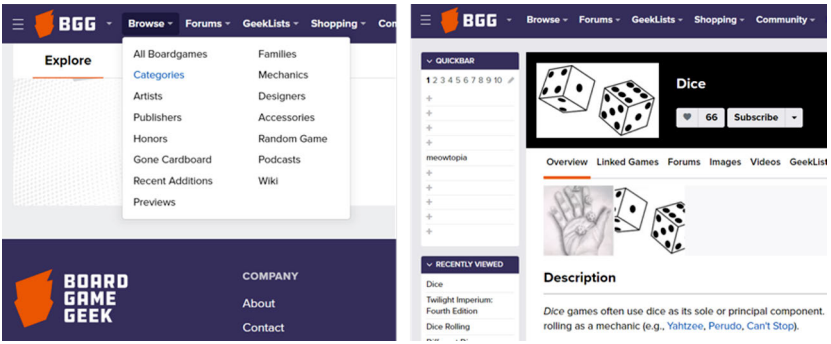
*Figure 1: Browsing BGG to find Categories and Game Mechanisms*




Source: Screenshot by Micael Sousa

On the BGG website, it is possible to browse and search for specific keywords. Surprisingly, BGG only defines three direct dice type mechanisms: Dice Rolling (DR), Die Icon Resolution (DI), and Different Dice Movement (DDM). However, the database is by no way a perfect tool for collecting an exhaustive amount of information about dice games. While the homepage does classify games by families, there is not a clearly defined family for games with dice components. Instead, dice appear as a category (Dice Category), which might be confusing. This gap and misleading information hamper the search for games with dice and how dice are used alternatively, beyond roll and move mechanisms of most mass-market games.[27] Nevertheless, a closer look at BGG makes one aspect of modern popular board games stand out clearly: dice rolling and moving is the most common game mechanism at BGG.[28]

## FINDING INNOVATIVE DICE USAGES IN GAMES

Experimenting with BGG as a knowledge database allows for further methodological approaches: One way to find information is to search for the highest-ranked games at BGG and analyze each game entry, finding if each game uses dice or not

27 Sousa, Micael/Bernardo Edgar: "Back in the Game: Modern Board Games," in: Zagalo, Nelson (eds.), *Videogame Sciences and Arts*, Cham: Springer 2019, pp. 72-85.

28 Samarasinghe, Dilini et al.: "A Data Driven Review of Board Game Design and Interactions of Their Mechanics," *IEEE Access*, 2021, pp. 114051-114069.

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and how the game mechanisms are implemented. Adopting this selection method reveals games that are well known and enjoyed by many players. We can say that top-ranked BGG games are engaging because they are those that hobbyist players play or recognize the most, despite these ranks being prone to marketing effects.

The games related to the dice game category were considered first, followed by the games related to three types of dice mechanisms (see below). After obtaining these four lists (BGG top 10 ranked games in each list), it was necessary to cross the obtained data in a spreadsheet. Other complementary information was gathered by informal social interviewing. Discussing with expert hobby players allowed us to identify other paradigmatic dice games to analyze. The treated data show the publication year of each game and how the dice are used, defining a typology proposal for dice games. The result data will be presented further in this chapter.

Because BGG information was not perfectly adapted to the purposes of this chapter, we analyzed the four lists proposing new categories and classifications. This process demanded understanding the gameplay of every game and how the dice are used. We used the Grounded Theory to generate clusters until patterns emerged.[29] This method allowed to deal with qualitative information in an interactive approach, evaluating data as it was collected. Each time a game was being analyzed, we filled a spreadsheet with notes about the game characteristics and dice usage. These steps were done for every list of related games to the categories and mechanisms (four in total). Each time a game was analyzed, all the previously collected data were reanalyzed and reclassified. Categories emerged as the analysis progressed (the categories are explained in the next sections). We collected the raw data from the ten higher-ranked BGG games on the following lists:

- Dice Category
- Mechanisms: Dice Rolling
- Mechanisms: Dice Icon
- Mechanisms: Different Dice Movement

From the previous lists, a new summarized list emerged with 37 games. From the 40 obtained games, three games appeared simultaneously in the different lists.

29 Charmaz, Kathy: *Constructing Grounded Theory*, Los Angeles: SAGE 2014; Farkas, Timea et al.: "A Grounded Analysis of Player-Described Board Game Immersion," in: *CHI PLAY 2020—Proceedings of the Annual Symposium on Computer-Human Interaction in Play*, 2020, pp. 427-437.

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## The Top-Ranked Games Related to Dice at BGG

*Table 1: The general characteristics of BGG selected dice games*

| | | Abbreviation | Description |
|---|---|---|---|
| **Type** | Abstract | A | No defined metaphor for mechanics |
| | Eurogame | E | Theme but focus on mechanics |
| | Thematic | T | Focus on theme/narrative |
| | Wargame | W | Focus on simulation |
| **BGG Source** | Dice Rolling | DR | Mechanism at BGG |
| | Dice Icon | DI | Mechanism at BGG |
| | Different Dice Movement | DDM | Mechanism at BGG |
| | Dice category | DC | Category at BGG |
| **Dice Usage description** | Roll dice to determine conflict outcomes | RDcoutcomes | Used in combat or other types of conflicts and threshold comparison |
| | Roll dice to define available actions | RDactions | Determine what players are allowed to do. Related to restrictions. |
| | Roll dice to change game state | RDgamestate | Define and change the game state and affect players' decisions or narrative progress. |

Selecting the list of ten ranked BGG games for every list related to dice "Category" and the mechanisms of "Dice Rolling" (DR), "Dice Icon" (DI), and "Different Dice Movement" (DDM) provided considerable data. The merged table from the four lists was divided into three tables (2, 3, and 4) filtered by BGG rank. Table 2 refers to the general characteristics of the selected games. It presents the year of publication, the complexity (one being the lowest complexity and five the highest), the type of game according to the hobby designations,[30] the BGG source (list from where the game appeared), and a brief description of how dice are used in each game. To ease the reading of Table 2, which presents the sample of

30 M. Sousa/E. Bernardo: "Back in the Game;" S. Woods: *Eurogames*.

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analyzed games, we created a support table (Table 1) to explain the concepts and abbreviations used to define the games.

The previous classification results from the terminology hobby gamers adopt.[31] Even though games like SAGRADA and PAPER APPS: DUNGEON have a defined theme and were considered Eurogames, they could also be defined as abstract games. Eurogames typically have a clear abstract dimension that can lead to this confusion. They try to address the theme through the game mechanisms, which are the core drive for the game. Thematic games were those related to Ameritrash (avoiding some of the negative conations the word may carry), where the theme and narrative are core for the game system. Wargames were those games that simulate credible and detailed contemporary or historical conflicts, battles, and wars.

*Table 2: The general characteristics from BGG selected dice 37 games*

| General | | | | | | Dice usage description |
|---|---|---|---|---|---|---|
| **Name** | **Rank** | **year** | **Com-plex** | **Type** | **BGG Source** | |
| TWILIGHT IMPERIUM: FOURTH EDITION | 6 | 2017 | 4,26 | T | DR | RDcoutcomes |
| STAR WARS: REBELLION | 8 | 2016 | 3,73 | T | DR DI | RDcoutcomes |
| WAR OF THE RING: SECOND EDITION | 11 | 2011 | 4,18 | T | DR | RDactions. |
| TWILIGHT STRUGGLE | 13 | 2005 | 3,60 | W | DR | RDcoutcomes |
| THE CASTLES OF BURGUNDY | 16 | 2011 | 3,00 | E | DC DR | RDactions |
| NEMESIS | 17 | 2018 | 3,40 | Tc | DR | RDcoutcomes RDdefinestate |
| A FEAST FOR ODIN | 22 | 2016 | 3,85 | E | DR | RDcoutcomes |
| WINGSPAN | 23 | 2019 | 2,44 | E | DR | RDactions |
| ROOT | 26 | 2018 | 3,73 | W | DR | RDcoutcomes |
| MAGE KNIGHT BOARD GAME | 29 | 2011 | 4,33 | T | DR | RDactions. |
| TOO MANY BONES | 38 | 2017 | 3,85 | T | DC DI | RDcoutcomes |
| STAR WARS: IMPERIAL ASSAULT | 53 | 2014 | 3,30 | T | DI | RDcoutcomes |

31 Ibid.

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| | | | | | | |
|---|---|---|---|---|---|---|
| ROBINSON CRUSOE: ADVENTURES ON THE CURSED ISLAND | 71 | 2012 | 3,80 | T | DI | RDcoutcomes RDdefinestate |
| THE VOYAGES OF MARCO POLO | 73 | 2015 | 3,18 | E | DC | RDactions. |
| TROYES | 88 | 2010 | 3,46 | E | DC | RDactions. |
| ROLL FOR THE GALAXY | 106 | 2014 | 2,78 | E | DC | RDactions. |
| CHAMPIONS OF MIDGARD | 109 | 2015 | 2,59 | E | DC | RDactions. RDcoutcomes |
| STONE AGE | 130 | 2008 | 2,47 | E | DC | RDcoutcomes |
| THAT'S PRETTY CLEVER! | 141 | 2018 | 1,89 | A | DC | RDactions. |
| RAJAS OF THE GANGES | 147 | 2017 | 2,89 | E | DC | RDactions. |
| MEMOIR '44 | 154 | 2004 | 2,27 | W | DI | RDcoutcomes |
| SAGRADA | 168 | 2017 | 1,93 | E | DC | RDcoutcomes |
| THE MANHATTAN PROJECT: ENERGY EMPIRE | 255 | 2016 | 3,07 | E | DI | RDcoutcomes |
| KING OF TOKYO | 349 | 2011 | 1,49 | T | DI | RDcoutcomes |
| 1775: REBELLION | 418 | 2013 | 2,24 | W | DI | RDcoutcomes |
| BLACK ORCHESTRA | 432 | 2016 | 2,41 | T | DI | RDcoutcomes RDactions. |
| RUNEBOUND (THIRD EDITION) | 488 | 2015 | 2,70 | T | DI | RDactions. |
| FORMULA D | 563 | 2008 | 1,97 | T | DDM | RDactions. |
| RALLYMAN: GT | 1018 | 2020 | 2,22 | T | DDM | RDcoutcomes |
| BRISTOL 1350 | 3059 | 2021 | 1,41 | T | DDM | RDactions. |
| BATTLEBALL | 3143 | 2003 | 1,51 | T | DDM | RDcoutcomes |
| SPURS: A TALE IN THE OLD WEST | 4955 | 2014 | 2,56 | T | DDM | RDactions. RDcoutcomes |
| AGE OF DOGFIGHTS: WW1 | 7803 | 2020 | 2,50 | W | DDM | RDcoutcomes |
| MOB: BIG APPLE | 8552 | 2022 | 2,20 | T | DDM | RDactions. RDcoutcomes |
| ROLL IN ONE | 9058 | 2021 | 1,75 | T | DDM | RDcoutcomes. |
| PAPER APPS: DUNGEON | 13235 | 2021 | 1,50 | T | DDM | RDcoutcomes |
| POTATO PIRATES: ENTER THE SPUDNET | 13428 | 2020 | 2,17 | E | DDM | RDcoutcomes |

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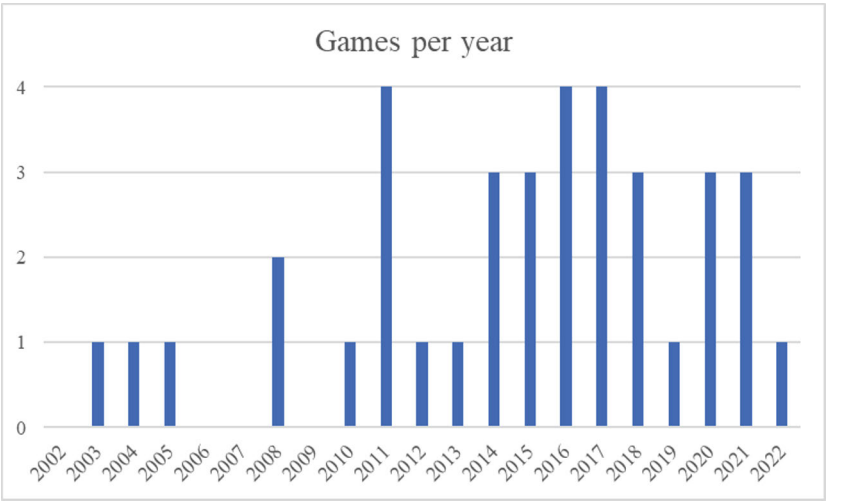
As stated before, games like STAR WARS: REBELLION, CASTLES OF BURGUNDY, and TOO MANY BONES appeared in more than one list. They were considered as "Dice Rolling" games but not in the BGG "Dice Category." Another pattern is the games with "Different Dice Movement" mechanisms appear as the lower BGG ranked games, with lower complexity. Race games like FORMULA D and RALLYMAN: GT appear on the list. Other games related to movement dynamics also may be identified, like BRISTOL 1350 and BATTLEBALL. These games resemble some of the mass-market games where dice rolls define the movement.[32] These lower complexity games can be explained by the demographics and preferences of BGG users. They are hobby gamers that tend to prefer complex games with many mechanisms and thematic experiences.[33]

*Figure 2: Games from the sample per publication year.*




Source: Graphic by Micael Sousa

The year of publication gives an overview of new board game trends. All the games were published in the last 20 years. Most of the games are less than ten years available on the market. This timeframe means new games are still using dice, and hobby gamers enjoy them (recent games with high BGG rank). It also

32 Ibid.

33 Samarasinghe: "A Data Driven Review of Board Game Design;" M. Sousa/E. Bernardo: "Back in the Game;" Booth, Paul: *Board Games as Media*, New York, NY: Bloomsbury 2021.

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shows that the eventual prejudice that games with dice are very random and not fit for heavy and hobby gamers is questionable. These perceptions are common among some hobbyist players, mainly Eurogamers and those that prefer highly strategic games with low random effects that can impact their choices.[34]

Table 2 gives a brief description of the dice usage in each game. This option was a way to avoid some of the abstractions that mechanism descriptions induce. It provides complementary information for Tables 3 and 4, with "Y," meaning the game has this trait.

*Table 3: The aesthetics from BGG selected dice games*

| Name | Dice aesthetics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | D | | | | | | | Colors | Images |
| | 4 | 6 | 8 | 10 | 12 | 20 | 30 | | |
| TWILIGHT IMPERIUM: FOURTH EDITION | | | | Y | | | | N | N |
| STAR WARS: REBELLION | | Y | | | | | | Y | Y |
| WAR OF THE RING: SECOND EDITION | | Y | | | | | | Y | Y |
| TWILIGHT STRUGGLE | | Y | | | | | | N | N |
| THE CASTLES OF BURGUNDY | | Y | | | | | | N | N |
| NEMESIS | | Y | | Y | | | | Y | Y |
| A FEAST FOR ODIN | | | Y | | Y | | | Y | N |
| WINGSPAN | | Y | | | | | | Y | Y |
| ROOT | | | | | Y | | | N | N |
| MAGE KNIGHT BOARD GAME | | Y | | | | | | Y | Y |
| TOO MANY BONES | | Y | | | | | | Y | Y |
| STAR WARS: IMPERIAL ASSAULT | | Y | | | | | | Y | Y |
| ROBINSON CRUSOE: ADVENTURES ON THE CURSED ISLAND | | Y | | | | | | Y | Y |
| THE VOYAGES OF MARCO POLO | | Y | | | | | | Y | N |
| TROYES | | Y | | | | | | Y | N |
| ROLL FOR THE GALAXY | | Y | | | | | | Y | Y |
| CHAMPIONS OF MIDGARD | | Y | | | | | | Y | Y |
| STONE AGE | | Y | | | | | | N | N |
| THAT'S PRETTY CLEVER! | | Y | | | | | | Y | N |

34 S. Woods: *Eurogames*; Wilson, Devin. "The Eurogame as Heterotopia," *Analog Game Studies* 2, No. 7 (2015), https://analoggamestudies.org/2015/11/the-eurogame-as-heterotopia/

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RAJAS OF THE GANGES | | Y | | | | | | Y | N |
| MEMOIR '44 | | Y | | | | | | Y | Y |
| SAGRADA | | Y | | | | | | Y | N |
| THE MANHATTAN PROJECT: ENERGY EMPIRE | | Y | | | | | | Y | Y |
| KING OF TOKYO | | Y | | | | | | Y | Y |
| 1775: REBELLION | | Y | | | | | | Y | Y |
| BLACK ORCHESTRA | | Y | | | | | | Y | Y |
| RUNEBOUND (THIRD EDITION) | | Y | | | | | | Y | Y |
| FORMULA D | Y | Y | Y | Y | Y | Y | Y | Y | N |
| RALLYMAN: GT | | Y | | | | | | Y | N |
| BRISTOL 1350 | | Y | | | | | | Y | N |
| BATTLEBALL | Y | Y | | Y | Y | Y | | Y | N |
| SPURS: A TALE IN THE OLD WEST | | Y | | | | | | Y | Y |
| AGE OF DOGFIGHTS: WW1 | | Y | | | | | | Y | Y |
| MOB: BIG APPLE | | Y | | | | | | Y | N |
| ROLL IN ONE | Y | Y | Y | Y | Y | Y | | Y | Y |
| PAPER APPS: DUNGEON | | Y | | | | | | N | N |
| POTATO PIRATES: ENTER THE SPUDNET | | | Y | | | | | Y | N |

Table 3 presents the aesthetics of the dice, the format, colors, and images they have. D6 dice (six faces) are the most common. They have been used for centuries, showing pips in their faces from one to six. Although most games use D6 (33 Games, 89,2%), other types appear as follows:

- D4 (3 games, 8,11%)
- D8 (4 games, 10,51%)
- D10 (5 games. 13,51%)
- D12 (5 games. 13,51%)
- D20 (3 games, 8,11%)
- D30 (1 game, 2,71%)

The shape of the dice is associated with geometric solids and face shapes. As the number of geometric shapes increases, practicability may be jeopardized. The D100 type of dice is unstable: it rolls inadvertently and even after the first stop. Depending on the size, reading the results is not easy. These shapes might be a limitation that led designers to innovate in a new direction.

In games like FORMULA D and A FEAST FOR ODIN, players use different dice in each move, representing distinct opportunities and probabilistic outcomes. The dice format is a way to model a range of results, the variability of an uncertain action like speeding, hunting, or hitting something. Dice of different forms are

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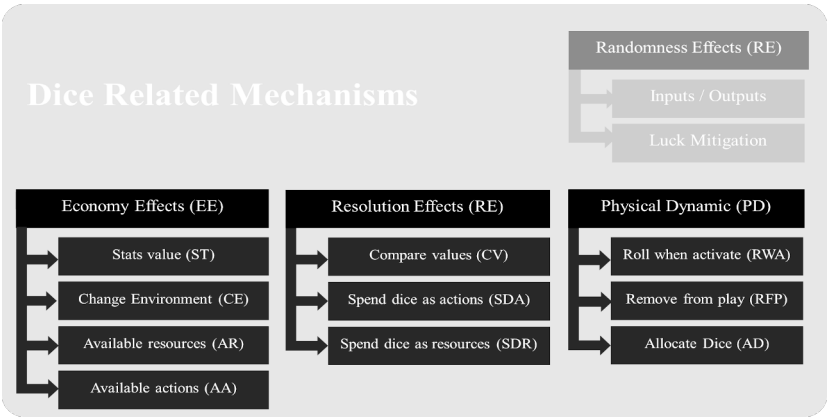
usual among narrative hobby games,[35] but they are also present in contemporary board and card games. Besides the dice format and colors, the information dice faces show is relevant. Games may use customized dice with common shapes (i.e., D6) but express modified values and images in the faces. This design option allows higher configuration and addresses specific themes. We see these types of dice in games like WINGSPAN, where the dice show bird food available to be transformed into food tokens. These tokens allow playing bird cards. Adding to the dice aesthetics, WINGSPAN also features an original cardboard dice tower shaped like a birdhouse and feeder. This construction helps the game theme and functionality. It increases the dice rolling as a metaphor for bird food.

*Figure 3: Scheme of dice related mechanisms obtained from Tables 1, 2, and 3*




Source: Graphic by Micael Sousa

Table 4 specifies how even the traditional dice rolling to generate results is implemented differently in those modern board games that hobbyist players enjoy according to BGG ranks. These innovations are expressed not just by the dice aesthetics but by the way they are combined with game mechanisms. In order to make these relations evident, we propose the following "Dice Related Mechanisms" (Figure 3) obtained from the samples (Grounded Theory application). Luck Input/Output (Luck In/Out); Direct Luck Mitigation (DLM) relate to Randomness Effects (RE). Economy Effects (EE), Resolution Effects (RE), and Physical Dynamics (PD) are new proposals to classify the dice according to the way they are

35 Arnaudo, Marco: *Storytelling in the Modern Board Game: Narrative Trends from the Late 1960s to Today*, Jefferson, NC: McFarland 2018.

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combined with game mechanisms. The subtypes of each Dice Related Mechanisms are presented in Figure 3 as additional information to avoid the typical abstraction of game mechanisms.

*Table 4: The mechanisms from BGG selected dice games*

| Name | Dice Related Mechanisms | | | | |
|---|---|---|---|---|---|
| | RE | | New mechanisms dimensions | | |
| | Luck In /Out | DLM | EE | RE | PD |
| TWILIGHT IMPERIUM: FOURTH EDITION | Out | Y | ST | CV | RWA |
| STAR WARS: REBELLION | Out | Y | ST | CV | RWA |
| WAR OF THE RING: SECOND EDITION | In | Y | AA | SDA | RFP |
| TWILIGHT STRUGGLE | Out | N | ST | CV | RWA |
| THE CASTLES OF BURGUNDY | In | Y | AA | SDA | RFP |
| NEMESIS | Out | Y | CE | CV | RWA |
| A FEAST FOR ODIN | Out | Y | ST | CV | RWA |
| WINGSPAN | In | Y | AR | SDR | RFP |
| ROOT | Out | Y | ST | CV | RWA |
| MAGE KNIGHT BOARD GAME | In | Y | AR | SDR | RFP |
| TOO MANY BONES | Out | Y | ST | CV | RFP |
| STAR WARS: IMPERIAL ASSAULT | Out | Y | ST | SDA | RFP |
| ROBINSON CRUSOE: ADVENTURES ON THE CURSED ISLAND | Out | Y | CE | CV | RWA |
| THE VOYAGES OF MARCO POLO | In | Y | AA | SDA | AD |
| TROYES | In | Y | AA | SDA | RFP |
| ROLL FOR THE GALAXY | In | Y | AA | SDA | AD |
| CHAMPIONS OF MIDGARD | In | Y | AR | SDR | RWA |
| STONE AGE | Out | Y | SV | SDR | RWA |
| THAT'S PRETTY CLEVER! | In | Y | AA | SDR | RFP |
| RAJAS OF THE GANGES | In | Y | AA | SDR | RFP |
| MEMOIR '44 | Out | N | CE | CV | RWA |

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| | | | | | |
|---|---|---|---|---|---|
| SAGRADA | In | Y | AR | SDA | AD |
| THE MANHATTAN PROJECT: ENERGY EMPIRE | Out | Y | AR | CV | RWA |
| KING OF TOKYO | Out | Y | AR | SDA | RWA |
| 1775: REBELLION | Out | N | CE | CV | RWA |
| BLACK ORCHESTRA | Out | Y | AA | CV | RWA |
| RUNEBOUND (THIRD EDITION) | Out | Y | AA | SDA | RFP |
| FORMULA D | Out | N | CE | SDA | RWA |
| RALLYMAN: GT | Out | Y | CE | CV | RWA |
| BRISTOL 1350 | In | Y | AA | SDA | RFP |
| BATTLEBALL | Out | N | CE | CV | RWA |
| SPURS: A TALE IN THE OLD WEST | Out | Y | CE | SDA | RFP |
| AGE OF DOGFIGHTS: WW1 | Out | N | CE | CV | RWA |
| MOB: BIG APPLE | In | Y | AA | CV | RWA |
| ROLL IN ONE | Out | N | AA | SDA | RWA |
| PAPER APPS: DUNGEON | In | N | CE | CV | RWA |
| POTATO PIRATES: ENTER THE SPUDNET | In | N | AR | SDR | RWA |

Table 4 is where we propose a classification for dice mechanisms. It classifies the game dynamics and how the dice are used as mechanisms, as playable interactions, express decision making, and outcomes affected by uncertainty. All the identified games demand dice to be rolled, which intends to generate various levels of randomness for the game system. This uncertainty can be classified as input and output randomness, following the definitions of LUDOLOGY Podcast.[36] Input is when the dice change the game state affecting players' decisions but not defining them in an absolute way. Output is when the results of the dice set the players' choices. From the list, 22 games were considered to have output randomness resulting from dice rolling, but all the games had some direct or indirect ways to mitigate the results (28), while all had some indirect system to mitigate luck. This design is

36 Engelstein, Geoffrey: "GameTek Classic 183—Input Output Randomness," in: *Ludology*, 2018, https://ludology.libsyn.com/gametek-classic-183-input-output-randoness

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predictable because hobby gamers usually dislike games with no player agency to affect the outcomes.[37]

The dice-related mechanisms scheme (Figure 3) is a proposal to analyze games that use dice. The dice can affect the game economy, changing the values of the game stats (statistics) or the position of other elements impacting the game environment. These environmental impacts can be visual and material (game components and bits), while the stats tend to be represented by numbers. The dice can also define available resources and actions.

*Table 5: Summary of game characteristics from BGG selected dice games*

| **Classifications** | | **Number of games** | **% of the sample** | |
|---|---|---|---|---|
| Type | Eurogame (E) | 10 | 27,03% | 100% |
| | Wargame (W) | 5 | 13,51% | |
| | Thematic (T) | 19 | 51,35% | |
| | Abstract (A) | 3 | 8,11% | |
| Economy Effects (EE) | Stats value (ST) | 8 | 21,62% | 100% |
| | Change environment (CE) | 10 | 27,03% | |
| | Available resources (AR) | 7 | 18,92% | |
| | Available actions (AA) | 12 | 32,43% | |
| Resolution Effects (RE) | Spend dice as resources (SDR) | 7 | 18,92% | 100,00 |
| | Compare values (CV) | 17 | 45,95% | |
| | Spend dice as actions (SDA) | 13 | 35,14% | |
| Physical Dynamic (PD) | Roll when activate (RWA) | 22 | 59,46% | 100% |
| | Remove from play (RFP) | 12 | 32,43% | |
| | Allocate Dice (AD) | 3 | 8,11% | |

The resolution mechanisms are often common in games. It is done simply by rolling and seeing if the results achieved a defined threshold or are bigger or smaller than other values (sometimes other players' dice). These are all considered "compared values." When dice are resources or actions, the resolution mechanism can be just spending the dice to establish the scarcity of the resource or action at stake.

Resolution mechanisms affect the game economy mechanisms and vice-versa. It is the resolution that changes the game state (economy of the game). But dice

37 Booth, Paul: *Game Play: Paratextuality in Contemporary Board Games*, New York, NY: Bloomsbury 2015.

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require physical actions to generate meaningful game state changes, affecting the economy as a resolution. The identified physical mechanisms were rolling dice, removing to define what is available, or allocating the dice to a board or similar game component. Removing or allocating dice is a way to track and bookkeep the game economy. It is an auxiliary activity to support the economic mechanisms.

Merging Tables 2, 3, and 4 provides a general overview of the sample. On average, the games had a complexity of 2,77 (considered as medium or medium-high complexity). But the Standard deviation of 0,84 shows that there are low and complex games in the sample. This variation means dice can be used in games of all complexity ranges.

Analyzing the type of games, 51.35% of the games are thematic, and 13,51% are wargames. We can say that dice are common ways to deliver thematic significance to a tabletop game. Dice often define the unpredictability of interactions, conflicts, weather conditions, and the possibility of failure and success when simulating an activity. Even Eurogames (27,03%), which tend to be more deterministic and mechanical centered, use them to introduce thematic representation like in A FEAST FOR ODIN hunting, fishing, and raiding. Other games like CASTLES OF BURGUNDY generate random inputs that increase replayability by changing the available actions and resources players can choose each round.

## Complementing the Tables: Other Dice Games Identified by Hobby Gamers

Despite considering the BGG rank system to identify popular dice games, many other innovative dice usages in modern tabletop games were missing. Asking hobby tabletop gamers can complement this information. We attended several game meetings in Leiria (Portugal), including the LEIRIACON national convention. This city is one of the most dynamic Portuguese cities regarding modern tabletop games. There are three publishers, one association (BOARDGAMERS OF LEIRIA), and the biggest national convention in Leiria. Also, the POLYTECHNIC OF LEIRIA offers a videogame course.

Discussing what innovative games with dice these gamers knew helped to find new games to analyze. These interactions with gamers consisted of three meetings of approximately 30 minutes before the local hobbits' local gaming gathering that happens every Friday evening. The same was done at Leiriacon 2022 during the playtest sessions. We asked: "*What were the more innovative dice games and games with dice they knew*?" Through informal conversation, it was possible to collect several game examples:

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One of the first examples is "MANSION OF MADNESS, 2ND EDITION" (2016), which appears in the 12th best game with the "Dice Rolling" mechanism. This example is interesting because it uses dice of different shapes, colors, and images while maintaining regular D6. As stated before, the game uses a digital App to guide the narrative. But the App does not replace dice. The game keeps them as part of the experience players enjoy.

Gamers identified at least two other examples of dice usage beyond rolling within the Eurogame type of game: First, designers may mix dice with other typic Eurogame mechanisms like "Worker Placement," a mechanic defined by Engelstein and Shalev.[38] One example of this is TEOTIHUACAN: CITY OF GODS (2018), where dice are never rolled, but their faces reveal the power of the worker they represent, changing whenever they acquire more experience as a deterministic outcome along the circular path in the game board. Another example is CRYSTAL PALACE (2019), where the dice represent workers. Here dice face values are predetermined at the beginning of each round simultaneously in a hidden way by players. Players need to pay the sum of the pips in each dice face, choosing how much they are willing to spend to have weaker or stronger workers for the round. Then, in a turn-based process, each player decides where to allocate dice to resolve in order of power later. These two games exemplify how standard D6 dice can be used alternatively without the effects of rolling and associated random outcomes. These games depart from the familiarity of dice as a game component and use innovative mechanisms.

During the conversations, gamers identified the "Worker Placement with Dice Workers," which we missed during our survey on BGG. But the complementary literature about tabletop game design alerted us to these mechanical options.[39] Exploring this mechanism revealed games like TROYES (2010), GRAND AUSTRIA HOTEL (2015), THE VOYAGES OF MARCO POLO (2015), LORENZO, IL MAGNIFICO (2016), and so many other popular Eurogames. These games appeared in the category of dice games, reinforcing the importance of crossing multiple lists and keywords when analyzing BGG databases. This mechanism has been used in the last ten years in many successful games, reinventing the worker placement mechanisms as a variation of the action point system. Here, players have a determined quantity of action points to do different actions. Players can block other players, and there are loops and cycles of renewal that allow repeating moves and reno-

38 Engelstein, Geoffrey/Isaac, Shalev: *Building Blocks of Tabletop Game Design: An Encyclopedia of Mechanisms*, Boca Raton: CRC Press LLC 2019.

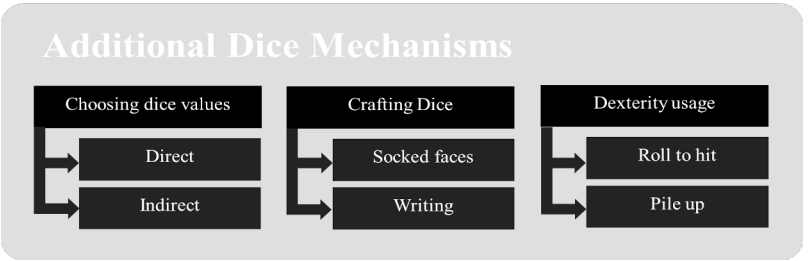
39 Ibid.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

vating resources. The power and effect of the actions can vary depending on the dice value when the worked placement mechanisms and dice are combined.

The other mechanic beyond rolling is found in dice crafting games. Players use the same dice along with the game, but they can change the faces of their dice. In DICE FORGE (2017), players use a customized device that resembles dice with sockets to change the dice faces. During the game, players customize their dice differently. Players change the actions, resources, and outcomes probability. Alternately, BLANK WHITE DICE (2016) is all about writing tags in the dice faces that give players actions to activate. Each player has a set of dice that allow them to write and erase during the gameplay according to the available tags defined by setup cards. DICE CITY (2015) is also a dice crafting game, but players do not change dice. In this game, players change what the pips represent. It is an alternative way of dice crafting by maintaining standard dice and changing only the auxiliary board and components.

*Figure 4:* Additional Dice Mechanisms emerged from hobby gamers' suggestions and previously collected data.




Source: Graphic by Micael Sousa

A little older than previous games is DUNGEON FIGHTER (2011), where dice rolling is the core game mechanism, but the space where the dice stops is relevant. This game comes with several customized D6 and a target (in a board format). Players roll the dice, trying to obtain the best dice face over the center of the target. Rolling dice simulates attacks of the different playable characters. It is an additional layer to the physical outcome of the dice rolling. The materiality of the dice can also be explored as a dexterity game. BATACLAN (1997) is older, less known, and simpler than the previous games. It is a dexterity dice game. It uses D6 dice of different sizes and demands players to pile them by pip value, regarding the size.

Based on the collected game information, we propose these new findings as additional dice mechanisms:

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- Choosing dice values
- Crafting dice
- Dexterity usage

These additional mechanisms and their generic implementations are presented in Figure 4.

## CONCLUSION

As expected, dice are far from obsolescent. Although non-hobby board gamers might feel that dice usage in games is static, new game releases prove otherwise. New tabletop games, board, card, and dice games continue to be invented. These modern board games can be highly successful, providing engaging experiences. Many of these new games depend on the materiality of dice to function, although considering other dimensions helps to understand how game design innovations are happening. Modern tabletop games provide examples of how dice are part of the ongoing design innovations. This novelty results from the new physical implementations, metaphors, and mechanical representation.[40] The aesthetics of dice are relevant, but even standard D6 dice (piped faces) can be innovative through the associated game mechanisms. Successful applications of dice are the result of mixing their material dimensions with mechanisms that build engaging game experiences.

This chapter proposed a method to find how dice appear in recent tabletop and board games. We proposed a framework to classify their uses according to the associated game mechanisms. This proposal aims to tackle the lack of systematic analysis of modern dice game systems. BGG proved to be useful for exploring tabletop dice game dimensions, despite the need to complement and adapt data. Interacting with the hobbyists is recommended, like crossing this informal information with updated literature. It is easy to miss a mechanism or other data at BGG. Talking with hobby gamers to collect data and understand their game experiences helps fill these gaps.

The proposed approach revealed how hobby games deal with the random effects of dice, using them to simulate uncertain results, but combining dice with mechanisms that increase player agency and meaningful decisions. Dice may

40 Sousa, Micael/Oliveira, Ana Patrícia/Zagalo, Nelson: "Mechanics or Mechanisms: Defining Differences in Analog Games to Support Game Design," in: *IEEE Conference on Games*, 2021.

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maintain the same shape as centuries ago, but their appearance in contemporary games has changed. Dice are examples of game components that never ceased to adapt to game design trends, proving to be adaptable and supporting new game mechanisms while maintaining the ability to engage players. We argue that game mechanisms are continuously reinventing dice games and enhancing our fascination for these material objects, despite some ground-breaking innovations like dice crafting that affect the particular materiality of dice.

Analog game innovations continue to occur. Even though the COVID-19 pandemic affected the hobby tabletop industry considerably,[41] it is expected that dice games continue to be developed in new, innovative, and exciting ways.

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41 Samarasinghe: "A Data Driven Review of Board Game Design."

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# Immateriality and Immortality

## Digital Toys in Video Games

EMMA REAY

This chapter takes the puzzle-platform game UNRAVEL as a case study to explore how the 'haptic-panoptic'[1] quality of digital toys can locate players in the liminal space between material reality and immaterial imaginings. Drawing across Zoe Jaques'[2] theorization of the 'spectrality' of stuffed animals and Katriina Heljakka's[3] examination of toys as avatars, I argue that toylike protagonists in video games are intuitive vehicles to shuttle players between the realms of the physical and the digital. I suggest that since digital toys occupy an intermedial space between sensory planes, they can simultaneously elicit an intense sense of presentness and a profound sense of absence. I consider the paradox of manipulability and intangibility through the lenses of nostalgia and tactile memories, making connections between UNRAVEL*'s* core mechanic of 'dis-membering' the protagonist and 're-membering' the past. I posit that the subject position available to players in UNRAVEL is that of 'ghost,' haunting the playspace and possessing the doll-like

1 Lancaster, Kurt: *Interacting with Babylon 5: Fan Performances in a Media Universe,* Austin: University of Texas Press 2001.

2 Jaques, Zoe: Children's Literature and the Posthuman: Animal, Environment, Cyborg, New York: Routledge 2015, and Jaques, Zoe: "Always Playing: The Specral Nostalgia of Cinematic Pooh," in: Harrison, Jennifer (ed.), Positioning Pooh: Edward Bear after One Hundred Years, Mississippi: University Press of Mississippi 2021.

3 Heljakka, Katriina "Aren't You a Doll! Toying With Avatars in Digital Playgrounds," in: *Journal of Gaming & Virtual Worlds,* Volume 4: Issue 2, 2012, pp. 153-17, and Heljakka, Katriina/Harviainen, J. Tuomas: "From Displays and Dioramas to DollDramas: Adult World Building and World Playing with Toys," in: *American Journal of Play,* 11(3), 2019, pp. 351-378.

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avatar. I conclude by exploring the idea of spectral 'play-echoes' in video games, looking specifically at traces left in gameworlds by deceased players.

## DOLLS, PLUSHIES, AND PLASTIC FIGURINES

While collecting data for a content analysis documenting depictions of children in contemporary video games,[4] I identified a subset of texts that featured avatars designed to resemble dolls, plushies, and plastic figurines. I was struck by the 'haptic-panoptic'[5] quality of these avatars: their digital skins had been carefully designed to evoke sensory memories of soft, warm wool, flat, stiff paper, or shiny, rubbery plastic. I appropriate Kurt Lancaster's coinage 'haptic-panoptic' here to refer to that synesthetic space between senses where the visual is suffused with tactile qualities that call to mind experiences of weight, texture, pliancy, and other physical sensations. The avatar in the LITTLEBIGPLANET series, for example, is a crocheted creature made from itchy, brown yarn with black buttons for eyes and a comedy-kitsch zip running from gusset to neck that serves as a tie. His construction looks as straightforward as his overly literal name: Sackboy. Sackboy appears to have been assembled from scrap materials—the reincarnation of a holey jumper, perhaps, or a widowed sock—and the crafting process is rendered visible in the lumpy stitching that secures his hands to his arms and seals up his disproportionately large head. The fact that Sackboy bears signs of being handmade, in conjunction with the fact that the scale of the game's virtual environments suggests he is hand-sized, makes him feel graspable. As a result, there is a gestural congruence between the shape and size of the player's hand movements as they press buttons on the controller and the audiovisual feedback of Sackboy responding on screen.

The playable protagonist in the puzzle-platform game UNRAVEL is also designed to represent a handcrafted woolen doll. In the game's marketing material, this doll is given the name 'Yarny,' suggesting that his identity is closely tied to his materiality. Yarny belongs to a long fairy-tale tradition of toymaker's creations that are absent-mindedly imbued by their artisans with a soul—a side effect of a long lost, pre-Fordist magic. Homely and whimsical, Yarny seems as if he were quickly crafted from offcuts—not without love, but without pretension. The low cost of Yarny's production is inversely proportional to his sentimental value. His

4 Reay, Emma: "Representations of Children in Videogames," in: *Game Studies,* Volume 21: Issue 1, 2021.

5 K. Lancaster: *Interacting with Babylon 5*, pp. 1-33.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

loose ends and visible stitching evidence the unique quirks of his human creator, making him individual, irreplaceable, and therefore priceless. In a binary medium of computational precision, Yarny's imperfections convey traces of human craftsmanship: this knitted being re-weaves the rainbow, and his corporeal crochet conceals the cold, wraithlike code from which his is actually constructed. That is to say, "the medium's computational materiality—inherently founded as it is upon the empirical value, the defined procedure, the rigid binary of true and false"[6] is sublimated beneath a skin that strongly evokes sensory memories of an organic, homespun, folksy texture.

While characters like Sackboy, Yarny, and Yoshi are made of fuzzy wool, the avatars in TEARAWAY and TEARAWAY UNFOLDED resemble animate origami and move through dioramas of painted cardboard, confetti, and crumpled tissue. Similarly, the heroes of SCRIBBLENAUTS UNLIMITED seem to be constructed from stickers and split pins. The playable characters and the in-game objects in SCRIBBLENAUTS UNLIMITED are composed of simple, saturated, two-dimensional shapes with hard, contrasting outlines. Furthermore, the fact that there is no movement along the Y-axis in this game compounds the sense that the world of SCRIBBLENAUTS is paper-thin. The flatness of the environments—which consist of just two stacked layers—is reminiscent of a Victorian paper theatre, with the edge of the screen functioning as a miniature proscenium arch. The visual design of SCRIBBLENAUTS UNLIMITED—combined with the skeuomorphic 'skrish' sound of a paper page turn that accompanies the main game mechanic—gives the virtual world the modest heft of a coloring book or a paste collage that might be showcased on the family fridge.

Finally, there were several avatars in my corpus that recalled the armies of identical figurines often found heaped in bargain bins near toyshop tills or begreased between burger and fries in a McDonald's Happy Meal™. The toylike characters in FALL GUYS and PIKMIN 3, for example, share a cheap, shiny plasticity that Roland Barthes would have likely condemned for being "a graceless material, the product of chemistry, not of nature" and having "an appearance at once gross and hygienic."[7] Synthetic, lurid, and effortlessly replicable, Pikmin look like injection-molded mandrakes, while Fall Guys appear to be made from a gummy, neon flubber that combines the robustness of a dog's chew toy with the gelatinousness of a Jelly Baby.

6 Vella, Daniel: "No Mastery Without Mystery: Dark Souls and the Ludic Sublime," in: *Game Studies,* Vol. 15, Issue 1, 2015.

7 Barthes, Roland: *Mythologies,* translated by Annette Lavers, London: Vintage 1993 (1957).

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I posited that the diverse toylike textures of these avatars all scripted a certain style of play, namely roughhousing.[8] As a blimpish blobject, the rubbery elasticity of a Fall Guy spectacularizes bloodless sadism. That is to say, the avatar's wobbly tactility invites violence because it is biteable, squishable, and deformable whilst simultaneously being reassuringly robust, durable, and resilient. Equally, the pleasure found in hurling hordes of Pikmin into battle is contingent upon their inorganic materiality. Smooth, hard, and uniform, Pikmin have no breakable parts nor vulnerable soft spots: they do not look like they would decompose, shatter, or hemorrhage. Players are prompted to treat the Pikmin as if they were wholly expendable in part because their materiality is suggestive of inexpensive mass production. Although he is neither waterproof nor wipe-clean, Sackboy's toylike materiality also encourages players to conduct playful experiments using his body—many of which result in him being incinerated, melted in acid, and pulverized by heavy machinery. Sackboy's blithe attitude towards his own repeated destruction sets the tone for a joke that is repeated in the tutorial of each game in the series: the narrator questions whether Sackboy is resurrected after each dismemberment or whether he is simply replaced by an identical toy. The series hamstrings aggression by invoking a childly world of wonder, but, paradoxically, this apparent innocence makes violent play—specifically, the reckless sacrificing of Sackboy's body—acceptable by alleviating the player's sense of culpability.

SCRIBBLENAUTS UNLIMITED makes creative spontaneity and impulsive curiosity feel safe and viable in the same way: the ramifications of vandalism and destruction are mitigated when enacted within a paper world. This goes some way to explaining the countless Let's Play videos uploaded to YouTube in which players of SCRIBBLENAUTS UNLIMITED attempt to solve the game's puzzles solely using a flamethrower. Despite 'fire' being a suboptimal solution in most of the game's scenarios, setting the paper world alight is a valid response to the latent, transgressive script that runs counter to the game's overt encouragement of neighborly community service. I concluded my analysis of toylike avatars by positing that the pleasure found in their rippable, crushable, destructible materiality was augmented by their restartable, respawnable, rewindable *im*materiality. That is to say, both their materiality and their immateriality work in parallel to mitigate consequences by suggesting an imperviousness to pain and a forgiving sturdiness. Like exhibits protected behind a screen of glass in a toy museum, the avatars

8 Reay, Emma: "Cute, Cuddly and Completely Crushable: Plushies as Avatars in Video Games," in: *Journal of Gaming & Virtual Worlds,* Volume 13: Issue 2, 2021, pp. 131-149.

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invited boisterous, rough manhandling whilst simultaneously attenuating the consequences of touch.

One game in my corpus, however, seemed to be at odds with this 'best of both worlds' interpretation. Despite featuring a delightfully destructible doll-avatar, UNRAVEL is a game that is deeply anxious about disintegration. Rather than Yarny's woolly materiality and his pixelated immateriality working in tandem to support a carefree, careless playstyle, UNRAVEL scaffolds a tactile experience that elicits a bittersweet sense of a loss, distance, and disconnection. Entangled with the feelings of satisfaction players derive from the game's physics-based puzzles that simulate weight, gravity, tension, and friction is a fundamental dissatisfaction rooted in an unsatiated yearning for physical contact induced by sensory nostalgia. This chapter offers a close reading of UNRAVEL that centers on the gap between its haptic plane and its audiovisual plane as a key site of meaning. Just as picture book theorists[9] have argued that tension between the verbal plane and the visual plane in children's books can generate interpretive gaps that prompt 'literary' readings, I argue that the snags between the haptic and the audiovisual in videogames generate complex, layered, subjective possibility spaces. I suggest that UNRAVEL uses the partial embodiment that characterizes both toy play and video game play to elicit feelings of homesickness and separation that speak to the game's central themes of loneliness, mourning, and letting go.

## TACTILE NOSTALGIA

UNRAVEL begins in the front room of a grandmother's cozy cottage that is bathed in the low, golden glow of a long Swedish summer's evening. On a small, wooden table stands a vase of foraged wildflowers, a tin kettle, a plate of Swedish biscuits, and an open photo album. A hand-embroidered prayer cushion reads, "*Lycka blommar ur sma enkla*"—'Happiness blooms out of small, simple things.' The accompanying music is ruminative—even plaintive—but nonetheless sweet and soothing. An elderly woman wrapped up in a crocheted shawl smiles at the framed photograph held in her hands, but her expression soon drops, and she bows her head. She walks over creaking floorboards to a staircase, stopping briefly to straighten a portrait of a toddler sitting in a heap of autumn leaves. She collects a wicker basket of half-finished knitting and carries on upstairs, but the camera, rather than following her, is distracted by a ball of bright red yarn that falls from the

9 E.g., Scott, Carole/Nikolajeva, Maria: *How Picturebooks Work,* New York: Routledge 2001.

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basket and bounces across the kitchen floor coming to rest under a dining chair. The screen fades to black, and the next moment, the player sees Yarny—a red, woolen sprite—climbing onto the table, stepping over a hand-written letter, and gazing around the room, saucer-eyed with wonder and curiosity.

Through the character of Yarny, UNRAVEL facilitates a fantasy of being born again into a second childhood, one more magical and more vivid than the first—a childhood lived between the *hÿgge* game hub of the grandmother's rustic, welcoming home and the breath-taking Scandinavian natural landscapes that constitute the game's levels. Toy theorist Katriina Heljakka writes:

> "[a]dults who acquire toys and play with them have their activities often explained as nostalgia, their toys considered objects that merely provoke a yearning for childhood. However […] this remembered childhood is not a lived childhood but, instead, a voluntary one."[10]

The childhood revisited in UNRAVEL is not a 'lived childhood' but a Platonic ideal of childhood—a childhood viewed both through the long lens of nostalgia and also through the tinted lens of a coveted fantasy. Carolyn Steedman has argued that childhood as an abstract concept has become an emblem of a lost past and lost selves,[11] and this is certainly the case for UNRAVEL. In fact, the poignancy of the game rests in the partial and temporary nature of the experience it offers to players: they can re-enter the Edenic garden of childhood as visitors, but with the knowledge that they will never be repatriated to this universal homeland.

The transitory impermanence—this sense of being out(side) of time—is embedded in the videogame medium itself. In the opening cutscene described above, the rotary telephone, the rustic wood stove, and the old-fashioned furniture all feel anachronistic because they are rendered as computer-generated images. Equally, the precision and fidelity with which the game portrays its timeless pastoral environments paradoxically draw attention to the medium's technical sophistication. The visual style of this game reaches towards photorealism, to the extent that the photographs by the grandmother's staircase and in her albums are real-world images taken by the development team of their friends and loved ones. This careful commitment to visual verisimilitude—particularly to the minutiae of the natural world—feels like an act of loving devotion. What is more, since the game's serene digital vistas are experienced from the perspective of a very small creature (Yarny measures approximately four inches tall), this meticulous attention to detail is

10 K. Heljakka/J. T. Harviainen: "From Displays and Dioramas to DollDramas," pp. 355.

11 Steedman, Carolyn: "Inside, Outside, Other: Accounts of National Identity in the 19th Century," in: *History of the Human Sciences,* Vol. 8, No. 4, 1995, pp. 59-76.

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further exaggerated. The distortion of scale imbues the humble pinecone with the majesty of a mountain, gives the moth the air of an angel, and other such Burkean sentiments. The size of these artifacts relative to the avatar enlarges their importance for the player, replicating the fascination young children are thought to have with objects that have lost their intrigue for adults.

The game's paean to small pleasures is connected to long outgrown childly perspectives and to Romantic, pre-industrial rural locales that have remained 'unadulterated' by modernity. As a result, the sublime beauty of the gameworld tugs the player into personal and collective pasts, eliciting something Zoe Jaques terms "spectral nostalgia." "Spectral nostalgia," Jaques writes, "can be defined as a wistful looking back to the past, certainly, but via a backward glance that is specifically attentive to its hauntings and echoes, the way specters not only emerge from the past but can shape an inflect the present and future."[12] The immateriality of these computer-generated images combined with the reverential veracity with which these digital specters reproduce the physics, dimensions, and textures of their material referents gives them a phantasmagorical quality. The analog is rendered in the digital and is experienced like a mirage in the desert. The fact that these objects are both interactive and intangible exaggerates the sensory shortfall of digital formats. The resultant feeling is like an unscratchable itch on a phantom limb.

UNRAVEL is profoundly nostalgic for its material referents, and this is made explicit in the game's narrative premise, which entrusts Yarny and the player with collecting (or recollecting) the grandmother's fading memories. The recollection process is symbolized by the restoration of the damaged photographs in an album. Torn, sun-bleached, and stained, the photographs held between yellowing pages evoke age-related memory loss and familial neglect. Yarny traverses different game levels encountering soft-focus, life-sized still images of moments from the grandmother's memory. These images dissolve into glowing particles of dust that Yarny absorbs so that he can 're-member' them when he returns to the photo album in the game's hubspace.

The 're-membering' process is also expressed via Yarny's material body. Yarny is a visualization of two linguistic metaphors: the images of one's mind 'UNRAVELling' with age and of 'losing one's thread' when retelling a story. As an avatar, he is subjected to repeated dismemberment at the hands of the player as part of solving the game's physics-based puzzles. Players must use the wool that makes up Yarny's body to strategically connect platforms so that he can climb it, swing from it, and use it to form tensile bridges. The wool available is finite and begins to unwind as Yarny moves from the left-hand side of the screen towards

12 Z. Jaques: "Always Playing."

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the right-hand side until he is reduced to a thin, hunched, single-threaded skeleton. Like Theseus' Ship, Yarny's 'original' body is quickly replaced with entirely new skeins of wool, gesturing towards the fact that a memory of an event is not equivalent to the original experience and that reliving a memory creatively overwrites the previous recording. The final lengths of Yarny's wool have a series of knots that, rather disturbingly, evoke organs, and the sense that he is being disemboweled is compounded by the blood-red color of the wool. The player can replenish Yarny's wool by directing him towards fresh spools snagged on odd nails and splinters of wood, but when he is reduced to his final lengths, he moves pitifully slowly as if he were almost too weak to carry on. In these moments, his size and appearance evoke a bloodied tampon, or even a fetus, far from the womb of the grandmother's cottage, pathetically trailing its umbilical cord behind it. Additionally, when played with a controller, the player experiences rumbling vibrations as Yarny yanks at the last lengths of his own intestinal tubes. Yarny's materiality both facilitates and limits the player's ability to master the game's puzzles. When players run out of thread, the grandmother's status as someone who is both 'forgetful' and 'forgotten' are brought to mind, along with the attendant emotions of frustration and despair.

The disintegration of Yarny's body recalls Shel Silverstein's weepy picture book THE GIVING TREE, in which a tree representing a caregiver has its resources entirely depleted by a demanding child. However, in UNRAVEL, it is the surrogate child that hazards its physical body for the benefit of its elderly creator. Both the tree and the toy are transitional objects, and their eventual abandonment is inevitable, but the toy's childliness loans it a hopeful, regenerative, evergreen endurance that allows it to outlast individual generations and remain in the garden of childhood. More so than photographs preserved in an album—which hold only the past—the toy is a script that always solicits new performers and generates new performances. It is a doorstop that holds open the entrance to the polyreal realm of *paidia*[13] so that players of all ages can step through and encounter both their own *childselves* and the *childselves* of the players who came before them.

Lynda Barry questions whether "a toy can exist without a person"[14] and insists "the same toy is not the same toy for anybody else," [15] suggesting that what brings a toy into being is the act of play as a spatio-temporal event and that each time a toy is awoken from dormancy by a new player the seemingly constant

13 Caillois, Roger: *Man, Play, and Games,* translated by M. Barash, New York: Free Press of Glencoe 1961.

14 Barry, Lynda: *What it is,* Montreal: Drawn and Quaterly 2008, p. 51.

15 Ibid., p. 46.

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material object is made fundamentally different. Jaques compares the lifecycles of toys in two contemporary children's films, noting that as "Christopher Robin's toys [find] fresh playfulness in Madeline just as Andy's do in Bonnie, the recyclability of the relationship between toy and child paper[s] over the unsettling fact that such beings can eternally outlive their human companions, even as they become tattered and frayed."[16] Jaques draws attention to the parallels between Roland Barthes' horror at "that rather terrible thing that is in every photograph: the return of the dead"[17] and the spectral quality of toys preserved in museums.[18] A key difference between photographs and toys, however, is that as photographs fade, their referent also disintegrates, meaning that the material and the immaterial are effaced in tandem. In contrast, as toys grow more 'tattered and frayed,' the immaterial begins to manifest on a material plane. That is to say, the intangible play-echoes of imaginative games become concretized as marks upon the body of the toy. Like tattoos or scars, the vandalization and destruction of the toy is a record of ephemeral incidents of pretend play—specifically, it preserves what was seen in the mind's eye, mediated via idiosyncratic haptic gestures. The gap between the material and the immaterial is never so narrow as it is in the moment before a toy disintegrates entirely.

In UNRAVEL, the toy exceeds the photograph as a focal point of nostalgia—not just because it functions as a record of a tactile experience, but because it bears the traces of previous players' 'aliveness.' Barry hypothesizes, "[t]here is something brought alive during play, and this something, when played with, seems to play back."[19] This is perhaps why Yarny's total disintegration towards the end of UNRAVEL is so emotionally charged. The penultimate level requires Yarny to traverse a snow-covered cemetery during an intense blizzard. He spends the level shivering with his thin yarn arms wrapped around his tiny body for warmth. In the context of this gentle game, the puzzles in this level are punishing. A biting wind erases the players' progress by forcing Yarny back to the start of the level and brings about sudden fail-states by freezing him to death. Finally, threadbare and deformed, Yarny reaches the crocheted badge that signals the end of the level—in this case, it is one half of a ripped heart. As the player makes Yarny jump towards it, the game wrests control away from the player and runs a cutscene showing the ruthless wind snatching the heart from Yarny's hands at the last moment.

16 Z. Jaques: "Always Playing," p. 60.

17 Barthes, Roland: *Camera Lucida: Reflections on Photography*, translated by Richard Howard, New York: Hill and Wang 1980, p. 9.

18 Z. Jaques: "Always Playing," p. 53.

19 B. Lynda: *What it is,* p. 51.

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When Yarny dives after it, he overextends himself, UNRAVELling completely and disappearing from existence. The thread of life is cut—as is the connection between the grandmother's younger selves—and the portal to the past is finally closed.

The grief elicited by Yarny's UNRAVELling is only short-lived, as the game quickly replaces or repairs the broken toy. After a weighty pause, a *deus ex machina* in the form of a mitten-clad hand reaches down from the top of the screen and retrieves both the crocheted heart and the unspun string of red yarn. Following a black loading screen, what seems to be an eyelid peels open, revealing that it is, in fact, a backpack being unzipped. Light pours into the bag, and Yarny emerges, reborn and blinking in the sunlight. It is springtime once more, and he is at the bottom of the grandmother's garden, back where the game began. In juxtaposition to the previous level, the final brief stretch of gameplay facilitates Yarny's easy passage via a skyful of sparkling fireflies that allow Yarny to float, flip, and fly above the ground, creating a dreamlike feeling of weightlessness and joy. He is lifted by a flurry of fireflies up onto the windowsill of the grandmother's house, where he is—rather unceremoniously—launched inside as a football hits the pane of the open window.

Yarny's hard-earned reward for his dutiful restoration of the photograph album comes in the form of a little girl—presumably a grandchild—who flings open the door to the grandmother's front room and skips towards the table. Yarny throws himself prostrate and feigns lifelessness while the little girl helps herself to a traditional Swedish cinnamon swirl. She grabs Yarny and examines him approvingly before plonking him down on the table and running back outside into the garden. The passage of time and the process of aging are not linear and do not end with death in the frozen cemetery—they are cyclic and continuous, always returning to the child. Yarny's immortality and unending reincarnation rest on the permanence and persistence of his material body. The warm, safe haven of the grandmother's garden does not signify a final resting place but a transitional passage leading to reincarnation. Yarny's quick decision to hide his 'aliveness' from the granddaughter is an invitation for her to entwine her own imaginative aliveness with his physical form. That is to say, his inanimate state primes him for possession that will continue the unbroken chain of previous possessors, bridging the gap between grandmother and granddaughter. One of the hand-written captions in the grandmother's photograph album reads, "The past can help you cope. It can be a strength and a solace. But if you can't let it go, it can drag you under." UNRAVEL suggests that a photograph can only replay a single moment in time, but the graspable, poseable, manipulable body of a toy is future-oriented, always in anticipation of its next incarnation. Letting go of the past is less painful when it is framed as passing on a plaything to the next generation.

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## PLAYING AS POSSESSION: HAUNTED DOLLS IN VIDEO GAMES

The returning gaze of dolls, plushies, and action figures invites speculation about divergent forms of 'aliveness.' Jaques notes how fundamental a toy's materiality is to its 'aliveness' in her reading of Margery Williams's tale of *The Velveteen Rabbit.*[20] In this classic children's book, the old Skin Horse explains to the plushie protagonist that only attachment expressed through extensive physical handling can bring toys to life. Toys that "break easily, or have sharp edges, or who have to be carefully kept"[21] do not become real because they are not sufficiently graspable. Jaques comments on the way the text valorizes the gradual decay of frequently hugged toys, arguing that toys require something akin to an organic, mortal body in order to attain proximity to living beings. Roland Barthes also links a toy's material body to its' aliveness,' making an almost religious connection between the likelihood of a toy having an afterlife and the purity of the material it is made from. He writes:

"Wood is a familiar and poetic substance, which does not sever the child from close contact with the tree, the table, the floor. Wood does not wound or break down; it does not shatter, it wears out, it can last a long time, live with the child, alter little by little the relations between the object and the hand. If it dies, it is in dwindling, not in swelling out like those mechanical toys which disappear behind the hernia of a broken spring. Wood makes essential objects, objects for all time. Yet there hardly remain any of these wooden toys from the Vosges, these fretwork farms with their animals, which were only possible, it is true, in the days of the craftsman. Henceforth, toys are chemical in substance and colour; their very material introduces one to a coenaesthesis of use, not pleasure. These toys die in fact very quickly, and once dead, they have no posthumous life for the child."[22]

Only the toys that submit to and endure the mauling of the child-God gain admittance to his nostalgic heaven, where toys' physical bodies are retired, but the ephemeral, imagined play experiences that they once prompted are immortalized as sweet, hazy, haloed memories. The body of Winnie-the-Pooh may be out of reach in a display case in the New York Public Library, but the teddy's soul is

20 J. Zoe: *Children's Literature and the Posthuman.*

21 Ibid. p. 10

22 R. Barthes: *Mythologies*, pp. 54-55.

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forever "in that enchanted place on the top of the forest [where] a little boy and his Bear will always be playing."[23]

One wonders what Barthes would have made of digital toys that are simultaneously more durable and more intangible than those hewn from wood. Although digital toys cannot decay, they can bear traces of their handling by players, as Jordan Erica Webber records in her moving interviews with bereaved people who return to the save files of games played by their lost loved ones.[24] Many of the interviewees mention games from the ANIMAL CROSSING series, including Meredith Myers, whose sister, Kylie, passed away as a teenager. Myers describes wanting to maintain her sister's town in ANIMAL CROSSING: WILD WORLD because interacting with something that Kylie had once played with herself gave her a feeling of closeness and connection to her sister. Myers relates that, four years after Kylie's death, an inhabitant of the virtual town—an anthropomorphic cat named Lolly—revealed that she was in possession of a letter written by Kylie, which Myers was then able to read. Myers says, "Being able to see the relationship [Kylie] had built with this little virtual cat and seeing it come to life was like having a little piece of her again." Kylie was outlived both by her digital toy and by her own playfulness, which engaged her sister in a paidic interaction long after her death. While the haunted toy did not help Kylie to materialize on a physical plane, it did enable her sister to enter into the digital space containing Kylie's preserved play echo.

For Myers, the ANIMAL CROSSING village is a liminal space between the past and the present and the deceased and the living. Myers' play in this space is akin both to the ritual visiting of a gravesite and to a cross-sensory séance. Since paidic play takes place between the material and the immaterial, playing with the dead can feel like one is meeting them in the realm between imagination and experience. To put it another way, a memory exists somewhere between imagination and experience, and so a toy that straddles sensory worlds can shuttle the player back and forth in time as well as material planes.

The liminal space of toy play requires a sensory compromise—or, rather, it requires the relinquishing of presentness in one material plane to manifest in another. In encountering Kylie's play-echo, Myers experiences what is gained in terms of what is lost. She reflects, "I couldn't take care of [Kylie] in real life anymore. But I could take care of her [Animal Crossing] village. Hear her voice

23 Milne, A./Shepard, E.: *The House at Pooh Corner*, London: Egmont 2011.

24 Webber, Jordan E.: "Playing with the Dead," in: *BBC Radio 4,* 2020, https://www.bbc.co.uk/programmes/m000nv36

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through her letter. The game gave me this little piece of her."[25] Myers 'hears' Kylie's voice through the written text of Kylie's letter—combining auditory memory with a *new* communication—but her sister's resurrection is only partial: she is granted only a *piece of her*. She contrasts *real life* with the virtual playspace, suggesting that her actions within the digital game are mimetic signifiers of care rather than care itself. They are specters of care that exist in the present but belong to the past.

Similarly, the bereaved father of Ezra Chatterton describes interacting with a WORLD OF WARCRAFT quest designed and voiced by his son as "an echo—it's a shadow—of the thing that I want, which is to be able to actually touch him, feel him, be with him again. But it is something. It's more than the void."[26] Immateriality is, again, experienced as a loss, and the *actual* is contrasted with the *virtual.* Ezra's auditory (echo) and visual (shadow) manifestations scaffold the absence of his tactile, haptic manifestation. The same sensory language appears in Amy and Ryan Green's description of the memorialization of their son Joel in the autobiographical game THAT DRAGON, CANCER. Ryan comments,

> "They're echoes, but echoes fade. And we have to turn our hope to the future. My hope is that someday I will see Joel again and someday I will hold him for real and someday I will play with him for real."

The virtual afterlives of these deceased players who have been *saved* in games are beyond materiality and beyond mortality. The bereaved await their own dematerialization that will, paradoxically, allow them to experience the haptic, tactile aspects of their lost loved ones once more.

## TOYS AS MATERIALIZED FICTIONS

The omnipresence of toys in transmedia franchises attests to their ability not only to transport players into fictional worlds by inviting games of Let's Pretend but also to manifest fictional beings in the material realm. Hybrid character toys such as Nintendo's *Amiibos,* Activision's *Skylanders,* Hasbro's *Telepods*, and the figurines associated with the DISNEY INFINITY series draw on understandings of toys as two-way portals from material reality into individual mindscapes and into collective fantasies. LITTLEBIGPLANET positions Sackboy as the conduit that

25 Ibid.

26 Ibid.

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transports players to the "Imagisphere, the natural home of our creative wonderings."[27] The homophonic pun on "wondering" and "wandering" reflects the game's aim of manifesting creative fantasies in a mappable, navigable space. As a simulation of a concrete prop for make-believe play, Sackboy is an entry point into a parallel world that naturalizes the player's partial embodiment there. Brendan Keough has analyzed this phenomenon in the game TEARAWAY, played on the PlayStation Vita. He describes the moment when players are invited to poke their flesh-and-blood fingers into the game's paper world via a touchscreen as a "reverse trompe l'oeil, where the actual world is made to look as if it is part of the virtual."[28] The material affordances of the digital paper that constitutes the gameworld facilitate a metaleptic rip between semiotic planes that transforms the haptic into the visual and the physical into the virtual. Keogh does not explicitly connect the toyness of the game's avatar with the collapsing of sensory levels, but he does draw attention to the ways in which video game controllers are akin to toys in that they function as material interfaces that facilitate the manipulation of an internal, intangible, virtual world.

One could say, then, that toys are tools that encourage immersion, and their presence in video games cues players to imagine themselves re-materialized inside the gameworld. Keogh writes, "[t]he term *immersion* usefully describes the ideal sensation many videogames aim to imbue in their players: being transported to and enveloped in another world discrete from the actual world."[29] He notes, however, that the experience of interacting with video game worlds is best described as "an imperfect and partial sense of presence" that "flickers between present and absent, corporeal and incorporeal, immanent and transcendent, actual and virtual, 'me' and 'not me.'"[30] I would say that this 'between' state better captures the experience of play with physical toys than total immersion. Furthermore, I would argue that in UNRAVEL, this liminal space between the physical and the virtual is the intended destination.

The gap between sensory planes is a possibility space that has parallels with the 'interpretive gaps' in picturebooks. Children's literature scholars Carole Scott and Maria Nikolajeva devised a typology of interactions between the verbal (i.e., the written text) and the visual (i.e., the illustrations) that provides the critical terminology needed to distinguish between relationships. The terms they

27 From the opening narration of LITTLEBIGPLANET 3.

28 Keogh, Brendan: *A Play of Bodies: How We Perceive Videogames*, Cambridge MA: MIT Press 2018, p. 2.

29 Ibid., p. 33.

30 Ibid., p. 13.

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devised are: symmetrical, complementary, enhancing, counterpointing, and sylleptic.[31] When the verbal and the visual are 'symmetrical'—when the written text and the images convey the same information—the interpretive gap is narrow and monosemic. However, when the two planes express divergent or even contradictory information, this opens up a polysemic space in which readers can infer meaning in a subjective, creative, imaginative manner. Children's literature scholars have posited that snags between semiotic planes elicit *literary* readings of picturebooks, while a perfect weft and warp of the verbal and the visual can flatten and constrain meaning.

In contrast, discussions of tension between sensory planes within game criticism have primarily revolved around concepts such as 'ludonarrative dissonance,' a term coined by Clint Hocking to identify what he felt was a central design flaw in the *Bioshock* games.[32] Hocking was frustrated by the fact that the audiovisual narrative and the game's mechanics were not symmetrical, and he felt that this undermined *Bioshock's* intended player experience. While Hocking's critique might hold true for the *Bioshock* games, asymmetry between semiotic planes in other interactive texts can be a powerful poetic, aesthetic, or rhetorical device, expressing irony, choral perspectives, nuance, mystery, complexity, absurdity, paradox, or ambiguity. Applying critical lenses from picture book theory to video games allows for the possibility that imperfect, partial, or even contradictory relationships between semiotic planes can be deliberate and powerful ways to shape 'literary' playing experiences. Interpretive gaps can enshrine creative self-fashioning, playful resistance, and experimental boundary testing—all of which are central components of paidic play. Furthermore, if we think of 'immersive' toy play as being immersed in the liminal space *between* material and immaterial, the gap created by semiotic dissonance demarcates that space. Whether the space is used for sincere self-projection or ironic, critical distance, it is contingent on 'incompleteness.'

The 'incompleteness' of toys is directly linked to their capacity to elicit paidic play. David Myers writes, "[f]or a toy to remain a toy and an object of play, that toy must remain in the liminal space between what is and what is not,

31 Scott, Carole/Nikolajeva, Maria: *How Picturebooks Work, (Children's Literature And Culture),* New York: Routledge 2006.

32 Hocking, Clint: "Ludonarrative Dissonance in Bioshock: The Problem of What the Game is About," in: Davidson, Drew (ed.), *Well Played 1.0: Video Games, Value and Meaning*, Pittsburgh: ETC Press 2009.

https://doi.org/10.14361/9783839462003 https://www.inlibra.com/de/page/agb - Open Access - (cc) BY-SA

a state kept paradoxically 'alive' by the player's ludic attitude."[33] As a digital toy, Yarny sits in that liminal space of 'aliveness.' Unlike the 'complicated' toys reviled by Roland Barthes, Yarny is not a literal prefiguration of a component of the adult world—a world that is closed and complete; rather, he remains in a state of embryonic gestation. He is 'unmarked'—his odd shape does not signify a specific creature; he lacks clothing and accessories and is technically genderless. Mute and mouthless, he defers to players to narrate his inner monologue. The open scripts implied by his homely, simple form can be endlessly reinterpreted, and so he survives the lengths and breadths of time to be continually reawakened by new sets of hands. This immortality is further compounded by his immateriality. His digitization permits endless respawning following each UNRAVELling, which reflects his limitless potential for reanimation by future generations of players.

His immateriality is also key to fostering imaginative projection. The on-screen audiovisual responses to the player's hand gestures have a synaesthetic quality. When Yarny is swinging fluidly from point to point, for example, his audiovisual appearance makes him *feel* light and gracile. The player's carefully timed, rhythmic button-presses are a mimetic approximation of Yarny's on-screen acrobatics. Importantly, these gestures do not need to be symmetrical to what is rendered on an audiovisual plane: this imperfect mapping of haptic onto audiovisual creates an interpretive gap that allows for diverse interpretations. Perhaps Yarny does not feel light-footed and nimble to all players—perhaps to some, he feels insubstantial and frail, and his looping leaps are experienced as stomach-turning rather than effortless. Furthermore, the distance between the haptic and the audiovisual layers encourage metaphoric readings. If the bridge-building mechanic in UNRAVEL were overly literal and required players to enact the knot-tying hand gestures that Yarny performs on screen, it would align signifier and signified too closely, short-circuiting potential poetic interpretations of 'bridge building' as a symbol for interpersonal attachment and connection.

Yarny's digital nature means that he can simulate a level of independent sentience. A number of his animations in response to his environment are unprompted by the player—for example, Yarny turns his head to look at the world around him, he shakes himself like a dog when he gets wet, he claps his hands in delight, and he jumps in fright when he is startled by a passing butterfly. Stewart has theorized the fear of the mechanized toy as 'a dream no longer in need of its dreamer' as being rooted in anxiety about the uncontrolled incursion of the immaterial world

33 Myers, David: "A Toy Semiotics, Revisited," in: Magalhães, Luísa/Goldstein, Jeffrey (eds.), *Toys and Communication*, Palgrave Macmillan UK 2017, p. 51.

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into the material world.[34] However, UNRAVEL tackles the opposite fear—the dissolution of the material into the immaterial—the 'unbecoming' of one's physical self through death. Souvik Mukherjee writes, "[t]he term *avatar* is rather freely used in game criticism as meaning 'player embodiment' which is only a part of its original significance; its key connotations of reincarnation and immanent existence have so far been ignored."[35] I agree with Mukherjee's critique of the colonial repurposing of this term, and I would add that 'avatar' in its religious sense emphasizes only one direction of transformation between the material and the immaterial, or between the carnal and spiritual: the player-god materializing on screen. Rather than becoming flesh, players of video games could be said to become specters—to experience the dispersal of self as much as they experience incarnation. Thinking of the players of FALLGUYS as mischievous poltergeists, for example, seems more fitting than figuring them as gods made flesh (or made flubber).

Players experience a liminal, limited, co-constructed form of 'aliveness' when engaging with video games that is akin to being a ghost possessing an inanimate object. This 'flickering' sensation, as Keough puts it, is key to disrupting the idea that adults have a stable, unified self. Straddling worlds reminds players that their identities consist of fragments, and the pieces of themselves can be distributed between objects, locales, and moments in time. Children's literature scholar Clementine Beauvais notes, "[t]he child embodies for the adults the possible return of indeterminacy in their own existences."[36] I would add that as a proxy for the child—or, rather, as an object that scripts childliness—the digital toy solicits 'betweenness' and a spectral sense of being neither here nor there.

## CONCLUSION

When D.W. Winnicott described toys as 'transitional objects,' he meant that they were temporary aids to support children on their journey towards adulthood.[37] However, toys are transitional in another sense: they shuttle players between material and immaterial planes. When an object inspires make-believe play—be it a

34 Stewart, Susan: *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection,* Durham, NC: Duke University Press 1992.

35 Mukherjee, Souvik: "'Remembering How You Died': Memory, Death and Temporality in Videogames," in: *Proceedings of DiGRA,* 2009.

36 Beauvais, Clementine: *The Mighty Child: Time and Power in Children's Literature,* John Benjamins Publishing Company 2015, p. 185.

37 Winnicott, D.W.: *Playing and Reality,* London: Routledge 1971.

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tree branch, a teddy bear, or a tin can—it is incorporated into a mixed reality in which it is both a material thing and a screen that reflects projections from an imagined world. Toys have the capacity to anchor the virtual in the physical, allowing players to externalize their own mental simulations. As Heljakka puts it, "[t]he toy is a materialised fiction."[38] It is no coincidence, then, that many video games with toylike avatars lean on understandings of 'the toy' as an anchor point in the interdimensional waters between material and immaterial realms as a means of locating the player between the physical and the digital. The toy is an intuitive bridge between the material reality of the game's hardware operated using the player's body and the intangible, digital world seen through a glass screen.

In this chapter, I have argued that toys bridge the material and the immaterial, and their presence in video games works to bridge the physical and the digital. Furthermore, I have suggested that the bridge itself is a valid destination. Rather than aiming for the total dematerialization of players who abandon their bodies to enter the gameworld, or the materialization of gameworlds as hybrid toys or tactile hardware, the intended player experience can be one characterized by incompleteness. This incompleteness can create interpretive gaps that welcome distributed selves and elevate the literariness of a playing experience. Finally, I have suggested that we might nuance the language of 'avatars' and the process of incarnation it implies by thinking of play as a spectral experience and by positioning players as ghosts rather than gods.

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