Media and Communication
Open Access Journal | ISSN: 2183-2439
Volume 9, Issue 1 (2021)

Games and Communication —Quo Vadis?

Editors

Marko Siitonen, Felix Reer and Teresa de la Hera

COGITATIO

Media and Communication, 2021, Volume 9, Issue 1
Games and Communication—Quo Vadis?

Published by Cogitatio Press
Rua Fialho de Almeida 14, 2º Esq.,
1070-129 Lisbon
Portugal

Available online at: www.cogitatiopress.com/mediaandcommunication

Table of Contents

COGITATIO

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 1–4
DOI: 10.17645/mac.v9i1.3685

Editorial

Looking Ahead in Games Research: Entry Points into a Pragmatic Field of Inquiry

Marko Siitonen [1,*], Teresa de la Hera [2] and Felix Reer [3]

[1] Department of Language and Communication Studies, University of Jyväskylä, 40014 Jyväskylä, Finland; E-Mail: marko.siitonen@jyu.fi
[2] Department of Media and Communication, Erasmus University Rotterdam, 3000DR Rotterdam, The Netherlands; E-Mail: delahera@eshcc.eur.nl
[3] Department of Communication, University of Muenster, 48143 Muenster, Germany; E-Mail: felix.reer@uni-muenster.de

* Corresponding author

Submitted: 26 September 2020 | Published: 6 January 2021

Abstract
This thematic issue presents a number of emerging scholarships into the study of digital gaming. The articles are based on a 2019 symposium on game studies hosted by the Digital Games Research section of ECREA. As the phenomena related to digital gaming keep on evolving and emerging, so must research keep up with the times and constantly challenge itself. Whether speaking about validating previously developed research methods, imagining totally new ones, or even challenging the whole philosophy of science on which research is being done, there is a constant need for reappraisal and introspection within games research. As a cultural medium that has become deeply embedded into the social fabric of the 2020s, digital gaming continues to excite and challenge academia. This thematic issue provides a collection of approaches to look into the future that addresses some of the challenges associated with game research.

Keywords
digital games; game studies; methodology; serious games

Issue
This editorial is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

This thematic issue is built on a foundation laid down at a symposium organized by the Digital Games Research section of the European Communication Research and Education Association (ECREA) in 2019. The symposium, titled "Games, Media and Communication: Quo Vadis, Game Studies?," aimed at presenting both new scholarship within the interdisciplinary field of game studies, as well as pondering on research-related challenges and possibilities on the horizon.

Within media and communication studies, game studies represents a small but vibrant niche. In addition to ECREA, academic associations related to the field of communication research, such as the International Communication Association (ICA) and the US-based National Communication Association (NCA) have their own game studies sections, and we also know that communication researchers make up a large portion of the scholars doing games research in the first place (Quandt et al., 2015).

Despite being a young discipline, game studies has become an established field of research with its own methods, theory and, terminology (Mäyrä, 2008). Game studies, especially in the sense which we see it manifest within communication studies, represents in many ways a pragmatic field of inquiry. The phenomena it aims to understand are constantly changing and evolv-

ing, and researchers have widely adopted approaches where theoretical and methodological frameworks are 'borrowed' across what might once have been disciplinary boundaries. Even though actual mixed-methods research is quite rare, on the whole methodological plurality is prevalent, as anyone attending a game studies conference (or reading this thematic issue!) can attest. Naturally, this state of affairs leads to a heterogeneous field with multiple methodological entry points. The articles included in this thematic issue are no exception to this rule. Next, we will provide a brief overview of each of them.

2. Articles Included in the Thematic Issue

In the first article of this thematic issue, Wehden, Reer, Janzik, Tang, and Quandt's (2021) study looks at how gaming experience may be influenced by using an omnidirectional virtual reality treadmill. The study sets out to test established concepts like 'flow' (Csíkszentmihályi, 1990), 'presence' (e.g., Steuer, 1992), and 'cybersickness' (e.g., McCauley & Sharkey, 1992). The findings illustrate that even when new forms of gaming may be believed to solve existing problems (such as cybersickness here), they do not necessarily deliver on those promises. However, by connecting the concept of more natural locomotion in VR to a genre such as exergaming, it is possible to imagine new opportunities and directions for games' development and use. From a methodological viewpoint, Wehden et al.'s (2021) work also allows for us to consider an old question related to experimental design: How can we try to make sure that our carefully designed and controlled experiment is still close enough to actual lived reality? What kind of stimulus material and setup should we use, and how can we take into account issues such as possible novelty effects? As new gaming-related technologies continue to be introduced, the need for pushing boundaries also in research will remain a key challenge into the 2020s.

Keeping with the overall theme of experiments but taking a distinctly qualitative approach, Wilhelmsson, Susi, and Torstensson's (2021) article explores the benefits of combining elements of digital gaming with elements of analog games in the serious game Hidden in the Park. In the game, players are exposed to authentic online offender sexual grooming behaviors and are faced with the negative consequences of some of online information sharing. In their article the authors discuss how analog components can add an extra dimension to serious digital gaming experiences. In this case, the analog components allow for face to face social dynamics that contribute to the processing of the gaming experience, while the digital components provide an environment that is similar to the one that players are expected to reflect about and learn from. From a methodological perspective, this study required a synchronization of analog and digital components for which an activity system model that allowed both conceptualization and visualization of the game concept was used. This activity system became not only a valuable tool for communication within the design team, but also proved to be useful for the analysis of the effects and consequences of changes.

From a concrete viewpoint to developing so-called serious games, Jacobs' (2021) piece takes us to a more theoretically oriented pondering that sets out to explore avenues for research. Jacobs (2021) argues that even though the results of studies on the effects of serious games are quite promising, knowledge on their acceptance and adoption is still limited. Three different theoretical perspectives on player choice are outlined that can serve as starting points for future research: First, serious games can be understood as a form of promotional communication; second, playing serious games is a form of media experience; and third, serious games can be seen as technical innovations. Jacobs (2021) describes the implications of these three perspectives and discusses how knowledge from different research fields (like technology acceptance research or media psychology) may be fruitfully applied to serious games. The article concludes with methodological considerations on how these different theoretical viewpoints may be brought together in future empirical research.

In addition to educational settings, healthcare is often presented as one of the contexts where games and playful activities in general hold promise. De la Hera and Sanz (2021) present a timely example of how digital play may tie in with different phases of cancer treatment. Focusing especially on so-called unstructured free play, they illustrate the many ways in which young cancer patients may benefit from access to digital games, ranging from easing the difficulties related to isolation to benefits related to creating and maintaining social relations during the long treatment periods. Whether talking about playfully interacting with available technologies or drawing strength from identifying with game characters, the participants' experiences and perceptions speak volumes about the potential of play and games as coping strategies.

The idea that digital games can offer more than fun and can be meaningful to their users also plays a central role in the contribution by Daneels et al. (2021). Recent research has shown that games can provide eudaimonic experiences, such as feeling emotionally touched or gaining insights into purpose-in-life questions (Oliver et al., 2016). Against this background, Daneels et al. (2021) choose an innovative methodological approach by conducting a qualitative game experience analysis of the games Assassin's Creed Odyssey, Detroit: Become Human, and God of War. The results suggest that narrative elements and involvement with the characters evoke eudaimonic experiences. Further, these effects were found to be amplified by supporting game mechanics, like realistic graphics, the camera perspective, or in-game choices. The central findings of the study are visualized in an integrated model of eudaimonic game experiences that may serve as a basis for future research.

Moving on from game experiences to the broader societal context surrounding digital gaming, Meriläinen (2021) presents the results of a qualitative study exploring Finnish teenagers' and parents' views of gaming-related parenting practices. The study reveals the tensions that lie between intentions of protection and understanding, and the fact that participants' attitudes are not static but change depending on concrete families' circumstances. Young game players' perceptions analysis also shows that minors not only expect understanding, but also clear limits and guidance. The identification of this dichotomy is interpreted by the author as a clear need from young players to get the support from their parents to gain autonomy and agency. From a methodological perspective, the author highlights that the differences in perceptions identified in relation to different individual circumstances ask for a qualitative approach for a better understanding of gaming practices and interpretation of these practices.

Gekker (2021) closes the issue with "Against Game Studies," a thought-provoking piece of methodological exploration. The article offers a reading of the historical roots of game studies, and critiques the ways in which some of its typical characteristics may limit research. Gekker (2021) takes a strong stance in favor of adapting methodologies coming outside of the "core" of game studies, and imagines a new way forward that would center on play rather than games. This polemic piece evoked quite strong reactions from the three reviewers that read it, and it is our hope that it does exactly that within the broader readership as well. Being able to write a piece like this in the first place means that game studies as a field has a history, which we at least want to emphasize as a positive sign. Being able to look back opens up new doors into imagining a future for the field, and we quite simply need think-pieces such as this one to keep on advancing the field and exploring its boundaries.

3. Looking Ahead

The articles presented within this thematic issue, as well as the presentations during the symposium that spawned it, point to at least a couple of tendencies and central questions for game studies for the years to come.

A clear evolution in the field of game studies is the growing attention to play over (and/or on top of) just games. Some scholars are moving their attention from game studies to play studies. "Games don't matter," defends Sicart (2014, p. 2), "like in the old fable, we are fools looking at the finder when someone points at the moon. Games are the finger; play is the moon" (p. 2). This tendency can be seen in the contributions of some scholars to this issue (i.e., the pieces of de la Hera & Sanz, 2021; or Gekker, 2021).

Another topic of continuous attention is the question of methodologies. It has been argued that the particular characteristics of games that differentiate them from other media objects ask for more sophisticated methodologies that allow a systematic analysis of games and the discourses embedded and surrounding gaming practices (Fernández-Vara, 2014). We are confident that scholars interested in digital gaming will continue to explore new avenues in this regard, and tackle the challenges of the ever-changing phenomenon they are trying to understand. In many cases, this will mean continuing in multidisciplinary pathways and in what one could even characterize as following a philosophy of pragmatism.

The long game (pun intended) deals with slowly developing what could be called a paradigm or paradigms of research in game studies. Exploring "shared beliefs within a community of researchers who share a consensus about which questions are most meaningful and which methods are most appropriate for answering those questions" (Morgan, 2007, p. 53) is key in making sense not only of the phenomena we are trying to understand, but also of ourselves as researchers and academics. As a (relatively) young field, games research is in a good place when it comes to pondering philosophy of science: Not too old to suffer from the heavy burden of history, but old enough to have a heritage to draw on.

It is our hope as editors of this thematic issue, that the studies within motivates the reader to be bold in trying out new approaches and methodologies, as well as challenging existing assumptions on "how things are done" within game studies.

Conflict of Interests

The authors declare no conflict of interests.

References

Csíkszentmihályi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper.

Daneels, R., Malliet, S., Geerts, L., Denayer, N., Walrave, M., & Vandebosch, H. (2021). Assassins, gods, and androids: How narratives and game mechanics shape eudaimonic game experiences. *Media and Communication*, *9*(1), 49–61.

de la Hera, T., & Sanz, C. S. (2021). The role of spontaneous digital play during young patients' cancer treatment. *Media and Communication*, *9*(1), 39–48.

Fernández-Vara, C. (2014). *Introduction to game analysis*. New York, NY: Routledge.

Gekker, A. (2021). Against game studies. *Media and Communication*, *9*(1), 73–83.

Jacobs, R. S. (2021). Winning over the players: Investigating the motivations to play and acceptance of serious games. *Media and Communication*, *9*(1), 28–38.

Mäyrä, F. (2008). *An introduction to game studies: Games in culture*. London: Sage.

McCauley, M. E., & Sharkey, T. J. (1992). Cybersickness: Perception of self-motion in virtual environments. *Presence: Teleoperators and Virtual Environments*, *1*(3), 311–318.

Meriläinen, M. (2021). Crooked views and relaxed rules:

How teenage boys experience parents' handling of digital gaming. *Media and Communication*, *9*(1), 62–72.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, *1*(1), 48–76. https://doi.org/10.1177/2345678906292462

Oliver, M., Bowman, N., Woolley, J., Rogers, R., Sherrick, B., & Chung, M.-Y. (2016). Video games as meaningful entertainment experiences. *Psychology of Popular Media Culture*, *5*(4), 390–405.

Quandt, T., Van Looy, J., Vogelgesang, J., Elson, M., Ivory, J. D., Consalvo, M., & Mäyrä, F. (2015). Digital games research: A survey study on an emerging field and its prevalent debates. *Journal of Communication*, *65*(6), 975–996. https://doi.org/10.1111/jcom.12182

Sicart, M. (2014). *Play matters*. Cambridge, MA: The MIT Press.

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, *42*(4), 73–93.

Wehden, L.-O., Reer, F., Janzik, R., Tang, W. Y., & Quandt, T. (2021). The slippery path to total presence: How omnidirectional virtual reality treadmills influence the gaming experience. *Media and Communication*, *9*(1), 5–16.

Wilhelmsson, U., Susi, T., & Torstensson, N. (2021). Merging the analogue and the digital: Combining opposite activities in a mixed media game. *Media and Communication*, *9*(1), 17–27.

About the Authors

Marko Siitonen (PhD) works as an Associate Professor at the Department of Language and Communication Studies, University of Jyväskylä, Finland. His research has focused on social interaction in gaming communities across contexts. In addition, his research interests span the topical areas of intercultural communication and technology-mediated communication at work. He is the Chairperson of the ECREA Digital Games Research section, as well as the Finnish Society for Game Research.

Teresa de la Hera is Assistant Professor in Persuasive Gaming at Erasmus University Rotterdam, in the Netherlands, where she is a member of the Gaming Matters Research Cluster. Her expertise is in the study of the use of games and play to positively change players' attitudes and behaviors. She is the Author of the book *Digital Gaming and the Advertising Landscape* (2019) and the main Editor of the edited volume *Persuasive Gaming in Context* (2020), both published by Amsterdam University Press.

Felix Reer is a Postdoctoral Researcher in the Department of Communication at the University of Muenster, Germany. His research interests include social media and online communication, effects of digital games, and the use of highly immersive media technologies, such as virtual reality and augmented reality devices. He is Vice-Chair of the Digital Games Research Section of the European Communication Research and Education Association (ECREA).

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 5–16
DOI: 10.17645/mac.v9i1.3170

Article

The Slippery Path to Total Presence: How Omnidirectional Virtual Reality Treadmills Influence the Gaming Experience

Lars-Ole Wehden *, Felix Reer, Robin Janzik, Wai Yen Tang and Thorsten Quandt

Department of Communication, University of Muenster, 48143 Muenster, Germany;
E-Mails: lars-ole.wehden@uni-muenster.de (L.-O.W.), felix.reer@uni-muenster.de (F.R.),
robin.janzik@uni-muenster.de (R.J.), tangw@uni-muenster.de (W.Y.T.), thorsten.quandt@uni-muenster.de (T.Q.)

* Corresponding author

Submitted: 17 April 2020 | Accepted: 15 June 2020 | Published: 6 January 2021

Abstract
Researchers, game designers, and consumers place great hopes into the potential benefits of virtual reality (VR) technology on the user experience in digital games. Indeed, initial empirical research has shown that VR technology can improve the gaming experience in a number of ways compared to traditional desktop gaming, for instance by amplifying immersion and flow. However, on the downside, a mismatch between physical locomotion and the movements of the avatar in the virtual world can also lead to unpleasant feelings when using VR technology—often referred to as cybersickness. One solution to this problem may be the implementation of novel passive repositioning systems (also called omnidirectional treadmills) that are designed to allow a continuous, more natural form of locomotion in VR. In the current study, we investigate how VR technology and the use of an omnidirectional treadmill influence the gaming experience. Traditional desktop gaming, VR gaming, and omnidirectional treadmill gaming are compared in a one-factorial experimental design ($N = 203$). As expected, we found that VR gaming on the one hand leads to higher levels of flow, presence, and enjoyment, but at the same time also is accompanied by higher levels of cybersickness than traditional desktop gaming. The use of the omnidirectional treadmill did not significantly improve the gaming experience and also did not reduce cybersickness. However, this more physically demanding form of locomotion may make omnidirectional treadmills interesting for exergame designers.

Keywords
cybersickness; digital games; experimental research; gaming experience; locomotion; omnidirectional treadmill; passive repositioning systems; virtual reality

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

The market introduction of affordable virtual reality (VR) devices like the Oculus Rift or the HTC VIVE is currently a much-discussed development in the field of gaming. Market researchers expect the revenue of VR products to more than quadruple between 2018 and 2022 (Superdata, 2019). Gaming plays an important role within the market for immersive technology, making up for a substantial part of its income, accounting for 43% in 2018 (Viar360, 2019).

While the industry is expecting a positive effect on hardware and software sales, players of VR games hope for a more thrilling and realistic gaming experience. Empirical research has indeed shown that VR technology can significantly improve the gaming experience in various ways and, for example, lead to increases in game enjoyment (Klimmt, Possler, & Steger, 2018;

Shelstad, Smith, & Chaparro, 2017), flow (Tan, Leong, Shen, Dubravs, & Si, 2015), or immersion (Martel et al., 2015). However, there are also specific issues related to current VR systems, like the frequently reported *cybersickness* problem (Dennison, Wisti, & D'Zmura, 2016; McCauley & Sharkey, 1992; Yildirim, 2019).

In recent years, novel ways of locomotion in VR—among them passive repositioning systems in the form of omnidirectional treadmills—have been developed (Hale & Stanney, 2014). They were designed to allow for a more natural way of movement within VR by overcoming the problematic discrepancy between the available physical tracking space and the potentially unlimited virtual environment. These systems are expected to reduce cybersickness that results from an illusory mismatch between actual and perceived movement (Shafer, Carbonara, & Korpi, 2019). However, empirical research on the effects of using omnidirectional VR treadmills is still scarce.

The present study follows two main goals: First, we aim to confirm findings from previous studies that indicated a positive impact of VR technology on the gaming experience. And second, we follow an exploratory approach by investigating the effects of using a current commercial omnidirectional locomotion system (the Virtuix Omni). Particularly, we are interested in whether using the treadmill further improves the gaming experience and whether it may solve the cybersickness problem.

2. VR and the Gaming Experience

Several empirical studies assessed the impact of VR on players' gaming experiences. Some of these studies primarily focused on technical aspects, such as the visual quality and the performance of VR controllers. For example, Shelstad et al. (2017) showed in an experiment that players of a VR game reported a higher perceived sound and graphics quality than participants that played the same game on a desktop computer. In contrast, user performance experiments showed that players performed significantly worse in control and accuracy tasks (e.g., jumping, aiming, wall-hits) in VR compared to playing in a desktop setting (Martel et al., 2015; Tan et al., 2015).

Of greater interest for the current study is research that examined more complex, psychological constructs. Two often studied variables in this context are *presence* and *immersion* (Witmer & Singer, 1998). Presence—when used in a media context also called *telepresence*—is defined as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment" (Steuer, 1992, p. 76). Likewise, immersion in the gaming context describes the:

> Sense of being 'in a game' where a person's thoughts, attention and goals are all focused around the game as opposed to attending to being concerned with anything else, such as what is going on in the room around them. (Sanders & Cairns, 2010, p. 160)

Empirical studies have shown that gaming in VR positively affects reported levels of presence and immersion. Klimmt et al. (2018) showed in an experiment that VR gaming amplified presence as compared to traditional desktop gaming. Martel et al. (2015) and Tan et al. (2015) found that the level of reported immersion was significantly higher when a game was played in VR as compared to a desktop computer setting.

A related concept is *flow*. As a measure for general enjoyment and intrinsic motivation that can occur in relation to many activities (e.g., work, sports), flow is described as a state of total pleasure and optimal experience (Csíkszentmihályi, 1990). According to Sweetser and Wyeth (2005), a perfect match between skills and challenge is a major prerequisite of flow experiences. This makes flow an important concept to study in the context of digital games, as games provide players with an increasing level of difficulty, growing along with the skillset of the gamer. Flow has also been studied in relation to gaming in a VR context. Tan et al. (2015) showed that VR gaming induced higher levels of flow than desktop gaming. Accordingly, Shelstad et al. (2017) found that playing in VR led to higher levels of players' engrossment with the game, meaning that the game was able to hold players' attention and interest in a higher degree than gaming on a desktop computer.

Furthermore, experimental studies show that players of VR games reported higher *enjoyment* and overall satisfaction with the game when compared to players of desktop games (Klimmt et al., 2018; Shelstad et al., 2017). Even though novelty effects cannot be ruled out completely, these results further strengthen the assumption that gaming in VR could contribute to the formation of the above-mentioned optimal gaming experiences.

However, an important problem of VR gaming is *cybersickness*. Cybersickness is a form of motion sickness resulting from a mismatch between the illusory self-motion in the virtual environment and the actual external sensory information on the non-movement of the own body in physical space (McCauley & Sharkey, 1992; Nilsson, Serafin, Steinicke, & Nordahl, 2018). Cybersickness in VR is often caused by a lack of physical tracking space that prevents the user from unconstrained actual movement in a spatially vast virtual world. Therefore, movements have to be performed by pressing buttons or moving joysticks instead of one's own legs. In empirical research, players of VR games reported significantly higher levels of cybersickness when compared to players on desktop computers (Tan et al., 2015; Yildirim, 2019). Cybersickness is especially severe in games that include running avatars and fast movements in a first-person perspective, such as shooters and role-playing games (Shafer et al., 2019). One solution to potentially reduce the mismatch between virtually perceived and real movement may be newly introduced motion-based VR locomotion systems.

3. Locomotion in Virtual Environments

Locomotion—the players' self-initiated movement within the virtual world (Hale & Stanney, 2014)—is an essential interaction component in VR with potentially strong effects on elements of the user experience, such as immersion (Bozgeyikli, Raij, Katkoori, & Dubey, 2016). Further, overcoming the limitations of the physical tracking space to enable a natural, unconstrained movement in VR is regarded as a key component in reducing cybersickness (Nilsson et al., 2018). Even though the latest generation of VR systems works wirelessly, the problem of the limited physical tracking space persists. For example, the maximum playing area for the Oculus Quest is still limited to a maximum size of 25 by 25 feet. Besides these technical limitations, one should also keep in mind that the typical user will most likely not have large enough space available to walk in their home environment in order to explore huge virtual worlds.

One possibility to overcome long distances in virtual worlds is placing the avatar in a moving virtual vehicle (e.g., spaceship or car) steered with hand movements, while the player remains seated—both in the actual and virtual environment. Another option is to put the avatar in a zero-gravity environment to avoid the need for leg movement (e.g., in Mission ISS or Echo Arena). However, both options extensively limit the possibilities of game design. In genres where players typically move around on foot (e.g., shooters, role-playing games, sports simulations), other techniques are needed to solve the locomotion problem.

Boletsis (2017, p. 12) provides a typology of the most commonly used VR locomotion techniques. They can be distinguished by several criteria, for instance the interaction type (physical vs. artificial), the VR motion type (continuous vs. non-continuous) and the VR interaction space (open vs. limited). Based on these criteria, he describes four types of VR locomotion: (1) motion-based locomotion (physical, continuous, open, e.g., walking in place, redirected walking, arm-swinging, zero-gravity); (2) roomscale-based locomotion (physical, continuous, limited, e.g., real walking); (3) controller-based locomotion (artificial, continuous, open, e.g., joystick motion, head-directed); and (4) teleportation-based (artificial, non-continuous, open, e.g., point-and-teleport techniques).

Of these four types of VR locomotion, especially motion-based locomotion is considered a promising approach to solve the above-mentioned problems of VR locomotion in relation to the physical tracking space available to players. In recent years, such motion-based locomotion systems were developed that track players' physical movements and directly transfer them into the virtual world. These systems are believed to cause less cybersickness than artificial, controller-based locomotion (e.g., joystick, head-directed), as the illusory mismatch between perceived and actual movement is seemingly smaller (e.g., Boletsis, 2017; Shafer et al., 2019). Players perform more extensive movements with bigger body parts (e.g., arms, legs) than in artificial forms of locomotion (e.g., thumbs, head). Continuous motion is more realistically resembling real-world motions that would be performed to achieve a specific movement than, for instance, point-and-teleport techniques.

To enable continuous movement in VR, players have to either walk in place or have to be redirected or repositioned to not reach the limit of the tracking space. This can be achieved through passive repositioning systems that centrally restrain the player in the tracking space by cancelling out forward leg-movement forces with a friction-free platform or an omnidirectional treadmill. Warren and Bowman (2017, p. 163) describe this as a form of "semi-natural VR-locomotion." Repositioned walking is considered to feel more natural than walking in place, as the user is actually stepping forward (Nilsson et al., 2018).

Although passive repositioning systems are a promising technology thought to improve the user experience and to solve issues related to current VR systems, empirical evidence is still scarce. One of the very few studies that has focused exclusively on passive repositioning systems as a form of VR locomotion was conducted by Warren and Bowman (2017). They evaluated user performance in an experiment with an omnidirectional treadmill—the Virtuix Omni. Their findings indicated that playing with the Omni resulted in more negative affective states and a less positive gaming experience than playing with standard game controllers. However, the study followed an exploratory approach and the informative value is limited by the small sample size ($N = 10$).

4. The Current Study

Extending this line of research, the purpose of our study is twofold: We aim to investigate how the use of VR technology in general, and the use of an omnidirectional treadmill influence the gaming experience.

As summarized in Section 2, previous research suggests that the use of VR technology can positively influence some aspects of the gaming experience (e.g., Klimmt et al., 2018; Martel et al., 2015; Shelstad et al., 2017; Tan et al., 2015). Based on the existing literature, we assume that VR gaming leads to higher levels of *flow*, *presence*, and *enjoyment*. Additionally, we investigate the measure of *awe* that has recently been linked to gaming. Awe is defined as emotional responses, mostly positive, like amazement or impressiveness, in reaction to vast stimuli that require accommodation and lead to meaningful, pleasurable experiences (Possler, Klimmt, & Raney, 2018). Digital games are thought to have a high potential to inspire awe—and therefore increase the pleasure obtained from gameplay—as they often contain potential elicitors of this state, such as vast landscapes, large buildings, massive enemies, and epic soundtracks (Possler, Klimmt, et al., 2018). These elements could be perceived as being especially impressive when presented

in VR. To investigate the realism of VR locomotion, we further assess the perception of *natural mapping* connected to various forms of locomotion controls. Natural mapping is understood as "the ability of a system to map its controls to changes in the mediated environment in a natural and predictable manner" (Steuer, 1992, p. 47). Our hypothesis reads as follows:

> H1: Using VR technology leads to increases in (a) flow, (b) presence, (c) enjoyment, (d) awe, and (e) natural mapping in comparison to traditional desktop gaming.

However, previous research has also shown that VR gaming can be accompanied by some specific challenging side effects that may influence the gaming experience. For example, it can cause cybersickness (Tan et al., 2015; Yildirim, 2019), and some studies indicated that gaming in VR decreases players' accuracy and control (Martel et al., 2015; Tan et al., 2015). In general, players reported that VR gaming was experienced as more challenging when compared to desktop gaming (Tan et al., 2015). One reason may be the more physically demanding playing situation when using VR devices: Players usually have to stand while playing and perform more extensive body movements for locomotion than in traditional desktop gaming.

Accordingly, we consider *cybersickness* and *physical exertion* as two aspects that may make VR gaming more demanding than traditional desktop gaming. Further, we consider the perceived overall *challenge* and *tension* as two general components of the user experience that are often investigated in relation to digital games. We hypothesize:

> H2: Using VR technology leads to increases in (a) cybersickness, (b) physical exertion, (c) challenge and (d) tension in comparison to traditional desktop gaming.

The second aim of our study is to investigate how the use of an omnidirectional locomotion system influences the gaming experience in VR. As mentioned, research on new forms of locomotion in VR—like repositioned walking—is still scarce. Further, most existing studies focused on technological aspects (e.g., in-game performance, accuracy, wall-hits; Warren & Bowman, 2017), while there is little research on the user experience (Boletsis, 2017). Nilsson et al. (2018, p. 14) state that "the community has yet to establish how well these systems perform with respect to factors such as perceived naturalness, spatial performance, task performance, and simulator sickness." Presumably, the use of a passive repositioning system could have positive as well as negative effects on the gaming experience. On the one hand, these systems can potentially reduce cybersickness by minimizing the mismatch between perceived virtual and actual movement (e.g., Shafer et al., 2019). On the other hand, extensive movement that is needed to operate this motion-based form of locomotion may cause even more exhaustion than artificial locomotion in VR, which could negatively impair the gaming experience. Additionally, initial empirical results on the use of these systems are rather discouraging, finding that they lead to negative affective states and further reduce players' performance (Warren & Bowman, 2017). Given the few existing studies and the opposing findings and assumptions, we pose the following open research question:

> RQ1: How does the use of a passive repositioning system influence the gaming experience VR technology provides?

5. Material and Methods

5.1. Study Design and Stimulus Material

Our study follows a one-factorial experimental design. We used the popular role-playing game The Elder Scrolls V: Skyrim as stimulus material (see Figure 1).

The game is available in a VR and an identical non-VR version. We created a hunting task in which players had to shoot various animals using bow and arrow. The task at hand—embedded into a cover story of collecting food for the avatar's family—was running intensively and resembled a typical gaming situation (quest) in this type of game. To assess our hypotheses and research question, three different experimental conditions were implemented:

(1) Traditional desktop gaming ($n = 65$, see Figure 2): In this condition, participants used a 24-inch flat screen and controlled their avatar with a standard keyboard and mouse. This resembles a form of artificial, controller-based locomotion in a non-VR environment.

(2) VR gaming ($n = 68$, see Figure 3): For this condition, we used a popular head-mounted VR system—the HTC VIVE—with its respective handheld controllers as a form of artificial, controller-based locomotion in a VR environment.

(3) Omni gaming ($n = 70$, see Figure 4): In this condition, participants also used the HTC VIVE headset and its handheld controllers but were additionally equipped with an omnidirectional treadmill as a passive repositioning system in order to resemble a motion-based, physical form of locomotion in VR. We chose the Virtuix Omni, one of the field's market leaders, for two reasons: First, after its market introduction, this specific omnidirectional treadmill received highly positive reviews from consumer-oriented media (e.g., Carbotte, 2016; Ray, 2016; Tarantola, 2016), calling the Omni "the future of gaming" (Lang, 2013) and proclaiming the addition of a "fantastic new layer of immersion to the virtual reality experience" (Fulton, 2016). Second, to provide comparable results across studies, it is essential to focus on hardware settings that have been studied in previous research (e.g., Warren & Bowman, 2017).

Figure 1. In-game screenshot of The Elder Scrolls V: Skyrim. Source: Livingston (2011).

5.2. Procedure

Participants first completed a questionnaire that included measures for randomization checks and sociodemographic variables. They were then randomly assigned to one of the three experimental conditions. Participants were given a three-minute training session to familiarize with the locomotion controls, then they performed the main gaming task in Skyrim for seven minutes. After playing, participants completed a second questionnaire containing the dependent variables, were debriefed, and received a participation compensation of 10€.

5.3. Measures

We selected established scales to measure the different constructs. Some English original scales were translated to German with the help of a professional translation service.

Figure 2. Laboratory setup of the traditional desktop gaming experimental condition.

Figure 3. Laboratory setup of the VR gaming experimental condition.

Cybersickness was measured with six items from the ITC-Sense of Presence Inventory by Lessiter, Freeman, Keogh, and Davidoff (2001). Participants rated statements (e.g., "I felt dizzy") on a scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The scale showed satisfactory reliability (α = .80, *M* = 1.97, *SD* = .82).

To assess *physical exertion*, we used the German translation (Löllgen, 2004) of Borg's RPE (Borg, 1970). It consists of a single item ("Please indicate on the scale below how physically exhausted you felt while playing") measured on a scale ranging from 6 = "no exertion" to 20 = "maximal exertion" (*M* = 11.16, *SD* = 3.45).

Presence was measured using items of the MEC Spatial Presence Questionnaire by Vorderer et al. (2004). Two different dimensions of presence were considered, both measured with eight items using a scale ranging from 1 = "strongly disagree" to 5 = "strongly agree": self-location (e.g., "I felt like I was actually there in the environment of the presentation") and possible actions (e.g., "It seemed to me that I could have some effect on things in the presentation, as I do in real life"). Both subscales showed high reliability (self-location: α = .94, *M* = 3.32, *SD* = .99; possible actions: α = .86, *M* = 3.20, *SD* = .81).

To measure *flow* (e.g., "I forgot everything around me"), *challenge* (e.g., "I felt challenged"), and *tension* (e.g., "I felt frustrated"), participants rated their agreement to six items per construct from the German version (Nacke, 2009) of the Game Experience Questionnaire (IJsselsteijn, de Kort, & Poels, 2008). The items were measured using a scale ranging from 1 = "strongly disagree" to 5 = "strongly agree" (flow: α = .84, *M* = 3.34, *SD* = .85; tension: α = .80, *M* = 2.47, *SD* = .83; challenge: α = .65, *M* = 3.04, *SD* = .71).

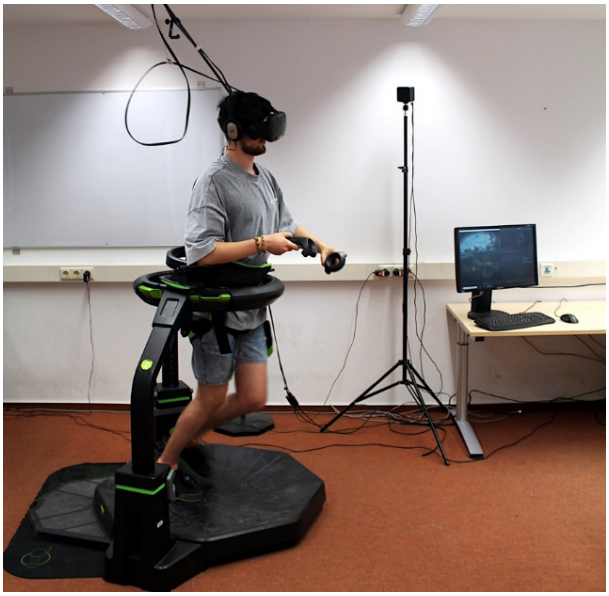

Figure 4. Laboratory setup of the Omni gaming experimental condition.

To measure *awe* experienced while playing, we used three items originally developed by Possler, Kuempel, Unkel, and Klimmt (2018). Participants rated their agreement to the items (e.g., "I was amazed by the vast and 'epic' gaming experience") on a scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The scale showed satisfactory reliability (α = .71, *M* = 3.18, *SD* = 1.05).

We assessed *natural mapping* with a translated version of the six-item scale by Skalski, Tamborini, Shelton, Buncher, and Lindmark (2011). Participants rated their agreement (e.g., "The game controls seemed natural") on a scale ranging from 1 = "strongly disagree" to 7 = "strongly agree." The scale showed a high reliability (α = .90, *M* = 4.17, *SD* = 1.36).

To measure *enjoyment*, we adapted the scale of Ryan, Mims, and Koestner (1983) to the context of gaming. In this six-item scale, participants rated their agreement with statements (e.g., "I enjoyed playing this game very much") on a scale ranging from 1 = "strongly disagree" to 7 = "strongly agree." Two negatively framed items were reverse coded before scale construction. The scale showed a satisfactory reliability (α = .94, *M* = 5.05, *SD* = 1.54).

Additional measures were used to check for a successful randomization: *Game skill* was measured with four items developed by Bracken and Skalski (2006) and translated by Pietschmann (2014). Participants rated items (e.g., "I am a very good computer game player") on a scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The scale showed a high reliability (α = .90, *M* = 2.69, *SD* = 1.04). Participants' *physical fitness level* was assessed with the five-item International Fitness Scale by Ortega et al. (2011) that proved to be highly reliable (α = .83, *M* = 3.64, *SD* = .68). Participants rated statements (e.g., "Your overall physical fitness is…")

on a scale ranging from 1 = "very poor" to 5 = "very good." Participants' *prior experience with VR technology* was measured with a self-report single item ("I am…in using VR systems") ranging from 1 = "completely inexperienced" to 5 = "very experienced" ($M = 1.87$, $SD = .90$).

Whenever a construct was measured with a scale consisting of several items, we assessed the scale's score by calculating the mean of the scale's items.

5.4. Sample

Our sample consisted of 203 participants. They were recruited mainly at a large university in Western Germany through university newsletters and mailing lists, recruitment posters in public places, and a newspaper advertisement. Participants were relatively young ($M = 24.18$, $SD = 4.02$, Min. = 18, Max. = 51) and highly educated (93.6% students; highest educational degree: 39.9% university degree; 58.6% high school). Gender was equally distributed (49.8% female). We checked for obvious straight lining in our data set (participants with > 50% of scales with $SD = 0$), but no cases had to be excluded as a consequence. As randomization checks, we calculated χ^2-tests for group differences in relation to gender ($\chi^2(2) = .07$, $p = .967$), education ($\chi^2(8) = 7.07$, $p = .529$), and occupation ($\chi^2(12) = 11.68$, $p = .472$). To further test our randomization, we calculated a number of independent one-way ANOVAs: There was no difference among groups in relation to participants' mean age ($F(2, 200) = 1.48$, $p = .231$), weekly hours of digital games use ($M = 4.67$, $SD = 6.84$, $F(2, 200) = .03$, $p = .970$), game skill ($F(2, 200) = 1.75$, $p = .176$), physical fitness level ($F(2, 200) = .002$, $p = .998$), or prior VR experience ($F(2, 200) = .199$, $p = .819$).

6. Results

A series of independent one-way ANOVAs were calculated with the SPSS 25 software package to compare the gaming experience induced by the different conditions. As displayed in Table 1, we found that the experimental condition affected all independent variables except for tension.

Bonferroni post-hoc tests were calculated to examine the differences between the three conditions in detail. For variables with unequal variances, the Games-Howell post-hoc test was used.

Our first hypothesis expected VR gaming to improve some aspects of the gaming experience when compared to traditional desktop gaming. As can be seen in Table 1, this was true for flow (H1a), both subdimensions (self-location and possible actions) of spatial presence (H1b), enjoyment (H1c), awe (H1d), and natural mapping (H1e). For these variables, gaming in either the VR gaming or the Omni gaming condition led to significantly higher values for the respective variable when compared to traditional desktop gaming. Therefore, H1 is fully confirmed.

Our second hypothesis addressed potentially challenging side effects during gameplay. We expected levels of cybersickness (H2a), physical exertion (H2b), challenge (H2c), and tension (H2d) to increase in the conditions using VR technology. H2 was partially confirmed: We found a significant increase in the levels of reported cybersickness (H2a) in both the VR gaming and the Omni gaming condition in comparison to traditional desktop gaming technology (see Table 1). Gaming in VR also led to significantly higher physical exertion (H2b) than gaming in front of a desktop screen and was perceived as more challenging (H2c). Regarding tension (H2d), no significant difference between desktop gaming, VR gaming, and Omni gaming was found.

Assessing our exploratory research question on how the use of a passive repositioning system would influence the gaming experience (RQ1), we found that the use of such a system did not differ from other forms of locomotion (see Table 1). We detected no significant differences between VR gaming and Omni gaming in relation to both subdimensions of spatial presence (self-location and possible actions), flow, awe, natural mapping, game enjoyment, cybersickness, challenge, and tension. The only significant difference between VR gaming and Omni gaming was detected in the reported level of received physical exertion. Participants that played in the Omni gaming condition reported significantly higher values of received physical exertion than those in the VR gaming condition.

7. Discussion and Conclusions

With regard to both hypotheses, our results support previous research findings (e.g., Klimmt et al., 2018; Martel et al., 2015; Shelstad et al., 2017; Tan et al., 2015) on the influence of VR technology for gaming when compared to more traditional game settings using a desktop computer with flat-screen monitor and mouse and keyboard as input. VR gaming led to higher reported values on several gaming experience measures. Participants reported significantly higher levels of spatial presence (in both subdimensions self-location and possible actions), flow, awe, and enjoyment. They also reported that the controls in VR gaming (i.e., the HTC VIVE controller) felt significantly more natural in comparison to mouse and keyboard. We did not find a difference between desktop and VR gaming in relation to tension. However, in accordance with findings of previous research (e.g., Tan et al., 2015; Yildirim, 2019), gaming in VR led to significantly more cybersickness among participants and was perceived as more challenging.

Passive repositioning systems are believed to reduce cybersickness in VR gaming through fewer sensory conflicts between actual and perceived movements (Boletsis, 2017; Shafer et al., 2019). However, there were no significant differences in reported cybersickness between gaming in VR with and without the Omni. Furthermore, the Omni did not feel more (or less) natural to participants as a locomotion control. Finally, regarding

Table 1. Detailed results of the independent one-way ANOVAs.

Measure	Total model					Conditions						Differences between conditions[a]		
						Desktop gaming (n = 65)		VR gaming (n = 68)		Omni gaming (n = 70)		Desktop vs. VR gaming	Desktop vs. Omni gaming	VR vs. Omni gaming
	df_1	df_2	F	p	ω^2	M	SD	M	SD	M	SD			
Cybersickness	2	129.23	19.50[b]	< .001	.15	1.55	.56	2.21	.81	2.13	.91	*** [d]	*** [d]	*n.s.*[d]
Received perception of exertion	2	125.74	125.64[b]	< .001	.55	8.38	2.45	10.72	3.08	14.17	1.82	*** [d]	*** [d]	*** [d]
Spatial presence														
Subdimensions:														
Self-location	2	200	38.48	< .001	.27	2.56	.90	3.69	.85	3.66	.80	*** [c]	*** [c]	*n.s.*[c]
Possible actions	2	200	21.85	< .001	.17	2.70	.79	3.47	.69	3.39	.73	*** [c]	*** [c]	*n.s.*[c]
Flow	2	129.70	13.16[b]	< .001	.11	2.93	.87	3.60	.64	3.47	.87	*** [d]	*** [d]	*n.s.*[d]
Challenge	2	130.09	6.98[b]	< .01	.06	2.78	.78	3.10	.69	3.23	.59	* [d]	** [d]	*n.s.*[d]
Tension	2	200	2.37	.096	.01	2.40	.86	2.36	.84	2.64	.79	*n.s.*[c]	*n.s.*[c]	*n.s.*[c]
Awe	2	200	49.64	< .001	.32	2.31	.93	3.63	.80	3.56	.85	*** [c]	*** [c]	*n.s.*[c]
Natural mapping	2	200	36.18[b]	< .001	.26	3.16	1.26	4.75	1.18	4.55	1.08	*** [c]	*** [c]	*n.s.*[c]
Game enjoyment	2	130.12	5.09[b]	< .01	.04	4.54	1.62	5.37	1.60	5.21	1.27	* [d]	* [d]	*n.s.*[d]

Notes: [a] Level of significance: *n.s.* not significant, * $p < .05$, ** $p < .01$, *** $p < .001$.; [b] F value calculated using Welsh's test to account for inequality of variances; [c] Bonferroni post-hoc test; [d] Games-Howell post-hoc test.

all measures of the gaming experience under study, there were no significant differences between Omni gaming and regular VR gaming. Therefore, we do not find extensive additional benefits of using a passive repositioning omnidirectional treadmill to control locomotion in VR games.

There was only one significant difference between controller-based VR gaming and VR gaming with the Omni: The latter was perceived as being significantly more physically exhausting during gameplay. One might see a utilization potential in the context of exergaming (Oh & Yang, 2010). As "the ability to tie video games and exercise into a single medium for the benefit of making exercise fun" (Klein & Simmers, 2009, p. 35), exergaming is believed to be more beneficial for players' physical and cognitive health than sedentary (button-pressing) gaming. Meta-analytical results (Best, 2013) support these hopes placed into the beneficial potential of exergaming. Further, an extensive body of literature describes the beneficial effects of combining sports equipment for physical training (like monodirectional gym-style treadmills) with an immersive gaming environment, usually displayed on standard flat-screen technology. These systems have been used to, for instance, improve stroke patients' balance skills (Yang et al., 2011) or to reduce the risk of falling for elderly people (Mirelman et al., 2016) by projecting the physical workout into a virtual environment that users may perceive as more realistic, natural, and enjoyable than when using standard workout equipment without an immersive component. Further, those systems have proven to support exercise motivation for overweight children who perceived their workout to be more enjoyable, as the immersive gaming component was able to distract their attention away from negative bodily sensations (Baños et al., 2016). Yet, these systems to date rely on monodirectional treadmills and flat-screen technology with a relatively low immersive potential. Our study showed that using VR technology in comparison to screen-based gaming significantly increased presence and enjoyment of our participants. Moreover, adding the Virtuix Omni, an omnidirectional VR treadmill, as locomotion device did not negatively impair participants' gaming experience, even though it was perceived more physically demanding and is less sedentary in nature. Therefore, gaming in VR with the Omni could be used as a form of beneficial physical exercise that is perceived as fun. At the same time, being potentially more immersive than a flat-screen monitor mounted to a standard monodirectional treadmill, we see the potential that the Omni gaming setup could further increase the above-mentioned positive effects of exergaming. We therefore suggest further research on the utilization potential of omnidirectional VR treadmills as an exergaming tool and especially see adolescents and the older gaming population as potential target groups worth to be studied in this context.

In recent times, science enthusiasts, consumer media, and the games industry consider VR technology to be one of the most important innovations in the games sector and express hopes that passive repositioning systems like the Virtuix Omni might help to solve the current problems of VR gaming. Our results only partially support this notion by showing that VR technology indeed improves some aspects of the gaming experience. However, other aspects such as unconstrained, continuous, and natural locomotion in VR as well as cybersickness remain a challenge for game designers. Passive repositioning systems are seemingly not the ideal and final solution for these problems: either because they are not fully developed yet, or because they do not truly allow for natural movement within the virtual world. Therefore, alternative physical locomotion techniques like redirected walking should be further examined. They are thought to allow for natural and continuous movement in an open world in a physical playing area of about 6 by 6 meters by slightly rotating the virtual world around the player (Nilsson et al., 2018; Suma, Azmandian, Grechkin, Phan, & Bolas, 2015). In combination with novel wireless VR systems (e.g., the Oculus Quest) that offer an expanded playing area in comparison to wire-operated head-mounted displays, this locomotion technique seems fruitful for further exploration. Another direction for future studies could be the combination of VR and treadmill gaming with other innovative peripheral devices, such as gaming vests, to achieve even higher levels of immersion.

Our study has some limitations. The first limitation is the rather homogenous student sample. It is possible that older participants may perceive an increased level of physical exertion as having a greater negative impact on their gaming experience than their younger counterparts. Therefore, it seems promising to replicate our study design with more diverse samples. Also, it cannot completely be ruled out that our results would have been slightly different with another game than Skyrim (VR) as stimulus material. The genre of adventure role-playing games includes a substantial amount of first-person movement while other genres like strategy/simulation or logical thinking games may be less running-intensive. Therefore, we suggest to conduct similar studies with games from various genres in the future. Further, as our respondents were relatively inexperienced in the use of VR technology, the positive perception of and excitement connected to VR technology in relation to gaming as well as the perception of certain aspects of the gaming experience in VR might be partly caused by novelty effects (e.g., Smith & Du'Mont, 2009). For example, awe might be a concept that could possibly be influenced by such novelty effects. To address this limitation in future research, longitudinal designs or a more experienced sample are recommended.

Acknowledgments

The authors acknowledge support from the Open Access Publication Fund of the University of Muenster. They

would like to thank Steve Bernard, Valentin Döring, and Patrick Williams for their help with setting up and conducting some of the field work, all participants of the study for contributing to the research, and the four anonymous reviewers for their thoughtful comments on an earlier version of the manuscript.

Conflict of Interests

The authors declare no conflict of interests.

References

Baños, R. M., Escobar, P., Cebolla, A., Guixeres, J., Alvarez Pitti, J., Lisón, J. F., & Botella, C. (2016). Using virtual reality to distract overweight children from bodily sensations during exercise. *Cyberpsychology, Behavior, and Social Networking*, *19*(2), 115–119.

Best, J. R. (2013). Exergaming in youth: Effects on physical and cognitive health. *Zeitschrift für Psychologie*, *221*(2), 72–78.

Boletsis, C. (2017). The new era of virtual reality locomotion: A systematic literature review of techniques and a proposed typology. *Multimodal Technologies and Interaction*, *1*(24), 1–17.

Borg, G. A. V. (1970). Perceived exertion as an indicator of somatic stress. *Scandinavian Journal of Rehabilitation Medicine*, *2*(2), 92–98.

Bozgeyikli, E., Raij, A., Katkoori, S., & Dubey, R. (2016). Point & teleport locomotion technique for virtual reality. In A. Cox, Z. A. Toups, R. L. Mandryk, & P. Cairns (Eds.), *Proceedings of the 2016 annual symposium on computer-human interaction in play* (pp. 205–216). New York, NY: Association for Computing Machinery.

Bracken, C. C., & Skalski, P. (2006). *Presence and video games: The impact of image quality and skill level*. Paper presented at the 9th Annual International Workshop on Presence, Cleveland, OH, USA.

Carbotte, K. (2016, January 12). Virtuix proved that the Omni VR treadmill is the real deal. *tom's HARDWARE*. Retrieved from https://www.tomshardware.com/uk/news/virtuix-omni-impresses-th-writers,30965.html

Csíkszentmihályi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper.

Dennison, M. M., Wisti, A. Z., & D'Zmura, M. (2016). Use of physiological signals to predict cybersickness. *Displays*, *44*, 42–52.

Fulton, W. (2016, January 11). Virtuix Omni hands-on: Walk across virtual worlds from the comfort of your living room. *Digital Trends*. Retrieved from https://www.digitaltrends.com/gaming/virtuix-omni-hands-on

Hale, K. S., & Stanney, K. M. (2014). *Handbook of virtual environments: Design, implementation, and applications*. Boca Raton, FL: CRC Press.

IJsselsteijn, W. A., de Kort, Y. A. W., & Poels, K. (2008). *Game experience questionnaire*. Eindhoven: Eindhoven University of Technology.

Klein, M. J., & Simmers, C. S. (2009). Exergaming: Virtual inspiration, real perspiration. *Young Consumers: Insight and Ideas for Responsible Marketers*, *10*(1), 35–45.

Klimmt, C., Possler, D., & Steger, F. (2018). *True presence, finally: The effect of virtual reality on video game enjoyment*. Paper presented at the 68th Annual Conference of the International Communication Association, Prague, Czech Republic.

Lang, B. (2013, April 19). Latest Virtuix Omni VR treadmill video shows intense TF2 gameplay with Oculus Rift and new prototype. *Road to VR*. Retrieved from https://www.roadtovr.com/virtuix-omni-omnidirectional-treadmill-oculus-rft-tf2-gameplay

Lessiter, J., Freeman, J., Keogh, E., & Davidoff, J. (2001). A cross-media presence questionnaire: The ITC-Sense of presence inventory. *Presence: Teleoperators and Virtual Environments*, *10*(3), 282–297.

Livingston, J. (2011, November 16). Skyrim [Screenshot from Bethesda Game Studio's The Elder Scrolls V: Skyrim]. *Flickr*. Retrieved from https://www.flickr.com/photos/xavierwilkinson/6350803784/in/album-72157628105061620

Löllgen, H. (2004). Das Anstrengungsempfinden (RPE, Borg-Skala) [Received perception of exertion (RPE, Borg Scale)]. *Deutsche Zeitschrift für Sportmedizin*, *55*(11), 299–300.

Martel, E., Su, F., Gerroir, J., Hassan, A., Girouard, A., & Muldner, K. (2015). Diving head-first into virtual reality: Evaluating HMD control schemes for VR games. In J. P. Zagal, E. MacCallum-Stewart, & J. Togelius (Eds.), *Proceedings of the 10th international conference on the foundations of digital games* (pp. 1–5). Santa Cruz, CA: Society for the Advancements of the Science of Digital Games.

McCauley, M. E., & Sharkey, T. J. (1992). Cybersickness: Perception of self-motion in virtual environments. *Presence: Teleoperators and Virtual Environments*, *1*(3), 311–318.

Mirelman, A., Rochester, L., Maidan, I., Del Din, S., Alcock, L., Nieuwhof, F., . . . Hausdorff, J. M. (2016). Addition of a non-immersive virtual reality component to treadmill training to reduce fall risk in older adults (V-TIME): A randomised controlled trial. *The Lancet*, *388*(10050), 1170–1182.

Nacke, L. (2009). *Affective ludology: Scientific measurement of user experience in interactive entertainment* (Unpublished doctoral dissertation). Blekinge Institute of Technology, Karlskrona, Sweden.

Nilsson, N. C., Serafin, S., Steinicke, F., & Nordahl, R. (2018). Natural walking in virtual reality: A review. *ACM Computers in Entertainment*, *16*(2), 1–22.

Oh, Y., & Yang, S. P. (2010). Defining exergames & exergaming. In MSU Serious Games Program (Ed.), *Proceedings of the meaningful play 2010 conference* (pp. 1–18). East Lansing, MI: Meaningful Play.

Ortega, F. B., Ruiz, J. R., España-Romero, V., Vicente-Rodriguez, G., Martinez-Gómez, D., Manios, Y., . . . Castillo, M. J. (2011). The International Fitness Scale (IFIS): Usefulness of self-reported fitness in youth. *International Journal of Epidemiology*, *40*(3), 701–711.

Pietschmann, D. (2014). *Spatial Mapping in virtuellen Umgebungen: Der Einfluss von Stereoskopie und Natural Mapping auf die User Experience* [Spatial mapping in virtual environments: The influence of stereoscopy and natural mapping on user experience] (Unpublished doctoral dissertation). University of Technology Chemnitz, Chemnitz, Germany.

Possler, D., Klimmt, C., & Raney, A. A. (2018). Gaming is awesome! A theoretical model on cognitive demands and the elicitation of awe during video game play. In N. D. Bowman (Ed.), *Video games: A medium that demands our attention* (pp. 74–91). London: Routledge.

Possler, D., Kuempel, A. S., Unkel, J., & Klimmt, C. (2018). *Awe-inspiring video games: Exploring the role of the emotion awe for video game entertainment*. Paper presented at the 7th Conference of the European Communication Research and Education Association, Lugano, Switzerland.

Ray, T. (2016, January 8). Virtuix's VR treadmill is a bit like a drug trip, and a good one. *Barron's*. Retrieved from https://www.barrons.com/articles/virtuixs-vr-treadmill-is-a-bit-like-a-drug-trip-and-a-good-one-1452286957

Ryan, R. M., Mims, V., & Koestner, R. (1983). Relation of reward contingency and interpersonal context to intrinsic motivation: A review and test using cognitive evaluation theory. *Journal of Personality and Social Psychology*, *45*(4), 736–750.

Sanders, T., & Cairns, P. (2010). Time perception, immersion and music in videogames. In T. McEwan & L. M. McKinnon (Eds.), *Proceedings of the 24th BCS interaction specialist group conference* (pp. 160–167). Swindon: BCS.

Shafer, D. M., Carbonara, C. P., & Korpi, M. F. (2019). Factors affecting enjoyment of virtual reality games: A comparison involving consumer-grade virtual reality technology. *Games for Health Journal*, *8*(1), 15–23.

Shelstad, W. J., Smith, D. C., & Chaparro, B. S. (2017). Gaming on the Rift: How virtual reality affects game user satisfaction. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, *61*(1), 2072–2076.

Skalski, P., Tamborini, R., Shelton, A., Buncher, M., & Lindmark, P. (2011). Mapping the road to fun: Natural video game controllers, presence, and game enjoyment. *New Media & Society*, *13*(2), 224–242.

Smith, S. P., & Du'Mont, S. (2009). *Measuring the effect of gaming experience on virtual environment navigation tasks*. Paper presented at the 2009 IEEE Symposium on 3D User Interfaces, Lafayette, LA, USA.

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, *42*(4), 73–93.

Suma, E. A., Azmandian, M., Grechkin, T., Phan, T., & Bolas, M. (2015). Making small spaces feel large: Infinite walking in virtual reality. In Association for Computing Machinery (Ed.), *Proceedings of SIGGRAPH 2015 emerging technologies* (p. 1). New York, NY: Association for Computing Machinery.

Superdata. (2019). Oculus expected to sell 1.3M Quest units in 2019; XR revenue reached $6.6B in 2018 and is projected to increase 442% by 2022. *Superdata*. Retrieved from https://www.superdataresearch.com/xrupdate

Sweetser, P., & Wyeth, P. (2005). GameFlow: A model for evaluating player enjoyment in games. *ACM Computers in Entertainment*, *3*(3), 3.

Tan, C. T., Leong, T. W., Shen, S., Dubravs, C., & Si, C. (2015). Exploring gameplay experiences on the Oculus Rift. In A. L. Cox, P. Cairns, R. Bernhaupt, & L. Nacke (Eds.), *Proceedings of the 2015 annual symposium on computer-human interaction in play* (pp. 253–263). New York, NY: Association for Computing Machinery.

Tarantola, A. (2016, June 1). I quite literally ran around a virtual arena and loved it. *Engadget*. Retrieved from https://www.engadget.com/2016-01-06-i-quite-literally-ran-around-a-virtual-arena-and-loved-it.html

Viar360. (2019). Virtual reality market size in 2018 with forecast for 2019. *Viar360*. Retrieved from https://www.viar360.com/virtual-reality-market-size-2018/

Vorderer, P., Wirth, W., Gouveia, F. R., Biocca, F., Saari, T., Jäncke, F., . . . Jäncke, P. (2004). *MEC Spatial Presence Questionnaire (MEC-SPQ): Short documentation and instructions for application*. Hannover: Measurement, Effects, Conditions (MEC).

Warren, L. E., & Bowman, D. A. (2017). User experience with semi-natural locomotion techniques in virtual reality: The case of the Virtuix Omni. In A. L. Simeone, K. Johnsen, R. Teather, & C. Sandor (Eds.), *Proceedings of the 5th symposium on spatial user interaction* (p. 163). New York, NY: Association for Computing Machinery.

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence*, *7*(3), 225–240.

Yang, S., Hwang, W.-H., Tsai, Y.-C., Liu, F.-K., Hsieh, L.-F., & Chern, J.-S. (2011). Improving balance skills in patients who had stroke through virtual reality treadmill training. *American Journal of Physical Medicine and Rehabilitation*, *90*(12), 969–978.

Yildirim, C. (2019). Cybersickness during VR gaming undermines game enjoyment: A mediation model. *Displays*, *59*, 35–43.

About the Authors

Lars-Ole Wehden is a PhD Student and Research Associate in the Department of Communication at the University of Muenster, Germany. In 2015 he received his MA in Communication Studies which he studied at the Free University of Berlin, Germany, and the University of Helsinki, Finland. His PhD thesis focuses on journalistic decisions in news distribution processes on social media. Further research interests are journalism studies, computational communication science, and the effects of using virtual reality technology.

Felix Reer is a Postdoctoral Researcher in the Department of Communication at the University of Muenster, Germany. His research interests include social media and online communication, effects of digital games, and the use of highly immersive media technologies, such as virtual reality and augmented reality devices. He is Vice-Chair of the Digital Games Research Section of the European Communication Research and Education Association (ECREA).

Robin Janzik is a Research Associate in the Department of Communication at the University of Muenster, Germany. He holds an MA degree in Communication Studies from the University of Muenster, Germany, and is currently working on his PhD project about the acceptance of virtual reality technology for private use. His further research interests include trust in technology and problematic media use.

Wai Yen Tang worked as a Postdoctoral Researcher in the Department of Communication at the University of Muenster, Germany, until 2019. He is a Communication Scientist with a background in Psychology. In 2016, he received his PhD in Communication Studies from the Ohio State University in Columbus, OH, USA. His research interests include digital games' influence on behavior and players' online communication, such as sexual harassment.

Thorsten Quandt is a Professor of communication studies at the University of Muenster, Germany. His research interests include online communication, digital games, VR, and journalism.

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 17–27
DOI: 10.17645/mac.v9i1.3203

Article

Merging the Analogue and the Digital: Combining Opposite Activities in a Mixed Media Game

Ulf Wilhelmsson *, Tarja Susi and Niklas Torstensson

Division of Game Development, University of Skövde, 54128 Skövde, Sweden; E-Mails: ulf.wilhelmsson@his.se (U.W.), tarja.susi@his.se (T.S.), niklas.torstensson@his.se (N.T.)

* Corresponding author

Submitted: 30 April 2020 | Accepted: 22 June 2020 | Published: 6 January 2021

Abstract
While much of the games research field for the last two decades has focused on digital games, this article draws attention to the benefits of combining analogue and digital game components to cater for a serious but fun game experience. In this case, the game design provides a set of game rules for players, where the goal is to win by finding another player's hidden treasure. But, the game also includes deceptive characters, initially unknown to the players, whose goal is to lure the players to reveal information, which will make a player lose the game. Hence, the players and the unknown characters are involved in opposite but intertwined activities. To describe the differing activities we use the activity system model found in Activity Theory. The theoretical conceptualisation, the game design and the play situation create what we term a *zone of experience* where young players can experience the consequences of sharing too much information. The game design mimics real world online interactions, but under safe off-line conditions. The zone of experience also creates the foundation for an ensuing activity that fits well within the concept of the zone of proximal development: A follow-up conversation under adult guidance of game experiences aimed at raising children's online risk awareness.

Keywords
activity theory; mixed media; online risk awareness; serious game; zone of experience

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

In the very first issue of *Game Studies: The International Journal of Computer Game Research* (*Game Studies*), Aarseth (2001) drew a line between computer games and old mass media and envisioned a new field of studies focused on the unique features of digital games. Since then, research in game studies has mainly focused on digital games, with less attention to earlier forms of analogue games, like board games. The founding of *Game Studies* in 2001 was, at the time, an important addition to journals such as *Simulation & Gaming: An Interdisciplinary Journal of Theory, Practice and Research* (Sage Journals) founded in 1970. As a counterweight to the focus on digital games that *Game Studies* brought to the table, yet a new journal, *Analog Game Studies*, was founded in 2014. As Torner, Trammel, and Leigh Waldron (2014) state in the very first volume of *Analog Game Studies*:

> Game studies can no longer afford to primarily focus on computer games in an era where the world has become so digitally mediated that the nomenclature ceases to carry the same weight that it once did. Furthermore, analog games are notably detached from many cultural attitudes prevalent in the comput-

> er game industry, and can offer an insight into the ways that games work to produce social change. They make clear the rulesets that govern behavior within games and, in doing so, reveal the biological and cultural rules which have forever governed our society. (para. 3)

In this article, we describe the game Hidden in the Park (Parkgömmet© in Swedish; The Change Attitude Foundation, 2019), a mixed media game that, regardless of any cultural attitudes towards digital or analogue games, can offer insight into the way the power of digital technology such as augmented reality (AR) and the tangibility of analogue games can be utilized to cater for valuable experiences. The purpose of this particular game is to raise young children's online risk awareness by allowing them to experience potentially negative consequences of choices concerning information sharing.

On the surface, the game is a player vs. player game. In this sense, all players have the same goal: to win the game. The player vs. player design in itself creates a dynamic gameplay where players compete over resources and information. Initially the game is perceived to be just that, a competitive game between players gathered around a table. However, there are also sinister within-game unknown characters (UCs; preprogrammed and non-playable) with a different agenda, that of gaining information from players, which will make a player lose the game. Hence, there are two different activities unfolding during gameplay. The game mimics real-world online events and draws from authentic online sexual grooming offender behaviours, which players are subjected to (but without any sexual insinuations or content). The game design and development required interdisciplinary collaboration—with expertise in game development (game writing, design, programming, graphics), cognition, linguistics and user experience design—and was developed by a team of researchers at the University of Skövde in Sweden, in collaboration with The Change Attitude Foundation and a professional game studio, IUS Innovation, in two successive projects.

The merging of analogue and digital media and the intertwining of two opposite activities, provided some interesting challenges. Some of the main questions were how to align the different kinds of media and AR-technology and how to combine two opposite gameplay activities that unfold during gameplay—all within a well-functioning and coherent game concept. There also needed to be a theoretical framing for the game concept. In addition, there were initial requirements that the game had to be a serious but fun game, suitable for children in school settings. The final product of this interdisciplinary project is a mixed media serious board game that consists of a tabletop game board, a tablet computer equipped with AR-technology and game pieces and sets of clue cards for each player. This game could also be seen as a hybrid game, which is often considered as the combination of physical and digital elements (Kankainen, Arjoranta, & Nummenmaa, 2017). However, as Kankainen et al. (2017) argue, such a viewpoint "can be seen as a limiting factor in their design and analysis" (p. 2). In their view, hybrid games should instead be understood through conceptual metaphors and blending and they describe hybridity as "the blending of different cognitive domains that are not usually associated together" (Kankainen et al., 2017, p. 1). Hidden in the Park does blend different cognitive domains, but to avoid terminological confusion, we chose to consider it a mixed media serious game. In our view it is suitable considering the game's purpose, and it is also in line with the definition of serious games being "games that engage the user, and contribute to the achievement of a defined purpose other than pure entertainment (whether or not the user is consciously aware of it)" (Susi, Johannesson, & Backlund, 2007, p. 5).

The main focus of this article is the game structure that provides a common ground for two contradictive and opposite, but intertwined, activities with different objectives and desired outcomes. The activities are those of players and unknown (pre-programmed) characters, that take place during a game session. In Activity Theory (AT), an activity is always defined by its object, that is, what someone's actions are directed towards. From the players' perspective the activity is *playing a game* and the objective is the gameplay, while the UCs activity is *deception* and the objective is access and control. The players' desired outcome is to win the game, while the UCs' outcome is pictures gained from players, which will make a player lose the game. To describe the game concept and the opposite goals of players versus UCs, we make use of the *activity system model* found in AT (Engeström, 1987). The activity system model describes the basic structure of human activity and places individuals in a wider socio-cultural context. The model also serves to describe the complexity and intertwining of the two activity systems, and how that creates a *zone of experience* for players during gameplay. A zone of experience is an arena where players get firsthand experiences of choices and consequences through the use of the game. As such, the game is intended to evoke thoughts and reflections which are then discussed in a follow-up conversation with a teacher or pedagogue, which fits well with the concept of the zone of proximal development (Vygotsky, 1978). The zone of proximal development is the difference between what can be achieved individually, and the level of potential development that can be achieved under guidance from more capable peers (Vygotsky, 1978).

Considering that the game is intended to evoke thoughts and reflections on game events, it could be seen as a learning game. However, there is no explicit defined learning outcome, so we consider the game rather a platform for raising awareness of online risks and consequences. This is achieved by subjecting players to offender strategies, but under safe conditions within

a closed system. It is noteworthy that the game is not constructed so as to teach children about offender strategies, but to reflect on online interactions and the realisation that things might not always be what they seem to be. One might still say there is an element of learning that could be explained, for instance, trough social constructivism or other learning theories. We will not, however, delve into learning theories since that goes beyond the focus of this article and is the subject for another article.

Section 2 provides first a short overview of the game itself, while Section 3 describes some of the main design challenges in merging the analogue and the digital within a coherent game concept. Sections 4 and 5 then focus on the activity system models of players and UCs. Section 6 describes the zone of experience created by the game structure, which precedes activity within the zone of proximal development. The article ends with some conclusions.

2. The Game

The game is designed for 8–10-year-old children, to be played in groups of 2–4 players, in Swedish elementary schools. The game consists of an analogue part and a digital part, which jointly constitute the game. The analogue part of the game comprises a classic cardboard game board, wooden game pieces and cardboard clue cards, whereas the digital part utilizes a tablet computer running a game application including AR-technology. The tablet also contains mini-games and other game events, and some voice acting. The AR-technology is used to display a 3D-version of the physical game board, in which each player hides a treasure (by touching the screen) and in return gets some clue cards to the hiding place (Figure 1). The players need to mind their clue cards so that other players cannot find their treasures.

The tablet is also used for rolling a dice and to show the current position of all the game pieces, in parallel to the physical game board to help players keep track of the correct positions. Furthermore, messages similar to online chat or text messages (SMS) appear in the tablet, sent to the players by the game's UCs. The SMSs create a direct connection to children's everyday life, and allow players to make choices whether or not to reveal information. The UCs want the players to take photos (with the tablet's camera) of their clue cards and send them in return. These characters initially use flattery, bribes, and coercion to lure players to take photos. If a player has taken and sent a photo, the UC can then later on use threats of revealing the photo/clue card unless the player takes more photos (Figure 2).

These strategies are based on original research on online offender behaviours (Susi & Torstensson, 2019). The game also has a built-in feature where an UC may reveal clues to progress the gameplay. Once clue cards are revealed a player can get the chance to look for another player's treasure, using the tablet's 3D view. After completing the game, a follow-up conversation led by a teacher or pedagogue takes place. This is a dialogue about the game events, risks and online behaviour, for which a specific pedagogical guiding material has been developed. Through such a follow-up conversation lead by a teacher, preceding game events can be related to everyday online activities and risk awareness. This is well in line with the curriculum for Swedish elementary schools, which states that pupils should be able to cope in a complex reality with increased digitalisation, develop their ability to review information critically, and to realise the consequences of different alternatives. It is also a step towards the goal expressed in the UN Agenda 2030, Goal 16.2, regarding sustainable development to "end abuse, exploitation, trafficking and all forms of violence against and torture of children" (United Nations, 2015, goal 16). Based on the game events, the follow-up conversation provides the opportunity to reflect and become aware of online risks. The game can be played

Figure 1. The game includes analogue and digital game parts, and here the tablet shows the board game as a 3D-world.

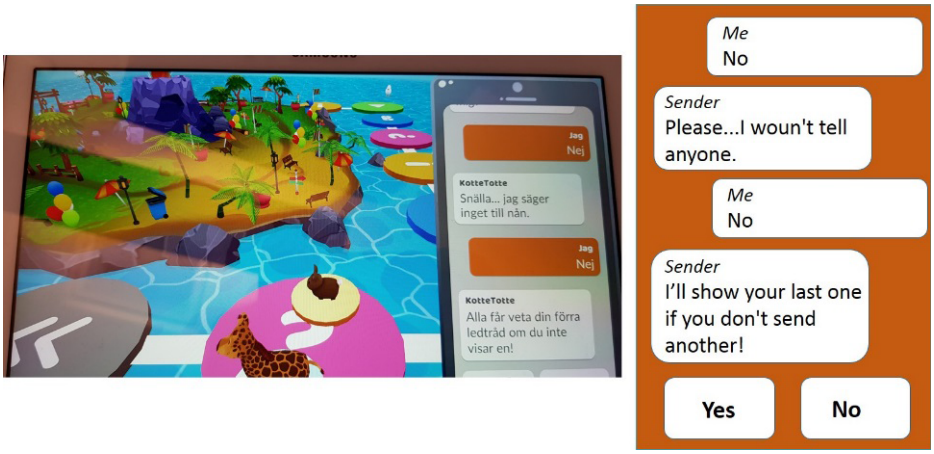

Figure 2. Messages appear in the tablet, in this case a threat from an UC who tries to gain more pictures. Note: Text on the right hand translated from Swedish.

on its own as just a fun game, but the conversation reinforces the connection between play experiences and everyday online interactions.

3. Design Challenges

As already mentioned in the introduction, there were some challenges in developing Hidden in the Park: how to align the different kinds of media and AR-technology and how to combine two opposite gameplay activities, all within a well-functioning and coherent game concept. At the same time, the game had to be perceived as fun by children and it had to be suitable for 8–10-year-old children in school settings. Consequently, factors such as the time it takes to play the game and having a follow-up conversation also affected the game design. Yet another matter of importance for the game design was the fact that the game would normally be played perhaps only once so the game rules had to be comprehensible from the start. We also needed to carry out game evaluations with the target group during the design phase and, later on, in the intended gameplay setting. Another important matter was the development of pedagogical guiding material for teachers. The pedagogical material, however, was developed by a project partner and will not be further discussed here.

It was important to create a game that would cater to 'fun gameplay' since obviously children would not want to play a boring game, regardless of the importance of the subject. In order to convey the intended message and to work as a platform for raised risk awareness, the game has to capture the interest of its audience in such a way that it motivates gameplay, and even re-play. By incorporating, e.g., mini-games as elements of fun and competition, the game experience distinctly stands out from 'regular' learning games that all too often have been deemed 'boring.' The perhaps biggest challenge was to create a game concept that would not only be perceived as fun, but that would also include deceptive characters mimicking behaviours in online offender strategies. Players and UCs would have opposite goals, and players should not initially know what the UCs 'had in mind.' With regards to the merging of analogue and digital game components, and AR-technology, there were a number of interconnected processes that needed to be implemented in order to make the game work as intended. The focal point, for the game to fulfil its main purpose of enhancing the players' risk awareness, is that at least one of the players actually falls into the trap of taking and sending a picture of a clue card, so that the picture/clue gets revealed and the hidden treasure is found. Firstly, AR tags were embedded in the graphics on the tabletop game board to support AR. The tablet computer is equipped with AR-technology, which allows players to view the tabletop game board as a three-dimensional animated world, in which treasures are hidden by pointing and touching the screen. As a player hides a treasure, she gets a set of four clue cards to the hiding place in return. The clue cards are considered as personal information that should be minded to avoid them being exposed to the other players. Then there had to be a progression that would cause game events to unfold, to drive the gameplay forward so the game would come to an end within a certain time frame: playtime should not be longer than perhaps 40 minutes, which is a regular time for lessons in Swedish elementary schools. Related to progression was the timing and sequencing of SMSs, prompting players to make choices like sending pictures of clue cards. The SMSs had to fit with the on-going gameplay context to make sense. For instance, there appeared an out-of-context SMS from an UC, saying "You're so lucky," when in fact a player had just lost all of his or her coins. There was also a need for a monetary system, partly with the function of rewarding players, but more importantly as an incentive to make players comply with requests in SMSs in order to acquire more coins. Yet another challenge was the exposure of clue cards, in case no player would agree to take a picture. It would still be necessary to somehow reveal clues to push the gameplay forward. The solution to this particular challenge

became to make a message appear saying "Oh no, someone saw you hide your treasures and will reveal a clue for each player," and so one clue for each player would be shown on the tablet. This mechanism of 'automated exposure' is triggered if a certain time of gameplay has elapsed with no pictures taken. Players may also become more wary of taking any pictures once they see that the pictures can be exposed, which could lead to very long playtime. In that case, the same time trigger mechanism comes into effect to forward the game progression.

To find solutions to these issues, and contradictions between players' and UCs' differing activities, we made use of the Wizard of Oz (WOz) method during real-time gameplay to identify interruptions and game events that were illogical for players. WOz is a well-known method in human-centred design, human factors, and other fields for exploring user interfaces in complex systems (Dow et al., 2005; Höysniemi, Hämäläinen, & Turkki, 2004). When WOz is used, users are usually led to believe they interact with a fully functioning system, while in reality the system is controlled by a human, a 'wizard.' This was the case also in our project where the described challenges to a great part were solved through the use of the WOz method during the game design and development. The benefit of the WOz method was that the UCs' behaviours could be adjusted and synchronised to fit the current game state. Hence, while the two activity systems of players and UCs have very different objectives and outcomes, they are framed within one medium (for more details, see Torstensson, Susi, Wilhelmsson, & Lebram, 2020).

Game evaluations with children as participants were carried out in house and school settings during the game development, and also when the game had been finalised. In sum, there were 15 groups of players (n = 70, in groups with 3–4, or up to 8 children). During the development phase, the game evaluations revealed a number of issues that needed adjustments and further development. The results from the evaluations with the completed game, from the researchers' perspective, showed that the game fulfilled the aim of catering for a fun play experience, that it is appropriate for the target group, and that it evokes reflections upon play experiences. From the participants' perspective, the game was first and foremost perceived as fun, rather than some kind of a learning game. The participating children much enjoyed the game's novelty with a combination of different media, the mini-games, and the competition in finding someone's treasure. Also, we found that the social dimension enhances the play experience, as most players were highly engaged in discussions and helped each other, for instance, to move game pieces (for further details on the evaluations, see Susi & Torstensson; 2019; Susi, Torstensson, & Wilhelmsson, 2019).

An interesting aspect of the game development was the theoretical framing of the game concept. What games do seem to have in common, regardless of them being digital, analogue, or a mix thereof, is that they may be understood as activities of a special kind. As a side note, one line of theory considered was frame analysis (Goffman, 1986). In this case the game session in itself would be a frame for a specific activity, that of playing a game. Several attempts have been made to define this special kind of activity. Huizinga (1955), Caillois (1958/2001), and Salen and Zimmerman (2003) all attribute games to a somewhat special kind of activity that in some aspects is circumscribed and more or less separate from other activities in our daily life. In Goffman's (1986) terms, a game is an activity that is performed within a frame of playfulness. The players inside such a frame are usually aware of the specific circumstances that govern gameplay. However, the game Hidden in the Park can be described as a "benign fabrication" (Goffman, 1986, p. 87) in that it is designed with the explicit purpose of introducing a playful frame to raise young children's online risk awareness. The keying (Goffman, 1986), that is, the introduction to the activity of playing the game, is just that: Playing a game that is seemingly all about finding another player's treasure to win the game. This keying establishes the benign fabrication and is part of the process of separating the players from everyday life and put them into the frame of playing. During a gameplay session the activity of play will change due to a new keying, that of a systematic transformation of a known schema of interpretation: receiving and sending SMSs which is an everyday experience even for young players (as statistics from the Swedish media Council show, most 8–10 year olds use mobile phones on an everyday basis; The Swedish Media Council, 2017a, 2017b). By means of the SMS, the original frame for the game, the objective to find another player's treasure while minding one's own clue cards, is put into a new frame that includes remote social interaction. This feature of the game, the SMS sent from UCs, reshapes the experience of playing to include not only direct social interaction but also another kind of communication, one that spans over distances. Following this line of theory however, it is not easy to incorporate a full picture of the role of the UCs, how they affect player choices, and the opposite goals of players and UCs. Instead, we turn our attention to AT, and the activity system model, which lends itself to a more useful description of how player and UC activities meet, thereby creating a zone of experience in which children can gain first-hand experiences of choices and consequences. In the next sections the activity system model is used to describe the player and UC activities, the zone of experience, and the ensuing activity of a follow-up discussion.

4. The Player Activity

AT is a line of research in the social sciences that studies human activities. Its origins are commonly ascribed to Vygotsky, Leontiev, and Luria (see, e.g., Engeström, 1987; Kozulin, 1996; Susi, 2006; Wertsch, 1981). An activity is the basic unit of analysis, and it comprises a subject, object, community, and their interrelatedness (Figure 3).

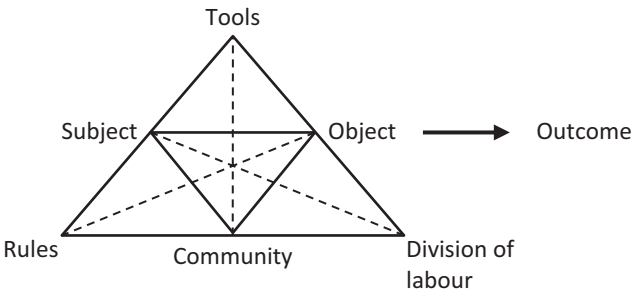

Figure 3. The basic structure of human activity. Source: Adapted from Engeström (1987).

Importantly, activities are object oriented and the object itself—what someone's actions are directed towards—defines the overall activity. Another main feature of (object oriented) activities is the concept of mediation, that is, the tools that mediate our actions. Hence, the relation between subject and object is mediated by physical and psychological tools, such as technology and language. The relationship between subject and community is mediated by rules that cover what it means to be a member of the community. The rules can be formal or informal, such as laws or cultural norms. Finally, the relationship between object and community is mediated by a division of labour. All these elements form the basic structure of human activity where an individual is considered in a wider socio-cultural context. This basic structure is also termed *activity system model* (Engeström, 1987).

AT, and the activity system model, has been used previously in game contexts, for instance by Carvalho et al. (2015) to create a conceptual model called AT-based Model of Serious Games (ATMSG). It is a model that "supports a systematic and detailed representation of educational serious games, depicting the ways that game elements are connected to each other throughout the game, and how these elements contribute to the achievement of the desired pedagogical goals" (Carvalho et al., 2015, p. 166; for the interested reader, Carvalho et al., 2015, also provide an overview of other models and frameworks).

In our case, the aim is not to detail an educational game and how it leads to desired pedagogical goals. Instead, the activity system model serves to illustrate the two very different activities of players vs. UCs, and when they coincide, the emergence of a zone of experience for players (further described below). In the context of gameplay, the overall activity is playing a game (Figure 4). The subject is an individual player, and the object is the gameplay. The mediating tools for players are the physical game and game pieces as well as the player's thinking skills. The player is also part of a community that shares the object of gameplay, so the community includes all the players playing the game. There is a set of rules that covers what it means to be a member of this community. Some of the rules are explicit, such as the formal game rules, while others are implicit, such as appropriate behaviour during gameplay and rules that develop as the group plays the game. The relationship between the group of players and the object of gameplay is mediated through a division of labour, where players take turns, help each other move game pieces, read instructions aloud, and so on. The desired outcome of the gameplay is to win the game.

5. The Unknown Character Activity

The game's UCs are engaged in a completely different, and opposing, activity. In what follows, the description of the UCs behaviour might imply intentional actions and autonomy but they are in reality pre-programmed. In that sense, the UC activity is constructed and artificial, but the activity model serves well to relate the UCs activity to player activities. One important aspect is that the

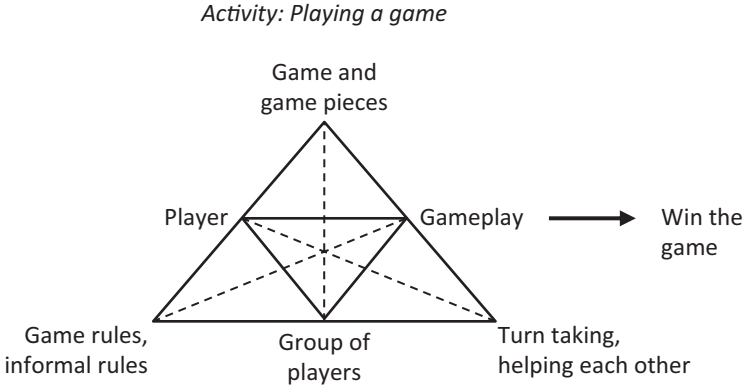

Figure 4. The activity of playing a game described as an activity model.

UCs do not actually play a game, or at least not the same game as the players do. There is a number of UCs, each one targeting an individual player, so the UCs actions and reactions are dependent on the current game state at each instance during gameplay. Hence, the UCs do not try to win the game as such, instead they act according to a hidden set of rules. Players are not initially aware of any UCs, and they do not know what the UCs want once they appear, not until it dawns on them that they are being lured. The aim of the UCs is to trick players to photograph their clue cards and then send them to an unknown character. To achieve this the UCs are programmed to use a combination of four offender strategies, obtained through the analysis of real world chatlogs from a closed online forum: flattery, coercion, bribes, and threats. Furthermore, the UCs are also programmed to perform actions of deceit (for further details on chatlog analyses, see Susi & Torstensson, 2019).

The overall activity then, for the UCs, is deception (Figure 5). The subject is an individual UC, and the object is to gain access to and control a player. The mediating tools for access and control are the pre-coded strategies, and game state sensitive SMSs sent to a player during gameplay. An UC is also part of a community of several UCs that shares the object of access and control. There is a division of labour between the UCs, in that they each target an individual player. There is also a set of programmed rules shared by this community. In this case, all the rules are explicit.

By relating the activity system models of players and UCs to each other we can see the emergence of a zone of experience for players during gameplay, which is discussed in the next section.

6. Zone of Experience

By combining the previously described different activities of players and UCs, the stage is set for what we term a *zone of experience*. The zone of experience is an arena where the players use tangible objects like game pieces, or the tablet to take pictures and send them to someone they do not know. Players also respond to SMSs from someone unknown, make choices, and get to experience the consequences thereof. The tangibility is important for facilitating children's thinking skills (Antle, 2013). At the same time, players bring their own previous experiences to the gameplay, to make decisions and solve problems presented in the game. For instance, experiences of other games and text messaging. There is a constant re-evaluation and adjustment of behaviour and strategies to solve problems presented in the game. Another important experience for players within the zone of experience is deception. Players do not initially know or understand that taking photos of clue cards will lead to their exposure, that someone will reveal information they have shared to get to play extra mini-games or to gain extra coins. This reminds us of real-world online experiences where other people may have hidden intentions. When considering the zone of experience, it can be summarised as the effect of a game that creates situations where players can gain first-hand experiences within the frame of the game rules and the activity of playing. Regarding experiences, they solely relate to the players since the UCs 'experiences' are obviously preprogrammed and based on the state of the game, time and player actions.

In the context of the game and gameplay, the zone of experience can be seen as preceding Vygotsky's (1978) zone of proximal development. The game events unfolding in the zone of experience constitute the foundation for a new activity: a follow-up conversation lead by a teacher or a pedagogue. This is an opportunity for reflection and processing of game experiences, choices and consequences, and their relation to real-world online interactions, under adult guidance. Hence, the situation is transformed from an activity within the zone of experience, into an activity within the zone of *proximal development*. This zone, as defined by Vygotsky (1978), is the distance between "the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). As shown in Figure 6, the interrelated player-UC activities become transferred to interrelated player-teacher activities on a higher level. It is a transfer from first-hand experiences to a reflection upon the experiences. Hence, this ensuing player-teacher activity includes two new activity models. On the

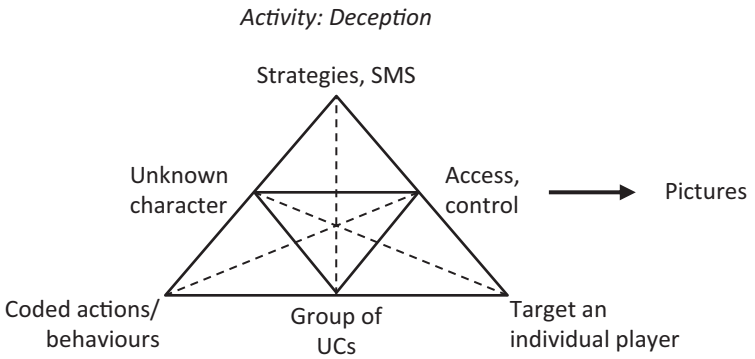

Figure 5. The activity of deception described as an activity model.

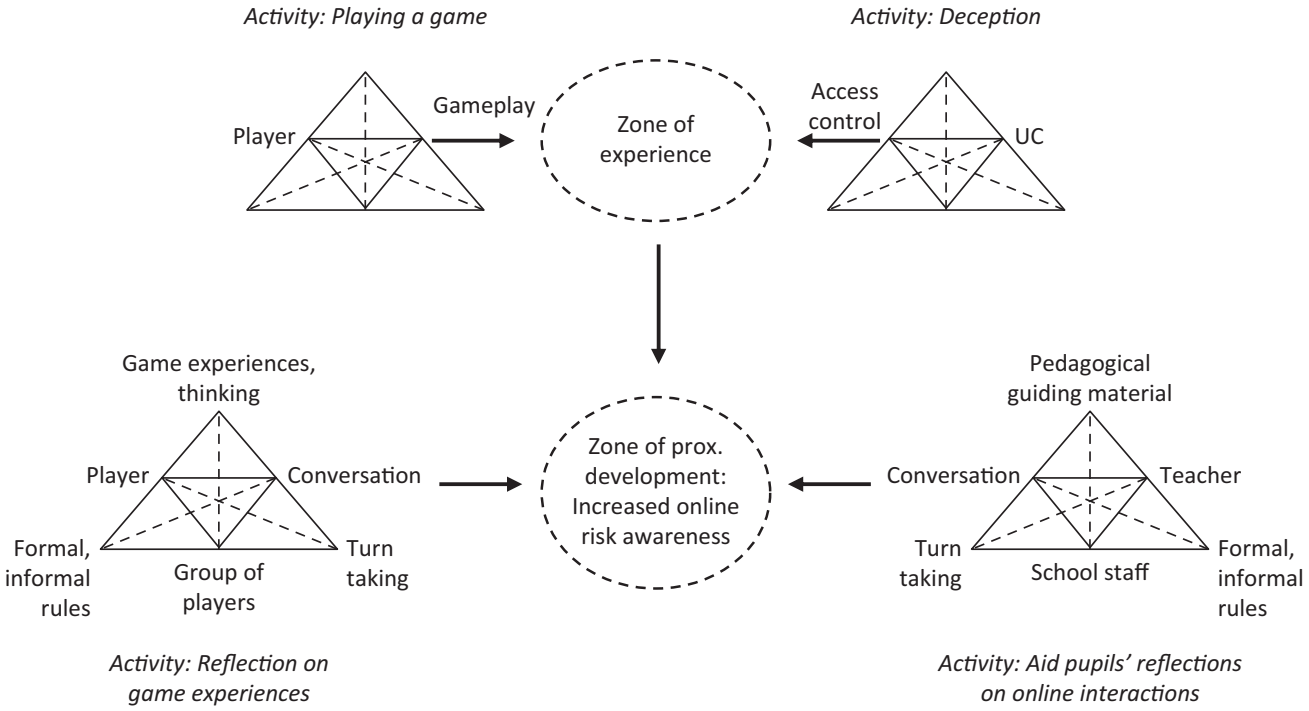

Figure 6. The zone of experience is a foundation for the ensuing follow-up conversation in the zone of proximal development, where players and teacher reflect on the gaming experience in relation to online interactions.

one hand are the pupils who reflect on their gaming experience, and on the other hand is the teacher who aids the players/pupils to reflect on the game events and online interactions.

The overall object in both the teacher and player activities is the follow-up conversation. For the players, the mediating tools are their gaming experiences and their reasoning and thinking skills, while the teacher's main mediating tool is the pedagogical guiding material. The players' community is the group of players who have just played the game, and their relationship is mediated by regulations and informal rules and norms. The community for the teacher is other staff members where the rules for being a member of that community is mediated by laws, local regulations and informal norms and agreements. There are clearly numerous kinds of division of labour, especially among staff members, but the one coinciding division of labour between players and teacher is turn taking. As these two activities meet, the common ground and desired outcome, becomes a zone of proximal development where young children can gain raised online risk awareness.

7. Conclusions

To combine analogue and digital features into a mixed media game experience certainly presented some challenges. The benefit, in this case, of merging the analogue and the digital to create the game was that it enabled the creation of a socially engaging game that also simulates real world online events, in a way that is not possible if only one or the other had been used. On the one hand, had the game only been digital, the tactile aspect of moving game pieces etc., and the social dynamics of a face to face gameplay situation would have been lost. On the other hand, had the game only been analogue, it would not have had the anchoring in contemporary technology and media usage, such as surprise SMSs, digital photography and the added thrill of AR-technology. The combination of different media allows players to gather around a table in a dynamical social play situation, where the players engage in each other's gameplay for instance, by helping out to move game pieces and reason about choices. The game board also provides a shared, easily accessible overview of the state of the game. Even though the combination of all these aspects—the technologies used, the tangibility of objects, young people's media usage and the social play situation—does provide a fun and engaging play experience, there is no guarantee it will always be the case. After all, we cannot design experiences, we can only design *for* a good user experience (Hassenzahl & Tractinsky, 2006).

To conceptualise the design required synchronisation of analogue and digital components, and also the alignment of contradictory but intertwined activities that should meet within the same frame of gameplay. For this we used the activity system model, which allowed both conceptualisation and visualisation of the game concept, and it provided a shared common ground between the developers' widely different fields of competence. It proved a valuable tool for communication within the development team as well as a tool for design, where the relations between the elements within an activity could be analysed. The activity model can aid an analy-

sis on effects and consequences of changes, for instance, the way a change of game rules affects the relationship between a player and the community of players, which in turn will affect the activity as such. Hence, the model can be utilised to solve inner contradictions within an activity. To solve the issues and contradictions between players' and UCs' differing activities, we used the WOz method during real-time gameplay, which was valuable for identification of interruptions and for the synchronisation of game events. The final product is a mixed media serious game that combines players' and agents' different objectives. It is also a game that draws on the well-known while adding novelty: Board games are familiar and provide tangibility and player engagement, while technology adds a level of something new and exciting. The technology also provides a means for simulating real-world online events, and to control game events and the pacing of the game.

More importantly, however, the zone of experience that a game session establishes creates an opportunity for a situation of insight through the experience of choices and their consequences, of sharing photographs, and to be deceived. We argue this creates the foundation for an activity within the zone of proximal development as described above, in which the gaming experiences are put in relation to real-world online activities under the guidance of an adult. Since the game mimics the target group's everyday media use, where it is not uncommon that children are asked to send photographs to online contacts (Susi et al., 2019), children can potentially increase their thinking skills to better identify and comprehend online risk behaviour.

In sum, the game mimics real-world online events and it is designed for 8–10 year olds, which is a common age when children begin to interact online. The gameplay draws from authentic online sexual grooming offender behaviours, that players are subjected to (without any sexual insinuations or content), thereby providing a zone of experience where players are faced with the negative outcomes of some of their decisions. The follow up conversation brings the experiences into the zone of proximal development, where players can discuss and reflect on game events. All these intricate activities and processes are clarified through the activity system model that contextualises the individual players within a wider sociocultural context. Furthermore, the activity system model can be a useful tool for design communication, and it can aid the analysis on the effects and consequences of changes in a design process.

Hidden in the Park can very well be played as just a fun and entertaining stand-alone game, as our evaluations clearly showed, but as a means to raise online risk awareness the follow-up discussion is fundamental for the game to reach its full potential. The game is distributed free of charge to all elementary schools in Sweden since 2019.

To return to Aarseth's (2001) thoughts on digital games as a unique media form, we agree but we also believe that analogue components combined with digital ones can add a further dimension to the gaming experience. The development of mixed media provides good opportunities to expand the experience of games in a way that perhaps no media on its own can do. We firmly believe the game discussed here is a tool that offers "an insight into the ways that games work to produce social change" (Torner et al., 2014). The game establishes a zone of experience that has a great potential to form young people's internet behaviour and online risk awareness. We believe mixed media has the potential to provide compelling platforms and various forms of games and thereby tease out good conditions for affecting behaviours for the benefit of social sustainability. This is a good reason for game study research to attend to the advantages of mixed media, because surely it is an exciting development that awaits around the corner.

Acknowledgments

The project was carried in two parts, as a joint venture between the University of Skövde, the non-profit organisation The Change Attitude Foundation, and the game company IUS Innovation. The first project was financed by the Sten A Olsson Foundation for Research and Culture. The second project was financed by the World Childhood Foundation and the University of Skövde. The research team includes the following people at the University of Skövde: Prof. Per Backlund, Assoc. Prof. Ulf Wilhelmsson, PhD student Marcus Toftedahl, Research Engineer Mikael Lebram, Dr. Niklas Torstensson, and Dr. Tarja Susi. We would also like to thank our anonymous reviewers for valuable and constructive comments.

Conflict of Interests

The authors declare no conflict of interests.

References

Aarseth, E. (2001). Computer game studies, year one. *Game Studies*, *1*(1), 1–15.

Antle, A. N. (2013). Exploring how children use their hands to think: An embodied interaction analysis. *Behavior & Information Technology*, *32*(9), 938–954.

Caillois, R. (2001). *Man, play and games* (Meyer Barash, Trans.). Champaign, IL: University of Illinois Press. (Original work published 1958)

Carvalho, M. B., Bellotti, F., Berta, R., De Gloria, A., Sedano, C. I., Hauge, J. B., . . . Rauterberg, M. (2015). An activity theory-based model for serious games analysis and conceptual design. *Computers & Education*, *87*, 166–181.

Dow, S., MacIntyre, B., Lee, J., Oezbek, C., Bolter, J. D., & Gandy, M. (2005). Wizard of Oz support throughout an iterative design process. *IEEE Pervasive Computing*, *4*(4), 18–26.

Engeström, Y. (1987). *Learning by expanding: An activity-*

theoretical approach to developmental research. Helsinki: Orienta-Konsultit Oy.

Goffman, E. (1986). *Frame analysis: An essay on the organization of experience*. Boston, MA: North Eastern University Press.

Hassenzahl, M., & Tractinsky, N. (2006). User experience: A research agenda. *Behaviour & Information Technology*, *25*(2), 91–97.

Höysniemi, J., Hämäläinen, P., & Turkki, L. (2004). Wizard of Oz prototyping of computer vision based action games for children. In A. Druin, J. P. Hourcade, & S. Kollet (Eds.), *Proceedings of the 2004 Conference on Interaction Design and Children: Building a Community* (pp. 27–34). New York, NY: ACM.

Huizinga, J. (1955). *Homo ludens: A study of the play-element in culture*. Boston, MA: Beacon Press.

Kankainen, V., Arjoranta, J., & Nummenmaa, T. (2017). Games as blends: Understanding hybrid games. *Journal of Virtual Reality and Broadcasting*, *14*(4).

Kozulin, A. (1996). The concept of activity in Soviet psychology: Vygotsky, his disciples and critics. In H. Danies (Ed.), *An introduction to Vygotsky* (pp. 99–122). London: Routledge.

Salen, K., & Zimmerman, E. (2003). *Rules of play: Game design fundamentals*. Cambridge, MA: The MIT Press.

Susi, T. (2006). *The puzzle of social activity: The significance of tools in cognition and cooperation*. Linköping: Department of Computer and Information Science, University of Linköping.

Susi, T., Johannesson, M., & Backlund, P. (2007). *Serious games: An overview*. (Technical Report HS-IKI-TR-07-001). Skövde: University of Skövde.

Susi, T., & Torstensson, N. (2019). "Who's texting?" Playful game experiences for learning to cope with online risks. In X. Fang (Ed.), *Proceedings of the International Conference on Human–Computer Interaction* (pp. 427–441). Cham: Springer.

Susi, T., Torstensson, N., & Wilhelmsson, U. (2019). "Can you send me a photo?": A game-based approach for increasing young children's risk awareness to prevent online sexual grooming. In A. Nakamura (Ed.), *DiGRA 19: Proceedings of the DiGRA 2019 International Conference: Game, Play and the Emerging Ludo-Mix*, (pp. 1–16). Kyoto: Digital Games Research Association.

The Change Attitude Foundation. (2019). Hidden in the Park [Video Game]. Skövde: IUS Innovation.

The Swedish Media Council. (2017a). *Småungar & medier* [Small kids & media]. Stockholm: The Swedish Media Council.

The Swedish Media Council. (2017b). *Ungar & medier* [Kids & media]. Stockholm: The Swedish Media Council.

Torner, E., Trammel, A., & Leigh Waldron, E. (2014). Reinventing analog game studies. *Analog Game Studies*, *1*(1).

Torstensson, N., Susi, T., Wilhelmsson, U., & Lebram, M. (2020). Wizard of Oz and the design of a multi-player mixed reality game. In X. Fang (Ed.), *Proceedings of the International Conference on Human–Computer Interaction 2020*. Cham: Springer.

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. New York, NY: United Nations. Retrieved from https://sustainabledevelopment.un.org/post2015/transformingourworld

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wertsch, J. V. (1981). *The concept of activity in Soviet psychology*. North Castle, NY: M. E. Sharpe.

About the Authors

Ulf Wilhelmsson is Associate Professor in media, aesthetics and narration at the University of Skövde, Sweden. He has worked in serious games projects within cultural heritage, raised online risk awareness for young children, and inclusive game design. He is a member of the research group Media, Technology and Culture at the School of Informatics, University of Skövde, Sweden.

Tarja Susi is a Senior Lecturer in cognitive science at University of Skövde, Sweden. She has worked in serious games projects within cultural heritage, raised online risk awareness for young children, and eSports. She is a member of the research group Media, Technology and Culture at the School of Informatics, University of Skövde, Sweden.

Niklas Torstensson is a Senior Lecturer in Cognitive Science at University of Skövde, Sweden. He has worked in serious games projects within cultural heritage, and raised online risk awareness for young children and eSports. He is a member of the research group Media, Technology and Culture at the School of Informatics, University of Skövde, Sweden.

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 28–38
DOI: 10.17645/mac.v9i1.3308

Article

Winning Over the Players: Investigating the Motivations to Play and Acceptance of Serious Games

Ruud S. Jacobs

Department of Communication Science, University of Twente, 7522NJ Enschede, The Netherlands;
E-Mail: r.s.jacobs@utwente.nl

Submitted: 31 May 2020 | Accepted: 24 July 2020 | Published: 6 January 2021

Abstract
Serious games are designed to educate, train, or persuade their players on specific topics and issues. While a lot of studies have sought to prove the effects of these games, the overall image and legitimization of serious games has not benefited fully from these efforts. Indicating that the issue stems from the difference between the captive audience exposed to games in effects studies and the contexts in which people come to play serious games in everyday life, the current article sketches out the research that needs to be performed before this gap can be filled. Three theoretical perspectives are offered, in turn looking at serious games as forms of (promotional) communication, personal media experiences, and technological innovations. This analysis results in insights relating to (among others), how the identity of serious games might hinder their diffusion, how expected gratifications could fail to match the intentions of these games, and what could cause someone to 'adopt' a serious game. Based on the insights gained by applying these lenses, potential factors are listed and linked to methodologies that could prove or disprove their importance. These methodologies involve quantitative and qualitative investigations to create a deeper picture of how potential players approach serious games. The article concludes with open questions to investigators and industry professionals generated from this process.

Keywords
acceptance; adoption; attitudes; games for change; media psychology; motivation; persuasive games; serious games

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

Despite their name, games have long been recognized to provide more than just playful entertainment to players. From assertions that games were used by ancient peoples to stave off hunger (McGonigal, 2011) to arguments that games subvert established ways of thinking (Flanagan, 2009), game academia abounds with demonstrating the purposes of what are—by most lay accounts—simply playthings. Nowhere is this more obvious than with the different etymological strands for games that are designed to cultivate attitudes, knowledge, competencies, and skills. The competing terms impact games, games for change, educational games, and (perhaps most of all) serious games show that industry and academia are attempting to legitimize the medium, or at the very least set games with these intentions apart from entertainment experiences. Considering there is as of yet no consensus on which term fits best (Breuer & Bente, 2010), true legitimization is likely still some way off. The current article notes the progress that has been made in this regard, identifies the most important gap in serious game research, and proposes a set of methods to start filling this gap.

One of the ways in which researchers contribute to legitimization of serious games is by *validating* them. Validation research typically involves testing a game's effects on players against various types of control group. The qualifier 'typically' is used here because there is no standard format for validating all existing forms of

serious gaming. This is understandable given the limitless range of attitudinal, cognitive, and behavioral effects these games are designed to exert and the equally unexplored arsenal of mechanisms serious games can be fitted with to exert these effects. There will never be a unified measurement method to explain and compare influences, nor is there a single research setting perfectly suited to exploring all mechanisms. In 2015, John Sherry lamented the lack of standardized pedagogical validation methods for educational games (here seen as a cognitively-focused subset of serious games), pointing out that results are determined per intervention and that researchers should temper their enthusiasm and demonstrate more 'vision' (Sherry, 2015, p. 129). He decried the absence of a 'Sesame Street' of educational games, referring to this seminal children's program's adherence to evidence-based pedagogical design methods. Apart from the notion that serious games had not yet reached the critical mass necessary for their diffusion when these statements were made (Uskov & Sekar, 2015), the fragmentation that was mentioned previously might be the biggest obstacle: Progress made in validating serious games to combat cyberbullying behaviors and bystander effects (DeSmet et al., 2018) does not necessarily aid those looking to design games to educate individuals with autism (Whyte, Smyth, & Scherf, 2015). In comparison to the range afforded by serious games as a medium, Sesame Street's remit is much more contained.

It is clear—for many reasons—that we are not yet there, five years on from Sherry's (2015) indictment of educational games research. Medium-wide evidence-based design strategies might not be feasible (or even desirable). However, the progress that has been made should not be denied. There is growing support for the notion that games affect their players in intended ways when tested in controlled settings. A review of this literature is beyond the scope of the current article, but positive and small outcomes have been established among games for learning (All, Núñez Castellar, & Van Looy, 2016; Clark, Tanner-Smith, & Killingsworth, 2016), skill development (e.g., Dankbaar et al., 2016; IJgosse, van Goor, & Luursema, 2018; Wouters, van der Spek, & van Oostendorp, 2009), and persuasion (Jacobs, 2018). With some exceptions (Soekarjo & van Oostendorp, 2015; van 't Riet, Meeuwes, van der Voorden, & Jansz, 2018), serious games show robust influences on those that have played them when compared to various control conditions (Boyle et al., 2016). Despite these promising results, serious games remain a niche communication tool. Something is missing before the medium can be accepted. The current article argues that this gap is less related to how games affect whoever plays them and more to who plays these games in what contexts, and why they do so.

2. Effects versus Impact

Speaking from anecdotal experience, serious game researchers presenting effects studies to a lay or professional audience are often posed a number of questions that evince that the public is better aware of this gap than researchers are. Questions run the gamut from 'Who plays these games (outside of the laboratory)?' and 'I do not know of any serious games myself, right?,' to the more charged 'Why is no one playing these games?' and the understandable 'Why would anyone play a game that openly tries to change them in some way?' These questions do not doubt whether the games work as intended on a captive audience; they center on the decision to play serious games at all. The distinction here is between audiences that are directed to the game specifically to participate in a study and a game's 'natural players,' which are the people that encounter or seek out serious games as part of their daily life either by personal choice (Jacobs, 2017) or through participation in educational or organizational curricula (Bourgonjon et al., 2013). In this way, the public interest in serious game research lies less with effects—a term for the direct influences a game exerts on any players—and more with effectiveness or impact, which denote influences a game exerts in the real world (de la Hera Conde-Pumpido, 2019). The gold standard of randomized controlled trials (RCTs; Boyle et al., 2016) cannot feasibly achieve information on serious game impact, as it relies inherently on abstracted (i.e., controlled) research settings. Respondents in such studies cannot choose to play or not play, as this would introduce confounds into the protocol. Any influences found in this way have high internal validity, though it says little about how the game would fare when released to the public. Evidently, other types of investigation are required in conjunction with RCTs to validate impact.

Returning to a previous point, serious games have something to prove that Sesame Street does not: The penetration of Sesame Street was apparent to most parents with access to a television set in countries across the world for decades, facilitating the program's pedagogical legitimization through research. Serious games, on the other hand, are invariably not nearly as popular, do not spring from a single, reputable source, and in some cases attempt to hide their intended effect behind a veneer of trivial fun (Spagnolli, Chittaro, & Gamberini, 2016). These factors of popularity (or virality), source and context, and communicated intent potentially affect their visibility as well as their player base. In truth, the vast majority of people nowadays have played serious games, from math games during school hours to typing games to improve keyboard proficiency and advergames on the interminable Flash portals of yesteryear. The cross-media public service announcement campaign 'Dumb Ways to Die' has caused hundreds of millions of players to try to prevent its cutesy characters from perishing in avoidable accidents, presumably picking up on the games' messaging on railway safety while chasing high scores.

With a few exceptions (e.g., Bourgonjon, Valcke, Soetaert, & Schellens, 2010), we know very little about why people played these games, the experiences they

had that caused them to stop or continue playing, or what drives them to remember their time with a game and maybe even share the game with friends (Cohen, 2014). Knowing more about this side of player experience is vital to help determine which elements of games are important attractors. In turn, this information could be used to improve game design strategies to make them more impactful. The following section discusses several theoretical approaches to player choice and experience, with Section 4 recommending methods that could provide empirical knowledge on these topics.

3. Theoretical Perspectives on Serious Game Player Agency and Motivation

This section discusses player choice in serious games from three different theoretical perspectives. The first approaches serious games as a form of communication that is also brought to players through persuasive communication. Second, serious games are mediapsychological experiences that are sought out to gratify certain needs. Finally, serious games can be seen as innovative technologies that diffuse through society in recognizable patterns. Each perspective yields separate but overlapping considerations that can inform future research.

3.1. Serious Games as Promotional Communication

By now, the notion that games are a form of communication is not seen as controversial, though few treat them as such. All games can (and many do) carry messages from developer to player. The reliability with which players will pick up on these messages as they were intended is a matter of some debate (Sicart, 2011), as some theorists argue that player agency and intention could skew interpretations of the already very player-driven experience of playing a (serious) game. While differential decoding seems intuitively plausible, the studies discussed so far demonstrate this could only result in unsystematic error in persuasive effects. Unfortunately, few studies have applied theories of communication to this rich setting, meaning monodisciplinary effect studies tend to treat games as black boxes (e.g., D. Ruggiero, 2015). Studies that do not, such as Peng, Lee, and Heeter's (2010) foray into disentangling the influences of interactivity and audiovisual content of Darfur is Dying, do not draw from communication theories to support their manipulations.

Although theoretical bridges are being built from social sciences (e.g., Malliet & Martens, 2010) and from design sciences and humanities (e.g., Christiansen, 2014), the two have not yet met in the middle with conclusively validated psychological mechanisms of serious games. Theoretical arguments made on the side of players so far involve cognitive load (of playing *and* attending to a message), enjoyment (discussed in Section 3.2), and mental models (to build an understanding of game systems and how they translate to the real world). These arguments all fit well with dual-system theories of persuasion such as the heuristic-systematic model (HSM; Chen & Chaiken, 1999) or the elaboration likelihood model (ELM; Petty & Wegener, 1999). Put simply, lasting persuasive impact can be attained by enabling and encouraging personal reflection on strong arguments. On the other hand, short-term, shallower persuasive influences can be established even from weak arguments, as long as they are delivered in a credible way and discourage reflection. The connotations this holds for serious games have yet to be explored fully, though Vyvey, Núñez Castellar, and Van Looy (2018) show many questions still have to be answered.

Completely unexplored, however, are the implications dual-system theories of processing (or indeed any other communication theories) have for attracting players. Important factors of the ELM are individual characteristics such as personal relevance (Malliet & Martens, 2010) and enduring traits like the need for cognition (Cacioppo & Petty, 1982), which both influence the kind of audience a game can attract. Personal relevance predicts that a game will be played with full attention mostly by the part of its audience that sees the subject of the game as personally relevant to them, while differences in need for cognition would mean that games that seem to be cognitively demanding might deter even more segments of the target audience.

Then there is also the way in which the game itself is communicated and promoted. The distinction between games that are played voluntarily and those that are not is made in Section 3.3, but assuming a game is freely available, the choice to play is very likely contingent on how the game is presented to potential players. Should a serious game advertise itself as such and wear its intended influence on its sleeve, or should it obfuscate its intentions with, as in the example of Figure 1, cutesy visuals and enjoyment-focused attract messages? In a study by Vagg et al. (2018), patients with cystic fibrosis using an MHealth application "commented that they liked that the app icon and game style as it does not appear to be for their [cystic fibrosis] and as such each participant felt comfortable playing in front of friends or in public" (p. 104). This suggests that answers to the question above might be specific to certain audiences, topics, and play settings.

How to advertise serious games is as much an ethical issue as it is an empirical question about their success and impact. When extrapolated, the persuasion knowledge model (Friestad & Wright, 1994) would predict that potential players would be less likely to play a serious game that is clear about its intent as they would want to shield themselves from potential influences. On the other hand, they could also appreciate the candor of this presentation if personal relevance for the message is high and the game's position on the topic is in line with their own. In a rare study on the importance of source motivation on enjoyment of an advergame (a serious game made for marketing purposes), Ham, Yoon, and

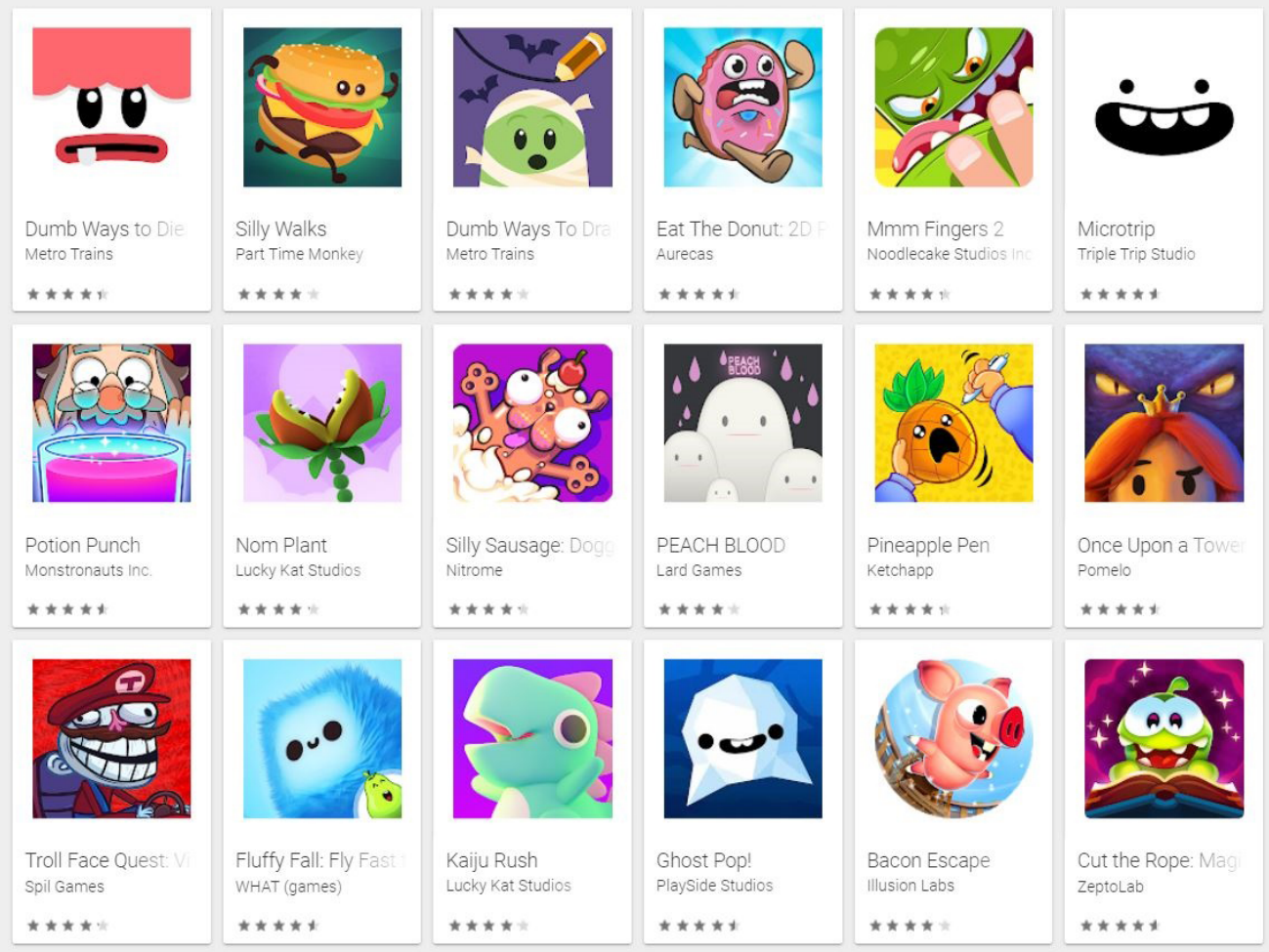

Figure 1. A screenshot of the Google Play Store: Should uninitiated users be able to tell serious games apart from entertainment games? Source: Google Play Store (n.d.), screenshot by author.

Nelson (2016) showed that playing a food advergame from an impartial source (versus a commercial source) resulted in improved attitudes towards food brands, but not in more enjoyment of the game itself. In other effect studies, message obtrusiveness and persuasion knowledge have been found to relate to serious game influences and experiences in various ways (Jacobs, 2017) that require further research to delineate, which means care must be taken to do this variable justice in investigations into the choice to play serious games.

3.2. Serious Games as Media Experiences

Even when setting aside persuasion knowledge, serious games tend to result in very different gameplay experiences from their commercial-off-the-shelf (COTS) entertainment counterparts. Current mediapsychological theories of play motivations and experiences do not necessarily translate from COTS games to serious games. One area that extant research shows to be very salient in this regard is the importance of enjoyment, and more specifically the granularity with which this concept is operationalized. While broader mediapsychological research has long since acknowledged that 'fun' is wholly inadequate as a construct for capturing positively rewarding experiences with media (Oliver & Bartsch, 2011), this kind of thinking has only recently begun to be applied to COTS games (Daneels, Vandebosch, & Walrave, 2020), and serious game research has not yet caught up (Crutzen, van 't Riet, & Short, 2015).

By virtue of discussing a 'serious' topic, serious games are more likely to elicit eudaimonic appreciation—meta-emotional sensations that often result in feelings of personal growth—than the more fun-focused hedonic enjoyment. To be sure, any game can offer both types of gratification, but they also do not necessarily need to trade on fun to keep players engaged, contrary to the truism among serious game researchers (e.g., Spagnolli et al., 2016). Whether or not this same flexibility of gratifications offered extends to pre-play attitudes towards serious games and, most importantly, the choice to start playing one, has not yet been investigated. Do potential players seek out freely available serious games to scratch a eudaimonic itch, as they for example look to learn more about the warning signs of dating violence (Crecente, 2014), or do they need to be lured in with

promises of the same kind of playful fun they expect from most COTS games? The latter outcome would lend credence to the oft-maligned cartooning of serious games as akin to 'chocolate-covered broccoli' (for example, see Hopkins & Roberts, 2015), with the nutritious center representing the positive influence of a game that is separate from and incongruent with the external coating of trivial, light-hearted entertainment. At the same time, this would contradict stories of the relative success and popularity of titles that seem to eschew fun, like Darfur is Dying (Cohen, 2014) and the teen dating violence games referred to previously. A longer discussion of the entanglement of fun with the objectives of serious play is necessary, since even the broader concept of play itself is often linked to learning and training (e.g., Samuelsson & Carlsson, 2008). For reasons of brevity, let us conclude that 'play' should not be seen by serious game researchers as a vehicle for fun alone.

Of course, hedonic and eudaimonic gratifications are just two of a number of possible reasons players might expose themselves to this kind of experience. Direct applications of the uses and gratifications approach to media choice (Katz, Blumler, & Gurevitch, 1973; T. E. Ruggiero, 2000) among serious games are lacking. In their early literature review, Connolly, Boyle, MacArthur, Hainey, and Boyle (2012) already noted this gap and pointed to its application to COTS games instead. Unfortunately, the list of reasons generated by Lucas and Sherry (2004), comprising competition, challenge, social interaction, diversion, fantasy, and arousal, does not translate intuitively to serious gaming. The three high-level needs of autonomy, relatedness, and competence posited as part of self-determination theory (Ryan, Rigby, & Przybylski, 2006) might fare better when operationalized in a fitting way. Still, Connolly et al. (2012) report conflicting results on motivations to play math and history games that highlight the knowledge gap on which factors from entertainment games can be taken into account when considering serious game uses and gratifications.

Coming in from the opposite end of the entertainment spectrum, a study on health applications concluded that whether or not existing users intended to continue using apps depended on how they perceived the apps' ability to register their data, enable sharing and discussion of these data with peers, present information credibly and comprehensibly, and even whether or not the app was seen as fashionable (Lee & Cho, 2017). At the same time, informational accuracy and entertainment value were unrelated to intention to continue use. If serious games are seen as falling somewhere between recreational and utilitarian, perceived gratifications should be drawn from both fields of research. Research into this topic should of course enable and encourage responses beyond these two poorly fitting paradigms and be open to altogether new constructions of serious game uses.

One last consideration comes forward when serious games are seen as media products. Although it has been a matter of some contention whether popular entertainment media reception is influenced by or simply predicted by their coverage in critical outlets (Eliashberg & Shugan, 1997), recent investigations found that—at least for games—critics indeed influence sales of COTS games (Sherrick & Schmierbach, 2016). Unfortunately, while industry-facing outlets such as *Edge Magazine* occasionally cover some serious games, public coverage of these games is dwarfed by that of their COTS counterparts. Comparing a serious game such as Attentat 1942 (Mago, 2019) with the predominantly COTS-oriented This War of Mine (also discussed by de Smale, Kors, & Sandovar, 2019) on Metacritic shows that the latter was discussed by around five times as many professional critics (63 versus 13, at the time of writing) and over a hundred times as many consumer reviewers (895 versus 8) than the former, even though both are sold on the popular PC gaming platform Steam. Serious games are not being measured by the same media product standards as entertainment games. Unfortunately, serious game criticism is equally underrepresented in the literature, so there is as yet no empirical data to support this contention.

3.3. Serious Games as Innovative Technologies

To provide more depth to the utilitarian side, we can see serious games as technological innovations that aim to diffuse through society and saturate the target audience. From this viewpoint, innovation diffusion theory (Rogers, 2003), and the second iteration of the unified theory of acceptance and use of technology (Venkatesh, Thong, & Xu, 2012) become salient. These theories emphasize the decision to adopt, use (or play) an innovation, conceptualizing it as an agentic choice that is either made once or that is revisited a few times. This realization splits the audiences of serious games into two. On the one hand there are the types of games that have been discussed the most up until this point; games that are developed to be placed online (or distributed in other ways) and are most often playable free of charge once the player seeks them out or gets them pointed out by peers. These serious games are often persuasive games with pro-social (Jacobs, Jansz, & de la Hera Conde-Pumpido, 2017) or advertising purposes. I refer to players of these games as 'natural players' as a short-hand for describing an uncoerced, organic *adoption* process. Serious games aiming for natural players most often have to promote themselves or be part of a cross-media campaign to stand a chance of 'going viral' (Cohen, 2014). Natural players are free to allocate more or less time to a serious game, or choose playing a serious game over other activities. This decision process is much like the adoption process of innovative technologies.

Contrast games for natural players with the rest of serious games, and the decision point and agency change. Educational and skill-training games such as Underground (Goris, Jalink, & ten Cate Hoedemaker, 2014) are not available to individual players at little to

no cost. They are embedded in (formal) educational programs or skill training courses. While most of these settings do not involve coercing play and often present the opportunity to opt out, the players themselves do not choose the game separately from the program, and their progress in this program can sometimes be contingent on their participation. Just like with RCT effect studies, this player group is referred to as a 'captive audience.' While serious games are presumably made for captive audiences, they are not marketed to them. Instead, they aim at the institutions or organizations that would make these games available in their programs. In the interest of the current article's focus, this discussion is limited to player choices and experiences even if the decision to use a game does not lie with the players but with their educators (Bourgonjon et al., 2013), caretakers (Bourgonjon, Valcke, Soetaert, De Wever, & Schellens, 2011), or even their managers (Riedel, Feng, & Azadegan, 2013). Readers should note that the distinction between natural and captive players depends not on any qualities of the game itself, but on how it is distributed, used, and/or applied.

I separate games for natural and captive audiences because different facets of acceptance and adoption are likely to contribute to the success of either type. As an adoption theory, innovation diffusion theory (IDT; Rogers, 2003) can aid in mapping the spread of a game among natural players. The individual's path to becoming a serious game player involves knowledge, persuasion, and decision stages. In the knowledge stage, would-be players first have to learn about the existence of a game and its topic. Serious game visibility is often quite low, as they jostle for attention with COTS games that often have much larger marketing budgets. Assuming that a potential player has learned about a game's existence, IDT proposes that they then need to be persuaded about the value of playing it. A game has relative advantage when it is perceived to better fulfill players' goals than competing works or activities. It should also appear compatible with the player's lifestyle. While this sounds vague, perceptions of what a game is can influence motivations to play and push away potentially valid sections of the target audience. This is related to complexity, as a game also needs to appear easy to start playing. This would suggest quick-fire, simply animated games such as Dumb Ways to Die draw in more players than complex 3D experiences with tutorials explaining its many systems like Fate of the World. Trialability is likely not an important factor for freely available games. Finally, games need to be observable, for instance by encouraging sharing on social media, or pushing players to discuss the game and topic with others. It is intuitively likely that these factors influence how many natural players flock to a serious game, but there does not seem to be any empirical work supporting this claim.

Returning to the ways serious games are labeled, promoted, and presented, the adoption perspective highlights a common-sense problem: Why would potential players choose a game that is labeled as 'serious' over normal games? Given the variety of monikers and wildly varying player counts across serious games, the current serious gaming landscape seems ready for investigations into the factors that cause natural players to accept or reject serious games. The difficulty in this investigation would be epistemological: How do we know a game to be serious (enough), and what kind of experiences are included here? Attentat 1942 and its earnest and melancholic handling of historic subject matter and references to in-classroom use easily make it a serious game—arguably more so than the more popular, fictionalized This War of Mine. It is unknown to what degree the difference in popularity and renown comes down to This War of Mine's abstraction of the setting.

Looking at captive audiences, an exploratory investigation demonstrated that the decision to use serious games tends to come from supervisors and managers (Riedel et al., 2013). The loss of player agency is reflected in the success or failure of the game's implementation, as it depends on corporate culture rather than individual attitudes. As indicated previously, the current article is limited to players' experiences for the sake of focus. The second unified theory of acceptance and use of technology (UTAUT2; Venkatesh et al., 2012) is better suited to exploring the *acceptance* (rather than adoption) of serious games by the captive players themselves. This model includes seven factors that would influence play behavior intention directly: performance and effort expectancy, social influences, facilitating conditions, hedonic motivations, price value, and habit. Although voluntariness was not included in this iteration of the model, it is applicable to serious games for captive audience, who have some degrees of freedom in deciding to play or not. For the player, effort expectancy, social influences, and hedonic motivation seem the most important factors. Players need to feel they are able to play without expending too much effort, see playing the game as a social activity that might fuel a discussion (wherever possible and applicable), and feel like the game gives them a positive experience—though, again, that should be operationalized more deeply than mere fun or hedonic enjoyment. Performance expectancy, facilitating conditions, and price value could be important factors for those responsible for embedding the game into educational practice. Finally, experience with games and demographic characteristics moderate the influences of these factors on actual play behavior, even though generational shifts serve to make basic gaming capital more and more common across societal strata (Kneer, Jacobs, & Ferguson, 2018).

4. Methodological Considerations for Comprehensive Impact Validation

The previous section is intended to generate more questions than can be discussed here. Many of these questions are organizational or sociological in nature, probing

the corporate and institutional cultures that can help or hinder managers in choosing for skill training methods (Riedel et al., 2013), for instance. More economical questions surround the financial feasibility of serious games as a function of their scalable nature and (highly topical) affordances for implementing in work-from-home settings. While these questions are highly important for the broader issues of legitimization and validation, the current article prioritizes individual agency. Within that scope, combining insights from the three theoretical angles discussed until now yields a number of important issues that need to be explored to approach an individualistic view on impact validation of serious games. A host of intra-individual perceptions and attitudes of would-be players flow from the previous discussion:

- Perceived differences between serious games and COTS games.
- A-priori perceptions of the experience of playing serious games (including persuasion knowledge, enjoyment, and appreciation).
- What serious games are being compared to (COTS games, traditional instructional methods, other persuasive media).
- Descriptive and injunctive norms around playing serious games in multiple audience segments.
- The salience of self-efficacy (the perceived ability to play serious games).
- Cognitions about time and effort investment required to play serious games.
- Differences between novelty attractors and persistent engagement.
- The importance of perceptions of voluntariness and free choice.

Note that this representation of the issues that still require attention in serious gaming is limited to intra-individual factors. I focus on these issues with the aim of providing handholds for further research towards legitimization and validation of the medium. Of course, they do afford investigations from different perspectives and taking place in diverse contexts. For example, when studying natural players, the focus should lie with attractors that enhance the adoption of serious games and potential barriers such as self-efficacy and displacement of other activities. Word of mouth should also be central here. Among captive audiences, distinguishing formal education and (adult) skills training might be fruitful. In the former, the focus should be on accepting games as part of the curriculum (Bourgonjon et al., 2010), the voluntariness of play, and expectations of what serious play entails. The latter setting affords investigations into acceptance of the use of games for these purposes, more nuanced distinctions in voluntariness, and the importance of social factors.

Rather than suggest a single gold standard research paradigm such as the RCT for in-lab validation, I advise the concurrent application of quantitative and qualitative methods. Starting with quantitative research, there is a need for (longitudinal) surveys of target groups, potential players, and actual players with data collection waves that are tied to a high-profile serious game launch. These surveys can track how multiple sets of attitudes and beliefs change over time and predict key outcomes such as finishing a game, persistent play, or behavior change. To prevent loss of power because of low visibility of the game and weak penetration, surveys could manipulate or control for the knowledge stage in IDT by informing the sample of the game's launch.

At the same time, only qualitative investigations could hope to show blind spots in current thinking about experiences with serious games. What is needed is a firmer understanding of the personal and social construction of the identity of serious games and the acceptability of games that are known (or not known?) to teach and persuade. Asking a captive audience to keep play diaries would demonstrate the path from initial appraisal through continued use and how observable the game is to the player's social environment. Potential players could be interviewed when a target audience is very specific, such as with Snow World, a pain-suppressing experience for burn victims (as discussed by de la Hera Conde-Pumpido, 2017). These interviews should probe expectations prior to play, and possibly be revisited after play. Taking a cue from human-centered design processes, use-based observational methods can help pinpoint what potential natural players look at before and during play. Lastly, captive audiences in (formal) education settings afford observation and focus group studies to learn more about how games are currently embedded in curricula and how class-based debriefing discussions (Crookall, 2014) contribute to perceptions of social norms and constructions of the worth of serious games.

In practice, researchers interested in investigating the real-world impact of serious games need to be opportunistic. Truly interdisciplinary research endeavors are rare and misaligned production cycles can easily cause these efforts to yield suboptimal outcomes. Researchers should prepare collaborations with multiple industry partners before production has begun. They need to be able to design a study around a game that is soon to launch, and roll out this study while collaborating with industry partners. One important source of data that is currently all too often out of reach of player-focused researchers are logged play data. As demonstrated by Smith, Hickmott, Southgate, Bille, and Stephens (2016), logging play behaviors can provide an additional layer of objective information, showing how long players spend on parts of the game, or the order in which they progress through it. Though these data might typically be seen as control variables in quantitative studies, they can also serve as outcome measures when investigating player persistence. More importantly, they can also provide input for qualitative research, helping players to discuss issues they had with a game (i.e., a memory aid) or to support subjective play diaries with more precise behavioral

data. Situations in which collaborations with industry are intensified could allow for aggregated data logging—meaning play data from regular players are anonymously and unobtrusively collected. Despite the enormous promise of this data type in charting games' impacts, studies using these data to discuss player behavior in games are scarce in COTS games (Holl, 2019) and all but absent in serious game research.

Only by working with real-life cases can serious game research attain the external validity that is lacking from studies that involve proprietary games (which are often simply prototypes not meant for natural players). To give an example, the previously mentioned Attentat 1942 was developed quite recently by a team of academics and game developers in the Czech Republic (Mago, 2019). As this game was launched on Steam it sought natural players, though its website (http://attentat1942.com) also invites visitors to use the game in an educational setting. If social scientists had been attached to this game's development, they might have tracked the game's spread on Steam and social media. Surveys could have been timed to capture audience reactions at release, measuring word-of-mouth and expectations on the game. A post-hoc analysis of the reviews currently listed for this game could help shed light on the game's reception and the way in which the game's serious intent landed with professional critics and consumer reviewers. Play diaries would help demonstrate how the game's historical elements (Mago, 2019) were experienced by players. Summarizing, the methods discussed above could have, when applied, yielded a lot of information on how Attentat 1942 reached and touched players. Naturally, this also means that organizations developing serious games should also look to collaborate with researchers to drive validation efforts forward. Since legitimacy of the medium can help developers and creatives attract funding for their games, such a development would be in every party's interest.

5. Conclusion

In the current article, I attempted to show how efforts to validate serious game have hit a snag. Although there is still plenty of ground to cover before effects studies on captive audiences no longer provide new information, the focus on research participants playing games because they were asked to means that we know next to nothing about how a game will be experienced by people in the real world. By discussing serious games alternatively as promotional communication, media experiences, and innovative technologies, multiple uncharted factors became apparent. As these are almost all centered around perceptions of would-be players prior to and during their time with a serious game, several methods are proposed that (when executed) can shed the necessary light on this issue.

By design, this article generates more questions than it could hope to answer. Two of the most pertinent questions for researchers are: To what degree should or can we borrow from knowledge of entertainment games and purely utilitarian applications to explain how people experience serious games? Do we need to work towards one unified theory of serious game acceptance and adoption, or should there be distinct explanations for different types of game (advergames, skill improvement games, etc.), separate contexts and player groups, or even for the play decision point as opposed to serious gameplay persistence? Finding answers for these questions involves comprehensive investigations into the 'player's journey,' most likely starting with the stages leading to adoption and ending with persistence and any resulting knowledge, behavior, or attitude change.

On a more practical level, the article also leads to more specific questions to people developing or commissioning the development of serious games: Do you take your players' time and interests seriously? Who are you competing with, entertainment games or other forms of instruction? What are you doing to draw in players besides offering 'fun'? What are you doing to encourage word of mouth once players are done with your game? As indicated before, none of these questions can be answered with just one (type of) investigation. We need collaborative efforts—including game developers and researchers—that reflexively adapt to specific circumstances but that can still generate insights beyond an individual case. The shift from studying effects to effectiveness requires impartial, interdisciplinary investigations. The range of methods discussed here comprise the next steps towards the goal of validating serious games.

Acknowledgments

The arguments in this article are partially the result of discussions that were held during the GAMECO2019 Symposium that was hosted in November of 2019 by the Erasmus Research Centre for Media, Communication and Culture in Rotterdam, the Netherlands. The attendees and organizers of this event, along with the anonymous reviewers of this special issue, were very helpful in refining this article.

Conflict of Interests

The author declares no conflict of interests.

References

All, A., Núñez Castellar, E. P., & Van Looy, J. (2016). Assessing the effectiveness of digital game-based learning: Best practices. *Computers & Education*, *92/93*, 90–103. https://doi.org/10.1016/j.compedu.2015.10.007

Bourgonjon, J., De Grove, F., De Smet, C., Van Looy, J., Soetaert, R., & Valcke, M. (2013). Acceptance of game-based learning by secondary school teachers.

Computers & Education, *67*, 21–35. https://doi.org/10.1016/j.compedu.2013.02.010

Bourgonjon, J., Valcke, M., Soetaert, R., De Wever, B., & Schellens, T. (2011). Parental acceptance of digital game-based learning. *Computers & Education*, *57*(1), 1434–1444. https://doi.org/10.1016/j.compedu.2010.12.012

Bourgonjon, J., Valcke, M., Soetaert, R., & Schellens, T. (2010). Students' perceptions about the use of video games in the classroom. *Computers & Education*, *54*(4), 1145–1156. https://doi.org/10.1016/j.compedu.2009.10.022

Boyle, E. A., Hainey, T., Connolly, T. M., Gray, G., Earp, J., Ott, M., . . . Pereira, J. (2016). An update to the systematic literature review of empirical evidence of the impacts and outcomes of computer games and serious games. *Computers & Education*, *94*, 178–192. https://doi.org/10.1016/j.compedu.2015.11.003

Breuer, J., & Bente, G. (2010). Why so serious? On the relation of serious games and learning. *Journal for Computer Game Culture*, *4*(1), 7–24. Retrieved from https://hal.archives-ouvertes.fr/hal-00692052

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, *42*(1), 116–131.

Chen, S., & Chaiken, S. (1999). The heuristic-systematic model in its broader context. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 73–96). New York, NY: Guilford Press.

Christiansen, P. (2014). Presence and heuristic cues: Cognitive approaches to persuasion in games. In R. Altizer, J. Zagal, A. Waern, & S. Björk (Eds.), *DiGRA '14: Proceedings of the 2014 DiGRA International Conference*. Tampere: Digital Games Research Association.

Clark, D. B., Tanner-Smith, E. E., & Killingsworth, S. S. (2016). Digital games, design, and learning. *Review of Educational Research*, *86*(1), 79–122. https://doi.org/10.3102/0034654315582065

Cohen, E. L. (2014). What makes good games go viral? The role of technology use, efficacy, emotion and enjoyment in players' decision to share a prosocial digital game. *Computers in Human Behavior*, *33*, 321–329. https://doi.org/10.1016/j.chb.2013.07.013

Connolly, T. M., Boyle, E., MacArthur, E., Hainey, T., & Boyle, J. M. (2012). A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education*, *59*(2), 661–686. https://doi.org/10.1016/j.compedu.2012.03.004

Crecente, D. (2014). Gaming against violence: A grassroots approach to teen dating violence. *Games for Health Journal*, *3*(4), 198–201. https://doi.org/10.1089/g4h.2014.0010

Crookall, D. (2014). Engaging (in) gameplay and (in) debriefing. *Simulation & Gaming*, *45*(4/5), 416–427. https://doi.org/10.1177/1046878114559879

Crutzen, R., van 't Riet, J., & Short, C. E. (2015). Enjoyment: A conceptual exploration and overview of experimental evidence in the context of games for health. *Games for Health Journal*, *5*(1), 15–20. https://doi.org/10.1089/g4h.2015.0059

Daneels, R., Vandebosch, H., & Walrave, M. (2020). "Just for fun?": An exploration of digital games' potential for eudaimonic media experiences among Flemish adolescents. *Journal of Children and Media*, *14*(3), 285–301. https://doi.org/10.1080/17482798.2020.1727934

Dankbaar, M. E. W., Alsma, J., Jansen, E. E. H., van Merrienboer, J. J. G., van Saase, J. L. C. M., & Schuit, S. C. E. (2016). An experimental study on the effects of a simulation game on students' clinical cognitive skills and motivation. *Advances in Health Sciences Education*, *21*(3), 505–521. https://doi.org/10.1007/s10459-015-9641-x

de la Hera Conde-Pumpido, T. (2017). Persuasive gaming: Identifying the different types of persuasion through games. *International Journal of Serious Games*, *4*(1), 31–39. https://doi.org/10.17083/ijsg.v4i1.140

de la Hera Conde-Pumpido, T. (2019). Advergames' effectiveness. In T. de la Hera Conde-Pumpido (Ed.), *Digital gaming and the advertising landscape* (pp. 67–76). Amsterdam: Amsterdam University Press. https://doi.org/10.2307/j.ctvnp0j4g.8

de Smale, S., Kors, M. J. L., & Sandovar, A. M. (2019). The case of This War of Mine : A production studies perspective on moral game design. *Games and Culture*, *14*(4), 387–409. https://doi.org/10.1177/1555412017725996

DeSmet, A., Bastiaensens, S., Van Cleemput, K., Poels, K., Vandebosch, H., Deboutte, G., . . . De Bourdeaudhuij, I. (2018). The efficacy of the Friendly Attac serious digital game to promote prosocial bystander behavior in cyberbullying among young adolescents: A cluster-randomized controlled trial. *Computers in Human Behavior*, *78*, 336–347. https://doi.org/10.1016/j.chb.2017.10.011

Eliashberg, J., & Shugan, S. M. (1997). Film critics: Influencers or predictors? *Journal of Marketing*, *61*, 68–78.

Flanagan, M. (2009). *Critical play: Radical game design*. Cambridge, MA: MIT Press.

Friestad, M., & Wright, P. (1994). The persuasion knowledge model: How people cope with persuasion attempts. *Journal of Consumer Research*, *21*(1), 1–31. https://doi.org/10.1086/209380

Google Play Store. (n.d.). *Android apps on Google Play*. Retrieved from https://play.google.com/store/search?q=dumb%20ways%20to%20die

Goris, J., Jalink, M. B., & ten Cate Hoedemaker, H. O. (2014). Training basic laparoscopic skills using a custom-made video game. *Perspectives on Medical Education*, *3*(4), 314–318. https://doi.org/10.1007/s40037-013-0106-8

Ham, C.-D., Yoon, G., & Nelson, M. R. (2016). The interplay of persuasion inference and flow experience in an entertaining food advergame. *Journal of Con-*

sumer Behaviour, *15*(3), 239–250. https://doi.org/10.1002/cb.1564

Holl, E. (2019). *Rise of the machines—Moral decisions in Detroit: Become Human*. Paper presented at 69th Annual International Communication Association Conference, Whashington, DC, USA. Retrieved from http://hdl.handle.net/10993/39629%0A

Hopkins, I., & Roberts, D. (2015). 'Chocolate-covered broccoli'? Games and the teaching of literature. *Changing English*, *22*(2), 222–236. https://doi.org/10.1080/1358684X.2015.1022508

IJgosse, W. M., van Goor, H., & Luursema, J.-M. (2018). Saving robots improves laparoscopic performance: Transfer of skills from a serious game to a virtual reality simulator. *Surgical Endoscopy*, *32*(7), 3192–3199. https://doi.org/10.1007/s00464-018-6036-0

Jacobs, R. S. (2017). *Playing to win over: Validating persuasive games*. Rotterdam: Erasmus Research Center for Media Communication and Culture. Retrieved from http://hdl.handle.net/1765/102769

Jacobs, R. S. (2018). Play to win over: Effects of persuasive games. *Psychology of Popular Media Culture*, *7*(3), 231–240. https://doi.org/10.1037/ppm0000124

Jacobs, R. S., Jansz, J., & de la Hera Conde-Pumpido, T. (2017). The key features of persuasive games: A model and case analysis. In R. Kowert & T. Quandt (Eds.), *New Perspectives on the Social Aspects of Digital Gaming: Multiplayer 2* (pp. 153–171). Oxford: Routledge.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly*, *37*(4), 509–523. Retrieved from http://www.jstor.org/stable/2747854

Kneer, J., Jacobs, R. S., & Ferguson, C. J. (2018). You could have just asked: The perception of motivations to play violent video games. *Studies in Media and Communication*, *6*(2), 1-11. https://doi.org/10.11114/smc.v6i2.3389

Lee, H. E., & Cho, J. (2017). What motivates users to continue using diet and fitness apps? Application of the uses and gratifications approach. *Health Communication*, *32*(12), 1445–1453. https://doi.org/10.1080/10410236.2016.1167998

Lucas, K., & Sherry, J. L. (2004). Sex differences in video game play: A communication-based explanation. *Communication Research*, *31*(5), 499–523. https://doi.org/10.1177/0093650204267930

Mago, Z. (2019). Attentat 1942. *Apparatus: Film, Media, and Digital Cultures in Central and Eastern Europe*, *9*. Retrieved from http://www.apparatusjournal.net/index.php/apparatus/article/view/181/444

Malliet, S., & Martens, H. (2010). Persuasive play: Extending the elaboration likelihood model to a game based learning context. In R. Van Eck (Ed.), *Interdisciplinary models and tools for serious games: Emerging concepts and future directions* (pp. 206–225). Hershey, PA: IGI Global.

McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. London: Penguin.

Oliver, M. B., & Bartsch, A. (2011). Appreciation of entertainment. *Journal of Media Psychology*, *23*(1), 29–33. https://doi.org/10.1027/1864-1105/a000029

Peng, W., Lee, M., & Heeter, C. (2010). The effects of a serious game on role-taking and willingness to help. *Journal of Communication*, *60*(4), 723–742. https://doi.org/10.1111/j.1460-2466.2010.01511.x

Petty, R. E., & Wegener, D. T. (1999). The elaboration likelihood model: Current status and controversies. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 37–72). New York, NY: Guildford Press.

Riedel, J. C. K. H., Feng, Y., & Azadegan, A. (2013). Serious games adoption in organizations: An exploratory analysis. In D. Hernández-Leo, T. Ley, R. Klamma, & A. Harrer (Eds.), *Scaling up learning for sustained impact* (pp. 508–513). Berlin: Springer Berlin Heidelberg.

Rogers. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.

Ruggiero, D. (2015). The effect of playing a persuasive game on attitude and affective learning. *Computers in Human Behavior*, *45*, 213–221. https://doi.org/10.1016/j.chb.2014.11.062

Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass Communication and Society*, *3*(1), 3–37. https://doi.org/10.1207/S15327825MCS0301_02

Ryan, R. M., Rigby, C. S. S., & Przybylski, A. K. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and Emotion*, *30*(4), 347–363. https://doi.org/10.1007/s11031-006-9051-8

Samuelsson, I. P., & Carlsson, M. A. (2008). The playing learning child: Towards a pedagogy of early childhood. *Scandinavian Journal of Educational Research*, *52*(6), 623–641. https://doi.org/10.1080/00313830802497265

Sherrick, B., & Schmierbach, M. (2016). The effects of evaluative reviews on market success in the video game industry. *The Computer Games Journal*, *5*(3/4), 185–194. https://doi.org/10.1007/s40869-016-0027-y

Sherry, J. L. (2015). Debating how to learn from video games. In R. Kowert & T. Quandt (Eds.), *The Video game debate* (pp. 116–130). New York, NY: Routledge.

Sicart, M. (2011). Game studies: Against procedurality. *The International Journal of Computer Game Research*, *11*(3). Retrieved from http://gamestudies.org/1103/articles/sicart_ap

Smith, S. P., Hickmott, D., Southgate, E., Bille, R., & Stephens, L. (2016). Exploring play-learners' analytics in a serious game for literacy improvement. In T. Marsh, M. Ma, M. F. Oliveira, J. Baalsrud

Hauge, & S. Göbel (Eds.), *Serious games: JCSG 2016—Lecture notes in computer science* (pp. 13–24). Cham: Springer.

Soekarjo, M., & van Oostendorp, H. (2015). Measuring effectiveness of persuasive games using an informative control condition. *International Journal of Serious Games*, *2*(2), 37–56. https://doi.org/10.17083/ijsg.v2i2.74

Spagnolli, A., Chittaro, L., & Gamberini, L. (2016). Interactive persuasive systems: A perspective on theory and evaluation. *International Journal of Human-Computer Interaction*, *32*(3), 177–189. https://doi.org/10.1080/10447318.2016.1142798

Uskov, A., & Sekar, B. (2015). Smart gamification and smart serious games. In D. Sharma, M. Favorskaya, L. Jain, & R. Howlett (Eds.), *Fusion of smart, multimedia and computer gaming technologies* (pp. 7–36). https://doi.org/10.1007/978-3-319-14645-4_2

Vagg, T., Tan, Y. Y., Shortt, C., Hickey, C., Plant, B. J., & Tabirca, S. (2018). MHealth and serious game analytics for cystic fibrosis adults. In J. Hollmén, C. McGregor, P. Soda, & B. Kane (Eds.), *2018 IEEE 31st International Symposium on Computer-Based Medical Systems (CBMS)* (pp. 100–105). Los Alamitos, CA: IEEE Computer Society. https://doi.org/10.1109/CBMS.2018.00025

van 't Riet, J., Meeuwes, A. C., van der Voorden, L., & Jansz, J. (2018). Investigating the effects of a persuasive digital game on immersion, identification, and willingness to help. *Basic and Applied Social Psychology*, *40*(4), 180–194. https://doi.org/10.1080/01973533.2018.1459301

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, *36*(1), 157–178. https://doi.org/10.2307/41410412

Vyvey, T., Núñez Castellar, E. P., & Van Looy, J. (2018). Loaded with fun? The impact of enjoyment and cognitive load on brand retention in digital games. *Journal of Interactive Advertising*, *18*(1), 72–82. https://doi.org/10.1080/15252019.2018.1446370

Whyte, E. M., Smyth, J. M., & Scherf, K. S. (2015). Designing serious game interventions for individuals with autism. *Journal of Autism and Developmental Disorders*, *45*(12), 3820–3831. https://doi.org/10.1007/s10803-014-2333-1

Wouters, P., van der Spek, E. D., & van Oostendorp, H. (2009). Current practices in serious game research. In T. Connolly, M. Stansfield, & L. Boyle (Eds.), *Games-based learning advancements for multi-sensory human computer interfaces* (pp. 232–250). Hershey, PA: IGI Global. https://doi.org/10.4018/978-1-60566-360-9.ch014

About the Author

Ruud S. Jacobs researched the validation of persuasive games at the Erasmus University Rotterdam as part of the research project Persuasive Gaming. From Theory-Based Design to Validation and Back. Since defending his dissertation in 2017, he now works as an Assistant Professor of communication and technology at the University of Twente, among others lecturing in media psychology and investigating why people play serious games.

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 39–48
DOI: 10.17645/mac.v9i1.3216

Article

The Role of Spontaneous Digital Play during Young Patients' Cancer Treatment

Teresa de la Hera * and Camila Sarria Sanz

Department of Media and Communication, Erasmus University Rotterdam, 3000 DR Rotterdam, The Netherlands;
E-Mails: delahera@eshcc.eur.nl (T.d.l.H), camila@quanticaeducation.com (C.S.S.)

* Corresponding author

Submitted: 8 May 2020 | Accepted: 17 June 2020 | Published: 6 January 2021

Abstract
In Europe alone, more than 120,000 children and 150,000 adolescents are diagnosed with cancer every year. Thanks to treatment innovations the survival rates of young patients' cancer increase substantially every year, but improved prognoses are in many cases linked to longer treatments. To cope with the social, emotional, and developmental challenges associated with cancer, play and playful activities are widely recognized as fundamental for adolescents and children. This article presents the results of an exploratory study conducted to better understand the role of free digital play for young cancer patients (0–17 years). Methodology: 15 semi-structured qualitative interviews were conducted, divided into two groups. The first group consisted of four experts and the second group consisted of 11 parents of young cancer patients. Conversations with the participants revolved around children's use of digital platforms during cancer treatment, emphasizing their motivations to play digitally, methods and patterns of use, perceived benefits, and impact on children's social interactions, identity development, and personal narrative. The results show that digital play becomes a valuable activity for young cancer patients during three phases of the treatment: (1) inpatient care; (2) outpatient care; and (3) remission. We also identified three types of digital play patients engage with: (1) playing with digital games; (2) playfully interacting with digital technologies; and (3) the overlap between digital and non-digital play. Finally, the results also show that digital play has an impact on at least three aspects of young patients' lives: (1) social interactions; (2) identity development; and (3) communication.

Keywords
digital play; digital games; meaningful play; qualitative interviews; pediatric cancer; serious digital play

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

In Europe alone, more than 120,000 children and 150,000 adolescents are diagnosed with cancer every year (Steliarova-Foucher et al., 2018). Thanks to treatment innovations the survival rates of young cancer patients increase substantially every year, but improved prognoses are often linked to longer treatment, including longer hospitalization periods (Long & Marsland, 2011), and longer periods of isolation both in inpatient and outpatient care. Consequently, long-term cancer treatment is perceived as extremely challenging for young cancer patients and their families (Berríos-Rivera, Rivero-Vergne, & Romero, 2008).

To cope with the social, emotional, and developmental challenges associated with long-term cancer treatment, play and playful activities are broadly recognized as fundamental for adolescents and children (Nijhof

et al., 2018). However, the situation of limited contact with friends and loved ones, together with the physical limitations and psychological distress associated with the illness and the treatment, have an impact on young patients' 'playness' (Gillis, 1989). Thus, fostering play and playful interactions during long-term cancer treatment is fundamental for young patients.

Efforts in this direction are increasingly being advanced. Many hospital settings are now equipped with playroom areas for young patients and have begun to incorporate play activities as well. Yet, it is important to highlight that the benefits of these efforts are oftentimes missed by children that are immobilized or isolated for physical or medical reasons, and it is these children that are more impacted by the lack of this type of support (Gillis, 1989; Rae, Sullivan, & Askins, 2016). Under these circumstances, digital tools offer valuable alternatives to both alleviate limitations and complement children's participation in playful activities during long-term cancer treatment (Lambert, Coad, Hicks, & Glacken, 2014). Consequently, digital tools' social leisure value in healthcare contexts deserves special attention (Nijhof et al., 2018; Williams, Ben Birk, Petkus, & Clark, 2019).

Although academic interest in the role of digital play for cancer patients is not new, several aspects remain under-researched. First, most previous studies have focused on exploring *structured and guided play* activities designed to convey health-related information (e.g., Beale, Marín-Bowling, Guthrie, & Kato, 2006) or with therapeutic purposes such as pain relief (see Ghazisaeidi, Safdari, Goodini, Mirzaiee, & Farzi, 2017). However, little attention has been paid to the role of *unstructured free digital play* during cancer treatment, and the few studies that have explored it focus on free digital play activities limited only to hospital settings organized and supervised by adults. This project, therefore, is focused on exploring the role of free (unstructured) digital play for young cancer patients during all stages of the treatment, not only during hospitalization. This article provides an answer to the following research question: What is the role of free digital play during young patients' (0–19 years) cancer treatment?

The nature of this study is exploratory as it is the first stage of a bigger research project. Thus, the aim here is to explore and identify directions for future research regarding the meaning and relevance of digital play for young cancer patients in two countries: Spain and the U.S. The relevance of this project is twofold, referring both to the societal impact and scientific possibilities: First, services and resources focused on fostering play are fundamental to support the increasing number of young cancer patients facing the challenges associated with the limitations they experience in their ability to play during all phases of the treatment; second, the increasing penetration of digital technologies and the popularization of digital games have opened new possibilities to foster the positive role of digital play in this context.

2. Theoretical Framework

2.1. The Role of Play during Cancer Treatment

For children, play is a fundamental way to develop their imagination and resourcefulness, and a way to individually test their courage, initiative, and daring (Haiat, Bar-Mor, & Shochat, 2003). Through play, children and adolescents develop and consolidate their identities and their capacity to handle daily social interactions and events (Piage, 1967). The absence of play or an unwillingness to play is in many cases the first symptom that children show when they are not feeling well (Liptzin, as cited in Haiat et al., 2003). At the same time, play can be crucial for children undergoing long-term illnesses insofar as it can help them regain their equilibrium (Rutter, 1981). Among two of the valuable characteristics of play is that it is voluntary and it offers freedom of choice (Haiat et al., 2003) and freedom of expression (Burroughs & Evans, 1986), freeing players from the struggles of their daily circumstances. Equally important is the sense of control that children can experience when making their own decisions during play. Finally, play can also be linked to hope: While playing, anything is possible (Hewes, 2014). For these reasons, play should not be only labelled as an entertaining activity focused on having fun, but a fundamental activity necessary for emotional balance.

Despite the relevance of play for children in general, literature exploring the play behavior of hospitalized children shows that the side effects of the illness and the circumstances of hospitalization have a disruptive effect on their play performance (Tisza, Hurwitz, & Angoff, 1970). For these reasons, interventions focused on fostering play during hospital stays are necessary and should be available (Bolig, 2018). It is possible to distinguish between three types of play interventions in healthcare contexts: (1) therapeutic play, which is play interventions with physical or psychological therapeutic purposes; (2) medical/hospital play, which involves play activities designed to prepare the children for hospital experiences; and (3) free play, which means settings or services provided to give children opportunities to freely play (Bolig, 2018).

While therapeutic play and medical play are structured play sessions guided by an adult, free play is focused on fostering unstructured play sessions in which children have the opportunity to choose what they do. Moreover, the unpredictable nature of spontaneous free play helps children to learn to adapt to the unexpected, gaining skills related to flexibility and resilience to respond to unanticipated circumstances, which are common during cancer treatment. Therefore, through play, children can learn how to navigate difficult circumstances, reducing the anxiousness that this exploration might bring (Hewes, 2014). For these reasons, understanding the relevance and role of free and spontaneous play for young cancer patients is crucial.

2.2. Digital Play during Cancer Treatment

Digital play can be seen as an important alternative to cope with the challenges associated with serious illnesses. The capacity of children undergoing cancer treatment to play might have been limited, or they might be experiencing a diminished or absence of willingness to play due to the side effects of the treatment. Furthermore, many children in cancer treatment are in situations of medical isolation or have their movements limited due to the use of specific instruments or medication. For this reason, when they look for entertainment many young patients choose activities that they can carry out from their room or bed (Lima & Santos, 2015). In this context, it is relevant to better understand the role that technologies have in the way children play and how they use them to socialize in all settings, not only playrooms.

Moreover, it is relevant to consider the fact that children's digital and non-digital practices are not completely disconnected and that there are new ways in which they merge these two domains (Jones, Chik, & Hafner, 2015). It is common, for example, to see young children basing their play activities on media narratives or characters (Sutton-Smith, 2008), thus engaging in mediated meaning-making practices in which what is seen on screens transforms their physical playful interactions with non-digital objects and individuals (Burnett, Merchant, Pahl, & Rowsell, 2014). This means that it should not be assumed that digital play displaces or replaces other practices, but that it could have the potential to foster or enhance spontaneous and unstructured play in the way we see it in the daily routines of children (Huh, 2017). For this reason, it is relevant to explore youngsters' capacity to incorporate digital technologies and digital universes in their playful interactions during cancer treatment.

2.3. Digital Play and Social Interactions

Cancer treatment not only limits young patients' capacity to play, but also their capacity to maintain social connections. Making new friends or investing in existing bonds serves children not only to critically think about their own emotions and feelings but is also an important part of their identity development (Fitzgerald, Fitzgerald, & Aherne, 2012). During long-term treatment, peer relations also gain paramount relevance because emotional support from friends is fundamental to cope with negative experiences (Shochet & Smith, 2014). Despite this, young cancer patients report having difficulties keeping contact with existing social bonds during treatment (Gibson, Richarson, Hey, Horstman, & O'Leary, 2005). Thus, fostering social interactions for young patients is vital to prevent the negative consequences linked to social isolation or loneliness. Concretely, digital games give players chances to establish social connections (Colwell, 2007; Russoniello, O'Brien, & Parks, 2009) and are in some cases useful to alleviate the lack of social ties, becoming a useful resource to socialize and prevent feelings of loneliness (Griffiths & Meredith, 2009).

Despite their potential, digital games have been assigned the label of antisocial (Kowert & Kaye, 2018), opening debates in which teachers, researchers, policymakers and parents have expressed concerns and criticism about the impact of games on children and adolescents (Bryce & Rutter, 2003). However, the old assumption that digital game players have small or deteriorated social networks (Williams, 2006), has proven to be inaccurate, as contemporary digital games offer multiple opportunities for social interaction (de Kort, Poels, & Ijsselsteijn, 2007; Kowert & Kaye, 2018). Previous studies have shown how shared online play supports long-lasting bonds and serves to mediate in intimate conversations, which friends sometimes use to disclose sensitive or personal information or to discuss their worries (Cole & Griffiths, 2007). Therefore, exploring the role of digital play in relation to social interactions for young cancer patients is of special relevance.

3. Methodology

To explore the role of digital play for young cancer patients, this study takes a qualitative approach. It is important to highlight the exploratory nature of this study, which is the first stage of a bigger research project. Thus, the aim here is to explore and identify directions for future research regarding the meaning and relevance of digital play for young cancer patients in two countries, Spain and the U.S. Concretely, 15 semi-structured interviews were conducted during the period March–September 2019. Interviews were carried out via phone calls and lasted 45 minutes on average. Two groups of informants participated in this study. First, four expert interviews were conducted, with one child-life specialist, one volunteer coordinator, and two managers of gaming organizations/foundations that collaborate closely with hospitals' pediatric oncology departments. The data gathered during these interviews was not only considered in the analysis but also used to identify relevant topics to address with the second group of participants, namely 11 Spanish parents of young cancer patients (0–17 years old). Interviews with experts were conducted in English, while interviews with parents were conducted in Spanish. The quotations included in this article from the latter set of interviews were translated from Spanish into English by the authors.

The parents participating in this study have children who were undergoing cancer treatment or had undergone such treatment in recent years. All children were between 0 and 17 years old during the cancer treatment, and the treatment was long term, i.e., at least one year. Therefore, most children had faced critical intervals of social isolation both at the hospital and at home. Parents were contacted through snowball sampling using the social network of Juegaterapia, a Spanish foundation that delivers digital game consoles for children hospi-

talized in diverse hospitals in Spain. While recognizing the limitations of snowball sampling, this method was considered the best way to contact participants for this study given the difficulty in finding parents of young cancer patients who were actively playing digital games during treatment.

Conversations with the parents revolved around children's use of digital platforms during cancer treatment, emphasizing their motivations to play digitally, methods and patterns of use, perceived benefits and drawbacks of digital games during treatment, and impact on children's social interactions, identity development, and personal narrative.

The transcriptions of the interviews were analyzed using thematic analysis. The researchers followed the six-step process proposed by Braun and Clarke (2006). The analysis of the data was conducted through an inductive approach, paying attention to emerging themes. One of the researchers was responsible for the initial coding phase, which was supervised by the second researcher. Sub-themes and main themes were individually identified by both researchers first, which were then discussed and adjusted later by both researchers to lead to the results discussed in this article.

Research in the context of pediatric cancer treatment can trigger uncomfortable or negative feelings for the parents interviewed. Thus, bearing in mind the sensitivity of the topic, this study put an important emphasis on ethical considerations. For this reason, parents were interviewed instead of their children during this exploratory phase of the project, to identify relevant themes to discuss with the children during a later stage of this project, and thereby protecting the most vulnerable group at this stage. Furthermore, all individuals were informed before the interview about the purpose and scope of this research project, as well as the topics to be discussed during the conversation. Informed consent was obtained to participate and record the interviews, which made clear that participants could end the interview at any time and refuse to answer any questions or issues that were uncomfortable for them. Audio recordings (as well as transcripts) of all interviews are stored for the duration of the research at a secure server location of the Erasmus University Rotterdam. In this article, only the initials of the parents interviewed are used, in order to preserve their anonymity.

4. Results

The analysis of the data has resulted in three main themes. We have identified that in order to understand the role of digital play for young cancer patients it is important to pay attention to: (1) phases of the treatment in which digital play is relevant; (2) types of digital play young cancer patients engage with; and (3) the impact of digital play on young cancer patients. These three themes and the sub-themes linked to them are discussed in detail in the following three sub-sections.

4.1. Three Phases of Young Patients' Cancer Treatment in Which Digital Play Is Relevant

During the interviews, all participants agreed on the benefits of digital play for young cancer patients, recognizing its relevance to cope with the difficult experiences lived throughout the entire treatment. Although all parents were asked about the negative aspects of digital play for their children, none of them expressed major concerns in this regard. Instead, they described digital play in the context of cancer treatment as "tremendously valuable," "a great advantage," or as "a fundamental tool to change children's perception of the disease." What is most important is to note that playing digitally was perceived not only crucial during (a) inpatient care at the hospital, but also during (b) outpatient care at home and even during (c) the remission phase. Depending on the phase of the treatment, different roles of digital play were highlighted by the participants.

4.1.1. At Hospital during Inpatient Care

The main role of digital play during inpatient care identified in the interviews was the normalization of the hospital experience. Because children and their families suffer a drastic change in daily life routines, digital play serves as a tool that often connects patients to known or familiar activities that they used to do before the treatment. The normalization of this experience often depends on the possibility that children have to overcome physical limitations caused by both the treatment itself and by isolation periods. Many parents expressed concerns regarding the lack of opportunities that isolated hospitalized children have to use the playing facilities of the hospital or to attend ludic workshops:

> He was almost always isolated, so the game had to be in the room. We had to ask to let us take in a console for him to play. He didn't have many options…he couldn't go out because there is a playroom but of course, it's for when kids are feeling well, so he was playing alone in the room. And logically what helps you the most, in that case, are digital games. (N.)

4.1.2. At Home during Outpatient Care

Outpatient care is another phase of cancer treatment often experienced by young patients. During periods of homestay, children are still bounded to isolation. In many cases visits are limited to family members and there are very few opportunities in which they can go outside. The majority of interviewees recognized how their children had difficulties in engaging in ludic activities, such as playing with toys, painting, doing role-play, or in general other forms of traditional games at home. Thus, digital play has also been perceived by the parents as very relevant to this phase of the treatment.

It is important to mention that parents expressed how they would actively try to engage their children in alternative activities, such as reading a book or playing board games, in an attempt to limit contact with technology during outpatient care. In many cases, the need to limit children's time with technology seemed to emerge from what interviewees expressed as a fear of addiction or dependence. Besides this, parents also recognized being much more flexible with digital play during inpatient care than at home:

> We have to adapt. In the hospital, we are quite flexible. At home we try to not be too dependent on them [digital technologies] because in the end, of course, there are many hours in the hospital, many days and she needs a lot of things to do. At home we set rules, [and] we let her play a maximum number of hours per day. (N.)

4.1.3. During Remission

During remission, children begin to resume daily activities and other routines, while still attending regular check-ups. Consequently, the relevance of digital play during remission is closely related to their possibilities of integrating back into daily life. The majority of interviewees explained how digital games and other digital technologies helped children connect with others once they were back in school. Recovering friendships and re-establishing the social circle fragmented due to the illness were important concerns expressed by parents regarding their children's reintegration. The role of digital games in this regard cannot be taken lightly, especially when considering that playing digitally is a widely extended practice among young children today. In fact, as L. mentioned, digital games were for her daughter, "a way of engaging back when facing school. When my daughter returned after a year of not going to school, all her friends had grown up…and the way she recovered those friendships was by bringing popular games to school" (L.).

Integrating back into daily life can be a challenging process for children who have been absent for months or even years. In the case of Y., a child who spent more than 5 years in the hospital after being diagnosed when he was only a few months old, digital games were his single common-ground topic with other children. His mother explained how, while conversation about amusement parks or the First Communion "sounded like Chinese to Y.," he could use digital technologies to build relationships and bring friends home to play, have fun, and connect.

4.2. Types of Digital Play during Young Patients' Cancer Treatment

Previously we have established the value of digital games for children and their families at different phases of treatment, understanding the multiple relevant roles that these technologies can play in each phase. In this subsection, we turn to discuss in more detail the different genres, platforms, and ways in which children combine digital games with both digital and non-digital tools during cancer treatment.

4.2.1. Playing Digital Games

The genres chosen by children were often—though not always—linked to differences in their age. Concretely, younger children (0–4), who often discovered digital games as a consequence of their hospitalization, have preferences for logic games, didactic games, and simple skill games. This preference was perceived by parents who explained how these games were helpful for their children to develop abilities appropriate for their age, which might have been difficult to acquire during long-term cancer treatment. The case of Y., who was hospitalized at only 6 months old, illustrates this point. After the first two years at the hospital, Y. started using a tablet to develop multiple skills, from completing memory challenges and putting puzzles together, to following recipes in cooking games or familiarizing with daily life concepts.

A similar experience was shared by S., mother of E., a two-year-old girl at the time of the diagnosis, who described her daughter's preferences for games that allowed her to accomplish small goals. Like Y., E. also discovered digital games after hospitalization and expressed great motivation for using digital tools to relate with the outside world, for example, by learning the names of animals through different skill games.

Participants also described sports and races games as preferred by older children. The social character of these games has been crucial for older children to develop a sense of competition. Lastly, platform games were perhaps the most mentioned genre, played across different devices and treatment phases. Because platform games are primarily about overcoming obstacles to advance in the game's levels, many parents described them as a way in which children relate to their illness. For example, the Mario Bros. series was mentioned by the majority of the parents as one of the favorite games played both during inpatient and outpatient care, and that sparked a fighting mindset in their children that helped them cope with difficult situations:

> I think he liked Mario Bros. because it's a character who didn't stop, who had to pass tests and keep going, and I think that's what he had to do at that time too: overcoming. And of course, he liked it a lot; it's a very active game, about jumping and passing tests, and he loved it. (P.)

4.2.2. Playfully Interacting with Other Technologies

During interviews, it also became apparent that parents associated digital play not only with playing digital

games but also playfully interacting with different digital devices. Parents explained how their children engaged in playful attitudes while for example using a camera or cellphones, by for instance taking pictures of multiple funny faces or taking pictures upside down. J., for example, explained how her two-year-old daughter used to playfully engage with her tablet by recording videos of herself. This speaks to children's ability to navigate digital tools intuitively and make them part of their overall playing experience during treatment.

Furthermore, many parents described how their children used YouTube to search and learn how to play a digital game, how to move forward in a game, or simply to watch other children play the same or similar games:

> My son watches videos of how to use certain game tricks to play, or if he is somewhere and does not know how to go out then he uses my cellphone, [searching for] "how do I get out of here?" or "how do I pick up this or that tool?" (C.)

Comparable episodes were narrated by parents who frequently highlighted the ease with which their children would handle a tablet or cellphone to look for videos and content, not only to learn how to play but also to discover new games.

4.2.3. Overlap between Digital and Non-Digital Play

Interacting with different digital technologies is not the only way children enrich their playing experience; according to the interviewees, children have also combined digital and non-digital forms of play on different occasions during treatment. The overlapping of digital and non-digital practices was commonly described by parents, who perceived it as a way of experiencing the outside world through digital technologies after children were socially isolated due to treatment. As S. explained, her daughter E. used the tablet to recover playing experiences that used to take place in the outside world from which she was isolated after being diagnosed:

> Instead of saying "I want to go to the park" or "I want to go to the pool," it was more like "I'm going through this." Whatever she wanted to do at a certain moment, she would do it through the phone or the tablet. (S.)

Other parents describe how their children would engage in role-play following a digital game scenario or imitating a character. As one mother explained, even though sometimes her son does not have access to Fortnite or Pokémon, he often recreates game scenes or embodies the main characters. Parents explain how playing to match the qualities of certain digital game characters has helped young cancer patients feel more secure during critical phases of treatment and medical procedures. This is the case for many children who, guided by their parents, understood difficult experiences as embedded in playing where they were the main character. This is the case for P.'s son who embodied the qualities of his favorite video game character to face a CT scan:

> He was a lot like Mario, so he would say to me "look, I'll do it like Mario, if he overcomes stuff and today is my turn, I'll do it the same as Mario." So, indeed, he strongly identified with the character that in this case was Mario. It was helpful, it gave him motivation. (P.)

This process, in which children combine digital and non-digital games, not only enriches their playing practices, but also significantly impacts their experiences during long-term cancer treatment. In the following section, we discuss such impact in more detail.

4.3. Types of Impacts of Digital Play on Young Cancer Patients

During the interviews, the impact of digital play on young cancer patients was also discussed. As described by many participants, an important consequence of long-term cancer treatment seems to be the "loss of childhood." Digital play can be tremendously valuable in dealing with such a process. In general, three types of impacts were identified and thus discussed hereafter: (a) social interactions; (b) identity development; and (c) communication.

4.3.1. Social Interaction

Due to the illness, many of the children's social relations are weakened. While they leave behind family and friends, they enter an environment where establishing new relations can be challenging, especially when they are isolated. In this regard, most participants recognized that digital games can be crucial for restoring children's social circle in concrete ways: making new friends, and in some cases, keeping contact with loved ones left behind. As explained by the co-founder of Fully Loaded Electronics (a company that provides gaming equipment for hospitals in the U.S.), digital games can act as a starting point that children use to build meaningful relations at the hospital, providing them with a bonding experience that is difficult to develop in their circumstances (personal communication). In fact, many parents described how through play, their children could overcome the shyness and discomfort of meeting new friends, as they saw it as a sort of platform that facilitated friendship.

Digital play can also be extremely important to maintain social connections. Many parents identified the relevance of digital games to keep up with other children's experiences—a crucial aspect in strengthening social connections outside of the hospital as well:

> Digital games and being up to date are evidently important because all his classmates are into it. It's

> great that he's not left behind in that, because it gives him the opportunity to be able to connect with them immediately; to be able to play whatever they want, the latest digital game, because they know it and know how it works because they have been playing it. In that, they are exactly the same. (V.)

It is important to highlight that some parents perceived an advantage of games over other forms of connection through technology, such as video calls or cellphone calls. For example, some parents mentioned that although sometimes their children did not feel like calling family or friends, they did feel more comfortable maintaining these social connections through online play. Some parents even recognized that their children preferred to cut off contact with their school friends, because they felt ashamed of their condition or were afraid of being pointed out by others; under these circumstances, online play was considered an optimal resource.

4.3.2. Identity Development

Free and spontaneous play fulfils an important role in the development of the child's identity during treatment, especially when confronting the sense of childhood loss. Many aspects were identified related to this type of impact: how children develop certain traits such as resilience and autonomy, how they discover likes and preferences through digital games such as sports or vocations, or how they adopt and grow qualities from gaming characters to face difficult situations. All these processes evidently play a role in the development of their identity, which, according to interviewees, manifest in specific situations, even after the treatment is over. As M. J. said, "for my son, the games have been everything, Y. is what he is thanks to the games."

An overarching aspect of the impact that digital play has on children's identity development is the value of digital games in helping them to identify as more than sick children. Playing digitally offers children an opportunity to "broaden who they are, from 'just a kid with an illness' to 'a kid who's playing digital games and who also by the way, you know, has an illness,"' in the words of Fully Loaded Electronics' co-founder (personal communication). This broadening of their identity is also related to the opportunities that children have to preserve and perform their childhood, even when facing a serious illness. For example, one participant explained how there were times when her son seemed to forget about being a kid with an illness and instead turned all his attention to being a kid playing digital games: after receiving chemotherapy, he could be immersed in the playing narrative in such a way that secondary effects of the treatment were even imperceptible for him. In his mother's own words, "in those moments, there is no disease, there is nothing; it is just a kid playing" (V.).

J.'s account also speaks to the agency that children recover as a consequence of broadening their identity during the illness: In free and spontaneous play they decide where to go, what to do, when, with whom, and so forth. Such decisions, limited in the physical world, become possible digitally where they have control over the gaming experience. The relevance of recovering agency has also been recognized by Marty, Digital Gaming Coordinator at Texas Children's Hospital, who explained that during the illness:

> Doctors, nurses, everybody else in the hospital is giving them things they have to do, and kind of telling them things, so just being open to whatever they want to do, giving them the reins and the control of the session…can definitely help them to kind of regain a lot of that control, especially for long-term stays. (Marty)

Additionally, an important consequence of the impact that digital play has on young cancer patients is the way they remember their treatment experience: Broadening their identity and enabling agency seemed to aid the construction of a personal narrative in which cancer treatment can even become a fun and enjoyable process. In fact, many parents accounted for the positive way in which children remember their illness.

4.3.3. Communication

Lastly, digital play was also found to have an impact on the ways in which children communicate with others. In this case, we explored the capacity or willingness of children to communicate about their process and, also, the ability of parents to address both treatment-related issues as well as other topics with their children. Particularly, playing experiences seemed to be perceived by the participants as a resource to overcome various communication barriers faced during treatment. One such barrier is the lack of conversation topics, a clear consequence of long and monotonous days at the hospital or at home. In this regard, Shikha, manager of the Program Impact at the Starlight Children Foundation, accounts for several occasions when shared playing experiences between children and their parents could help overcome this difficulty. According to her, when "you're pulling teeth trying to make a conversation happen," sharing a game can be a common experience to connect on and build bridges of communication between parents and children who are living the disease in two radically different ways. Such differences can result in difficulties to empathize with the children's experience:

> You're running out of conversations, there's a lot of silence. Then you pick up there, you start a conversation because these are conversations that lead you to avoid what is happening and then you use it…is something that I know he is interested in and that takes us out of the silence…simply talk to him about something else, which is much more fun than treatment. (C.)

Another communication challenge experienced by parents is the difficulty of knowing how their children feel during treatment. Playing was perceived by some parents as a way of navigating better sensitive conversations about the illness. For example, P. remembered "initiating deeper conversations through the games" which has helped her to engage her son in a sort of "therapy for him to express his feelings." Similarly, digital games have sometimes been useful for some young cancer patients to express with more ease how they are feeling throughout the treatment, by using examples such as "I feel sad like when Pikachu lost x match" or similar.

Conversely, the games have also allowed parents to communicate better about the consequences or procedures associated with the disease to their children, which is one of the most complicated and important challenges during the process. Concretely, parents acknowledged using digital game examples to encourage their children and explain some of the processes. For instance, seizing the child's ability to identify with the characters, one of the mothers said that at times she has used metaphors:

> We have said 'you're going to take Hulk's medicine, you'll see how strong you're going to be, you're going to heal.' That has always been present. Or in many situations, it's like 'Pikachu has faced I don't know who in a mega-challenge, now you have to do it yourself.' We have used this more than once. (M.)

In this case, M. sees the value of using this kind of metaphor insofar as it is a language that is easy for her son to interpret and to feel comfortable with when talking about complicated procedures or concepts that are difficult for young cancer patients to grasp.

5. Discussion and Conclusions

This exploratory study was designed to better understand the role of digital play for young cancer patients. The results of analyzing the data collected through 15 qualitative interviews show that digital play becomes a valuable activity for young cancer patients beyond (1) inpatient care. Accordingly, our study shows that patients can benefit tremendously from digital play during (2) outpatient care and (3) remission too. Considering that the role of digital games has been overlooked in cancer treatment outside of hospital settings, we propose to advance studies in this direction, not only aiming to better understand the relevance of digital play in all three stages of treatment but also to understand how its presence during one phase has an impact on its role during other phases.

We were also able to identify three types of digital play patients engage with: (1) playing with digital games; (2) playfully interacting with digital technologies; and (3) the overlap between digital and non-digital play activities. The different ways in which young patients engage in spontaneous free digital play suggest the need to broaden our conventional understanding of digital play, which is currently limited to digital games, to include other forms of interaction with technologies. Therefore, we also recommend future research to pay attention to young cancer patients' motivations to play digitally, their preferred methods, patterns of use, perceived benefits and limitations, and impact on children's development, among other things. These are timely and relevant issues, not only considering the rapid penetration of digital play nowadays, but also bearing in mind how this knowledge is indispensable to ensure the efficient implementation of this type of service and technology during all phases of the treatment.

Finally, the results also show that digital play has an impact on at least three aspects of young patients' lives: (1) social interactions; (2) identity development; and (3) communication. These results are in line with previous research in the field of game studies, supporting the idea that online games are nowadays considered exceptional social spaces affording communication and fostering interaction even among socially anxious or introverted individuals (Kowert & Kaye, 2018; Ramirez & Zhang, 2007). For young cancer patients, these affordances could be key to help normalize the overall experience of cancer treatment and isolation as our results suggest. Thus, the relevance of the social interactions triggered by digital games nowadays cannot be taken lightly (de Kort et al., 2007). The results of this study therefore open up clear new avenues for continuing the exploration of this phenomenon, which will be explored in future steps of the research project of which this study is part.

We acknowledge that the number of interviews ($n = 15$) conducted for this study is limited and the results are mainly connected to the patients participating in the programs carried out by the NGO who facilitated the sampling process. This only provides a limited understanding of this phenomenon; however, we would like to highlight the exploratory nature of this study, which is the first stage of a bigger research project. Thus, the aim here was to identify directions for future research regarding the meaning and relevance of digital play for young cancer patients. Thanks to this exploratory study we have understood the relevance of studying this phenomenon in and out of the hospital during three different phases of the treatment, and also the need to understand the connection of the role of digital play during these three phases, which will serve to structure future phases of this project.

A decision was made not to interview children at this exploratory stage of the process, as the sensitivity of the subject first requires a thorough understanding of the topic to better approach children whose lives have been greatly affected by cancer treatment. We acknowledge that this is a limitation of this study, as conducting interviews directly with young cancer patients would result in more meaningful data, but this can be contemplated for the following stages of the research project.

Acknowledgments

We would like to thank all the parents who agreed to participate in this study and shared their valuable time to make it happen. We also would like to thank Juegaterapia for facilitating access to the participants to this study. Finally, we would like to thank the representatives of Starlight Children's Foundation, Fully Loaded Electronics, and Texas Children's Hospital for contributing to this study by providing their professional point of view.

Conflict of Interests

The authors declare no conflict of interests.

References

Beale, I. L., Marín-Bowling, V. M., Guthrie, N., & Kato, P. M. (2006). Young cancer patients' perceptions of a video game used to promote self care. *The International Electronic Journal of Health Education*, *9*, 202–212.

Berríos-Rivera, R., Rivero-Vergne, A., & Romero, I. (2008). The pediatric cancer hospitalization experience: Reality co-constructed. *Journal of Pediatric Oncology Nursing*, *25*(6), 340–356. https://doi.org/10.1177/1043454208323618

Bolig, R. (2018). Play in hospital settings. In T. D. Yawkey & A. D. Pellegrini (Eds.), *Child's play: Developmental and applied* (pp. 323–346). London: Routledge. https://doi.org/10.4324/9781315099071

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bryce, J., & Rutter, J. (2003). The gendering of computer gaming: Experience and space. In S. Fleming & I. Jones (Eds.), *Leisure cultures: Investigations in sport, media and technology* (pp. 3–22). Eastbourne: Leisure Studies Association.

Burnett, C., Merchant, G., Pahl, K., & Rowsell, J. (2014). The (im)materiality of literacy: The significance of subjectivity to new literacies research. *Discourse: Studies in the Cultural Politics of Education*, *35*(1), 90–103. https://doi.org/10.1080/01596306.2012.739469

Burroughs, S., & Evans, R. (1986). *Play, language, and socialisation: Perspectives on adult roles*. New York, NY: Routledge.

Cole, H., & Griffiths, M. D. (2007). Social interactions in massively multiplayer online role-playing gamers. *CyberPsychology & Behavior*, *10*(4), 575–583. https://doi.org/10.1089/cpb.2007.9988

Colwell, J. (2007). Needs met through computer game play among adolescents. *Personality and Individual Differences*, *43*(8), 2072–2082. https://doi.org/10.1016/J.PAID.2007.06.021

de Kort, Y. A. W., Poels, K., & Ijsselsteijn, W. A. (2007). Digital games as social presence technology : Development of the social presence in gaming questionnaire (SPGQ). In L. Moreno (Ed.), *Proceedings of the 10th Annual International Workshop on Presence* (pp. 195–203). Barcelona: Starlab. Retrieved from https://www.researchgate.net/publication/228091680

Fitzgerald, A., Fitzgerald, N., & Aherne, C. (2012). Do peers matter? A review of peer and/or friends' influence on physical activity among American adolescents. *Journal of Adolescence*, *35*(4), 941–958. https://doi.org/10.1016/j.adolescence.2012.01.002

Ghazisaeidi, M., Safdari, R., Goodini, A., Mirzaiee, M., & Farzi, J. (2017). Digital games as an effective approach for cancer management: Opportunities and challenges. *Journal of Education and Health Promotion*, *6*, 30. https://doi.org/10.4103/jehp.jehp_146_14

Gibson, F., Richarson, A., Hey, S., Horstman, M., & O'Leary, C. (2005). *Listening to children and young people with cancer*. London: Institute of Child Health.

Gillis, A. J. (1989). The effect of play on immobilized children in hospital. *International Journal of Nursing Studies*, *26*(3), 261–269. https://doi.org/10.1016/0020-*7489*(89)90007-2

Griffiths, M. D., & Meredith, A. (2009). Digital game addiction and its treatment. *Journal of Contemporary Psychotherapy*, *39*(4), 247–253. https://doi.org/10.1007/s10879-009-9118-4

Haiat, H., Bar-Mor, G., & Shochat, M. (2003). The world of the child: A world of play even in the hospital. *Journal of Pediatric Nursing*, *18*(3), 209–214. https://doi.org/10.1053/jpdn.2003.28

Hewes, J. (2014). Seeking balance in motion: The role of spontaneous free play in promoting social and emotional health in early childhood care and education. *Children*, *1*(3), 280–301. https://doi.org/10.3390/children1030280

Huh, Y. J. (2017). Uncovering young children's transformative digital game play through the exploration of three-year-old children's cases. *Contemporary Issues in Early Childhood*, *18*(2), 179–195. https://doi.org/10.1177/1463949117714080

Jones, R. H., Chik, A., & Hafner, C. A. (2015). *Discourse and digital practices : Doing discourse analysis in the digital age*. New York, NY: Routledge.

Kowert, R., & Kaye, L. K. (2018). Video games are not socially isolating. In C. Ferguson (Ed.), *Video game influences on aggression, cognition, and attention* (pp. 185–195). Cham: Springer. https://doi.org/10.1007/978-3-319-95495-0_15

Lambert, V., Coad, J., Hicks, P., & Glacken, M. (2014). Social spaces for young children in hospital. *Child: Care, Health and Development*, *40*(2), 195–204. https://doi.org/10.1111/cch.12016

Lima, K. Y. N., & Santos, V. E. P. (2015). Play as a care strategy for children with cancer. *Revista Gaúcha de Enfermagem*, *36*(2), 76–81. https://doi.org/10.1590/1983-1447.2015.02.51514

Long, K. A., & Marsland, A. L. (2011). Family adjustment

to childhood cancer: A systematic review. *Clinical Child and Family Psychology Review*, *14*(1), 57–88. https://doi.org/10.1007/s10567-010-0082-z

Nijhof, S. L., Vinkers, C. H., van Geelen, S. M., Duijff, S. N., Achterberg, E. J. J. M., van der Net, J., . . . Lesscher, H. M. B. (2018). Healthy play, better coping: The importance of play for the development of children in health and disease. *Neuroscience and Biobehavioral Reviews*, *95*, 421–429. https://doi.org/10.1016/j.neubiorev.2018.09.024

Piage, G. (1967). *The philosophy of the child*. Tel Aviv, IS: Hipoalim.

Rae, W. A., Sullivan, J. R., & Askins, M. A. (2016). Play interventions for hospitalized children. In L. A. Reddy, T. M. Files-Hall, & C. E. Schaefer (Eds.), *Empirically based play interventions for children* (2nd ed., pp. 115–133). Washington, DC: American Psychological Association. https://doi.org/10.1037/14730-007

Ramirez, A., Jr., & Zhang, S. (2007). When online meets offline: The effect of modality switching on relational communication. *Communication Monographs*, *74*(3), 287–310. https://doi.org/10.1080/03637750701543493

Russoniello, C. V., O'Brien, K., & Parks, J. M. (2009). The effectiveness of casual video games in improving mood and decreasing stress. *Journal of Cyber Therapy and Rehabilitation*, *2*(1), 53–66.

Rutter, M. (1981). *Maternal deprivation reassessed* (2nd ed.). Harmondsworth: Penguin Books.

Shochet, I. M., & Smith, C. L. (2014). A prospective study investigating the links among classroom environment, school connectedness, and depressive symptoms in adolescents. *Psychology in the Schools*, *51*(5), 480–492. https://doi.org/10.1002/pits.21759

Steliarova-Foucher, E., Fidler, M. M., Colombet, M., Lacour, B., Kaatsch, P., Piñeros, M., . . . Dolya, A. (2018). Changing geographical patterns and trends in cancer incidence in children and adolescents in Europe, 1991–2010 (automated childhood cancer information system): A population-based study. *The Lancet Oncology*, *19*(9), 1159–1169. https://doi.org/10.1016/S1470-*2045*(18)30423-6

Sutton-Smith, B. (2008). Play theory: A personal journey and new thoughts. *American Journal of Play*, *1*(1), 80–123.

Tisza, V. B., Hurwitz, I., & Angoff, K. (1970). The use of play program by hospitalized children. *Journal of the American Academy of Child Psychiatry*, *9*(3), 515–531. https://doi.org/10.1016/S0002-*7138*(09)61856-2

Williams, D. (2006). Groups and goblins: The social and civic impact of an online game. *Journal of Broadcasting & Electronic Media*, *50*(4), 651–670. https://doi.org/10.1207/s15506878jobem5004_5

Williams, N. A., Ben Birk, A., Petkus, J. M., & Clark, H. (2019). Importance of play for young children facing illness and hospitalization: Rationale, opportunities, and a case study illustration. *Early Child Development and Care*, *128*(1), 1–10. https://doi.org/10.1080/03004430.2019.1601088

About the Authors

Teresa de la Hera is Assistant Professor in Persuasive Gaming at Erasmus University Rotterdam, in the Netherlands, where she is member of the Gaming Matters Research Cluster. Her expertise is in the study of the use of games and play to positively change players' attitudes and behaviors. She is the Author of the book *Digital Gaming and the Advertising Landscape* (2019) and the main Editor of the edited volume *Persuasive Gaming in Context* (2021), both published by Amsterdam University Press.

Camila Sarria Sanz is a Communication Designer and holds a MA degree in media studies from the Department of Media and Communication at Erasmus University Rotterdam, the Netherlands. She currently runs a social enterprise in Colombia, which specializes in training change-makers using social entrepreneurship and participatory design tools to develop high-impact projects. In 2017 she started her academic career and since then she has worked on different research projects. Her research interests include indigenous media practices, forced migration, citizens' media, and design thinking methodologies.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 49–61
DOI: 10.17645/mac.v9i1.3205

Article

Assassins, Gods, and Androids: How Narratives and Game Mechanics Shape Eudaimonic Game Experiences

Rowan Daneels [1,*], Steven Malliet [1,2], Lieven Geerts [3], Natalie Denayer [1], Michel Walrave [1] and Heidi Vandebosch [1]

[1] Department of Communication Studies, University of Antwerp, 2000 Antwerp, Belgium; E-Mails: rowan.daneels@uantwerpen.be (R.D.), steven.malliet@uantwerpen.be (S.M.), natalie.denayer@student.uantwerpen.be (N.D.), michel.walrave@uantwerpen.be (M.W.), heidi.vandebosch@uantwerpen.be (H.V.)
[2] Inter-Actions Research Unit, LUCA School of Arts, 3600 Genk, Belgium
[3] Department of Sociology, University of Antwerp, 2000 Antwerp, Belgium; E-Mail: lieven.geerts@student.uantwerpen.be

* Corresponding author

Submitted: 29 April 2020 | Accepted: 21 June 2020 | Published: 6 January 2021

Abstract
Emerging research has suggested that digital games can generate entertainment experiences beyond hedonic enjoyment towards eudaimonic experiences: Being emotionally moved, stimulated to reflect on one's self or a sense of elevation. Studies in this area have mainly focused on individual game characteristics that elicit singular and static eudaimonic game moments. However, such a focus neglects the interplay of multiple game aspects as well as the dynamic nature of eudaimonic experiences. The current study takes a novel approach to eudaimonic game research by conducting a qualitative game analysis of three games (Assassin's Creed Odyssey, Detroit: Become Human, and God of War) and taking systematic notes on game experiences shortly after playing. Results reveal that emotionally moving, reflective, and elevating eudaimonic experiences were elicited when gameplay notes suggested a strong involvement with the game's narrative and characters (i.e., narrative engagement) and, in some cases, narrative-impacting choices. These key aspects, in turn, are enhanced by clean player interfaces, graphically realistic characters, close camera perspectives, tone-appropriate soundtrack scores, and both narrative-enhancing (e.g., God of War's health mechanic) and choice-enhancing mechanics (e.g., Detroit: Become Human's flowchart). Eudaimonic experiences were also found to evolve throughout the game, with more powerful experiences occurring near the end of the game and some narrative themes fueling the eudaimonic flow of experiences throughout the overall game narrative. This study adds to academic research studying digital games by suggesting an innovative methodological approach that provides a detailed, integrative, and dynamic perspective on eudaimonic game experiences.

Keywords
digital games; dynamic approach; eudaimonic entertainment experiences; games; mechanics; narratives; qualitative game analysis

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

In the last decade, scholars have shifted from predominantly studying hedonic entertainment experiences like enjoyment (Vorderer, Klimmt, & Ritterfeld, 2004), towards researching eudaimonic experiences. Previous studies have defined eudaimonic entertainment experiences as experiences with mixed affective responses,

heightened cognitive effort, the fulfillment of intrinsic needs (e.g., autonomy, competence, relatedness, and insight), and real-life relevance (Daneels, Vandebosch, & Walrave, 2020; Oliver et al., 2018). Studying eudaimonic experiences in media entertainment is relevant, as these experiences may potentially increase prosocial attitudes and behaviors to help others (e.g., more likely to volunteer or give frequent financial charity donations; see Thomson & Siegel, 2017), may be beneficial for individuals' increased feelings of connectedness with and compassion for others (Janicke-Bowles et al., 2020), and may enhance their long-term well-being (Rieger, Reinecke, Frischlich, & Bente, 2014).

Focusing on digital games, research has shown that they often provide players with emotionally deep stories and characters, realistic in-game choices, and high-quality audiovisuals that make it possible to elicit these eudaimonic entertainment experiences (Rogers, Woolley, Sherrick, Bowman, & Oliver, 2017). In their survey among 512 adult players, Oliver et al. (2016) found that 72% could recall an eudaimonic game experience, concluding that such experiences are not uncommon. Eudaimonic game moments are also experienced by different generations of players: While De Schutter and Brown (2016) found that elderly people can experience eudaimonic enjoyment by playing together, Daneels et al. (2020) showed that adolescent players also have eudaimonic experiences they described as being socially connecting, reflective, emotionally moving, and elevating with a connection to real life.

Since the research field of eudaimonic game entertainment is fairly new, previous research tends to (1) focus on how individual game characteristics (e.g., specific narrative themes; see Bopp, Mekler, & Opwis, 2016) or how players' interactions with these characteristics (e.g., character attachment; see Bowman et al., 2016) elicit eudaimonic experiences, and (2) provide a static and retrospective perspective by investigating players' recollections of singular eudaimonic game moments (Daneels et al., 2020; Oliver et al., 2016). These studies, however, do not provide insight into how various game aspects interact with each other to create eudaimonic experiences, nor do they account for how eudaimonic experiences might evolve while progressing through the game. By playing three recent, critically acclaimed, and theoretically relevant games (i.e., Assassin's Creed Odyssey, Detroit: Become Human, and God of War) and taking systematic notes on different game aspects and (eudaimonic) game experiences shortly after playing, the current study provides a dynamic perspective on how eudaimonic entertainment experiences are elicited and evolve during game play.

2. Defining the Player/Game Experience: The Integrated Model of Player Experience

Compared to movies or video clips, digital games are a highly complex, dynamic, and interactive form of media entertainment with a multitude of sensory stimuli such as graphics, soundtrack, and narratives (Elson, Breuer, & Quandt, 2014). In their integrated model, Elson, Breuer, and Quandt (2014) state that the player experience (i.e., the game phase) is elicited through the interplay between the game narrative and mechanics (i.e., the game content), and the game context (Elson, Breuer, Ivory, & Quandt, 2014). The narrative dimension includes aspects such as the game's plot, characters, and their attributes and dialogues. The mechanics dimension includes all rules defining interaction options, feedback cues, and user controls. Finally, the context dimension mainly includes the presence of co-players and the interaction with them.

In the following sections, we connect the literature on eudaimonia and digital games with the integrated model of player experience framework (Elson, Breuer, Ivory, et al., 2014; Elson, Breuer, & Quandt, 2014) by describing how the narrative and mechanic dimension can elicit eudaimonic game experiences. In this study, we will not address the third dimension (social context) as we will focus on single player games only (see also the cases in Section 6.2).

3. Eudaimonic Experiences through Digital Game Narratives

3.1. Narrative Characteristics and Player–Narrative Interactions

Both technological and artistic advancements have led to current digital games offering players emotionally complex and engaging stories that potentially lead to eudaimonic game experiences (Rogers et al., 2017). Oliver et al. (2016) showed that a game's story had the strongest connection to eudaimonic experiences. Adolescent players from the study of Daneels et al. (2020) also mentioned that eudaimonic game experiences are more likely to result from single player games with strong story elements than from multiplayer games without these elements. Research has also shown that sudden story twists, difficult narrative themes such as illness, death or social issues, and game events resembling real-life situations can elicit emotionally moving or challenging eudaimonic game experiences (Bopp et al., 2016; Bopp, Opwis, & Mekler, 2018).

Next to these narrative characteristics, players' interactions with the narrative—such as their narrative engagement or involvement—are additional important factors to take into account when discussing eudaimonic entertainment experiences (Daneels et al., 2020; Oliver et al., 2016). Busselle and Bilandzic (2009) state that narrative engagement includes the abilities to understand and focus attention towards the narrative, engage emotionally with the characters (e.g., character attachment), and transition from the real world to the story world (e.g., transportation). Research has also shown that narratives are more powerful and impactful when people

are engaged with them (Nabi & Green, 2015). Linking this to eudaimonic experiences, research on awe-inspiring game experiences by Possler, Kümpel, and Unkel (2019), for example, has found that feeling engaged with the game's narrative can account for the occurrence of eudaimonic game experiences. However, little research to date has directly examined the link between narrative engagement and eudaimonic game experiences.

Besides story elements, characters are also part of a game's narrative (Elson, Breuer, Ivory, et al., 2014). Several concepts such as identification (Cohen, 2001) and character attachment (Bowman et al., 2016) all relate to the notion of a player connecting and feeling closeness towards a game character. These interactive player–character relationships tend to range from seeing characters as objects for their functional value to seeing them as authentic social beings, friends or even as oneself, leading to emotionally valuable relationships with them (Banks, 2013; Bopp et al., 2016). Related to eudaimonic game experiences, previous studies found that feeling emotionally close or engaged to game characters, having a sense of control over the character's actions, and feeling responsible for the character's well-being can lead to these specific game experiences (Bowman et al., 2016; Daneels et al., 2020).

Finally, the unique interactive nature of digital games is often operationalized in terms of being able to make in-game choices to participate in the game's narrative (Iten, Steinemann, & Opwis, 2018). Choices that include information on possible consequences (i.e., consequential choices), choices with a strong impact on the story and progress of the game, moral choices that pit two moral considerations against each other to create a moral dilemma, and social choices involving other, often non-playable characters (NPCs) are perceived as meaningful or eudaimonic by players and/or lead to eudaimonic appreciation of game experiences (Daneels et al., 2020; Iten et al., 2018; Rogers et al., 2017). Furthermore, players have emotionally challenging experiences when they are conflicted between close character relationships and gameplay advantages (cf. emotional vs. functional value of characters) or between the goals of the game and personal values, but also when consequences of choices are ambiguous or present undesirable options (Bopp et al., 2018). These studies all imply that eudaimonic experiences are often elicited by players struggling to make in-game choices.

3.2. Game Narratives and Emotional Experiences as Dynamic and Evolving Phenomena

The studies mentioned in the previous paragraphs tend to take on a static approach, as they study specific eudaimonic moments at a single point in time without addressing how eudaimonic experiences can change or evolve while progressing through the game narrative. Below, we offer a short overview as to how digital game narratives and players' interactions with these narratives form a dynamic process (Wei, 2011), with shifts in the emotional flow of these narrative structures serving as a potentially important factor in eliciting eudaimonic experiences.

Broadly, we can distinguish between traditional linear narratives (i.e., narratives structured in a straight, single authored story direction and typically in the form of predetermined levels or chapters) and nonlinear or branching narratives (i.e., narratives offering players a greater sense of freedom and control through choices that unfold the story in a dynamic fashion). In Ip's (2011) narrative analysis, the 10 analyzed single-player games had mainly linear narrative structures that offer restricted branching opportunities within specific levels (e.g., taking alternative routes, free roaming the game world or exploring side quests) which offered only minor additions to the narrative and player experience.

In addition, game narratives also unfold over time: While playing a game, players progress through the game and its narrative, implying that game narratives are dynamic and evolving phenomena (Wei, 2011). One of the most prominent and established narrative structures, especially within digital games (Glassner, 2004), is that of the monomyth or 'The Hero's Journey' (Vogler, 2007; based on the original work by Campbell, 1949). This narrative structure includes 12 key stages (e.g., stage two 'Call to adventure,' stage four 'Meeting the mentor,' or stage eight 'The ordeal/final boss'; see Ip, 2011, for the full overview) of how compelling stories evolve.

Connecting these dynamic narrative structures to eudaimonic experiences, the dynamic nature of experiencing emotions is a relevant approach to consider, since mixed affective responses are a part of eudaimonic entertainment experiences (Oliver et al., 2018). Nabi and Green (2015) state that studies linking emotional responses to certain narrative outcomes often take on a static approach by focusing on the dominant or final emotional state. A more ecologically valid approach would be to investigate changes or shifts in emotional experiences through the course of an unfolding media narrative, conceptualized by Nabi and Green (2015) as emotional flow. Emotional shifts can include changes in emotional valence as well as changes in intensity of specific emotional experiences. Finally, Nabi and Green (2015) also theorize that emotional shifts might promote continued attention towards and engagement with the narrative. Following Nabi and Green's (2015) call on a more dynamic approach towards emotional experiences and media narratives, this study will examine how unfolding game narratives influence the emotional (or in this case the eudaimonic) flow of experiences.

4. Eudaimonic Experiences through Digital Game Mechanics

Next to the narrative, game mechanics (e.g., rules on interaction options, controls, player interface) also have an important influence on player experiences. For example, the Mechanics, Dynamics, and Aesthetics game

design framework (Hunicke, LeBlanc, & Zubek, 2004) states that objective mechanics lead to dynamics relating to the interactions between players and mechanical components which, in turn, lead to experiential aesthetics or emotional responses such as hedonic enjoyment or eudaimonic appreciation. Past research has found that mechanical gratifications only relate to hedonic experiences or enjoyment (Kümpel & Unkel, 2017; Oliver et al., 2016). However, other studies support the notion that game mechanics can enhance and augment the game narrative, leading to both the narrative and mechanics being important catalysts of eudaimonic experiences (Iten et al., 2018; Possler et al., 2019).

Switching to how game design can elicit eudaimonic experiences, one recent study looked at how changes in game mechanics throughout three specific games can lead to eudaimonic experiences (Aytemiz, Junius, & Altice, 2019). These authors discussed how Brothers: A Tale of Two Sons (Starbreeze Studios, 2013) provides eudaimonic story elements through the mechanics (e.g., the player controls two brothers, each brother with one half of the controller) and players' interactions with the mechanics (e.g., when the older brother dies, half of the controls are rendered ineffective). Isbister's (2016) work on emotional game design also stresses the importance of meaningful choices that can influence outcomes and have reflective consequences as an important mechanic towards emotional experiences. Next to this, character customization (i.e., the ability to control how game characters look and feel), something that is often present in role-playing games, can encourage emotional closeness to playable characters and NPCs (Isbister, 2016) and, in turn, lead to eudaimonic experiences (Rogers et al., 2017). Furthermore, Cole and Gillies (2019) show that different possibilities for agency (i.e., the range of actions available to players) are connected to eudaimonic experiences in games. They suggest that interpretive fictional and—to a lesser extent—interpretive mechanical agency are most suited to elicit eudaimonic game experiences, as players who are left to both construct their own understanding of the narrative (i.e., fictional) and reflect on their own actions (i.e., mechanical) could have thought-provoking and emotionally moving experiences. This also leads to believe that having a certain degree of control over mechanics and players' interactions with them, is distinctive from the actual game mechanics themselves. Finally, linked to reflective eudaimonic experiences, there is much research on how games can be seen and used as thought experiments that allow reflective play, moral learning, and ethical reasoning in a safe environment (Schulzke, 2011). For instance, Simkins and Steinkuehler (2008) argue that specific mechanics in role-playing games like open-ended worlds, playing the role of a character, having the ability to make meaningful and consequential choices, and receiving feedback from NPCs on their own actions (i.e., mirroring) might help players reflect on themselves and their own real-life behavior. Game mechanics and design principles can also support the creation of emotional relationships with NPCs by how players receive feedback and have the ability to empathize with or take care of NPCs (Schrier, 2019).

4.1. Digital Games as a Demanding Technology

Taking a dynamic approach towards players' interactions with games and their mechanics, we observe that interactivity in games—which grants players some control to create their own unique experiences—can also be seen as demands that potentially hinder overall game experiences (Bowman, 2018). At least four types of game demands can be distinguished: cognitive (associated with making sense of the game), emotional (associated with making affective investments into the game's narrative), physical (associated with mastering the game's input mechanics), and social demands (associated with social relations with both in-game characters and other players; Bowman, 2018). Related to this is the limited capacity model of motivated mediated message processing (LC4MP; Lang, 2000), which states that media users (here, digital game players) have limited cognitive resources to process the complex and interactive process of playing digital games.

Since eudaimonic experiences require mixed affective responses and heightened cognitive effort (Oliver et al., 2018), the demanding nature of digital games might form barriers to have eudaimonic experiences. Following Elson, Breuer, Ivory, et al., (2014), game mechanics that are too complex or demanding might inhibit reflective processes present in eudaimonic experiences, as cognitive resources of players are limited (following the LC4MP model; Lang, 2000). The same observation can be made regarding controls: although players immediately start forming mental schemata of connections between controller functions and specific in-game actions, players who are either less experienced in playing games in general or struggle with learning specific controller systems will have physically and cognitively demanding experiences (Bowman, 2018). This, in turn, might hinder eudaimonic game experiences as players need to assert cognitive resources in learning the physical input system before being able to become emotionally involved with the game narrative and characters. The demanding nature of learning game controls also relates to the dynamic perspective on eudaimonic game experiences, suggesting that such experiences might only be elicited further in the game when players have already mastered the mechanics.

5. The Current Study

The study of eudaimonic entertainment experiences and digital games is an emerging research track within different fields such as media psychology and communication studies. We take a different methodological approach compared to previous studies (e.g., Daneels et al., 2020;

Oliver et al., 2016) by playing through three specific games and taking systematic notes on (eudaimonic) game experiences shortly after playing. This study will address: (1) How eudaimonic game experiences are elicited through the interplay between narrative and mechanic aspects; and (2) how players' interactions with these aspects dynamically evolve while playing the game. This leads to the following research question:

> RQ: How do the changing interactions between players, narrative, and mechanic aspects of the analyzed games elicit eudaimonic experiences?

6. Methods

6.1. Procedure

We conducted a qualitative game analysis combined with the immediate reporting of eudaimonic game experiences similar to a think-aloud protocol. Data collection occurred by playing through the games while systematically taking notes using the analysis scheme proposed by Malliet (2007). This scheme records several dimensions such as graphics and soundtrack, story elements, characters, in-game choices, player interface, and so forth (see the Supplementary File for the detailed scheme). The researchers performed several test sessions before the actual data collection to get acquainted with the analysis scheme and, after discussing these test cases, maintained similar interpretations of the scheme's dimensions as well as the study's central concepts across all researchers.

Five researchers played the games and performed the analysis on the notes to address player diversity (e.g., differences in playstyles, game experience and mastery, levels of engagement; see Schmierbach, 2009) and create more potentially diverse readings of the game (Malliet, 2007). The first two authors analyzed all three games and three undergraduate students (including the third and fourth author) each played one game, leading to three different readings per analyzed game and nine in total. Beyond using multiple player-researchers, we performed an additional reading of secondary resources—including game reviews, walkthroughs and blogposts—of all three games to account for player diversity and obtain different readings of the games (Malliet, 2007).

We divided the game content into distinct analysis units based on either pre-defined chapters and missions (i.e., syntactical categorization) or time categories of up to 30 minutes (i.e., temporal categorization) for games with lengthy missions or without clear chapters, to make detailed notes (Schmierbach, 2009). While the student players and the second author recorded notes for approximately 20 hours of gameplay, the first author recorded notes for the entire games (i.e., when the game's story had ended). This methodological approach of analyzing entire games is both innovative and fitting to explore dynamic game experiences, as we play through the entire game and its narrative compared to examining early-game, specific, and static experiences in short gameplay sessions (Schmierbach, 2009).

6.2. Cases

We chose to analyze three different digital games available on PlayStation 4: Assassin's Creed Odyssey (Ubisoft Quebec, 2018), Detroit: Become Human (Quantic Dream, 2018), and God of War (SIE Santa Monica Studios, 2018). The selection of these games is based on several criteria. Firstly, the analyzed games are theoretically relevant, as they all include strong emotional narratives, characters, and choices—each are aspects found in previous research to be of importance to eudaimonic game experiences (Daneels et al., 2020; Rogers et al., 2017). Assassin's Creed Odyssey is set in Ancient Greece, where players control either a male (Alexios) or female (Kassandra) protagonist that has to deal with family issues and dangerous plots relating to a secret cult directly tied to the player's character. Detroit: Become Human is set in 2038 Detroit where players control three human-like androids in three intertwined storylines who struggle with social injustice and domestic abuse. God of War is set in Norse mythology, where the player is Kratos, the Greek god of war, who is charged with raising his 10-year-old son Atreus alone after his wife dies. Secondly, the analyzed games are all recent, popular, and critically acclaimed games (e.g., Game of the Year award for God of War; see Massongill, 2019) that might reach the average player, compensating for the small and deliberative sample (Schmierbach, 2009). Finally, the analyzed games include a diversity of narrative structures (Ip, 2011) and mechanic systems to create a balanced sample: Detroit: Become Human is a narrative-focused game with a branched narrative structure, Assassin's Creed Odyssey is a 3rd person action/adventure game with an open world (i.e., linear narrative with branching in specific levels) and role-playing game elements (e.g., leveling system, looting, skill tree), and God of War is a 3rd person action/adventure game that combines elements from the two previous games (i.e., narrative-driven game with some role-playing game elements).

6.3. Coding and Analysis

The recorded gameplay notes were analyzed by the five researchers who also played the games using the NVivo 12 software package, with each researcher coding their own gameplay notes. While giving labels or codes to separate pieces of the text, the researchers used axial coding to categorize these codes in the different dimensions of the analysis scheme. A separate category was made for the codes related to the different eudaimonic experiences derived from playing the games. Iterative rounds of identifying, structuring, and restructuring categories occurred until no new topics and categories could be derived from the data. Following the analysis pro-

cedure by Malliet (2007), all player-researchers wrote down separate provisional analysis reports based on their own axially coded data and specific eudaimonic experiences. These reports were then discussed among all the player-researchers of the three games. We combined all these discussion sessions in a final analysis report combining all three games. This was used as a basis for the results section below. Next to the gameplay notes, the consultation of several secondary resources was used to either confirm or contradict the player-researchers' eudaimonic experiences, as well as to provide a more detailed insight into different narrative and mechanic aspects of the specific games.

7. Results

The findings reported below are derived from both the analyzed player-researchers' gameplay notes and the additional reading of secondary resources of the three games. During our playthrough of the three selected games, the five player-researchers encountered three types of eudaimonic experiences: emotionally moving, reflective on one's personal self or on society, and elevating (i.e., heartwarming and uplifting feelings in response to acts of kindness, altruism, sacrifice, and so on; see Ellithorpe, Ewoldsen, & Oliver, 2015) experiences.

While we distinguished three key narrative themes contributing to eudaimonic experiences, in the next sections we will present our analysis on one specific, arguably the most important theme: the exploration and evolution of family relationships. As this narrative theme is present in all three analyzed games, we will discuss how engagement with this narrative theme led to different eudaimonic experiences, how this theme and associated eudaimonic experiences evolve throughout the game (narrative), and how engagement with this theme is enhanced by several audiovisual and mechanic aspects interacting together to create eudaimonic experiences. Afterwards, we present a visual model of how this interplay between narratives and mechanics leads to eudaimonic game experiences.

7.1. The Evolving Relationship between Kratos and Atreus (God of War)

The titular hero Kratos, the former Greek god of war, has no idea how to be a father or how to comfort the grieving Atreus, who just lost his mother Faye. Especially in the first chapters, this distant father-son relationship leads to both emotionally moving (e.g., Kratos' difficulties expressing his emotions towards the mourning Atreus, for instance, when he refrains from laying his hand on Atreus' shoulder to comfort him) and reflective experiences (e.g., one player-researcher mentioned this made him reflect on his own difficult father-son relationship). Throughout the game, their relationship grows as they start to trust and communicate with each other, in turn leading to several elevating experiences (e.g., when Atreus sacrifices himself during the final battle against Baldr by throwing himself in front of his father to catch Baldr's blow). Besides the player-researchers' gameplay, other players' readings led to similar experiences: The organically growing relationship between the two main characters is the reason why the game's story works so well and why the narrative packs a huge emotional punch (Dunthorne, 2019).

Framing this within 'The Hero's Journey' narrative structure, emotionally moving and reflective experiences occurred throughout the different narrative stages, while elevating experiences mainly occurred towards the end of the game. For instance, Atreus' heartwarming sacrifice happens in stage eight (the final ordeal), while stage nine (the reward) consists of Kratos and Atreus reaching the heartwarming end of their journey by spreading Faye's ashes together and seeing how their relationship improved over the course of their journey.

Engagement with this narrative theme in God of War is enhanced by several other aspects of the game, for example, by how little on-screen information players get to see. This clean player interface allows players to focus on the narrative without too many artificial indicators, leading players to forget they are in the game. Furthermore, the interplay between audiovisual aspects such as using motion capture technology that represents detailed affective facial expressions of Kratos and Atreus, the use of close-ups to focus on these facial expressions during conversations between father and son (see Figure 1 for an example), and the close-third person camera perspective looking over Kratos' shoulder provides more narrative engagement with this key narrative theme to elicit eudaimonic experiences (see also PlayStation, 2018). Besides these audiovisual aspects, the game also provides two mechanics that subtly intensify this evolving father-son relationship and, in turn, lead to emotionally moving and elevating experiences. Firstly, the spatial structure of the game world frequently requires Kratos and Atreus to work together to solve puzzles and get past certain obstacles to progress in the game. For example, Atreus often gets a push from Kratos to reach a higher up area and Atreus lowers down a rope so Kratos can climb up. In other areas, Atreus needs to solve puzzles involving Norse runes that only he can read, implying that Kratos fully relies on Atreus. Secondly, a specific health mechanic refers to audio cues from Atreus—next to the traditional visual health bar—to warn Kratos and the player when his health is low: He screams at Kratos when his father is almost dead or when he asks Kratos if he is doing alright.

7.2. The Evolving Relationship between Kara and Alice (Detroit: Become Human)

Only Kara's storyline, which mainly deals with the evolving relationship between the android Kara and the young girl Alice, who try to survive on the streets of Detroit, leads to emotionally moving and elevating experiences

Figure 1. Close-up of a heartwarming interaction when Kratos kneels before his son in a close and gentle manner to fix his broken quiver (taken from in-game screenshot). Source: SIE Santa Monica Studios (2018).

in this narrative theme. After escaping Alice's abusive father Todd at the beginning of the story, Kara must take care of Alice, although Kara (being an android) has no experience with being a mother. Their struggles to survive create both emotionally moving moments (e.g., when they have no place to sleep or when Alice gets ill later in the game) and heartwarming moments (e.g., when Kara and Alice interact with each other, grow towards each other, and develop a mother-daughter bond in the process). However, Detroit: Become Human also evoked feelings of uneasiness and even existential confusion for one player-researcher due to the moral reflection on humans vs. machines and both the humanization of androids (e.g., showing off beautiful human emotions like love between Kara and Alice) and dehumanization of the human characters (e.g., showing off awful moral actions such as domestic violence). Because the game is also played from the perspective of the androids (i.e., internal narrative focalization; see Ip, 2011), the player-researcher experiences empathy towards androids, but an existential confusion also arises when considering the thought of androids gaining too much freedom and power leading to a futuristic dystopian scenario. While this uneasiness hindered having affective-based eudaimonic experiences (i.e., feeling emotionally moved and elevation), it did lead to reflective eudaimonic experiences.

Eudaimonic experiences within this narrative theme evolve from smaller eudaimonic moments at the start of the game towards more powerful experiences near the end of the game narrative. As Kara and Alice see their goal in sight (escaping to Canada by boat), during their escape the boat is shot by the police, leading to an emotional ending of their story as they die in each other's arms on the snowy Canadian shore.

Similar to God of War (see Section 7.1), the clean player interface, the use of motion capture technology to create realistic facial expressions (e.g., Kara's smile is realistic for an android), and the use of close-ups to focus on these facial expressions during conversations between Kara and Alice, enhances narrative engagement with this key theme (also see Cooper, 2018). In addition, the often sad and somber soundtrack theme in Kara's storyline, symbolizing their desperation, announces and elicits emotionally moving experiences when they have another setback to deal with. Finally, Detroit: Become Human's branched narrative structure entails that players are frequently presented with in-game choices. Especially choices determining the narrative path for each playable character have found to both directly elicit eudaimonic experiences and indirectly through enhancing engagement with the narrative. Heartwarming interactions between Kara and Alice often occur as a result of the player's choice to comfort Alice by saying things like "everything will work out as long as we are together," continuously ask Alice if she is alright, and showing physical affection by kissing her on the forehead. Two unique mechanics in Detroit: Become Human connected to narrative engagement and in-game choices that improve chances of eliciting eudaimonic experiences are the displayed branched structure after completing each chapter (see Figure 2 for an example) and an appreciation system that shows off dispositions of important NPCs towards the playable characters. Firstly, the flowchart shows choices the player has made, the narrative consequences of these choices, as well as how and when making other choices would have led to other outcomes. The display also shows which choice moments were definitive to determine life and death of both important NPCs and the own playable characters. This mechanic provides emotionally moving or elevating experiences in a retrospective manner, for example when seeing a moving choice has led to the death (i.e., moving) or survival (i.e., elevating) of a character.

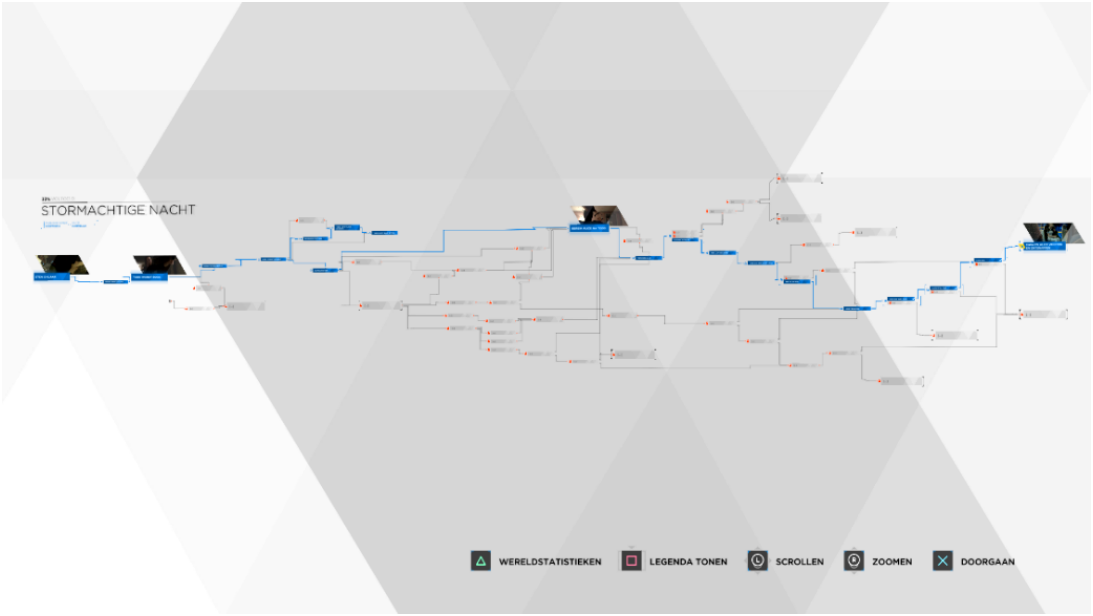

Figure 2. Flowchart mechanic of Detroit: Become Human chapter seven 'Stormy Night,' with the blue line depicting the narrative path taken during that specific playthrough by one player-researcher (taken from in-game screenshot). Source: Quantic Dream (2018).

Secondly, several important NPCs in each storyline have a certain mood or disposition (e.g., neutral, loving, hostile) towards the playable character, influenced by the actions and choices made by the player. Focusing on this specific narrative theme, Alice's disposition starts out with a neutral feeling towards Kara, which evolves into warm when the player chooses to take care of and comfort her. This mechanic is an important factor to elicit eudaimonic experiences as it provides direct feedback on the player's choices, enhancing engagement with the narrative in the process. It also shows how the NPC dispositions change over time and how connected eudaimonic experiences evolve with them.

7.3. The Relationship between Alexios, Kassandra, and Myrinne (Assassin's Creed Odyssey)

Within Assassin's Creed Odyssey, two main relationships lead to eudaimonic experiences: the players' relationship with both their long-lost mother Myrinne and their long-lost sibling Alexios/Kassandra (depending on the initial gender choice of the playable character). The first relationship leads to moving and heartwarming moments when the player is reunited with Myrinne after so many years. The second relationship is with the sibling, who turned out to be the secret weapon of the cult that tries to kill the player's family. The most moving and heartwarming experiences here occur at the end of the story, during the final confrontation with the sibling. After he/she draws his/her sword to attack the playable character and Myrinne, the player can choose to take a risk and sacrifice him-/herself by offering the sibling his/her spear. This sacrifice is a heartwarming moment in and of itself, but the sacrifice also breaks the brainwashed sibling. This moment is touching as players get to witness what all their decisions have led to: the player gets the happy ending and accomplishes the sibling's transformation. The sacrifice also leads to the heartwarming final mission 'Dinner in Sparta,' where the player dines with their reunited family.

Assassin's Creed Odyssey fits well within the narrative structure of 'The Hero's Journey.' Using this, the eudaimonic experiences mentioned above are situated mainly within stages eight and nine (i.e., the final battle and the reward), near the end of the game. The reward of playing through the narrative and the final confrontation leads to close family relationships with the playable character's relatives. However, these family relationships do not evolve over time, implying that this narrative theme within Assassin's Creed Odyssey elicits only static eudaimonic experiences.

Similar to God of War (see Section 7.1) and Detroit: Become Human (see Section 7.2), the game uses motion capture technology to show off graphically realistic facial expressions of characters, which enhances engagement with them. The game also includes small in-game choice opportunities along with several major choice moments. The latter type decides how much of the playable character's family is still alive at the end of the game (for an overview of these choices; see Reseigh-Lincoln, 2018). Since the most important eudaimonic experience in this game is connected to this specific narrative theme and to having the best possible ending (i.e., having a reunited family and a heartwarming dinner with everyone), these narrative-impacting choices have a direct influence on eliciting eudaimonic experiences. However, engagement with this narrative theme is also diminished by several aspects throughout the game. For example, the

player interface permanently shows on-screen information like the current mission, character level, health and adrenaline bars, and nearby objects, drawing the attention away from the narrative and connected eudaimonic experiences. There is also an imbalance between the linear narrative structure and role-playing game mechanics during the second half of the game. Specifically, the combination of level gating (i.e., small level differences between the player's character and enemies cause disproportionally difficult battles) and big differences between subsequent missions in the main narrative and character levels (e.g., the first mission's level is 24, while the next is 31) creates frustrating experiences (also see LifeOnMarsden, 2019). This combination forces players to play optional side quests without major narrative value and grind for experience points to level-up the character, so players can continue the main narrative. In turn, these often-extended grind sessions hinder engagement with the main narrative and specific eudaimonic themes. One specific reaction from the player-researchers' gameplay analysis illustrates this claim, as they reported less emotional engagement with the narrative and less reflective moments as a result of the game's main focus on the experience points system, the open world, and other role-playing mechanics.

7.4. Integrated Model of Game Aspects Eliciting Eudaimonic Experiences

To summarize our findings on how the interplay between narrative elements and mechanics shape eudaimonic game experiences, we present a visual model below (see Figure 3). The model includes engagement with key narrative themes and characters, narrative-impacting choices, a clean player interface, audiovisual aspects, and both narrative- and choice-enhancing mechanics. The model shows that, overall, the narrative aspects directly elicit eudaimonic experiences, while the audiovisual and mechanic aspects enhance these narrative aspects, indirectly leading to eudaimonic experiences.

8. Discussion

The present study provides an integrated and dynamic understanding of how the interplay between players, narrative, and mechanics elicit eudaimonic game experiences. Overall, we find that eudaimonic experiences occur more frequently when mechanics support and blend well with key narrative themes also identified in previous studies (such as close family relationships; Bopp et al., 2016, 2018). While this balance was experienced

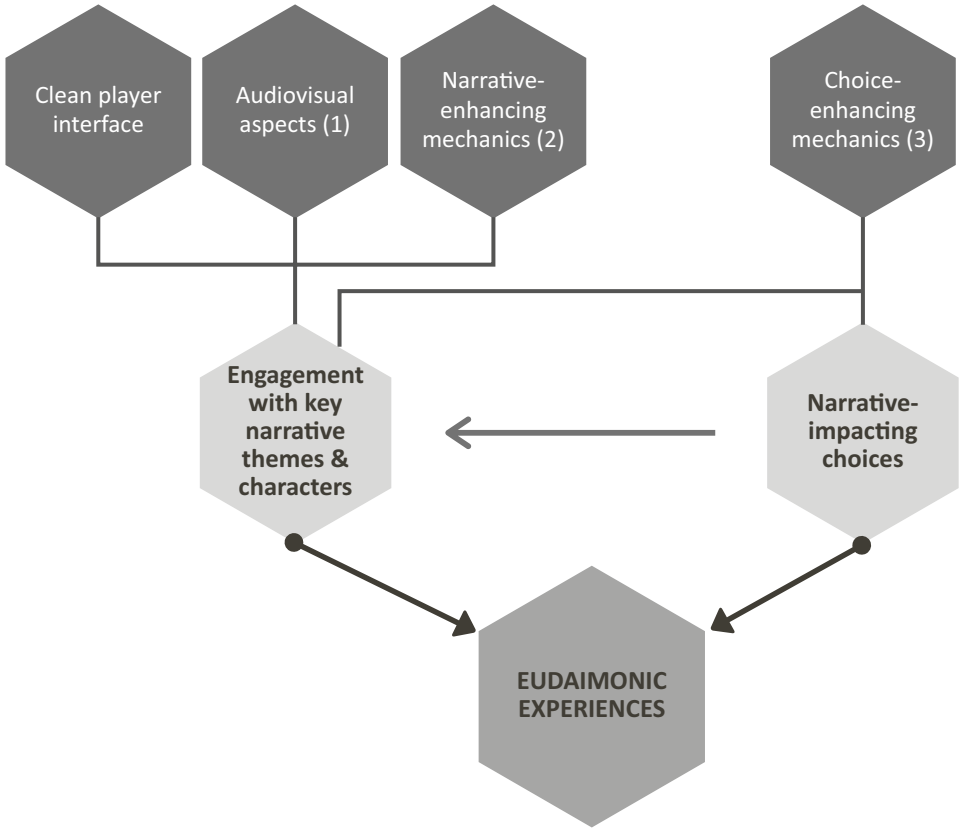

Figure 3. Visual representation of narrative and mechanic aspects interacting to elicit eudaimonic experiences. Notes: Audiovisual aspects (1) include realistic environmental graphics, realistic character graphics (motion capture), camera perspectives, and soundtrack—main scores; Narrative-enhancing mechanics (2) include the health mechanic and spatial structure of the game world in God of War; Choice-enhancing mechanics (3) include the flowchart of the branched narrative and the NPC appreciation mechanic in Detroit: Become Human.

for both God of War and Detroit: Become Human, the player-researchers of Assassin's Creed Odyssey mostly experienced an imbalance between the narrative and mechanics. The game forces players to really grind for experience points in a manner similar to how playing games can almost feel like working, which Yee (2006) termed as the labor of fun in his work. In turn, this imbalance led to less eudaimonic experiences while playing the game.

Results also show that providing players with a clean player interface, graphically realistic characters through, for example, motion capture, different camera techniques closing the gap between players and characters, tone-setting soundtrack main scores, in-game choices, and several unique mechanics (e.g., the NPC appreciation system in Detroit: Become Human) enhances engagement with these eudaimonic narrative themes, as these facilitate a better understanding of the key narrative themes, a stronger emotional connection with the characters linked to these themes, and transportation into the game world (Busselle & Bilandzic, 2009). For example, we observed that less on-screen information allows players to focus more on the eudaimonic narrative themes and be immersed in the game world, sometimes forgetting they were playing a fictional game. This connects to the concept of suspension of disbelief (i.e., the willingness to temporarily forget the narrative/environment is fictional), an important prerequisite to enjoy media entertainment (Vorderer et al., 2004), which also might be important to elicit eudaimonic game experiences. Besides this, in-game choices impacting the narrative in Assassin's Creed Odyssey and Detroit: Become Human have also been found in previous studies to elicit eudaimonic game experiences (Cole & Gillies, 2019; Daneels et al., 2020; Iten et al., 2018). However, choice mechanics and branched narrative structures are not a requirement to elicit eudaimonic experiences, as God of War provided some of the strongest eudaimonic experiences while having a linear narrative structure.

Finally, an innovative perspective of this study is examining the dynamic nature of eudaimonic experiences. Results show that the affective eudaimonic experiences (i.e., emotionally moved and elevation) evolve throughout the game, whereas reflective experiences do not. The more powerful eudaimonic experiences occurred near the end of the game narrative, often in rewarding situations after a final confrontation (cf. 'The Hero's Journey'; see Glassner, 2004; Vogler, 2007). A possible explanation here is that emotionally valuable player–character relationships, which are essential to eudaimonic experiences (Bowman et al., 2016), are closer near the end of the game narrative. Another explanation lies with the LC4MP model (Lang, 2000), as eudaimonic experiences are experienced later on in the game after players can use more cognitive resources to focus on the eudaimonic narrative and need to invest less of these resources after mastering the mechanics and control systems. The games also include both dynamic eudaimonic experiences, interwoven throughout the games' overall setting and narrative (e.g., family relationships in God of War and Detroit: Become Human), and singular static eudaimonic moments (e.g., heartwarming family dinner in Assassin's Creed Odyssey).

8.1. Limitations and Future Research

Despite the merits of this study, it also has some limitations to consider when interpreting the results. Arguably the most apparent drawback of the study is the limited sample size in both the number of player-researchers (three per game) and number of analyzed games (three games). Previous game analyses (e.g., Ip, 2011) have experienced similar issues regarding generalizability and subjectivity of the obtained results. The current study attempted to account for this subjectivity by letting three players analyze each game as well as complement our gameplay notes with an additional reading of secondary resources like walkthroughs, blogposts, and reviews including other players' readings. Conversely, a benefit of focusing on a small number of games is that each one could be analyzed in depth, examining every aspect of each game in terms of their ability to elicit eudaimonic experiences with the principal goal of expanding on extant theories of eudaimonia in digital games. Future research should attempt to replicate these results, or perhaps even expand on them, by considering other elements that could contribute to eudaimonic experiences in various types of games and players.

Another limitation of this study is that it focused only on single player games for analyses. Despite the difficulty of analyzing multiplayer games (e.g., having different modes and other real-life players strongly influencing the analyzed content; see Malliet, 2007), leaving them out of the analysis led to missed opportunities to study how the social context dimension (next to narrative and mechanics; Elson, Breuer, & Quandt, 2014) impacts eudaimonic game experiences.

Beyond the limitations of the study, future research should try to build upon our exploratory qualitative work by quantitatively testing several proposed relationships. Possible research paths include testing the importance of narrative engagement to eudaimonic game experiences, using the measurement instrument of Busselle and Bilandzic (2009), and how digital games' demanding nature on specific dimensions of demand (Bowman, 2018) hinder or strengthen the elicitation of eudaimonic experiences.

Acknowledgments

The authors would like to thank the Academic Editors and reviewers for their detailed feedback, which improved this research article. They would also like to thank Elke De Ridder for designing several versions of our visual model of interacting narrative and mechanic aspects in the elicitation of eudaimonic game experiences.

Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

References

Aytemiz, B., Junius, N., & Altice, N. (2019). *Exploring how changes in game systems generate meaning*. Paper presented at the 2019 DiGRA International Conference: Game, Play and the Emerging Ludo-Mix, Kyoto, Japan.

Banks, J. (2013). *Human-technology relationality and self-network organization: Players and avatars in World of Warcraft* (Doctoral dissertation). Colorado State University, Fort Collins, CO.

Bopp, J., Mekler, E., & Opwis, K. (2016). Negative emotion, positive experiences? Emotionally moving moments in digital games. In J. Kaye & A. Druin (Eds.), *Proceedings of the 2016 CHI conference on human factors in computing systems* (pp. 2996–3006). San Jose, CA: ACM.

Bopp, J., Opwis, K., & Mekler, E. (2018). "An odd kind of pleasure": Differentiating emotional challenge in digital games. In R. Mandryk & M. Hancock (Eds.), *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (pp. 1–12). Montreal: ACM.

Bowman, N. (2018). The demanding nature of video game play. In N. Bowman (Ed.), *Video games: A medium that demands our attention* (pp. 1–24). New York, NY: Routledge.

Bowman, N., Oliver, M., Rogers, R., Sherrick, B., Woolley, J., & Chung, M.-Y. (2016). In control or in their shoes? How character attachment differentially influences video game enjoyment and appreciation. *Journal of Gaming & Virtual Worlds*, *8*(1), 83–99.

Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology*, *12*(4), 321–347.

Campbell, J. (1949). *The hero with a thousand faces* (1st ed.). New York, NY: Pantheon Books.

Cohen, J. (2001). Defining identification: A theoretical look at the identification of audiences with media characters. *Mass Communication & Society*, *4*(3), 245–264.

Cole, T., & Gillies, M. (2019). Thinking and doing: Challenge, agency, and the eudaimonic experience in video games. *Games and Culture*, 1–21. https://doi.org/10.1177/1555412019881536

Cooper, J. (2018, May 31). *Detroit: Become Human mocap behind-the-scenes* [Video file]. Retrieved from https://www.youtube.com/watch?v=HIm9PtAdRVs

Daneels, R., Vandebosch, H., & Walrave, M. (2020). "Just for fun?": An exploration of digital games' potential for eudaimonic media experiences among Flemish adolescents. *Journal of Children and Media*, *14*(3), 285–301. https://doi.org/10.1080/17482798.2020.1727934

De Schutter, B., & Brown, J. (2016). Digital games as a source of enjoyment in later life. *Games and Culture*, *11*(1/2), 28–52.

Dunthorne, M. (2019, December 5). How God of War converted a non-believer. *Gamesindustry.biz*. Retrieved from https://www.gamesindustry.biz/articles/2019-12-05-how-god-of-war-converted-a-non-believer

Ellithorpe, M., Ewoldsen, D., & Oliver, M. (2015). Elevation (sometimes) increases altruism: Choice and number of outcomes in elevating media effects. *Psychology of Popular Media Culture*, *4*(3), 236–250.

Elson, M., Breuer, J., Ivory, J., & Quandt, T. (2014). More than just stories with buttons: Narrative, mechanics, and context as determinants of player experience in digital games. *Journal of Communication*, *64*, 521–542.

Elson, M., Breuer, J., & Quandt, T. (2014). Know thy player: An integrated model of player experience for digital games. In M. Angelides & H. Agius (Eds.), *Handbook of digital games* (pp. 362–387). Hoboken, NJ: Wiley.

Glassner, A. (2004). *Interactive storytelling: Techniques for 21st century fiction*. Natick, MA: A. K. Peters.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). *MDA: A formal approach to game design and game research*. Paper presented at the Game Developers Conference, San Jose, CA.

Ip, B. (2011). Narrative structures in computer and video games: Part 1: Context, definitions, and initial findings. *Games and Culture*, *6*(2), 103–134.

Isbister, K. (2016). A series of interesting choices: The building blocks of emotional design. In K. Isbister (Ed.), *How games move us: Emotion by design* (pp. 1–42). Cambridge, MA: The MIT Press.

Iten, G., Steinemann, S., & Opwis, K. (2018). Choosing to help monsters: A mixed-method examination of meaningful choices in narrative-rich games and interactive narratives. In R. Mandryk & M. Hancock (Eds.), *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (pp. 1–13). Montreal: ACM.

Janicke-Bowles, S., Raney, A., Oliver, M., Dale, K., Zhao, D., Neumann, D., . . . Hendry, A. (2020). *Content matters: Effects of inspiring Facebook posts on subjective and eudaimonic well-being*. Paper presented at the 70th International Communication Association conference, Gold Coast, Australia.

Kümpel, A. S., & Unkel, J. (2017). The effects of digital games on hedonic, eudaimonic and telic entertainment experiences. *Journal of Gaming & Virtual Worlds*, *9*(1), 21–37.

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, *50*(1), 46–70.

LifeOnMarsden. (2019). The level gating in this game is ridiculous. *Reddit*. Retrieved from https://www.reddit.com/r/assassinscreed/comments/azu3ec/the_level_gating_in_this_game_is_ridiculous

Malliet, S. (2007). Adapting the principles of ludology to the method of video game content analysis. *Game Studies*, *7*(1). http://www.gamestudies.org/0701/articles/malliet

Massongill, J. (2019, January 17). Game of the year 2018: The winners. *Playstation.Blog*. Retrieved from https://blog.us.playstation.com/2019/01/17/game-of-the-year-2018-the-winners

Nabi, R., & Green, M. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology*, *18*(2), 137–162.

Oliver, M., Bowman, N., Woolley, J., Rogers, R., Sherrick, B., & Chung, M.-Y. (2016). Video games as meaningful entertainment experiences. *Psychology of Popular Media Culture*, *5*(4), 390–405.

Oliver, M., Raney, A., Slater, M., Appel, M., Hartmann, T., Bartsch, A., . . . Das, E. (2018). Self-transcendent media experiences: Taking meaningful media to a higher level. *Journal of Communication*, *68*, 380–389.

PlayStation. (2018, March 21). *God of War in a single shot* [Video file]. Retrieved from https://www.youtube.com/watch?v=l_RpwPcfhB8

Possler, D., Kümpel, A., & Unkel, J. (2019). Entertainment motivations and gaming-specific gratifications as antecedents of digital game enjoyment and appreciation. *Psychology of Popular Media Culture*. Advance online publication. https://psycnet.apa.org/doi/10.1037/ppm0000248

Quantic Dream. (2018). Detroit: Become Human [Video game]. Tokyo: Sonic Interactive Entertainment.

Reseigh-Lincoln, D. (2018, December 18). Assassin's Creed Odyssey best ending explained: Decisions, choices and how to get the best ending with Kassandra or Alexios. *Eurogamer*. Retrieved from https://www.eurogamer.net/articles/2018-10-18-assassins-creed-odyssey-best-ending-decisions-choices-5022

Rieger, D., Reinecke, L., Frischlich, L., & Bente, G. (2014). Media entertainment and well-being: Linking hedonic and eudaimonic entertainment experience to media-induced recovery and vitality. *Journal of Communication*, *64*(3), 456–478.

Rogers, R., Woolley, J., Sherrick, B., Bowman, N., & Oliver, M. (2017). Fun versus meaningful video game experiences: A qualitative analysis of user responses. *The Computer Games Journal*, *6*(1/2), 63–79.

Schmierbach, M. (2009). Content analysis of video games: Challenges and potential solutions. *Communication Methods and Measures*, *3*(3), 147–172.

Schrier, K. (2019). Designing games for moral learning and knowledge building. *Games and Culture*, *14*(4), 306–343.

Schulzke, M. (2011). Reflective play and morality: Video games as thought experiments. In K. Poels & S. Malliet (Eds.), *Vice city virtue: Moral issues in digital game play* (pp. 51–68). Louvain: Acco.

SIE Santa Monica Studios. (2018). God of War [Video game]. Tokyo: Sony Interactive Entertainment.

Simkins, D., & Steinkuehler, C. (2008). Critical ethical reasoning and role-play. *Games and Culture*, *3*(3/4), 333–355.

Starbreeze Studios. (2013). Brothers: A Tale of Two Sons [Video game]. Milan: 505 Games.

Thomson, A., & Siegel, J. (2017). Elevation: A review of scholarship on a moral and other-praising emotion. *The Journal of Positive Psychology*, *12*(6), 628–638.

Ubisoft Quebec. (2018). Assassin's Creed Odyssey [Video game]. Quebec: Ubisoft.

Vogler, C. (2007). *The writer's journey: Mythic structures for storytellers and screenwriters* (3rd ed.). London: Boxtree.

Vorderer, P., Klimmt, C., & Ritterfeld, U. (2004). Enjoyment: At the heart of media entertainment. *Communication Theory*, *14*(4), 388–408.

Wei, H. (2011). *Analyzing the game narrative: Structure and technique* (Doctoral dissertation). Simon Fraser University, Burnaby, Canada.

Yee, N. (2006). The labor of fun: How video games blur the boundaries of work and play. *Games and Culture*, *1*(1), 68–71.

About the Authors

Rowan Daneels is a PhD Researcher at the Department of Communication Studies, University of Antwerp, Belgium. He holds two MSc degrees in Communication Sciences at the University of Antwerp (specialization Media Studies) and Ghent University (specialization New Media and Society). His research interests include topics such as digital games, positive media psychology, eudaimonic media entertainment, and elevation; specifically focusing on adolescents as a target group.

Steven Malliet is an Associate Professor at the Department of Communication Studies, University of Antwerp, Belgium, and a Senior Lecturer/Researcher at the LUCA School of Arts in Genk, Belgium. He holds a PhD in Communication Sciences from the KU Leuven, and his research interests focus on digital game effects, player experiences, serious games, and game realism.

Lieven Geerts holds a BSc in Sociology from the University of Antwerp, and is currently a Master's student in Sociology at the University of Antwerp, Belgium.

Natalie Denayer holds a BSc in Communication Sciences from the University of Antwerp, and is currently a Master's student in Communication Sciences at the University of Antwerp, Belgium.

Michel Walrave is a Full Professor at the Department of Communication Studies, University of Antwerp, Belgium, and the Spokesperson of the Media and ICT in Organizations & Society research group. He holds a PhD in Communication Sciences from the KU Leuven. In his research, he investigates individuals' self-disclosure and privacy in interpersonal online communication and consumers' entrusting of personal data to businesses for marketing purposes.

Heidi Vandebosch is a Full Professor at the Department of Communication Studies, University of Antwerp, Belgium. She holds a PhD in Communication Sciences from the KU Leuven. Her research focuses on cyberbullying among children and adolescents: prevalence, profiles of bullies and victims, impact, and the development of evidence-based interventions (e.g., serious games, narrative interventions, etc.).

COGITATIO

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 62–72
DOI: 10.17645/mac.v9i1.3193

Article

Crooked Views and Relaxed Rules: How Teenage Boys Experience Parents' Handling of Digital Gaming

Mikko Meriläinen

Game Research Lab, Tampere University, 33100 Tampere, Finland; E-Mail: mikko.merilainen@tuni.fi

Submitted: 27 April 2020 | Accepted: 22 June 2020 | Published: 6 January 2021

Abstract
Digital gaming is a major part of the current media landscape. Parents employ a variety of practices, such as limiting gaming time and discussing games, when addressing their childrens' gaming. Yet, there is still a notable gaming-related generational gap between adolescents and their parents. In this qualitative study, gaming-related parenting practices and parents' and teenagers' views are examined through a thematic analysis of reports from Finnish, 16–19-year-old, active game players. The results suggest a core tension between elements of protection and understanding. Perceived parental attitudes towards gaming ranged from excessively negative to indifferent to very positive. These attitudes were not static, but instead changed according to life situations and parents' familiarity with gaming. Young game players' perceptions and views were also not uniform. Respondents indicated the need for both parental understanding of games and gaming, and parents' responsibilities in limiting gaming, particularly in the case of younger children. Implications for parenting and future research are discussed.

Keywords
digital gaming; gaming literacy; media education; parental mediation; parenting

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction

Digital gaming is an established pastime globally. While enjoyed by people of all ages, digital gaming is often addressed in the context of children, adolescents, and emerging adults in both research (e.g., Brus, 2018; Chai, Chen, & Khoo, 2011; Russell & Johnson, 2017) and public discourse (e.g., Gregory, 2020; Stuart, 2020). This is unsurprising considering the popularity of the activity: In the author's native Finland, 36.4% of young people under 20 report playing digital games daily, while 69.8% do so at least weekly (Kinnunen, Lilja, & Mäyrä, 2018).

While it is a common activity, the role of digital gaming is contentious: Since the 1970s, digital gaming has been the subject of both moral panics (Pasanen, 2017) and more legitimate concerns focusing, for example, on problematic or disordered gaming (see Aarseth et al., 2017; Billieux et al., 2017), and the convergence of gaming and gambling (Macey & Hamari, 2019). Despite digital gaming also being an activity common to adults (Entertainment software association, 2019; Kinnunen et al., 2018), studies on gaming as part of family life reveal a notable gaming-related generational gap between adolescents and their parents (e.g., Brus, 2018; Russell & Johnson, 2017). As gaming can be an intensive, time-consuming activity, it has become a challenging parenting issue in some families (Brus, 2018; Chai et al., 2011; Russell & Johnson, 2017).

This article explores teenaged boys' experiences of parental views and practices, as well as their own views on parenting in respect to digital gaming. This is achieved through a thematic analysis of qualitative survey reports from Finnish boys who actively play digital games.

2. Background

In this study, the expressions *gaming-related parenting* and *parenting digital game players* are used interchangeably to discuss the different practices parents adopt when addressing their children's digital gaming. Despite the topicality of the issue, research on parenting adolescent digital game players, especially older adolescents, is sparse. A considerable part of the research literature has approached the subject through quantitative methods, utilizing some variant of the parental mediation model (e.g., Eklund & Bergmark, 2013; Martins, Matthews, & Ratan, 2017; Nikken & Jansz, 2006), originally developed for studying television mediation (Valkenburg, Krcmar, Peeters, & Marseille, 1999). The three practices listed in the parental mediation model, i.e., limiting gaming time or the games children are allowed to play, discussion of gaming and game content, and co-playing games with their children, are often employed by parents addressing their children's gaming (e.g., Jiow, Lim, & Lin, 2016; Martins et al., 2017; Nielsen, Favez, Liddle, & Rigter, 2019). Different styles of mediation may co-occur in families, with suitable methods being chosen according to the situation (Jiow et al., 2016; Nielsen et al., 2019).

There is limited qualitative research on the ways in which parents address young game players' digital gaming. This can be considered a weakness in the existing literature, as both qualitative (e.g., Kutner, Olson, Warner, & Hertzog, 2008) and quantitative (e.g., Martins et al., 2017) approaches have revealed the subject of digital gaming, and gaming-related parenting, to be complex and nuanced. The subject lies at the intersection of three phenomena, parenting, gaming, and youth, all of which are already complex and diverse topics.

While the amount of qualitative research into gaming-related parenting is limited, a growing body exists. Enevold and Hagström (2008) have studied how mothers negotiate their own digital gaming with parenthood and gender expectations, reminding us that in the context of digital gaming parents can also perform the role of an active player, not simply that of a mediator. Furthermore, Enevold (2012), Aarsand and Aronsson (2009), Brus (2018), and Gregersen (2018) have examined how gaming is situated at home, both physically and as a part of family politics and power struggles, and how both parents and children demonstrate agency in the context of gaming.

Interviews with 12–14 year-old boys and their parents about digital gaming, conducted by Kutner's research group (Kutner et al., 2008; Olson, Kutner, & Warner, 2008), demonstrated both parents' concerns related to gaming, and that their children accurately perceive those parental concerns. Most of the adolescents interviewed indicated that they considered their parents to be ignorant about video games, either in general terms, or in respect to their child's gaming habits. Madill's (2011) study of the ways in which parents experience and view adolescents' gaming revealed insecurities and internally conflicting views on gaming and related parenting. As in Kutner et al. (2008), parents recognized both risks and benefits in gaming, yet found it challenging to balance these in their parenting.

Russell and Johnson's (2017) study of parents of emerging adults (aged 23–25) who had been labelled as excessive gamers, highlighted the difficulties parents face when addressing gaming that they perceive as problematic—a situation made especially challenging when their children are already adults and, consequently, no longer dependent on their parents to the same degree. The lack of understanding of gaming displayed by parents in previous studies (e.g., Kutner et al., 2008; Madill, 2011) was also evident in Russell and Johnson's study.

Although an exhaustive review of qualitative research on parenting and video gaming is not possible in the confines of this article, the studies above highlight the complex interplay of gaming and domestic life, with family dynamics affecting gaming, and vice versa. Gaming at home is not contingent on the individual game player alone; instead, it is physically, mentally, and socially shaped by the home environment.

Examples from the domain of problematic digital gaming (e.g., Bax, 2016; Nielsen, 2015) have shown that qualitative approaches can illuminate crucial facets of both parent-child interaction and family dynamics, while also allowing young game players to voice their own views in research concerning them. A considerable portion of the research on young people's gaming concerns the risks involved (e.g., Choo, Sim, Liau, Gentile, & Khoo, 2015; Festl, Scharkow, & Quandt, 2013; Gabbiadini & Riva, 2018), rather than exploring other facets of a common, and often important (e.g., Lenhart, Smith, Anderson, Duggan, & Perrin, 2015) pastime. This is potentially due to a long-standing tendency to, somewhat erroneously, view youth as a period of inevitable problems, of risky behaviour, and of so-called *Storm and Stress* (e.g., Arnett, 1999; Collins & Steinberg, 2008; Steinberg & Morris, 2001).

3. Method and Data

This exploratory study examined teenaged game players' (aged 16–19) views and experiences of gaming-related parenting; a qualitative approach, focusing on detailed reports from a small number of respondents, was adopted in order to better capture nuances of the phenomenon. The study was part of a larger, multi-method study (Meriläinen, 2020) that examined gaming motives and adverse consequences in addition to views on parenting.

The study addresses the following research question:

> How do teenaged digital game players describe and perceive their parents' approach to digital gaming and gaming-related parenting, and how does it compare to their own views?

By addressing this question, the study renders visible everyday interactions around digital gaming, as well as normative views young game players hold of parenting in the context of digital gaming. It adds to a limited body of research which considers young people's gaming from a perspective centred on their own views, with a focus on older adolescents.

A survey questionnaire was administered to male students (N = 22) participating in a voluntary course on gaming culture at a general upper secondary school in the spring of 2018. In Finland, general upper secondary school is typically attended by students aged 16 to 19 in preparation for further studies (Finnish Ministry of Education and Culture, 2020). The questionnaire consisted of background questions (age, weekly gaming time [WGT]) and four open-ended questions, while gaming times were collected in order to retain comparability with other sections of the larger study, and to ensure that the respondents could be considered active game players based on their gaming activity. The open-ended questions consisted of several sentences (e.g., "How do you think guardians should address their children's gaming? You can consider the question in regard to both your own age group and that of game players younger than you"). In addition to questions on views and experiences of game-related parenting, the questionnaire included questions on gaming motives and gaming-related adverse consequences as part of a larger study. While responses to these questions were included in the analysis, findings not related to parenting are not discussed in this article. The total size of the Finnish language data was 3613 words.

A thematic analysis, following Braun and Clarke (2006), was conducted on the data; thematic analysis is a qualitative method in which the researcher seeks to identify broader themes in data, based on either their own interpretation or existing theory. In this study, the former approach was adopted. The conducted thematic analysis was descriptive, focusing on what was explicitly said rather than possible underlying structures. Initially, I identified 110 individual codes in the data, 46 of which related to parenting. Through an iterative process, the codes were grouped into larger sub-themes, which were in turn interpreted to form broader, overarching themes.

The themes discussed in the results section explicitly concern parenting. Other important themes, addressing issues such as motives for gaming, and adverse consequences of gaming, have been discussed in a separate publication (Meriläinen, 2020).

4. Results

The results section is organised according to the two main themes identified: *Protection*, focused on limiting gaming and addressing problems; and *Understanding*, which addressed the need for parents to understand and accept games and gaming. Each theme is examined individually below. Example quotes have been used to illustrate the main themes and sub-themes. Quotes have been translated from Finnish by the author, and minor editing work such as grammar and punctuation, as well as clarification of some sentences, has been performed during translation. To provide context, the respondent's age is reported in parentheses after each quote, as well as their self-reported WGT.

All but one of the respondents reported playing digital games for at least two hours per week. More than half of the respondents (n = 13, of 22) reported playing over 14 hours per week on average, the average WGT for their age group in Finland being 10,8 hours per week at the time the data was gathered (Kinnunen et al., 2018).

4.1. Protection

The main theme *Protection* included the sub-themes: *Rules and limits are needed*, *Age matters*, and *Problems in gaming should be addressed*. These are discussed below.

4.1.1. Rules and Limits are Needed

Respondents both considered that parents should limit gaming in some ways and had experiences of their parents doing so. Different limits on gaming, based on time or age ratings, were usually justified by the protection point of view. Negative impacts of gaming were explicitly and implicitly discussed in many of the responses, especially in the context of younger children, and were presented as justification for limiting gaming. The sub-theme indicates that the concept of limiting gaming in different ways is something that young gamers generally agree with, although not to an unlimited extent, as explored in the second sub-theme:

> I think guardians should limit gaming in some way, because nothing good will come out of it if a child just plays and plays and plays. (16, 14–20h WGT)

> Parents should talk about gaming with their children and set rules, like that they need to do their homework before they're allowed to play, and if they're playing despite not finishing their homework, then parents should take away the controllers. If this continues, then set a rule that gaming is only allowed on weekends. The age ratings of games should also be given a look. (18, 14–20h WGT)

> There must be limits, especially for preteens and small children. Otherwise gaming will get out of control and that will be reflected in poor school performance, among other things. As a child grows and understands the importance of school, they can be given more leeway with their gaming. (18, 14–20h WGT)

4.1.2. Age Matters

Players were given more responsibility for their own gaming with age. As with many other parenting-related views, this was presented both as descriptive and as normative: this had been done and it should be done. The sub-theme reflects the role of development and maturation, as parents appear to acknowledge the difference between teenagers and children, and teenagers in turn wish to set themselves apart from children and young adolescents, possibly also by adopting a stance imitating that of their parents and other adults:

> When I was younger (approximately 6–12 years old) I had a certain amount of "gaming time." I could get more of this gaming time if I went outside to do something else for a few hours. Nowadays my parents assume that I can limit the time I spend on gaming myself, if necessary. (18, 2–7h WGT)

> When I was young, there were strict time limits set on my gaming, but nowadays I play according to my own wants….Time limits need to be set for young gamers, and [parents need to] make sure that too young players don't play too distressing games. (17, 14–20h WGT)

> Before, I had a given time that I could play, but these days my parents don't restrict it in any way….Of course it would be good to pay some attention to younger kids' gaming, but obviously I think that the gaming of my age group doesn't need to be addressed in any way. (17, 7–14h WGT)

4.1.3. Problems in Gaming Should Be Addressed

Responses included wishes for fewer restrictions to gaming, but respondents also mentioned addressing and preventing problems as being important. Addressing problems was typically seen necessary if gaming started causing problems in other areas of life. Importantly, this view did not conflict with an overall positive attitude towards gaming. Responses also revealed some of the issues teenagers identify as risks associated with gaming, such as problems related to school achievement, inadequate sleep, and negative impacts on social relationships:

> If gaming starts to impede e.g., studies or friendships, I think it should/has to be reduced. (18, 2–7h WGT)

> Guardians should adopt as positive a view of gaming as possible and allow it just like other hobbies….Of course parents also have to take responsibility for fulfilling a child's or a youth's needs and make sure that they [children and youth] handle their responsibilities, to prevent for example marginalization or poor school performance. (18, 14–20h WGT)

> Parents shouldn't limit gaming, because limits invite breaking them. Parents should accept that their children are interested in games. This doesn't mean, however, that parents shouldn't monitor sleeping. If a child plays deep into the night, this should be very quickly addressed because it can become a habit. (17, 20–40h WGT)

4.2. Understanding

The main theme of *Understanding* consisted of responses which mentioned the need for parents to understand digital gaming, as well as responses in which parents' views were criticized for a lack of understanding. The theme included sub-themes *Stereotypical negativity*, *Gaming-positive parents*, and *Differing parental views*.

4.2.1. Stereotypical Negativity

Responses in this sub-theme indicated that teenagers perceived, or assumed, parents' attitudes towards gaming as being predominantly negative, disinterested, or both. This appears to be a notable stereotype, with the assumption that parents viewed gaming as "a bogeyman," "a vice" or "a waste of time." Some responses indicated that this perception was based on personal experience, while others were more general:

> My guardian views gaming with a crooked eye, like the stereotype assumes parents to do. Everything that I do wrong or skip doing is magically the fault of "video games." (17, 2–7h WGT)

> Gaming should also be discussed with children, and not just from a negative perspective, but so that you have clearly set rules. Of course, every parent should also observe what kind of an effect gaming has on their child and even play together with them sometimes. (17, 20–40h WGT)

> Guardians should be open-minded towards gaming, and not see it as a bogeyman excluding children from society. Parents should be present in children's gaming and be interested in it, especially at a younger age [presumably the child's]. (19, 7–14h WGT)

> In my opinion guardians should discuss gaming constructively, and not just set time limits and consider games a waste of time. While younger children are not as responsible as those around my age, I still think that their gaming shouldn't be limited all that much. Parents should also discuss gaming and be at least a little interested, so that gaming doesn't just feel like a vice. (18, 2–7h WGT)

4.2.2. Gaming-Positive Parents

There were many reports of positive interactions with parents around gaming. These reports mentioned, for example, playing games together with parents, parents supporting the respondent's gaming hobby or parents' attitudes becoming more positive with time. This contrasts directly with the previous sub-theme; despite the stereotype identified, many parents held predominantly positive views of gaming, whether grounded in their own gaming hobby, the perceived benefits of gaming, or observation of their children's gaming over the years:

> My parents are really relaxed in regard to gaming. If gaming is not impacting other things in my life, such as schoolwork, I'm free to play as much as I want. My parents have supported my gaming especially when I was younger. Gaming was a hobby for me, and my parents supported me in it just as much as they did in my football playing. (19, 2–7h WGT)

> When I was younger, my parents weren't fans of my gaming. They were afraid that it would disturb my schoolwork and/or friendships. Now that school is going well, my parents have started to understand my gaming and realized that gaming doesn't impact my schoolwork, at least not to any meaningful extent. My father plays FPS [first-person shooter] games occasionally, my mother plays FB [Facebook] games. (18, 14–20h WGT)

> We've always had a relaxed approach to gaming at home. Since I was little there have been no attempts to limit my gaming apart from age restrictions when I was younger. When I was younger, my parents played games together with me, which I think helped them better understand my gaming. These days gaming is normal in our house and my little brother has also started gaming. I see my parents adopt a similar approach as they did with me: They play games with my brother and view it as a good way to learn English. (19, 7–14h WGT)

4.2.3. Differing Parental Views

Two of the respondents commented that their parents have differing views on gaming from one another; in one case the respondent's mother held the more positive view, in the other case it was the father. The responses do not reveal whether parents were separated, or if the family was living together, but simply that parents endorsed different views. This theme reminds us that whether co-habiting or separated, parents are still individuals in terms of their views and parenting practices, although parents often likely seek to align the latter to some extent:

> My father holds a very negative view of gaming, because he doesn't see anything beneficial in it. In contrast my mother hasn't really addressed my gaming other than by saying, that I should do something else as well. Still, my mother sees that gaming keeps me happy and that I do it with my friends. My father always makes this old classic connection: gaming is the problem that causes poor school performance. (16, 14–20h WGT)

> My mother's perspective is almost a polar opposite of my father's. My father loves technology and games, whereas my mother has never fully understood this interest. It's the same thing with my gaming. She was strongly against me ever gaming for more than two hours per day, and for many years she tried to get me to stop gaming. She was also very strict with age limits, and if I ever wanted to get games, I had to get them through my father. (17, 20–40h WGT)

5. Discussion

This study examined teenaged digital game players' descriptions of how their parents addressed digital gaming, and how these descriptions compared to the teenagers' own views. In line with previous qualitative studies, results revealed a heterogenous selection of different parental practices and attitudes (e.g., Brus, 2018; Chai et al., 2011; Kutner et al., 2008). Mediation strategies outlined in previous quantitative research (e.g., Eklund & Bergmark, 2013; Martins et al., 2017), as well as other approaches, could be identified in the data.

Two key themes, *Protection* and *Understanding*, were constructed from the responses, and formed the core of the respondents' descriptive and normative views of gaming-related parenting. Although they were two distinct themes, there was overlap: protection and risk mitigation, and understanding gaming were not seen as mutually exclusive, but instead often seen to be complementary.

Gaming-related parenting was often perceived to be reactive, focusing on the protection aspect: limiting gaming in a variety of ways rather than engaging with the activity or seeking to foster skills such as game literacy (e.g., Klimmt, 2009; Squire, 2005). Although parents' negative approach to gaming is a stereotype, the stereotype does not appear to be completely unfounded. While many of the respondents reported their parents worrying over gaming, this worry often did not translate into interest in gaming but, instead, manifested as setting various limitations on gaming. Based on teenagers' reports, in addition to the explicitly negative attitudes, there are still significant gaps in many parents' understanding of games, gaming, and gaming culture. This is similar to the results obtained by both Kutner et al. (2008) and Madill (2011) around a decade previously, suggesting that while parents' knowledge and understanding of gaming may be increasing, the situation is still far from ideal.

Serious conflict in families over gaming (see Brus, 2018; Chai et al., 2011; Russell & Johnson, 2017) was not present in the reports. While minor conflict situations were mentioned, these did not appear to differ from typical arguments occurring between parents and teenagers during youth (Collins & Steinberg, 2008; Steinberg & Morris, 2001). In contrast, several respondents mentioned their parents having a positive approach and participating in their children's gaming in different ways, such as by co-playing or helping them go to LAN parties (see also Brus, 2018). According to the respondents, some parents were active game players themselves (see Enevold & Hagström, 2008), although this was rare.

Parents' views on gaming were often interpreted to be pragmatic, sometimes even indifferent, in situations where parents did not address gaming unless it was perceived as visibly interfering with issues such as school or sleeping patterns. Similar experiences were reported by adolescents in earlier research by Kutner et al. (2008). School performance was repeatedly raised in the responses as a source of parents' worry; sometimes parents would ascribe problems at school to gaming, a view that some of the respondents did not share. However, school disruption due to gaming was also one of the main issues the respondents considered important for parents to address, and to prevent. While there is considerable variation between individuals, moderate gaming has been associated with better school performance in Finnish youth (Meriläinen, 2020).

Parents appeared to become more accommodating of gaming as children matured, an observation in line with previous research (e.g., Eklund & Bergmark, 2013; Shin & Huh, 2011; cf. Brus, 2018). This is likely due to the higher degree of autonomy afforded to older teenagers (e.g., Steinberg & Morris, 2001), as well as to parents' observations of gaming. In several respondents' interpretations, parental worry had decreased with time as no negative changes in their children were noticed, despite years of digital gaming.

The respondents' normative views of gaming-related parenting followed the two main themes discussed above. The balance between elements of the two varied, with some respondents stressing the need to understand, and others the need to protect. Individual quotes suggest that some of the respondents may have turned a descriptive account of their own experience into a normative view on parenting: if something had worked for them, it could, and possibly should, also work as a general rule. According to Hirsjärvi and Perälä-Littunen (2001), the beliefs of older children often resemble those of their parents, suggesting a transmission of beliefs from one generation to another.

It is notable that several of the respondents expressed surprisingly conservative views regarding game-related parenting, conservative in this case meaning views stricter than guidelines suggested by actors such as the APA (American Psychological Association, 2019). These views were typically brought up when discussing younger children's gaming. While respondents did not explicitly mention ages, it can be assumed from the context of their answers that they meant pre-teen and younger children, approximately aged 7–12. Similar results of young game players expressing worry over younger children's gaming, but not their own, have been obtained from early adolescent respondents in previous studies (Scharrer & Leone, 2006; Olson et al., 2008).

Strict or relaxed rules on gaming, whether descriptive or normative, did not appear to be obviously connected to reported amounts of gaming. According to the respondents, parents sometimes complained of excessive gaming despite the actual amounts of gaming being reasonably low, while some respondents who spent considerable amounts of time gaming, and held very positive views on gaming, considered limitations important. This reinforces previous findings that time spent gaming is, in itself, an insufficient measure of the role gaming plays in an individual's life, and by extension that of their family (see e.g., Brunborg, Mentzoni, & Frøyland, 2014; Lemmens, Valkenburg, & Peter, 2011).

5.1. Study Limitations

There are some limitations of the study. First, the results are based on adolescent reports, instead of parent-son dyads (cf. Kutner et al., 2008); thus, they are the respondents' perceptions and interpretations of their parents' views and motives, and as such may differ from how their parents view the situation (see Nikken & Jansz, 2006) or the actual reality of the situation. That which a respondent considers to be an unfair and categorically negative view of gaming may, from the parent's point of view, be a lenient, if cautious, approach. In addition, there is the potential for social desirability bias to be present (see Nederhof, 1985). While respondents were assured of the confidentiality of their responses, and explicitly informed both in text and verbally that the research did not have an agenda to paint gaming as positive or negative, some respondents may have provided what they assumed to be a "correct" or desirable answer. Although the data was rich overall, a few individual responses were brief, consisting of only a few sentences.

While the course had several female students, they, as well as several male students, were unfortunately absent on the day the survey was administered, thus necessitating the focus of this study on male digital game players. As data collection occurred during the school day, and on the final session of the course, scheduling constraints prohibited a second round of data collection. Existing research shows that gender and gender expectations may considerably impact an individual's experiences of digital gaming cultures (e.g., Lopez-Fernandez, Williams, & Kuss, 2019; Salter & Blodgett, 2012; Taylor, Jenson, & de Castell, 2009), and may additionally influence related parenting (Enevold & Hagström, 2008). Gender differences have also been observed in parental influence on problematic gaming (Bonnaire & Phan,

2017; Choo et al., 2015). Although a meta-analysis by Endendijk, Groeneveld, Bakermans-Granenburg, and Mesman (2016) suggests minimal differences in parenting regarding control and autonomy support between boys and girls, parents' worry over gaming appears to focus on boys (e.g., Madill, 2011), implying potentially different parenting approaches based on gender. Further studies are required to explore the gaming, and gaming-related parenting, of female and non-binary game players.

The qualitative nature of the study provides detailed and contextualized data, but also limits its generalizability. This is a common feature of qualitative research (Onwuegbuzie & Leech, 2010). The themes described in the results section, as well as the codes they consist of, are constructed by the researcher; they do not spontaneously emerge but represent the author's interpretation and abstraction (see Braun & Clarke, 2006). Other themes could be interpreted from the same data, based on an individual researcher's interests, views, and disciplinary background, as well as the abstraction level of the themes.

The study features a small, predominantly white, group of Finnish young men attending the same general upper secondary school. Although not representative of young Finnish game players, it illustrates some of the diversity of teenage boys who play digital games, and the variety of their experiences and views of parenting. While demographic information was not collected from participants, their attendance of a general upper secondary school indicates a moderate level of academic achievement, as there are grade requirements for entrance. It should be noted, however, that the grade requirements for this individual school were low compared to city averages. In terms of interest in games and gaming cultures, the collaborating teacher responsible for the course described the respondent group as diverse, with variation in motives for participation (some were intensely interested in gaming cultures, others chose the course for schedule reasons) and engagement with course content. The written responses to the questionnaire support this observation of a diverse group of participants, with heterogenous views and experiences.

5.2. Implications for Parenting and Future Research

Taking the aforementioned limitations into account, this study offers new insights into how older teenagers (cf. Chai et al., 2011; Kutner et al., 2008; Olson et al., 2008) view parenting related to digital gaming: a qualitative approach enabled teenaged game players to voice their views on an issue that directly concerns them. In previous research, qualitative approaches have allowed young game players to challenge prevailing narratives about issues such as problematic gaming (e.g., Brus, 2018; Nielsen, 2015).

Results suggest that tension between protecting youth and children from perceived risks related to gaming, and understanding games, gaming, and gaming cultures, appears to lie at the core of parenting related to digital gaming. This tension was apparent both in the teenaged respondents' descriptions and perceptions of parenting, and in their normative views. While protection and limiting gaming, especially in the case of younger children, was viewed as necessary, the respondents also considered parents' understanding of gaming to be important. Parents' perceived lack of understanding, as well as their negative attitudes, were seen to be problems.

Rather than framing gaming as primarily positive or negative, an approach common in media discourses of gaming (Kümpel & Haas, 2016), many of the reports from the young respondents were nuanced, and the respondents perceived their understanding of the phenomenon to be more advanced than that of their parents. As data in this study and previous research (Bax, 2016; Brus, 2018; Madill, 2011; Nielsen, 2015; Shin & Huh, 2011) inform us, tension and conflict over gaming may result from the fact that parents have difficulties understanding or accepting gaming; a considerable disconnect between parents' and their children's understanding of gaming still exists in many families. Although adults make up a large portion of digital game players (Entertainment software association, 2019; Kinnunen et al., 2018), it is apparent that this does not mean that most parents are familiar with games and gaming, or that they can address them constructively in their parenting. Also, as evidenced by some of the teenagers' views, understanding of, and participating in, gaming culture does not automatically equate to a particularly understanding approach to parenting digital game players.

While the generation gap regarding gaming is mentioned (e.g., Squire, 2005) in existing literature on games and gaming literacy, the importance of parents' gaming literacy is addressed to a very limited extent, with the focus mostly on formal education contexts (e.g., Apperley & Beavis, 2013; Buckingham & Burn, 2007; Squire, 2005; cf. Chuang & Tsai, 2015). This can be considered surprising, as demonstrated by both the current study and existing research (e.g., Brus, 2018; Li, Lo, & Cheng, 2018; Su et al., 2018), while they are living at home, young people's gaming is closely tied to the relationship between them and their parents. It follows that instead of focusing only on youth or their parents in isolation, families should be examined as a system of interconnected actors (see Aarsand & Aronsson, 2009; Brus, 2018; Steinkuehler, 2015).

Despite negative aspects commonly attributed to both digital gaming (Pasanen, 2017) and adolescence (Arnett, 1999), parenting adolescent digital game players did not appear to be a continuous, inevitable struggle, nor were the opinions of teenagers and their parents in polar opposition (see also Kutner et al., 2008). Although some respondents reported minor conflict around gaming, serious incidents were not present in the data. In most responses, digital gaming was framed as an

everyday activity which did not trouble parents as long as it did not interfere with other life areas, especially health and schoolwork. This finding is supported by previous research (e.g., Chai et al., 2011; Madill, 2011; cf. Bax, 2016; Brus, 2018), although the possibility of either an especially conflict-free sample or gaps in reporting cannot be ruled out.

Both this study and much of the literature discussed previously suggest that parents' approaches to parenting digital game players are mainly formed around protection and reactive action, rather than understanding. This is understandable, for example as a result of parents' limited resources, fears, and uncertainties (Madill, 2011), negative media portrayals of gaming (Kümpel & Haas, 2016; Pasanen, 2017), and actualized adverse consequences from gaming (e.g., Brunborg et al., 2014). However, the approach appears to have limited impact in reducing problems associated with gaming (Choo et al., 2015; Meriläinen, 2020), and may even add to them by increasing family tension and conflict (Madill, 2011; Nielsen, 2015; Shin & Huh, 2011). More research, both qualitative and quantitative, is needed to discern the motives and causes leading to different approaches to parenting digital game play, as well as their impact on gaming-related adverse consequences and family dynamics.

To keep gaming-related parenting from becoming merely reactive and protection-focused, parents might adopt a more active and conscious approach, one grounded in an understanding of both gaming as a phenomenon, and the personal and family dynamics involved. Based on teenaged game players' experiences, this could constitute a viable means of alleviating parental concern, helping to bridge the gaming-related generation gap and reducing conflict around gaming, thus promoting well-being in both parents and youth. Gaming-specific media education with the goal of increasing parents' game and gaming literacy (e.g., Klimmt, 2009; Meriläinen, 2020; Squire, 2005) has been suggested as a way to address this (Meriläinen, 2020; Schott, 2010), an argument that finds support in this study (see also Madill, 2011).

This study adds to a body of research which underlines the need to move discussion and parenting practice away from simplistic approaches based on limiting so-called screen time and, instead, towards a more nuanced view of youth well-being and participation in digital cultures (see Blum-Ross & Livingstone, 2018). Youth reports suggest that the broadly criticized idea of young people as passive media victims (Hobbs, 2011) still lingers in parenting practices. Contrary to this view, many of the respondents held nuanced and critical views on gaming and related parenting. These views are best described as responsible, and in some cases even conservative.

The dual aspects of protection and understanding raised by the young respondents strongly suggest that gaming-related parenting should involve more than just protection and setting limits, namely the dimension of seeking to understand and support gaming, and by extension youth autonomy and agency. This approach does not mean that parents should forgo the protection dimension of gaming-related parenting, which was also considered important by young game players, but rather that protection should be one aspect of a broader whole, not its entirety. The result reflects a broader discussion on gaming-related parenting and gaming in general. The needs to protect and to understand have been previously highlighted by both parents (e.g., Madill, 2011) and researchers (e.g., Klimmt, 2009; Meriläinen, 2020), and suggest a key source of tension not only in the context of parenting, but for example in the ongoing discussion of problematic or disordered gaming (see Aarseth et al., 2017; Billieux et al., 2017). While this tension has been explored previously (e.g., Brus, 2018; Madill, 2011), more empirical research is needed to discern how this tension is perceived and negotiated in both everyday domestic situations and in gaming cultures more broadly, and how it is affected by variables such as power dynamics and gaming behaviour.

As a final note, gaming-related parenting, as well as adolescent gaming in general, has received limited attention in game studies, despite the discipline's explicit focus on digital games and gaming (Aarseth, 2001). Considering that digital gaming is a highly prevalent activity among teenagers, and that parents considerably shape youth involvement in gaming, this can be seen as a deficiency in the literature. With the prevalence of problem-focused research and the dearth of studies grounded in nuanced understanding of gaming cultures, there is a risk of research consciously and unconsciously framing youth gaming as primarily a risk for both the players and their parents, thus reinforcing existing negative narratives.

6. Conclusions

The study suggests a core tension between elements of protection and understanding in teenaged game players' descriptions and normative views of gaming-related parenting. Considerable variance in both youth views and reported parenting practices highlight the importance of qualitative approaches when addressing the subject. Teenaged boys' digital gaming, and parenting related to it, are both heterogenous phenomena, contingent on a wide range of situational variables. This complexity should be acknowledged when addressing games and parenting, whether conducting research, devising guidelines, or engaging in public discourse.

Acknowledgments

The author wishes to thank Professor Markku Hannula and Associate Professor Petri Lankoski for their feedback during the research process, as well as the reviewers for their valuable comments. The research was partly funded by the Strategic Research Council

project *Growing Mind: Educational Transformations for Facilitating Sustainable Personal, Social, and Institutional Renewal in the Digital Age* (grant #326603), and a grant from the University of Helsinki.

Conflict of Interests

The author declares no conflict of interests.

References

Aarsand, P. A., & Aronsson, K. (2009). Gaming and territorial negotiations in family life. *Childhood*, *16*(4), 497–517. https://doi.org/10.1177/0907568209343879

Aarseth, E. (2001). Computer game studies, year one. *Game Studies*, *1*(1).

Aarseth, E., Bean, A. M., Boonen, H., Colder Carras, M., Coulson, M., Das, D., . . . Van Rooij, A. J. (2017). Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal. *Journal of Behavioral Addictions*, *6*(3), 267–270. https://doi.org/10.1556/2006.5.2016.088

American Psychological Association. (2019). Digital guidelines: Promoting healthy technology use for children. *Apa.org*. Retrieved from https://www.apa.org/topics/healthy-technology-use-children

Apperley, T., & Beavis, C. (2013). A model for critical games literacy. *E-Learning and Digital Media*, *10*(1). https://doi.org/10.2304/elea.2013.10.1.1

Arnett, J. J. (1999). Adolescent storm and stress, reconsidered. *American Psychologist*, *54*(5), 317–326.

Bax, T. (2016). "Internet Gaming Disorder" in China: Biomedical sickness or sociological badness? *Games and Culture*, *11*(3), 233–255. https://doi.org/10.1177/1555412014568188

Billieux, J., King, D. L., Higuchi, S., Achab, S., Bowden-Jones, H., Hao, W., . . . Poznyak, V. (2017). Functional impairment matters in the screening and diagnosis of gaming disorder: Commentary on—Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal (Aarseth et al.). *Journal of Behavioral Addictions*, *6*(3), 285–289. https://doi.org/10.1556/2006.6.2017.036

Blum-Ross, A., & Livingstone, S. (2018). The trouble with "screen time" rules. In G. Mascheroni, C. Ponte, & A. Jorge (Eds.), *Digital parenting: The challenges for families in the digital age* (pp. 179–187). Göteborg: Nordicom.

Bonnaire, C., & Phan, O. (2017). Relationships between parental attitudes, family functioning and Internet gaming disorder in adolescents attending school. *Psychiatry Research*, *255*, 104–110. https://doi.org/10.1016/j.psychres.2017.05.030

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brunborg, G. S., Mentzoni, R. A., & Frøyland, L. R. (2014). Is video gaming, or video game addiction, associated with depression, academic achievement, heavy episodic drinking, or conduct problems? *Journal of Behavioral Addictions*, *3*(1), 27–32. https://doi.org/10.1556/JBA.3.2014.002

Brus, A. (2018). Generagency and problem gaming as stigma. In A. M. Thorhauge, A. Gregersen, & J. Enevold (Eds.), *What's the problem in problem gaming? Nordic research perspectives* (pp. 51–63). Göteborg: Nordicom.

Buckingham, D., & Burn, A. (2007). Game literacy in theory and practice. *Journal of Educational Multimedia and Hypermedia*, *16*(3), 323–349.

Chai, S. L., Chen, V. H.-H., & Khoo, A. (2011). Social relationships of gamers and their parents. *Procedia—Social and Behavioral Sciences*, *30*, 1237–1241. https://doi.org/10.1016/j.sbspro.2011.10.239

Choo, H., Sim, T., Liau, A. K. F., Gentile, D. A., & Khoo, A. (2015). Parental influences on pathological symptoms of video-gaming among children and adolescents: A prospective study. *Journal of Child and Family Studies*, *24*(5), 1429–1441. https://doi.org/10.1007/s10826-014-9949-9

Chuang, T.-Y., & Tsai, C.-M. (2015). Forecast the scarcity of game generation: Digital game literacy. In T.-B. Lin, V. Chen, & C. Chai (Eds.), *New media and learning in the 21st century: A socio-cultural perspective* (pp. 109–128). Singapore: Springer.

Collins, W. A., & Steinberg, L. (2008). Adolescent development in interpersonal context. In W. Damon & R. Lerner (Eds.), *Child and adolescent development: An advanced course* (pp. 551–592). Hoboken, NJ: Wiley.

Eklund, L., & Bergmark, K. H. (2013). Parental mediation of digital gaming and internet use. In G. N. Yannakakis, E. Aarseth, K. Jørgensen, & J. C. Lester (Eds.), *Proceedings of the 8th international conference on the foundations of digital games (FDG 2013)* (pp. 63–70). Santa Cruz, CA: Society for the Advancement of the Science of Digital Games.

Endendijk, J. J., Groeneveld, M. G., Bakermans-Granenburg, M. J., & Mesman, J. (2016). Gender-differentiated parenting revisited: Meta-analysis reveals very few differences in parental control of boys and girls. *PLoS One*, *11*(7), e0159193. https://doi.org/10.1371/journal.pone.0159193

Enevold, J. (2012). Domesticating play, designing everyday life: The practice and performance of family, gender, and gaming. In R. Koskimaa, F. Mäyrä, & J. Suominen (Eds.), *Proceedings of DiGRA Nordic 2012 Conference: Local and global—Games in culture and society*. Tampere: University of Tampere and Digital Games Research Association DiGRA.

Enevold, J., & Hagström, C. (2008). My momma shoots better than you! Who is the female gamer? In S. Mosberg Iversen (Ed.), *Proceedings of the [player] conference* (pp. 144–167). Copenhagen: IT University of Copenhagen.

Entertainment software association. (2019). *2019 Essential facts about the computer and video game industry*. Washington, DC: Entertainment software association. Retrieved from https://www.theesa.com/wp-content/uploads/2019/05/2019-Essential-Facts-About-the-Computer-and-Video-Game-Industry.pdf

Festl, R., Scharkow, M., & Quandt, T. (2013). Problematic computer game use among adolescents, younger and older adults. *Addiction*, *108*(3), 592–599. https://doi.org/10.1111/add.12016

Finnish Ministry of Education and Culture. (2020). General upper secondary education. *Ministry of Education and Culture*. Retrieved from https://minedu.fi/en/general-upper-secondary-education

Gabbiadini, A., & Riva, P. (2018). The lone gamer: Social exclusion predicts violent video game preferences and fuels aggressive inclinations in adolescent players. *Aggressive Behavior*, *44*(2), 113–124. https://doi.org/10.1002/ab.21735

Gregersen, A. (2018). Games between family, homework, and friends. In A. M. Thorhauge, A. Gregersen, & J. Enevold (Eds.), *What's the problem in problem gaming? Nordic research perspectives* (pp. 35–49). Göteborg: Nordicom.

Gregory, S. (2020, April 22). Don't feel bad if your kids are gaming more than ever. In fact, why not join them? *Time*. Retrieved from https://time.com/5825214/video-games-screen-time-parenting-coronavirus

Hirsjärvi, S., & Perälä-Littunen, S. (2001). Parental beliefs and their role in child-rearing. *European Journal of Psychology of Education*, *16*(1), 87–116.

Hobbs, R. (2011). The state of media literacy: A response to Potter. *Journal of Broadcasting & Electronic Media*, *55*(3), 419–430. https://doi.org/10.1080/08838151.2011.597594

Jiow, H. J., Lim, S. S., & Lin, J. (2016). Level up! Refreshing parental mediation theory for our digital media landscape. *Communication Theory*, *27*(3), 309–328. https://doi.org/10.1111/comt.12109

Kinnunen, J., Lilja, P., & Mäyrä, F. (2018). *Pelaajabarometri 2018: Monimuotoistuva mobiilipelaaminen* [Player barometer 2018: Diversifying mobile gaming] (TRIM Research Reports No. 28). Tampere: University of Tampere. Retrieved from http://urn.fi/URN:ISBN:978-952-03-0870-4

Klimmt, C. (2009). Key dimensions of contemporary video game literacy: Towards a normative model of the competent digital gamer. *Eludamos*, *3*(1), 23–31.

Kümpel, A. S., & Haas, A. (2016). Framing gaming: The effects of media frames on perceptions of game(r)s. *Games and Culture*, *11*(7/8), 720–744. https://doi.org/10.1177/1555412015578264

Kutner, L. A., Olson, C. K., Warner, D. E., & Hertzog, S. M. (2008). Parents' and sons' perspectives on video game play: A qualitative study. *Journal of Adolescent Research*, *23*(1), 76–96. https://doi.org/10.1177/0743558407310721

Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2011). Psychosocial causes and consequences of pathological gaming. *Computers in Human Behavior*, *27*, 144–152. https://doi.org/10.1016/j.chb.2010.07.015

Lenhart, A., Smith, A., Anderson, M., Duggan, M., & Perrin, A. (2015). Teens, technology & friendships. *Pew Research Center*. Retrieved from http://www.pewinternet.org/2015/08/06/teens-technology-and-friendships

Li, A., Lo, B. C., & Cheng, C. (2018). It is the family context that matters: Concurrent and predictive effects of aspects of parent-child interaction on video gaming-related problems. *Cyberpsychology, Behavior, and Social Networking*, *21*(6), 374–380. https://doi.org/10.1089/cyber.2017.0566

Lopez-Fernandez, O., Williams, A. J., & Kuss, D. J. (2019). Measuring female gaming: Gamer profile, predictors, prevalence, and characteristics from psychological and gender perspectives. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.00898

Macey, J., & Hamari, J. (2019). Esports, skins and loot boxes: Participants, practices and problematic behaviour associated with emergent forms of gambling. *New Media and Society*, *21*(1), 20–41. https://doi.org/10.1177/1461444818786216

Madill, L. (2011). *Scripting their stories: Parents' experiences with their adolescents and video games* (Unpublished Doctoral dissertation). University of Victoria, Victoria, Canada. Retrieved from https://dspace.library.uvic.ca/bitstream/handle/1828/3253/Madill_Leanna_PhD_2011.pdf?sequence=1&isAllowed=y

Martins, N., Matthews, N. L., & Ratan, R. A. (2017). Playing by the rules: Parental mediation of video game play. *Journal of Family Issues*, *38*(9), 1215–1238. https://doi.org/10.1111/comt.1210910.1177/0192513X15613822

Meriläinen, M. (2020). *Kohti pelisivistystä: Nuorten digitaalinen pelaaminen ja pelihaitat kotien kasvatuskysymyksenä* [Towards being gaming literate: Youth digital gaming and adverse consequences as a parenting issue] (Helsinki Studies in Education No. 66). Helsinki: University of Helsinki. Retrieved from https://helda.helsinki.fi/handle/10138/309143

Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, *15*(3), 263–280. https://doi.org/10.1002/ejsp.2420150303

Nielsen, P., Favez, N., Liddle, H., & Rigter, H. (2019). Linking parental mediation practices to adolescents' problematic online screen use: A systematic literature review. *Journal of Behavioral Addictions*, *8*(4), 649–663. https://doi.org/10.1556/2006.8.2019.61

Nielsen, R. K. L. (2015). Turning data into people: Player perspectives on game addiction. In D. Brown (Ed.), *2015 International conference on interactive technologies and games* (pp. 76–83). https://doi.org/10.1109/iTAG.2015.17

Nikken, P., & Jansz, J. (2006). Parental mediation of children's videogame playing: A comparison of the reports by parents and children. *Learning, Media and Technology*, *31*(2), 181–202. https://doi.org/10.1080/17439880600756803

Olson, C. K., Kutner, L. A., & Warner, D. E. (2008). The role of violent video game content in adolescent development: Boys' perspectives. *Journal of Adolescent Research*, *23*(1), 55–75. https://doi.org/10.1177/0743558407310713

Onwuegbuzie, A. J., & Leech, N. L. (2010). Generalization practices in qualitative research: A mixed methods case study. *Quality & Quantity*, *44*, 881–892. https://doi.org/10.1007/s11135-009-9241-z

Pasanen, T. (2017). *Beyond the pale: Gaming controversies and moral panics as rites of passage* (Jyväskylä studies in humanities No. 323). Jyväskylä: University of Jyväskylä. Retrieved from http://urn.fi/URN:ISBN:978-951-39-7152-6

Russell, L. L. H., & Johnson, E. I. (2017). Parenting emerging adults who game excessively: Parents' lived experiences. *Issues in Mental Health Nursing*, *38*(1), 66–74. https://doi.org/10.1080/01612840.2016.1253808

Salter, A., & Blodgett, B. (2012). Hypermasculinity & dickwolves: The contentious role of women in the new gaming public. *Journal of Broadcasting & Electronic Media*, *56*(3), 401–416. https://doi.org/10.1080/08838151.2012.705199

Scharrer, E., & Leone, R. (2006). I know you are but what am I? Young people's perceptions of varying types of video game influence. *Mass Communication & Society*, *9*(3), 261–286. https://doi.org/10.1207/s15327825mcs0903_1

Schott, G. (2010). *Parents and gaming literacy*. Wellington: Office of Film and Literature Classification.

Shin, W., & Huh, J. (2011). Parental mediation of teenagers' video game playing: Antecedents and consequences. *New Media & Society*, *13*(6), 945–962. https://doi.org/10.1177/1461444810388025

Squire, K. D. (2005). Toward a media literacy for games. *Telemedium*, *52*(1/2), 9–15.

Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, *52*(83), 83–110. https://doi.org/10.1146/annurev.psych.52.1.83

Steinkuehler, C. (2015). Parenting and video games. *Journal of Adolescent and Adult Literacy*, *59*(4), 357–361. https://doi.org/10.1002/jaal.455

Stuart, K. (2020, January 10). Putting controls on your kids' gaming is a key part of being a parent. *The Guardian*. Retrieved from https://www.theguardian.com/games/2020/jan/10/putting-controls-on-your-kids-gaming-is-a-key-part-of-being-a-parent

Su, B., Yu, C., Zhang, W., Su, Q., Zhu, J., & Jiang, Y. (2018). Father–child longitudinal relationship: Parental monitoring and internet gaming disorder in Chinese adolescents. *Frontiers in Psychology*, *9*(95). https://doi.org/10.3389/fpsyg.2018.00095

Taylor, N., Jenson, J., & de Castell, S. (2009). Cheerleaders/booth babes/Halo hoes: Pro-gaming, gender and jobs for the boys. *Digital Creativity*, *20*(4), 239–252. https://doi.org/10.1080/1462626090329032

Valkenburg, P. M., Krcmar, M., Peeters, A. L., & Marseille, N. S. (1999). Developing a scale to assess three styles of television mediation: "Instructive mediation," "restrictive mediation," and "social coviewing." *Journal of Broadcasting & Electronic Media*, *43*(1), 52–66. https://doi.org/10.1080/08838159909364474

About the Author

Mikko Meriläinen is a Postdoctoral Researcher at Tampere University Game Research Lab, currently working in the Centre of Excellence in Game Culture Studies, funded by the Academy of Finland. In his work, Meriläinen is currently focusing on questions of youth gaming cultures, gaming-related parenting, game jam learning, and miniaturing.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2021, Volume 9, Issue 1, Pages 73–83
DOI: 10.17645/mac.v9i1.3315

Article

Against Game Studies

Alex Gekker

Media Studies, University of Amsterdam, 1012 XT Amsterdam, The Netherlands; E-Mail: a.gekker@uva.nl

Submitted: 1 June 2020 | Accepted: 20 August 2020 | Published: 6 January 2021

Abstract
The article explores the limitations of the current scholarly game studies (GS) field. Its central presuppositions are (1) that there are certain attributes broadly understood as "GS" by those writing in or adjacent to the field; (2) that those attributes are historically rooted in an attempt to disassociate videogames from other types of electronic (and later—digital) media; and that (3) the preconditions that have led to this split are currently moot. In the first section of this article, I elaborate on these presuppositions through reading GS as a historically rooted field, centred around the videogame artefact. Following, by examining the notion of being 'against' something in academic work, I move to my central claim for the article: that maintaining this conception of GS is counterproductive to the state of contemporary videogames scholarship and that adopting a post-dualistic and post-humanities stance will greatly contribute to the broadening of the field. I break down this claim into three separate threads. Ontologically, I show that videogames are much closer to non-videogames than they used to be. Methodologically, I point out how re-integrating methodologies from outside the field is crucial to address the complex phenomena evolved in and around gaming. Politically, I highlight the importance of games in contemporary digital culture and show how boundary-work and gatekeeping might harm the attempt to make game scholarship engage with larger political issues. The article concludes with suggestions for a more inclusive and intermingled vision for the field, focusing on the notion of play rather than games.

Keywords
game studies; play; methodology; post-humanities

Issue
This article is part of the issue "Games and Communication—Quo Vadis?" edited by Marko Siitonen (University of Jyväskylä, Finland), Felix Reer (University of Muenster, Germany) and Teresa de la Hera (Erasmus University Rotterdam, The Netherlands).

1. Introduction: Tilting at Windmills

Critiquing an entire academic field is a fool's errand. At best, one might point at some broad issues that are commonplace in any community of practice, academic or otherwise (cf. Mäyrä & Sotamaa, 2017). At worst, the critique will end up as nothing more than a pedantic rant against a fast-moving target: After all, a scholarly field is rapidly changing and contains multitudes. What is "commonplace" or "central" to the field can disappear the next day. Why, then, author an article lashing *at game studies as a whole*, besides a vague hope of accruing many a-negative citations, in a perverse click-bait-like take on the academic game?

The following pages attempt to prove the endeavour worthwhile. The central presuppositions of this article are: (1) that there are certain attributes broadly understood as "Game Studies" (GS) by those writing in or adjacent to the field; (2) that those attributes are historically rooted in an attempt to disassociate videogames from other types of electronic (and later—digital) media; and that (3) the preconditions that have led to this split are currently moot. In the first section of this article, I elaborate on these presuppositions through reading GS as a particular historiography, rooted in both technical and disciplinary developments. Drawing on key texts that similarly grapple with the field, I present an historically rooted operational definition of GS. Following, I move to my central claim for the article: that maintaining this conception of GS is counter-productive to the state of the contemporary videogames scholarship. I break down this claim into three separate objections: ontological,

methodological and political. The article concludes with (what I hope to be) a productive suggestion for a more inclusive and intermingled vision for the field, focusing on the notion of play rather than games.

Ultimately, this article can be read as a doomed project, a catch-22 of academic hot takes: I write it as someone familiar with GS yet more by way of flirtation than actual embeddedness in the field. I get invited each year to review DiGRA submissions, but never apply myself. On the one hand, I strongly believe that in order to mount a critique of the sorts presented below, one must have a somewhat external look on the field. On the other, to be able to even define the field and defend such critique requires an intimate level of detail available only to the most engaged insiders. The following is an attempt to reconcile this paradox.

2. What's in a Name?

GS can be understood as a "third wave" of research on games, after early anthropological research in the late 19th century and educational takes in the 1970's. Ushered in the early 2000's with the rise of gaming as popular pastime and establishment of key academic journals (Stenros & Kultima, 2018). Originally envisioned as interdisciplinary field (Deterding, 2017) the scholars drawn to it across various domains have attempted to develop a coherent framework for studying games, drawing from stories, mechanics and the communities arising from them, all the while bringing together various ontologies and methodologies from their own fields. With this, Stenros and Kultima draw a comparison to the field of design research as *'a paradoxical task of creating an interdisciplinary discipline*' (Stenros & Kultima, 2018, p. 344, emphasis in original work). Over time, voices within the field grew to re-consider it to include non-digital games and adjacent phenomenon (Mäyrä & Sotamaa, 2017), but as becomes apparent through several recent introspective works, it still skews heavily towards scholarship on a somewhat limited corpus of (mostly) digital games.

In recent years, several attempts have been made to gage the scope, make-up and topics of the field. Scientometric and bibliometric analysis of GS has been carried out using among others meta-data from key publication venues to detect topics and communities in the field (Melcer et al., 2015), the games and genres derived from top publications (Coavoux, Boutet, & Zabban, 2017), longitudinal trends derived from broader co-citation and co-occurrence in GS articles (Martin, 2018) or the canon of games arising from this scholarship (Frome & Martin, 2019). Parallel, surveys have been circulated to gage the self-perception and professional identity of those engaged in researching games (Mäyrä, Van Looy, & Quandt, 2013; Quandt et al., 2015). Consistently, GS was shown to be as rather monolithic in terms of scope, genres and methods, with a strong emphasis on social science and humanities scholarship and separate from technical and cognitive studies of games, although oftentimes bridged to it by design approaches. To be clear: in many ways this is excellent, especially for an emerging discipline. GS arose with the promise to bring cohesion to studying games, and a (relatively) stable repertoire is a step in the right direction. However, as Deterding points out in his state-of-the-field analysis 'while GS were initially formed to be the umbrella interdiscipline *of* (digital) game research, they have become a subcommunity *within* game research' (Deterding, 2017, p. 531., emphasis in original work). He points out to several particular reasons to this, chiefly the exodus of Media, Communication and Psychology scholars to other venues due to career and publishing limitations. He refers to this as the "pyrrhic victory" of GS: by legitimising the scholarship on games, it made easier for academic to pursue game research in broader disciplines. Regardless, he stipulates that:

> Game studies are today constituted by humanities, qualitative social sciences, and design scholars focused on games and play as cultural phenomena of meaning making, with homogenous epistemic cultures: some form of constructivism, pragmatism, or transformative critical theory, with a tendency toward qualitative or textual analysis. (Deterding, 2017 p. 533)

One particular aspect arising from studying the field is the emphasis on certain types of (commercial) gaming phenomena, particularly online games (Coavoux et al., 2017; Frome & Martin, 2019; Martin, 2018). This potentially leads to a *path dependence* that pushes game scholars to focus on a limited number of highly-visible games, genres and related practices, limiting publishing opportunities to those lacking certain gaming capital (Coavoux et al., 2017). Consequently, a familiarity with this canon of games seems to be a requirement for active participation in the field. Deterding (2017) similarly suggests that one potential outcome of GS is that they will become akin to film studies in predominantly addressing the cultural meaning of games, limiting their epistemic and practical authority but embracing such position within the broader game research. Due to contemporary game landscape, as well as the range of phenomena that fall under the term 'game' (Stenros & Kultima, 2018) this possibility might be even more limiting that previously imagined as the gap between established scholarship and current playing practices widens, particularly along race, gender and class divides. As Frome and Martin concur from their analysis of the GS canon:

> Simply put, students who are not familiar with World of Warcraft will not fully understand more than a quarter of the articles in the field's two leading journals. The more students know World of Warcraft, the better they will be able to critically engage with the arguments put forth in articles citing that game, and

> the same is true for Tetris, Grand Theft Auto, and other highly cited "canonical" games.' (Frome & Martin, 2019, p. 16).

Those parallel trends—the focusing of GS on cultural meanings and the reliance on a potentially exclusionary canon—are the key processes that serve as the foundation for the rest of this article's critique. Moreover, as identified by the Ludica research collective already more than a decade ago (Fron, Fullerton, Morie, & Pearce, 2007) and reiterated ever since, this leads to a serious imbalance for women and PoC in terms of access to the scholarly field.

From its inception GS always had a progressive social justice streak and have done much in addressing and critiquing the inequalities of games culture when approaching in-built divides (Consalvo, 2007; Mortensen, 2018; Shaw, 2010, 2012), gender discrepancies (Beavis & Charles, 2007; Cassell & Jenkins, 2000; de Castell & Skardzius, 2019), race (Everett & Watkins, 2008; Gray, 2012), colonial legacies (López, de Wildt, & Moodie, 2019; Mukherjee, 2015) and labour issues (Huntemann, 2013; Kerr, 2016; O'Donnell, 2014; Hammar et al. 2020). However, due to the narrowing described above and despite continuous attempts to open up the ranks, the centrality of *certain digital games* led to a dynamic of boundary-work (Gieryn, 1983; Star & Griesemer, 1989) that can be prohibitive for newcomers and limit the influx of ideas. As Emma Vossen, academic and past editor-in-chief of the popular scholarship website *First Person Scholar* writes in her autoethnographic take on the field:

> When writing about games, I feel that I need to constantly make it clear that I am a lifelong gamer in a way I wouldn't feel the need to establish myself as a lifelong reader of Middle English texts, because my experience in games culture has taught me that if I don't establish myself as someone who has been gaming since childhood, I won't be taken seriously. Because of my gender, if I don't insist on my expertise—and even when I do—I will be assumed not to have it. I've been asked by male scholars and students if I've ever heard of World of Warcraft or Skyrim, yet as an English major no one has ever asked me if I've heard of Nabokov or Dickens. Game studies is unique in this way because it's part of games culture, but also because all game scholars are in some way gamers and therefore even while we study games and those who play them, we still replicate the problems of games culture within our own field and therefore within our own culture. (Vossen, 2018, p. 214)

One could argue, partially based on the empirical introspective research above, that not all GS people are gamers. But therein lies the paradox. Potentially, there exist those who might be participating in GS, but not defining themselves according to their affinity with the medium. In practice, they often find themselves outside of the boundaries of the field. The surveys have shown a surprisingly low diversity in approaches to games. Field participants played an average of one hour or more games each day, two thirds have self-identified as gamers and very few never played a game at all (Mäyrä et al., 2013; Quandt et al., 2015). While a survey through a GS mailing list has an obvious self-selection bias, it nonetheless points to what Vossen identifies above—game researchers are predominantly gamers. Bordering on the banal, this truism opens the possibility for inquiry—what does GS loses when, even today, its opening move hinges on a potentially uniform an exclusionary approach to *games*. My answer, which I will articulate through the rest of this article, is that we lose some of the potential in engaging with objects, phenomena and scholarship existing on the boundaries of games by focusing too much on dualistic ontologies such as what constitutes a game or not, and instead advocate for a "post-humanities" approach to GS (Pettman, 2019). The argument proceeds through examining what does it mean to be "against" something in academia. Establishing the boundaries of the critique, I then suggest that current moment makes games more alike to other range of media phenomena than different from them, arguing against the institutional exceptionalism of GS through three facets: ontologically, methodologically and politically.

3. A Brief History of Against-Ing

What does it mean to be against something, in academic parlance? In brief, it is to recognise a broad framework or concept that is routinely deployed in a community of practice and question its quotidian use. One of the earlier examples in contemporary scholarship is Susan Sontag's (1966/2001) *Against Interpretation*. In it, the essayist and writer rejects the primacy of intellectual engagement with visual and written art, prevalent among her contemporaries. She points that the art world has disallowed mimetic representation notions ("art is what is depicted in art") yet nonetheless kept its foundation belief in the interpretative ones ("art is what can be understood from art"). To her, this rings as a fallacy that prioritises readings of content over the experiential engagement of individual encounter with the text. Consecutively, she writes, '[w]hatever it may have been in the past, the idea of content is today mainly a hindrance, a nuisance, a subtle or not so subtle philistinism' (Sontag, 1966, 2001, p. 2). Rejecting interpretation is one thing—but rejecting the idea of *content*? The answer, of course, is that Sontag revolts not against the notion of content itself, but the prioritization of well-accepted interpretive frameworks (particularly Marxist and Freudian) that neuter the artwork from its revolutionary potential to 'make us nervous' since 'by reducing the work of art to its content and then interpreting that, one tames the work of art. Interpretation makes

art manageable, comfortable' (Sontag, 1966, 2001, p. 5). Similarly, I recognise the existence of games studies as a field aimed at engaging with the complicated relations between videogames and various aspects of culture and society, but I warn against it becoming an interactive variant of film studies with limited ability to act politically outside of its academic circles.

In his excellent provocation *Fuck Nuance*, sociologist Kieran Healy similarly rallies against what he calls 'Actually Existing Nuance,' defined as:

> The act of making—or the call to make—some bit of theory "richer" or "more sophisticated" by adding complexity to it, usually by way of some additional dimension, level, or aspect, but in the absence of any strong means of disciplining or specifying the relationship between the new elements and the existing ones. (Healy, 2017, pp. 119–120)

Healy identifies the rise of nuance as a specific phenomenon in contemporary sociology and traces its start to the 1990s through a word analysis of leading sociological journals. He links it to several different trends in social theory, namely prioritising the empirical; cementing specific theoretical frameworks as a defence from rebuttal; and claiming that social realities cannot be reduced to theory. Some of those trends are also present in GS—particularly the second kind—seeing how many of the field's formalists' keep introducing new frameworks and/or typologies to be applied on selected games. However, my goal here is not to categorise the various moves performed by disciplinary scholars as Healy does. Rather, taking a cue from his historicising of nuance, I suggest that the current platitudes of GS are the product of changes in the field and its object of study, rather than some inherent flaw or a primordial sin. Here I am also influenced by inequalities sociologist Jo Littler's *Against Meritocracy* (2017). Combining a genealogical analysis of the term with a take on its current political deployment, Littler treats the meritocracy discourse as an urgent issue facing society that requires a strategic dissection. While seemingly less crucial, GS too have certain urgency, as games become the frontline of culture and political wars (Chess & Shaw, 2015; MacDonald, 2019). Therefore, my analysis here is never meant to critique or call-out a specific author, school of thought, or research direction. Rather I strive to illuminate contemporary developments within the field and their potential limitations.

This article is therefore far from being a scathing teardown of GS, the disciplinary presuppositions of those coming into it or the foundational theories on what games are or their role in the world (Aarseth, 2001; Abt, 1970; Caillois & Halperin, 1955; Huizinga, 1938; Juul, 2005; Murray, 1997). It is thus not written in the way of Feyerabend's seminal *Against Method* (1993), demolishing its every belief and common knowledge and arguing for epistemological anarchism. Quite the opposite, I welcome and cherish established methodologies and other "ways of doing" but find the current common toolset (identified by Deterding above) somewhat limiting. Still often derived from binaries as ludology/narratology, game/player, intent/meaning, to name but a few, such methodologies can regrettably function as a disciplining tool for who is—or is not—part of the field or which scholarship is accepted (Frasca, 2003; Voorhees, 2013). Let us then move beyond binaries, and instead examine the way those can be synthesised (Del Casino & Hanna, 2006). Specifically, I wish to promote what Escobar (2018) calls a posdualist ontology, one centred less of defining the boundaries of objects (games, in this case) and instead imagining them as continuous across a single ontological plane, with permeable borders.

One of the most famous (games) articles addressing binary thinking is Miguel Sicart's (2011) *Against Procedurality*. It launched a sustained critique of what Sicart perceived to be a practice of ascribing games' meaning primarily to gaps left there by designers for the players to act without agency. The article has ultimately resulted in many back-and-forths followed by an ongoing debate on the agency of designers vis-à-vis that of player. Already in his next major work, Sicart resolves the seemingly opposed meaning and incorporates the notion of procedurality that he was "against" into his analysis of toys and their operant conditions as play-instruments (Sicart, 2014). This type of postdualist ontology is also indicative of the growing line of hybrid thinking that Dominic Pettman (2019) refers to as the "post-humanities," or the intermingling between various forms of humanities and social sciences analyses to better account for the material shift in media technologies constituting life itself (cf. Deuze, 2012). Those two "post-'' approaches will be examined through three separate objections to certain aspects of GS.

4. Ontologically: Resisting the Game Boundary

The initial work on GS was to show how games were new, different, other, 'combin[ing] the aesthetic and the social in a way the old mass media, such as theatre, movies, TV shows and novels never could' (Aarseth, 2001, p. 1). Such proclamation were quite common around novel digital objects in those years, in what new media historian Michael Stevenson (2016) defines to be a rupture—rather than continuous—approach. In other words, entrepreneurs, journalists or scholars alike were eager to establish their own practices as new and distinct, breaking with historical continuities. It is therefore not at all surprising that early game scholars found the need to ascertain a field which also seemed to them 'very open to intrusions and colonisations from the already organized scholarly tribes. Resisting and beating them is the goal of our first survival game' (Eskelinen, 2001, p. 175). And so, much of what GS were originally about came from a sense of historical urgency to define and defend a field unlike many others, in a trajectory similar to the

constant oppositional re-definition that occurs in social sciences (Abbott, 2001). One clear example is in the need to define what constitutes a game or not. Almost two decades after its inception, and still:

> Often game studies should actually be called digital game studies….This may seem like a minor semantic quibble, but as our papers are filled with totalizing statements about "games," we too easily start to believe our own overly broad generalization. Games can be, and are, multiple. (Stenros & Kultima, 2018, p. 346)

Following, I want to suggest that the current media ecosystem has rendered the point moot, as the rapid digitalisation alongside the proliferation of gameplay elements in non-games have left the objects of research extremely porous (Deterding, 2015). Many the conditions that made the game/no-game distinction possible (if they ever existed)—separate physical objects, autotelic gaming devices, clear division into genres and specialised knowledge—are disappearing. From the proliferation of gamification, to the playful role of social media, to the growing ephemerality of goods and services that include gaming software and hardware—drawing clear boundaries is no longer possible. Stenros and Kultima, for example, give examples of game streaming and spectatorship that 'stand in stark contrast to the neat ontologies' which were previously common in GS (Stenros & Kultima, 2018, p. 347). Moreover, as those processes accelerate, I venture that the question of "what is a game and where are its boundaries" matters less than "what do game-like objects mean for the individual and society." Here I want to focus on the case of Bandersnatch, the interactive choose-your-own-adventure episode of the dystopian anthology *Black Mirror* (Slade, 2018).

Presented as a stand-alone offering to accommodate for its unique features, *Black Mirror: Bandersnatch* is a in interactive tale about game development in the form that resembles that of a game. The story follows the misadventures of a young game programmer in the 1980s, who begins to suspect his actions are controlled by sinister external force. This is a meta-commentary as well as a plot point, since the viewer is able to interject in key decision points to choose for the protagonists and influence outcomes. The film has sparked popular interest as well as scholarly one: an initial Google Scholar search revealed more than 300 publications on the film since its release. Bandersnatch scholarship is understandably not limited to games journals. It is used: for an exploration of agency, choice and trauma from philosophical and psychological perspectives (Lay & Johnson, 2019; McSweeney & Joy, 2019); in empirical research on the potential for various interfaces (Nascimento et al., 2019; Roth & Koenitz, 2019); as a mediation over the potential of data extraction and invasive product placement (Elnahla, 2019); a threat for hacking and data theft of the choices made by the viewers (Mitra, Vairam, Slpsk, Chandrachoodan, & Kamakoti, 2019) or within Netflix's overall goals and business models (Raustiala & Sprigman, 2019).

Ultimately, this is where Pettman's ideas are helpful. To him, the major shift that occurrs in researching various forms of digital media moves from epistemology (in our case, the boundary of defining games) to ontology (how do games, as amalgamated entities, exact influence on the world, including on the scholars studying them). Thus:

> [I]f the posthuman is the name we give to the recognition that the human has always been an inherently technical creature, then the post-humanities registers the fact that we are not so much the rational animal, as the mediated animal. Everything we do, think, and communicate is always already mediated. Hence the new global interest in media studies, as something that goes far beyond the analysis of the structures and contents of communications and entertainment industries, to the very heart of our own, semiotically saturated, being. (Pettman, 2019)

Understanding Bandersnatch as a primarily mediated object does not eliminate its potential heritage in games—or interactive/ergodic literature studies. Instead, it offers scholars the possibility of developing cross-disciplinary middle-range theories or boundary objects, advocated by Deterding, as one way to widen GS again. Specifically, it allows to bypass the notion of what is—or not—a game by adopting a perspective of 'be[ing] "the species without qualities": a creature with no clear defining feature, other than its deep need to find a stable definition and raison d'etre for itself' (Pettman, 2019). Approaching such a fuzzy research object requires a reconsideration of our tools as well.

5. Methodologically: Examining the Tools of the Trade

How do we go about researching games? With the seeming narrowing of the field identified previously, in this section I wish to interrogate questions of methodology, both in the sense of approaches to how analyse games, and in the selection of games to analyse. After all, pointing to the lack of representation of sports and dance games in the GS despite their popularity in broader public, Coavoux et al. (2017) contend that:

> [A]s in any field of research, especially research on culture or arts, the personal tastes of researchers in GS matter in the choice of research objects. However, these personal tastes are not only a matter of individual preferences but are also socially distributed. (p. 574)

Therefore, when examining the current state of GS methodologies, one must be mindful of the way messiness, flux and unclear object boundaries (Akrich, 1992)

interact with game researchers' path dependence and may ultimately lead to a repetition in the shape and trajectory of existing scholarship. My call in this section thus follows similar ones from prominent GS scholars to abandon rigid definitions and instead conceive of games as an assemblage or a mess (Bogost, 2009; Taylor, 2009). My point of difference, however, is in paying closer attention to what actually constitutes as tools for GS, and how those tools themselves change under the altering conditions of gaming.

The promise of GS in postdualistic and post-humanities approach is in the ability to:

> Pay special attention to our relationship to relationships; including and especially the relationship to our tools (which themselves are conscientiously helping to reveal new relationships, as well as often rendering older relationships—say, with viruses or carbon—in a new light). (Pettman, 2019)

In other words, I propose taking a (new-)materialist approach to the examination of the processes that lead to the formation of conditions to studying games in one way or the other, moving beyond the ontological traps discussed in the previous section. While Deterding (2017) suggests design focus to expand GS beyond its current scope, Stenros and Kultima (2018) warn that the notion of design is perhaps as multifaceted as games themselves, and caution against the potential loss of context when integrating with game research beyond GS. I agree with them and argue that we can instead move diagonally—re-integrating new directions from media, communications or psychology studies in a the same way it was done during the field's establishment, and thus also potentially countering the 'pyrrhic victory' described by Deterding. Importantly, doing so requires a re-examination of what has changed in the methodologies and epistemologies of those original disciplines, for example the move of media studies away from content and towards infrastructural analysis (Pettman, 2019; Plantin, Lagoze, Edwards, & Sandvig, 2018). In other words, reflecting on the historicity of GS alongside the historicity of the disciplines it moved away from. To demonstrate, let's examine the necessary toolsets to discuss the case of the CSGO Lotto.

In 2017, Trevor "TmarTn" Martin and Thomas "Syndicate" Cassell avoided a US Federal Trade Commission (FTC) fine for their promotion of a gambling site, which they secretly owned (FTC, 2017). The two are Counter Strike: Global Offensive (CS:GO) esports players, youtubers and streamers. From 2015 onwards, as part of their online activity on multiple platforms (mainly: Twitch, YouTube and Twitter) they began promoting a website called "CSGO Lotto." There, users could gamble on the outcome of professional CS:GO events for the chance to acquire weapon skins (cosmetic upgrades). This practice is borderline legal, as many countries forbid unregulated gambling in real money (as opposed to virtual goods) and the thriving CS:GO marketplace allows for conversion of skins into currency, as the case of a purchased rifle skin for $61,000 (Rose, 2018). The main issue in the case of Martin in Cassell, however, was that they owned this website and payed fees to other gaming celebrities as part of a "influencer programme" to promote it, without disclosing this connection to their audiences. Despite all this, FTC decided to settle with the two in their 'First-Ever Complaint Against Individual Social Media Influencers' (FTC, 2017) while also using this case to create and enforce clear influencers' self-disclosure rules.

To understand the case, one must explore the game itself, the (modding) community around it, the decisions made by Valve (the games' creator but also de-facto monopoly in PC gaming), YouTube and streaming culture and the political economy of influencers, at the very least (Abidin, 2016; Burwell & Miller, 2016; Joseph, 2018; Marwick, 2015; Taylor, 2018). These are not only cumulative aspects, but also mutually-entangled ones: a change performed by Valve regarding visibility of external CS:GO gambling sites on its Steam service might result in galvanising the community by a gaming micro-celebrity, which then manifests on other external platforms. All this requires a keen look into the way those various platforms normalise behaviours (Gillespie, 2017), but also how they influence each other in instances of cross-platformisation (Burgess & Matamoros-Fernández, 2016) and the people engaged with them. Consequently, the analysis will strongly benefit from a post-humanities approach that focuses on the "tool-relationship" aspects of all the entities above towards users, players, and towards each other. Such approach would further unashamedly borrow from fields and topics beyond the ones identified as common to GS (Coavoux et al., 2017; Martin, 2018)

6. Politically: Facing Gaming's Future

In her feminist critique Vossen (2018, p. 220) diagnoses a perceived "unseriousness" of GS's subject matter that leads to a defensive stance from those engaged in researching games. I would further argue that for people outside game research, games—and their audiences—are also perceived as very toxic (Mortensen, 2018). It is this combined view on something as silly and/or harmful that leads game scholars to defend games as legitimate medium/hobby to external audiences while mostly detailing its cultural and political flaws *internally*.

Part of this double position is the same territoriality that Aarseth (2001) and Eskelinen (2001) sought to promote in early (and since revised) writings: the field feels pulled into multiple directions. I speculate that some of the more experienced scholars might be somewhat resentful towards the domestication and normalisation of videogames as research objects, due to the processes described by Deterding (2017). They had to overcome resistance in the broader academic commu-

nity and carve a field around this new medium, only to see it become co-opted by other fields (often in a somewhat negative capacity and by those who don't seem to understand games at all). However as outlined throughout this article, this has to do as much with the changes that occurred within the gaming world and parallel "pyrrhic victory" of GS, as with desire of others to "colonise" it. Perhaps, in the spirit of the post-humanities, GS should recognise that they are part of the broader changing digital landscape where 'we can no longer assume we all agree, or even instinctively know, what counts as "media," and where '[e]verything can be considered an enabler of mediation (even objects or phenomena that seem to stubbornly refuse or even discourage communication; such as black boxes or censorship regimes)' (Pettman, 2019).

Adopting this flux and integrating more from other fields into GS might ultimately be the best way to academically represent games, their communities and realities in a time where they are so embroiled in various broader issues. One can only imagine how different the academic response could have been and what actions could be pre-emptively done if GamerGate would not have been perceived as a "games" issue, but rather through a broader societal, political and media upheaval (Wu, 2020). The predominantly female leadership (and other women/PoC members) of DiGRA at that time suffered horrendous abuse due to their seeming association with the "contaminating" of games. Yet the phenomenon has been rarely discussed or acted upon outside of game scholarship and gaming press, and only later was recognised as the proto-alt-right in the making (Lees, 2016). If we presume gaming to be the canary in the mine of contemporary digital culture, who knows what other fascinating—but also dangerous—phenomena lie in its crosshairs yet currently dismissed by more established and powerful fields? Unfortunate as it is, GS simply cannot afford *not to* stubbornly engage with those other disciplines.

7. Conclusions: Playing Together

This article followed a line of critics that identified a certain narrowing of existing GS as a scholarly field and thus potential exclusion of those lacking cultural capital to participate. While trying not to paint with too broad of a brush, I nonetheless attempted to identify three general lacking aspects of GS at large and offer some directions on addressing them.

To be clear, I am far from the only one to make those observation. Much of this work is already found in GS discussions and journals, or in broader media and communications publications. Several recent special issues come to mind that take games through cross-platform and intersectional lenses as a fluid object requiring diverse methodologies. The Ludic Economies issue *of Games and Culture* (Giddings & Harvey, 2018), the Contested Formations in *Television & New Media* (de Peuter & Young, 2019) or the two special issue co-edited by Sonia Fizek on automation for *Journal of Gaming and Virtual Worlds* (Fizek & Rautzenberg, 2018) and the seemingly promising upcoming Laborious Play and Playful Work issue for the *Digital Culture and Society*. Geography scholars have been similarly using games to build new theories on post-phenomenological relations with space (Ash, 2012) to re-examine domesticity (Pink, Hjorth, Horst, Nettheim, & Bell, 2018), or to make sense of ruins and landscapes (Fraser, 2016). Games are used in media studies to reflect on wearable technology (Wilmott, Fraser, & Lammes, 2018), platforms (Nieborg & Poell, 2018; Plantin et al., 2018) or market commodities (Hamari, 2011; Nieborg, 2015). I wish to emphasise again and again that nothing makes the above titles "better" than other game research. Rather, those are some publications that go beyond the established ontologies and methodologies of GS and instead address their messy entanglements with other complicated issues of contemporary media-life.

Finally, we must ask, if not GS—then what? It is always easy to dismantle without offering a constructive alternative (Latour, 2004). My answer is not in the least original and has been touted one way or another by many scholars beforehand: focus on *play* instead of *games* (Mäyrä et al., 2015). While some in the field already use the combined (and cumbersome) *Games and Play Studies*, I would urge to drop the first part altogether. This requires re-examining the relations of GS with the field that sprung from the "second wave" of game research (Stenros & Kultima, 2018) as exemplified in the Association of the Study of Play (TASP). While outside the scope of this article, this association is similarly approaching questions of (anthropological and behavioural) play, as can be seen in its recent *Celebrating 40 Years of Play Research* special collection (Patte, Sutterby, & Johnson, 2016). The revised name would incorporate videogames, but also board games, interactive stories, table-top, eSports, sports (games) and many other activities that are not easily classified as games but currently share some aspects or digital infrastructure (social media or Tinder come to mind), moving away from binary ontologies and towards fluid and inclusive ones. And finally and above all, this would somewhat lower the perceived barrier for newcomers who do not see themselves as gamers or game scholars (or—unfortunately—are not allowed to be seen as such), opening the field for novel ideas, faces and ways. If, as Zimmerman (2015) famously claimed, we are entering a "ludic century," then surely, we need all the help we can get to make sense of it.

Acknowledgments

I wish to thank the participants of the 2019 ECREA Games Section Symposium in Rotterdam who provided valuable feedback on an early presentation version of this article. To the organisers who further encouraged me to submit

to this special issue. To Joleen Bloom who provided a crucial perspective during the re-writing of the article and to Sam Hind, Emma Fraser and Sybille Lammes for their insightful remarks.

Conflict of Interests

The author declares no conflict of interests.

References

Aarseth, E. J. (2001). Computer game studies, year one. *Game Studies*, *1*(1), 1–15.

Abbott, A. D. (2001). *Chaos of disciplines*. Chicago, IL: University of Chicago Press.

Abidin, C. (2016). Visibility labour: Engaging with influencers' fashion brands and #OOTD advertorial campaigns on Instagram. *Media International Australia*, *161*(1), 86–100. https://doi.org/10.1177/1329878X16665177

Abt, C. C. (1970). *Serious games*. New York, NY: The Viking Press.

Akrich, M. (1992). The de-scription of technical objects. In W. E. Bijker & J. Law (Eds.), *Shaping technology/building society* (pp. 205–224). Cambridge, MA: The MIT Press.

Ash, J. (2012). Technology, technicity, and emerging practices of temporal sensitivity in videogames. *Environment and Planning A*, *44*(1), 187–203. https://doi.org/10.1068/a44171

Beavis, C., & Charles, C. (2007). Would the "real" girl gamer please stand up? Gender, LAN cafés and the reformulation of the "girl" gamer. *Gender & Education*, *19*(6), 691–705. https://doi.org/10.1080/09540250701650615

Bogost, I. (2009). *Videogames are a mess*. Paper presented at the Digtial Games Research Association (DiGRA) 2009 conference, Uxbridge, UK. Retrieved from http://bogost.com/writing/videogames_are_a_mess

Burgess, J., & Matamoros-Fernández, A. (2016). Mapping sociocultural controversies across digital media platforms: One week of #gamergate on Twitter, YouTube, and Tumblr. *Communication Research and Practice*, *2*(1), 79–96. https://doi.org/10.1080/22041451.2016.1155338

Burwell, C., & Miller, T. (2016). Let's play: Exploring literacy practices in an emerging videogame paratext. *E-Learning and Digital Media*, *13*(3/4), 109–125. https://doi.org/10.1177/2042753016677858

Caillois, R., & Halperin, E. P. (1955). The structure and classification of games. *Diogenes*, *3*(12), 62–75. https://doi.org/10.1177/039219215500301204

Cassell, J., & Jenkins, H. (Eds.). (2000). *From Barbie to Mortal Kombat: Gender and computer games*. Cambridge, MA: The MIT Press.

Chess, S., & Shaw, A. (2015). A conspiracy of fishes, or, how we learned to stop worrying about #gamergate and embrace hegemonic masculinity. *Journal of Broadcasting & Electronic Media*, *59*(1), 208–220. https://doi.org/10.1080/08838151.2014.999917

Coavoux, S., Boutet, M., & Zabban, V. (2017). What we know about games: A scientometric approach to game studies in the 2000s. *Games and Culture*, *12*(6), 563–584. https://doi.org/10.1177/1555412016676661

Consalvo, M. (2007). *Cheating: Gaining advantage in videogames*. Cambridge, MA: The MIT Press.

de Castell, S., & Skardzius, K. (2019). Speaking in public: What women say about working in the video game industry. *Television & New Media*, *20*(8), 836–847. https://doi.org/10.1177/1527476419851078

de Peuter, G., & Young, C. J. (2019). Contested formations of digital game labor. *Television & New Media*, *20*(8) 747–755. https://doi.org/10.1177/1527476419851089

Del Casino, V., & Hanna, S. P. (2006). Beyond the 'binaries': A methodological intervention for interrogating maps as representational practices. *ACME: An International E-Journal for Critical Geographies*, *4*(1), 34–56.

Deterding, S. (2015). The ambiguity of games: Histories and discourses of a gameful world. In S. P. Walz & S. Deterding (Eds.), *The gameful world: Approaches, issues, applications* (pp. 23–64). Boston, MA: The MIT Press.

Deterding, S. (2017). The pyrrhic victory of game studies: Assessing the past, present, and future of interdisciplinary game research. *Games and Culture*, *12*(6), 521–543. https://doi.org/10.1177/1555412016665067

Deuze, M. (2012). *Media life* (1st ed.). Cambridge and Malden, MA: Polity.

Elnahla, N. (2019). Black mirror: Bandersnatch and how Netflix manipulates us, the new gods. *Consumption Markets & Culture*, *23*(5), 506–511. https://doi.org/10.1080/10253866.2019.1653288

Escobar, A. (2018). *Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds*. Durham: Duke University Press Books.

Eskelinen, M. (2001). Towards computer game studies. *Digital Creativity*, *12*(3), 175–183. https://doi.org/10.1076/digc.12.3.175.3232

Everett, A., & Watkins, C. (2008). The power of play: The portrayal and performance of race in video games. In K. Salen (Ed.), *The ecology of games: Connecting youth, games, and learning* (pp. 141–166). Cambridge, MA: The MIT Press.

Federal Trade Commission. (2017, September 7). CSGO lotto owners settle FTC's first-ever complaint against individual social media influencers. *Federal Trade Commission*. Retrieved from https://www.ftc.gov/news-events/press-releases/2017/09/csgo-lotto-owners-settle-ftcs-first-ever-complaint-against

Feyerabend, P. (1993). *Against method* (3rd ed.). London and New York, NY: Verso. (Original work published 1975)

Fizek, S., & Rautzenberg, M. (2018). The work of game in the age of automation. *Journal of Gaming & Virtual Worlds*, *10*(3), 197–201. https://doi.org/10.1386/jgvw.10.3.197_2

Frasca, G. (2003). *Ludologists love stories, too: Notes from a debate that never took place*. Paper presented at Digtial Games Research Association (DiGRA) conference 2003: Level Up, Utrecht, Netherlands. Retrieved from http://www.digra.org/wp-content/uploads/digital-library/05163.01125.pdf

Fraser, E. (2016). Awakening in ruins: The virtual spectacle of the end of the city in video games. *Journal of Gaming & Virtual Worlds*, *8*(2), 177–196. https://doi.org/10.1386/jgvw.8.2.177_1

Frome, J. H., & Martin, P. (2019, August 7). *Describing the game studies canon: A game citation analysis*. Paper presented at the Digital Games Research Association (DiGRA) Conference 2019: Game, Play and the Emerging Ludo Mix, Kyoto, Japan. Retrieved from http://www.digra.org/digital-library/publications/describing-the-game-studies-canon-a-game-citation-analysis

Fron, J., Fullerton, T., Morie, J. F., & Pearce, C. (2007). *Playing dress-up: Costumes, roleplay and imagination*. Paper presented at Philosophy of Computer Games Conference, University of Wales, Newport, UK. Retrieved from http://gamephilosophy.org/wp-content/uploads/confmanuscripts/pcg2007/Pearce_PaperPCG2007.pdf

Giddings, S., & Harvey, A. (2018). Introduction to special issue ludic economies: Ludic economics 101. *Games and Culture*, *13*(7), 647–651. https://doi.org/10.1177/1555412018755912

Gieryn, T. F. (1983). Boundary-work and the demarcation of science from non-science: Strains and interests in professional ideologies of scientists. *American Sociological Review*, *48*(6), 781. https://doi.org/10.2307/2095325

Gillespie, T. (2017). Governance of and by platforms. In J. Burgess, A. E. Marwick, & T. Poell (Eds.), *The Sage handbook of social media* (pp. 254–278). Thousand Oaks, CA: Sage.

Gray, K. L. (2012). Deviant bodies, stigmatized identities, and racist acts: Examining the experiences of African-American gamers in Xbox Live. *New Review of Hypermedia and Multimedia*, *18*(4), 261–276. https://doi.org/10.1080/13614568.2012.746740

Hamari, J. (2011). *Perspectives from behavioral economics to analyzing game design patterns: Loss aversion in social games*. Paper presented at the CHI2011 conference (Social games workshop), Vancouver, Canada. Retrieved from http://www.researchgate.net/profile/Juho_Hamari

Healy, K. (2017). Fuck nuance. *Sociological Theory*, *35*(2), 118–127. https://doi.org/10.1177/0735275117709046

Nascimento, T. H., Nunes, F. A. A. D. M., Vieira, M. A., Felix, J. P., Mombach, J. G., de Campos, L. M. C., . . . & da Costa, R. M. (2019). Using smartwatches as an interactive movie controller: A case study with the Bandersnatch movie. In V. Getov, J.-L. Gaudiot, N. Yamai, S. Cimato, M. Chang, Y. Teranishi, . . . S. Puri (Eds.), *Processings 2019 IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC)* (pp. 263-268). Piscataway, NJ: IEEE. https://doi.org/10.1109/COMPSAC.2019.10217

Hammar, E. L., Wildt, L. de, Mukherjee, S., & Pelletier, C. (2020). Politics of Production: Videogames 10 years after Games of Empire. *Games and Culture*. https://doi.org/10.1177/1555412020954996

Huizinga, J. (1938). *Homo ludens: Proeve eener bepaling van het spel-element der cultuur* [Homo ludens: A study of the play-element in culture]. Amsterdam: Amsterdam University Press.

Huntemann, N. B. (2013). Women in video games: The case of hardware production and promotion. In N. B. Huntemann & B. Aslinger (Eds.), *Gaming globally: Production, play, and place* (pp. 41–57). New York, NY: Palgrave Macmillan US. https://doi.org/10.1057/9781137006332_3

Joseph, D. J. (2018). The discourse of digital dispossession: Paid modifications and community crisis on steam. *Games and Culture*, *13*(7), 208–233. https://doi.org/10.1177/1555412018756488

Juul, J. (2005). *Half-real: Video games between real rules and fictional worlds*. Cambridge, MA: The MIT Press.

Kerr, A. (2016). *Global games: Production, circulation and policy in the networked era* (1st ed.). London and New York, NY: Routledge.

Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical Inquiry*, *30*(2), 225–248. https://doi.org/10.1086/421123

Lay, C., & Johnson, D. K. (2019). Bandersnatch, a choose-your-own philosophical adventure. In David Kyle Johnson and William Irwin (Eds.), *Black Mirror and philosophy: Dark Reflections* (pp. 197–238). Hoboken, NJ: John Wiley & Sons. https://doi.org/10.1002/9781119578291.ch20

Lees, M. (2016, December 1). What gamergate should have taught us about the "alt-right." *The Guardian*. Retrieved from https://www.theguardian.com/technology/2016/dec/01/gamergate-alt-right-hate-trump

Littler, J. (2017). *Against meritocracy: Culture, power and myths of mobility*. London: Routledge.

López, L., de Wildt, L., & Moodie, N. (2019). 'I don't think you're going to have any aborigines in your world': Minecrafting terra nullius. *British Journal of Sociology of Education*, *40*(8), 1037–1054. https://doi.org/10.1080/01425692.2019.1640596

MacDonald, K. (2019, May 9). We've seen Carl Benjamin's rank misogyny before: Remember gamergate? *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2019/may/09/gamergate-carl-benjamin-ukip-mep

Martin, P. (2018). The intellectual structure of game research. *Game Studies*, *18*(1). Retrieved from http://gamestudies.org/1801/articles/paul_martin

Marwick, A. E. (2015). Instafame: Luxury selfies in the attention economy. *Public Culture*, *27*(1(75)), 137–160. https://doi.org/10.1215/08992363-2798379

Mäyrä, F., Lammes, S., Deterding, S., Giddings, S., Consalvo, M., Mortensen, T. E., . . . Jorgensen, K. (2015). *From game studies to studies of play in society: A panel*. Paper presented at the Digital Games Research Association (DiGRA) 2015: Diversity of Play: Games—Cultures—Identities, Lüneburg, Germany. Retrieved from https://fransmayra.fi/2015/05/15/panel-from-game-studies-to-studies-of-play-in-society

Mäyrä, F., & Sotamaa, O. (2017). Need for perspective: Introducing the special issue "Reflecting and Evaluating Game Studies." *Games and Culture*, *12*(6), 495–498. https://doi.org/10.1177/1555412016672780

Mäyrä, F., Van Looy, J., & Quandt, T. (2013). Disciplinary identity of game scholars: An outline. In *Proceedings Digital Games Research Association, Proceedings*. Paper presented at the Digital Games Research Association (DiGRA 2013). Retrieved from http://hdl.handle.net/1854/LU-4225122

McSweeney, T., & Joy, S. (2019). Change your past, your present, your future? Interactive narratives and trauma in Bandersnatch (2018). In T. McSweeney & S. Joy (Eds.), *Through the Black Mirror: Deconstructing the side effects of the digital age* (pp. 271–284). Cham: Springer. https://doi.org/10.1007/978-3-030-19458-1_21

Melcer, E. F., Nguyen, T.-H. D., Chen, Z., Canossa, A., El-Nasr, M. S., & Isbister, K. (2015). *Games research today: Analyzing the academic landscape*. Paper presented at Proceedings of the 10th International Conference on the Foundations of Digital Games (FDG 2015), Pacific Grove, CA.

Mitra, G., Vairam, P. K., Slpsk, P., & Chandrachoodan, N., & Kamakoti, V. (2019). White mirror: Leaking sensitive information from interactive Netflix movies using encrypted traffic analysis. In *Proceedings of the ACM SIGCOMM 2019 Conference Posters and Demos* (pp. 122–124). Beijing: Association for Computing Machinery. https://doi.org/10.1145/3342280.3342330

Mortensen, T. E. (2018). Anger, fear, and games: The long event of #GamerGate. *Games and Culture*, *13*(8), 787–806. https://doi.org/10.1177/1555412016640408

Mukherjee, S. (2015). The playing fields of empire: Empire and spatiality in video games. *Journal of Gaming & Virtual Worlds*, *7*(3), 299–315.

Murray, J. H. (1997). *Hamlet on the holodeck: The future of narrative in cyberspace*. New York, NY: Free Press.

Nieborg, D. B. (2015). Crushing candy: The free-to-play game in its connective commodity form. *Social Media+ Society*, *1*(2). https://doi.org/10.1177/2056305115621932

Nieborg, D. B., & Poell, T. (2018). The platformization of cultural production: Theorizing the contingent cultural commodity. *New Media & Society*, *20*(11), 4275–4292. https://doi.org/10.1177/1461444818769694

O'Donnell, C. (2014). *Developer's dilemma: The secret world of videogame creators*. Cambridge, MA: The MIT Press.

Patte, M. M., Sutterby, J. A., & Johnson, J. E. (2016). *Celebrating 40 years of play research: Connecting our past, present, and future*. Lanham, MD: Hamilton Books. Retrieved from http://ebookcentral.proquest.com/lib/uvanl/detail.action?docID=4658772

Pettman, D. (2019, April 23). The species without qualities: Critical media theory and the posthumanities. *B2O*. Retrieved from http://www.boundary2.org/2019/04/the-species-without-qualities-critical-media-theory-and-the-posthumanities

Pink, S., Hjorth, L., Horst, H., Nettheim, J., & Bell, G. (2018). Digital work and play: Mobile technologies and new ways of feeling at home. *European Journal of Cultural Studies*, *21*(1), 26–38. https://doi.org/10.1177/1367549417705602

Plantin, J.-C., Lagoze, C., Edwards, P. N., & Sandvig, C. (2018). Infrastructure studies meet platform studies in the age of Google and Facebook. *New Media & Society*, *20*(1), 293–310. https://doi.org/10.1177/1461444816661553

Quandt, T., Van Looy, J., Vogelgesang, J., Elson, M., Ivory, J. D., Consalvo, M., & Mäyrä, F. (2015). Digital games research: A survey study on an emerging field and its prevalent debates. *Journal of Communication*, *65*(6), 975–996. https://doi.org/10.1111/jcom.12182

Raustiala, K., & Sprigman, C. J. (2019). The second digital disruption: Streaming and the dawn of data-driven creativity. *New York University Law Review*, *94*(6), 1555–1622.

Rose, V. (2018, January 30). CS:GO fan drops $61K on rifle skin signed by tournament MVP. *Polygon*. Retrieved from https://www.polygon.com/2018/1/30/16952248/counter-strike-global-offensive-dragon-lore-skadoodle-skin-sale-opskins

Roth, C., & Koenitz, H. (2019). Bandersnatch, yea or nay? Reception and user experience of an interactive digital narrative video. In *Proceedings of the 2019 ACM International Conference on Interactive Experiences for TV and Online Video* (pp. 247–254). Salford: Association for Computing Machinery. https://doi.org/10.1145/3317697.3325124

Shaw, A. (2010). What is video game culture? Cultural studies and game studies. *Games and Culture*, *5*(4), 403–424. https://doi.org/10.1177/1555412009360414

Shaw, A. (2012). Do you identify as a gamer? Gender, race, sexuality, and gamer identity. *New Media & Society*, *14*(1), 28–44. https://doi.org/10.1177/

1461444811410394
Sicart, M. (2011). Against procedurality. *Game Studies*, *11*(3). Retrieved from http://gamestudies.org/1103/articles/sicart_ap
Sicart, M. (2014). *Play matters*. Cambridge, MA: The MIT Press.
Brooker, C. (Writer), Slade, D. (Diretor). (2018). Black Mirror: Bandersnatch [Television series episode]. In Russell McLean (Executive producer), *Black Mirror*. London: House of Tomorrow, Netflix.
Sontag, S. (2001). *Against interpretation, and other essays*. New York, NY: Picador U.S.A. (Original work published 1966)
Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's museum of vertebrate zoology, 1907–39. *Social Studies of Science*, *19*(3), 387–420. https://doi.org/10.1177/030631289019003001
Stenros, J., & Kultima, A. (2018). On the expanding ludosphere. *Simulation & Gaming*, *49*(3), 338–355. https://doi.org/10.1177/1046878118779640
Stevenson, M. (2016). Rethinking the participatory web: A history of HotWired's "new publishing paradigm," 1994–1997. *New Media & Society*, *18*(7), 1331–1346. https://doi.org/10.1177/1461444814555950
Taylor, T. L. (2009). The assemblage of play. *Games and Culture*, *4*(4), 331–339. https://doi.org/10.1177/1555412009343576
Taylor, T. L. (2018). *Watch me play: Twitch and the rise of game live streaming*. Princeton, NJ: Princeton University Press.
Voorhees, G. (2013). Criticism and control: Gameplay in the space of possibility. In M. Wysocki (Ed.), *Ctrl-Alt-Play: Essays on control in video gaming* (pp. 9–20). Jefferson, NC: McFarland.
Vossen, E. (2018). *On the cultural inaccessibility of gaming: Invading, creating, and reclaiming the cultural clubhouse*. Waterloo: UWSpace. Retrieved from https://uwspace.uwaterloo.ca/handle/10012/13649
Wilmott, C., Fraser, E., & Lammes, S. (2018). 'I am he. I am he. Siri rules': Work and play with the Apple watch. *European Journal of Cultural Studies*, *21*(1), 78–95. https://doi.org/10.1177/1367549417705605
Wu, B. [@BriannaWu]. (2020, June 20). 1/ A high-profile journalist writing a book about online radicalization told me recently that all his research kept pointing back to Gamergate, and he regretted not taking it more seriously. I'd like you to imagine an alternate timeline where we. [Tweet]. Retrieved from: https://twitter.com/BriannaWu/status/1274343193228840966
Zimmerman, E. (2015). Manifesto for a ludic century. In S. P. Walz & S. Deterding (Eds.), *The gameful world: Approaches, issues, applications* (pp. 19–22). Boston, MA: The MIT Press. Retrieved from http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2463983

About the Author

Alex Gekker is an Assistant Professor of New Media and Digital Culture at the University of Amsterdam. He writes on the ways in which sociotechnical systems are designed to influence users, and his research touches upon maps and surveillance, quantification and datafication of society, the experience economy and interface critique. He co-edited two Open Access books on mapping, one on temporality and the other on play.

Media and Communication (ISSN: 2183-2439)

Media and Communication is an international open access journal dedicated to a wide variety of basic and applied research in communication and its related fields. It aims at providing a research forum on the social and cultural relevance of media and communication processes.

www.cogitatiopress.com/mediaandcommunication

COGITATIO