TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Shaping Attitudes Across Realities

Citation for published version (APA):
Kors, M. J. L. (2022). *Shaping Attitudes Across Realities: Design Research at the Crossroads of Persuasive Games, Empathy, and Immersion*. [Phd Thesis 1 (Research TU/e / Graduation TU/e), Industrial Design]. Eindhoven University of Technology.

Document status and date:
Published: 09/06/2022

Document Version:
Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

• A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
• The final author version and the galley proof are versions of the publication after peer review.
• The final published version features the final layout of the paper including the volume, issue and page numbers.

Link to publication

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.tue.nl/taverne

Take down policy
If you believe that this document breaches copyright please contact us at:

openaccess@tue.nl

providing details and we will investigate your claim.

Download date: 17. Nov. 2023

Shaping Attitudes Across Realities

Design Research at the Crossroads of Persuasive Games, Empathy, and Immersion

Martijn Kors

This page intentionally left blank

Shaping Attitudes Across Realities

Design Research at the Crossroads of Persuasive Games, Empathy, and Immersion

Martijn Kors

The work presented in this dissertation is part of the project ‘Persuasive Gaming. From theory-based design to validation and back’ with number 314-99-106, funded by the Dutch Research Council. This project is a collaboration between the Eindhoven University of Technology, the Erasmus University Rotterdam, and the Utrecht University.

The design-oriented part of this collaboration is described in this dissertation, and carried out at the Eindhoven University of Technology and the Amsterdam University of Applied Sciences.

Cover and chapter opening page illustrations: Haruno Ito

A catalogue record is available from the Eindhoven University of Technology Library.

ISBN: 978-90-386-5507-9

This work can be cited (APA) as: Kors, M. J. L. (2022). Shaping Attitudes Across Realities: Design Research at the Crossroads of Persuasive Games, Empathy, and Immersion. Eindhoven University of Technology.

© 2022 Martinus (Martijn) Josef Ludovicus Kors. All Rights Reserved.

Shaping Attitudes Across Realities

Design Research at the Crossroads of Persuasive Games, Empathy, and Immersion

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Technische Universiteit Eindhoven, op gezag van de rector magnificus prof.dr.ir. F.P.T. Baaijens, voor een commissie aangewezen door het College voor Promoties, in het openbaar te verdedigen op donderdag 9 juni 2022 om 11:00 uur

door

Martinus Josef Ludovicus Kors

geboren te Naarden

Dit proefschrift is goedgekeurd door de promotoren en de samenstelling van de promotiecommissie is als volgt:

Voorzitter:	prof.dr. L. Chen
Promotor:	prof.dr. B.A.M. Schouten
Copromotoren:	dr. E.D. van der Spek
	dr. G. Ferri (Hogeschool van Amsterdam)
Promotiecommissieleden:	prof.dr. W.A. IJsselsteijn
	prof.dr. J. Jansz (Erasmus Universiteit Rotterdam)
	prof.dr. J.F.F. Raessens (Universiteit Utrecht)
	prof.dr. J.A.L. Hoeken (Universiteit Utrecht)
	prof.dr. F. Mueller (Monash University)

Het onderzoek of ontwerp dat in dit proefschrift wordt beschreven is uitgevoerd in overeenstemming met de TU/e Gedragscode Wetenschapsbeoefening.

This page intentionally left blank

Summary

Games are no longer designed exclusively for entertainment purposes, but increasingly often to aid in other pursuits such as problem solving, exercising, educating, as well as persuading. The work presented in this dissertation focuses on the latter burgeoning employment of games, often referred to as persuasive games, and thus designed with the specific intent to shape how players think and feel about people, objects, or issues in the extrafictional (real) universe. Think of a city-building game designed to make one realize how important it is to have enough green spaces or an action-adventure game designed to let one feel the struggles of someone dealing with psychosis to increase understanding of the condition. Other media, including books and film, can shape attitudes too, but games are unique in their capacity to facilitate a persuasive process through their interactive affordances and immersive properties, in turn opening up new and exciting possibilities for persuasive communication.

Over the past two decades a growing interest in persuasive games can be observed from both design and research fields alike, and the recent rapid diffusion of affordable immersive technologies has further helped to garner attention for the opportunities of interactive experiences to raise empathy and shape attitudes. However, practical design-oriented research to help advance this employment of games and use of immersive technologies is still limited. In response, this work takes on a design-oriented hat and explores persuasive game design and development, looking both at contemporary approaches as well as yet-untapped opportunities and challenges for persuasive game design, including an appeal to empathy and the use of immersive technologies.

Following a design research approach situated within the research field of Human-Computer Interaction, the objectives of this work are to map the landscape of persuasive games, survey current approaches and novel opportunities for persuasive game design, and explore the factors of empathy and immersion in the design of socially aware persuasive games.

To address these objectives, this work sets out to answers the following research questions respectively:

1. What are persuasive games, how do players interact with them, and how are they designed?
2. What are the current approaches and novel opportunities for persuasive game design?
3. How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?

The first chapters of this dissertation address research question 1 by offering a foundation for persuasive games and persuasive game design, describing the field of persuasive games, how players interact with them, and how they are professionally produced. The middle chapters of this dissertation address research question 2 by distilling the work discussed thus far and zooming in on the design space that lies at the crossroads of persuasive games, empathy, and immersion. The final chapters follow research question 3 and explore this still uncharted design space through the deployment of two research through design projects, A Breathtaking Journey and Permanent, illustrating various ways in which immersion and empathy can work together in socially aware persuasive games. In the concluding chapter, all the work is distilled into a set of practical insights, including the employment of different perspectives to empathic engagement, the importance of creating pockets of downtime during play, the value of offering in-game references to the real universe, the challenges of emotionally difficult experiences, as well as issues with impromptu role-play that could fuel self-absorption.

A reading guide and a summary of all chapters can be found in section 1.6 Overview of Chapters on page 26.

Altogether this dissertation offers a practical perspective - along with illustrative example cases - on how to strategically combine empathy and immersion in the design of socially aware persuasive games, in turn contributing to the advancement of persuasive game design and research.

Contents

1 / Introduction **11**

1.1 Design Research Focus 12
1.2 Design Research Objectives and Questions 15
1.3 Design Research Space 20
1.4 Design Research Approach 22
1.5 Design Research Contributions 25
1.6 Overview of Chapters 26

2 / Persuasion through Games **33**

2.1 Introduction 34
2.2 Persuasive Games 35
2.3 Persuasive Gameplay 60
2.4 Conclusion 77

3 / Persuasive Game Design **81**

3.1 Introduction 82
3.2 Persuasive Systems 83
3.3 Conducive Experiences 87
3.4 Persuasive Game Design Process 99
3.5 Conclusion 104

4 / Persuasive Game Production **107**

4.1 Introduction 108
4.2 Study Summary 111
4.3 This War of Mine 112
4.4 Method 122
4.5 Results 124
4.6 Discussion and Conclusion 133

5 / Empathic Engagement and Immersive Technologies **137**

5.1 Introduction 138
5.2 The Factors of Empathy and Immersion 139
5.3 Design Research Framework 140
5.4 A Springboard for Further Design Exploration 146
5.5 Conclusion 148

6 / A Victim Perspective to Empathic Engagement **151**
6.1 Abstract 152
6.2 Introduction 152
6.3 A Breathtaking Journey 159
6.4 Study 168
6.5 Design Opportunities 180
6.6 Conclusion 184

7 / A Partaker Perspective to Empathic Engagement **189**
7.1 Abstract 190
7.2 Introduction 190
7.3 An Appeal to Empathy 193
7.4 Design of Permanent 198
7.5 Deployment and Data Collection 211
7.6 Analysis 219
7.7 Discussion 228
7.8 Limitation 231
7.9 Conclusion 231

8 / Conclusion **235**
8.1 Introduction 236
8.2 Recap of the Work 236
8.3 Design Research Contributions 240
8.4 Wrapping Up 256

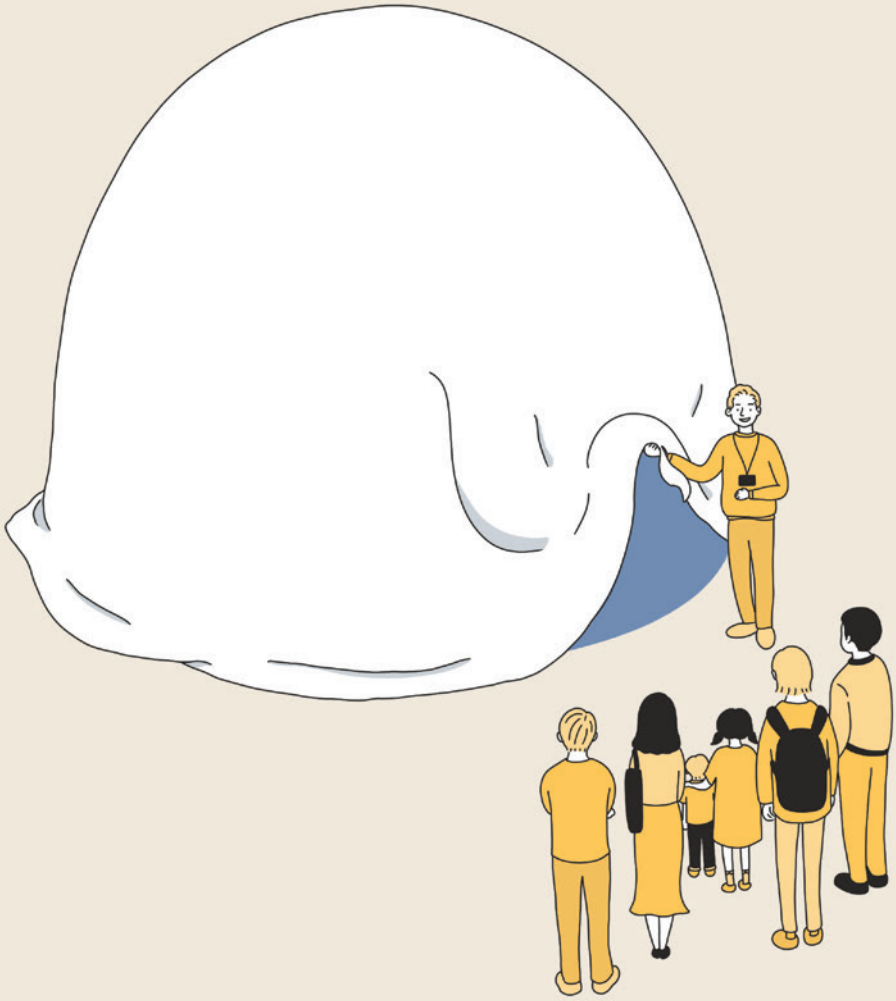
References **262**

List of Figures **286**

Formal Dissemination **294**
Articles and Presentations 294
Workshops 295
Research through Design Projects 296
Public Demonstrations 296
Public Presentations and Media Coverage 297

Acknowledgments **298**

Academic Curriculum Vitae **304**



Chapter 1

Introduction

1.1 Design Research Focus

The work presented in this dissertation focuses on the design and development of persuasive games, which are games specifically designed following the intent to shape players' attitudes about objects or issues in the extrafictional (real) universe. In other words, persuasive games are designed to influence how players think and feel in regards to a broad range of topics in real life, including those related to marketing, politics, humanitarian issues, and so forth. The goal of this work is twofold, with on one hand the mapping of contemporary and novel persuasive game design spaces and player experiences, and on the other hand the generation of practical design insights and approaches to advance persuasive game design and research. The work begins with a broad perspective on persuasive games but gradually focuses on socially aware persuasive games in particular, which is a category of persuasive games designed to specifically address humanitarian or social issues. At the same time, this focus is paired with a shift to a more applied exploration of the novel design space that lies at the crossroads of persuasive games, empathy, and immersion.

First, consider some examples of persuasive games. In terms of marketing, designers of a racing game commissioned by a car brand may intentionally give the virtual cars of this particular brand a noticeable performance edge over those of the competition. This, in turn, may instill positive attitudes towards this car brand that transcend well beyond the fictional boundaries of the game. In the more social domain, however, one may think of persuasive games that shape one's thoughts and feelings towards groups of people with a certain disorder, disability, or condition. For instance, a game may be intentionally designed with a protagonist on the autistic spectrum to offer players a hands-on experience of the advantages and disadvantages that come with this disorder. In turn, depending on how the designers represented this disorder, generated thoughts and feelings about autism through playing this game may trickle over into reality and become part of the player's attitude towards actual people on the autistic spectrum in the extrafictional universe.

While the employment of games as rhetorical vehicles is not new in itself, with examples dating back centuries ago, it has only been a little over a decade since the concept of so-called persuasive games has garnered a growing interest from designers and researchers alike. Perhaps most notably was Bogost's (2007) presentation of procedural rhetoric - offered

with his essay on using game rules and procedures persuasively - to highlight a unique persuasive capacity of games that is unknown to traditional media. This fueled further interest to explore the untapped potential of games as a persuasive medium, spurring numerous investigations into the ways in which games may sway players.

The design research offered in this dissertation spawned in the midst of these investigations, joining the objective to unpack the persuasive capacity of games. Whereas others may focus on the persuasiveness or validation of persuasive games, following a design-oriented perspective the focus of this work lies primarily in answering questions that pertain to the design, and designing, of persuasive games. In other words, this dissertation is focused on surveying the landscape of persuasive game design, uncovering novel design opportunities, challenges, and approaches, with later chapters on exploring the persuasive potential of strategically combining an appeal to empathy and the use of immersive technologies in socially aware persuasive games.

Broadly taken, this dissertation can be divided into two parts. The first part lays down a foundation for studying persuasive games and exploring the wider spectrum of persuasive game design opportunities, challenges, and approaches. In this part the concept of persuasive games is discussed, player interactions are mapped out, practical design approaches and strategies are surveyed, and a perspective into commercial persuasive game production is offered. The second part distills the insights gained from the first part and embraces the recent advancement in commercially available immersive technologies for the persuasive opportunities it offers. The current wave of immersive technologies is also closely tied to persuasive games, as the early development of the Oculus Rift head-mounted display was instigated following the need for a portable and immersive solution for immersive journalism - to offer the public an accessible means to inhabit another's point of view and experience a different perspective on issues (De la Peña et al., 2010). Right from the start immersive technologies were lauded for being empathy machines, with the ability to help change minds on various humanitarian and social issues (Milk, 2015). However, despite these promising and captivating claims, insights into related player experiences and design approaches are still scarce and only few related design opportunities have been documented thus far. This is unfortunate, as games - and particularly when combined with immersive technologies - excel at delivering some of the experiences

that are sought-after for their persuasive character in more traditional media, such as identification (De Graaf et al., 2011), immersion (Brown & Cairns, 2004), and empathy (Green, 2006, 2008; Green & Brock, 2002).

In response, this work aims to fill the design and research gap previously outlined by exploring novel design opportunities, challenges, and approaches for designing persuasive games, with a strong focus on the employment of immersive technologies and appeal to empathy halfway in. Following an explorative design research approach situated within the research field of Human-Computer Interaction, readers are offered a range of survey, theoretical, artifact, and empirical contributions aimed to help advance the design and research space of persuasive games. This work first details the unique characteristics of persuasive games, unpacks persuasive gameplay, explores contemporary persuasive game design approaches, and provides insight into the production of the highly acclaimed game This War of Mine. After exploring persuasive game design and production in general, this work then focuses on the employment of immersive technologies and the appeal to empathy in the design of socially aware persuasive games. With this a framework of three distinct perspectives to empathic engagement are offered, situating two research through design projects - A Breathtaking Journey (see Figure 1) and Permanent (see Figure 2) - that each materialized a variety of discussed concepts and theories. For instance, whereas the A Breathtaking Journey project employs a victim perspective to empathic engagement and focuses on offering an embodied experience, the Permanent project employs a partaker perspective to empathic engagement and focuses on a form of self-directed discovery. Both projects yield insight into immersive and empathic player experiences through the analysis of interviews with players at public events, in turn generating practical recommendations for the future design and research of socially aware persuasive games that strategically combine immersive technologies and an appeal to empathy. For instance, these projects illustrate the persuasive potential of designing pockets of downtime, small moments throughout the game in which players have the opportunity to reflect on their experience, as a means to bridge the fictional and extrafictional universe. A case is also made for exploring the opportunities and challenges of viscerally engaging players through the use of embodied contraptions, as it offers a novel affective dimension for persuasion. Finally, analysis of player interviews generated a series of promising approaches for persuasive game design. Among several, this work details the capacity of complex characters, transdiegetic

aspects, and user-directed discovery to shape the way players feel and think about objects or issues in reality. Beyond these insights, opportunities, and challenges, it is also worth noting that this work exemplifies the ability of games to foster the full spectrum of empathic states. This is an important byproduct of the conducted studies in light of recent observations that media - including games - may be at fault for a declining trend in empathic abilities, thus illustrating that games may very well be employed as a countermeasure, too. The following section will further unpack the design research objectives and questions that guided the studies presented in this dissertation.

1.2 Design Research Objectives and Questions

As introduced in the previous section, the work presented in this dissertation focuses on the design and development of persuasive games, with a particular interest in later chapters on strategically combining the employment of immersive technologies and appeal to empathy. It is the primary aim of this design research to shed light on aspects pertaining to the design and designing of persuasive games, to conclude with offering design approaches and opportunities to advance the design and production of socially aware persuasive games. To explore this design space and uncover novel design approaches, opportunities, and challenges, a set of three design research objectives and questions were formulated. Two of these objectives and questions were formulated at the initialization of this research, the third one after distilling an area of interest outlining a novel approach for socially aware persuasive game design. This section will unpack each design research objective and question, providing a foundation for consecutive chapters.

Objective 1: Mapping the landscape of persuasive games.

The first objective of this design research is to gain an understanding of what persuasive games are, how players interact with them, as well as to gain insight into contemporary persuasive game design and development approaches. At this stage the design research scope is still broad, with an open question pertaining to what persuasive games actually are, how players experience playing them, as well as how and why designers produce them. Accordingly, the first research question (RQ1) was formulated as follows:

> *What are persuasive games, how do players interact with them, and how are they designed?*

Figure 1 (↑)
The A Breathtaking Journey project is an embodied and multisensory mixed reality persuasive game providing players with a first-person experience of a refugee's journey. This project demonstrates the use of a victim perspective to empathic engagement.

Figure 2 (↑)
The Permanent project is a narrative-driven virtual reality exploration persuasive game designed to foster empathy towards evacuees from the 2011 Fukushima Daiichi nuclear disaster. This project demonstrates the use of a partaker perspective to empathic engagement.

The goal of this first objective and research question (RQ1) is to establish a foundation for categorizing games under the umbrella of persuasive games as well as the exploration of both current and future opportunities, strategies, approaches, principles, challenges, and player experiences.

It has only been a little over a decade that the notion of games as a persuasive vehicle gained traction, became more generally understood, and has been considered a viable means to sway players (Bogost, 2007). Still, beyond the few design insights on procedural rhetoric, as perhaps the most prevalent area of interest related to the discussion of strategies for designing and developing persuasive games, little is known about other current approaches and novel opportunities that may help in the design and development of persuasive games. In terms of design, this design research objective and question (RQ1) focused on two distinct aspects, with on the one side the actual game elements and mechanics of which a persuasive game is constructed (audiovisuals, rules, narrative, etc.) and on the other side the contextual and situational aspects of production (expert involvement, cultural background of designers, etc.) that may influence the design of a persuasive game.

Objective 2: Surveying current approaches and novel opportunities for persuasive game design.

Hand in hand with the first research objective and question (RQ1), exploring the contemporary landscape of persuasive game design, the second design research objective and question (RQ2) is formulated to survey for current and novel persuasive game design approaches to guide consecutive (applied) work that charts new design spaces. The second design research question is therefore formulated as follows:

> *What are the current approaches and novel opportunities for persuasive game design?*

In many ways, this design research question belongs within the scope of design research question 1 (RQ1), but is introduced separately as a means to specifically focus on gaining insight into current persuasive game design approaches and novel opportunities that may warrant further exploration. As part of the outcome of design research question 2 (RQ2), the third design research question (RQ3) is formulated as a springboard to explore a still unexplored design space and approach for persuasive game design in more detail.

Objective 3: Exploring the factors of empathy and immersion in the design of socially aware persuasive games.

The third design research objective and question (RQ3) is introduced to explore the novel game design space and approach distilled through addressing design research objective and question 2 (RQ2). This survey led to a focus on strategically combining an appeal to empathy and the employment of immersive technologies in the design of socially aware persuasive games. Accordingly, the third design research question (RQ3) is formulated as follows:

> *How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?*

Addressing this design research question means shedding light on the design, development, and player experiences related to the fostering of empathy as a persuasive appeal in socially aware persuasive games that use immersive technologies, as well as the formulation of opportunities, challenges, and recommendations accordingly. The notion of 'social awareness' helps to characterize the specific interest area within the broader design and research field of persuasive games, indicating that the insights generated are particularly useful for those designing and researching persuasive games aimed to shape attitudes regarding social or humanitarian issues. The particular focus on an appeal to empathy in this work is twofold, with empathy both as a considerably robust means to shaping attitudes through traditional media (Batson & Ahmad, 2009) and as a desirable outcome in itself (Waal, 2009; Segal et al., 2012). Next, the focus on immersive technologies is both technologically driven for its novelty in persuasive game design, as well as in response to recent claims regarding its empathy arousing and attitude shaping capacities - tying empathy and immersive technologies together in a single approach. However, despite the interest in both areas as an approach for persuasive game design, it is yet unclear how empathy may be fostered through persuasive games using immersive technologies, what kind of empathic states are - or can be - fostered, how players experience such moments, and why they do so.

In summary, the design research objectives and research questions described in this section aim at providing insight into the concept of persuasive games, the experience that they offer to players, and most importantly their design. Following a broad perspective on these

aspects throughout the first chapters the work gradually narrowed the research scope to explore the appeal to empathy and use of immersive technologies in the design of socially aware persuasive games.

1.3 Design Research Space

The design research objectives and questions as described in the previous section are situated within the multidisciplinary field of Human-Computer Interaction. Human-Computer Interaction focuses on the design of computer technologies, software designs, and the interactions between computers and users (Olson & Kellogg, 2014; Interaction Design Foundation, 2019). Accordingly, this design research focuses on how persuasive games are designed, how novel technologies may support the design of persuasive games, and how players experience interacting with persuasive games (using novel technologies).

In line with similar work in Human-Computer Interaction, the work presented in this dissertation is primarily about generating novel and illustrative designs and design insights to advance the future design and production of persuasive games, and less about understanding the historical aspects of persuasive games or validating their effectiveness. The empirical studies carried out alongside the presentation of the concepts and designs offered in this dissertation, however, do provide some insight into various player experiences, both in reflecting on the artifacts holistically (particularly related to empathic player experiences) as well as in relation to specific design aspects.

Furthermore, the deployment of the persuasive games discussed in this dissertation resonate with that of nonprofit organizations trying to make the case for certain social or humanitarian issues, aiming to increase awareness, shape attitudes, and perhaps increase donating behavior. This is why many of the presented projects have a connection with a nonprofit organization or events focused on social or humanitarian issues at some point during development and/or deployment. For instance, Amnesty International Netherlands has a connection with the A Breathtaking Journey project (described in chapter 6) and OurPlanet TV Japan has a connection with the Permanent project (described in chapter 7). To gain a realistic perspective on how people would experience these artifact contributions, the empirical studies were carried out at public events that are representative of how nonprofit organizations would deploy their own work. As such, the empirical studies described in this dissertation have been carried out ‘in the wild’

with self-motivated visitors of cultural events, design expositions, and film festivals.

Care has been taken to carry out the design research in a respectful, responsible, and trustworthy manner for both human subjects and the environment. To ensure an ethical treatment of human subjects and the environment this work follows the TU/e Code of Conduct (Eindhoven University of Technology, 2019), as well as the guidelines described in the ACM Code of Ethics and Professional Conduct (Association for Computing Machinery, 2018). As such, this research has been carried out with the promise to contribute to society and human well-being, avoid harm, be fair, be honest and trustworthy, and respect both privacy and the work of others. This promise also counts for the study and application of persuasion. Persuasion is a concept plagued with the connotation of being unethical and used to manipulate or deceive people to get a 'yes', or even to coerce them into performing certain behavior. Therefore, it is important to clarify that persuasion in the context of this work is distinctly different and seen as the intentional gradual process of gaining appreciation for a certain perspective, situation, or solution to shape attitudes towards an issues or objects in an atmosphere of free choice. Furthermore, in the objective to study and practice ethical persuasion it is understood that ethical persuaders "affirm the dignity of each person, treat audience members as free and autonomous agents, present facts and opinions fairly, and provide different perspectives on an issue to enable people to make the most thoughtful decision possible" (Perloff, 2008, p. 50). This perspective to ethical persuasion extends to the persuasive means discussed in this work, including the employment of empathy and immersion as part of a persuasive strategy. This work abides by these principles of ethical persuasion and wishes that persuaders employing the insights gained from this work will do the same.

Beyond being situated within the field of Human-Computer Interaction, this work also constitutes one of three pillars within the overarching 'Persuasive Gaming. From theory-based design to validation' project, funded by the Dutch Research Council (NWO) with number 314-99-106. Whereas this dissertation covers the design pillar of the project, the other two pillars focus on the persuasiveness and validation of persuasive games. These pillars are addressed respectively by three Dutch universities: the Eindhoven University of Technology (TU/e; Department of Industrial Design) focusing on design, the University of Utrecht (UU;

Department of Media and Cultural Studies) focusing on persuasiveness, and the Erasmus University of Rotterdam (EUR; Department of Media and Communication) focusing on validation. This collaboration reflects the multidisciplinarity of persuasive game studies (De La Hera et al., 2021), with theories and concepts borrowed from partners' research to inform design, and vice versa. More information about the project can be found at https://www.persuasivegaming.nl.

1.4 Design Research Approach

Design Research refers to the research activities that relate to design, is often explorative in nature, and is both a means of inquiry and a means of developing new insights and knowledge about design and designing (Frankel & Racine, 2010; Cross, 1999). The outcome of Design Research is often characterized by frameworks, strategies, principles, opportunities, challenges, and illustrative artifacts that support in advancing our understanding of design and the practice of designing. Design Research activities may be categorized as either 'research about design', 'research through design', or 'research for design' (Frankel & Racine, 2010). The characteristics of each of these categories will be discussed next, before describing how the design research as presented in this dissertation fits within each of these categories.

Research about design - also labeled as 'research into design' (Frayling, 1993) - is considered the most straightforward of the three approaches to design research and is characterized by the study of designs and designers (Frayling, 1993; Frankel & Racine, 2010). Research about design explores the theories, techniques, aesthetics, values, history, and so forth of existing designs and design processes, investigating how - for instance - designs are made, how they are experienced, and how designers approach design issues and find suitable solutions (Frankel & Racine, 2010; Frayling, 1993). Research through design differs from research about design in the sense that new knowledge is generated through the process of designing itself, rather than the examination of designs or design processes from the outside in. Research through design is often carried out by researchers who - at the same time - are also designers, applying their own practical design skills and designerly knowhow to generate design solutions, while reflecting on their own design and design process to generate an understanding of novel opportunity areas and new design approaches. This more applied form of design research typically has a focus on the discovery,

materialization, and exemplification of novel design opportunities and challenges, generating both insights as well as prototypes that function as illustrative artifacts for further design and research. The third category of design research, research for design, focuses on research carried out to enable design and to support the design process (Frankel & Racine, 2010; Frayling, 1993). This type of design research often takes the form of user observations, interviews with stakeholders, focus groups, and ethnographic studies to help designers make artifacts that resonate well with the needs and context of the end users. Unlike research about design and research through design, research for design is less about generating knowledge for future - still unknown - designs, but more about generating the required knowledge and insights to support producing a current - particular - design at hand (Frankel & Racine, 2010). The design research presented in this dissertation can be described according to this Design Research taxonomy.

A research about design approach is employed in understanding the design and designers of persuasive games through literature studies on persuasive media and persuasive games, as well as field studies focusing on the design and designers of persuasive games. For instance, the production study with members of 11 bit studios (see chapter 4) about their persuasive game This War of Mine sheds light on how situational and contextual factors of production may influence persuasive game designers, and in turn affect the design of a persuasive game. A research through design approach is employed for exploring new persuasive game design spaces, opportunities, and player experiences, and helps to uncover and illustrate novel ways of designing persuasive games. Beyond generating practical design approaches and offering insight into novel player experiences, research through design produces provisional artifacts that materialize core concepts, help underscore design challenges and opportunities, and may highlight the capacity of certain design decisions. Furthermore, artifact contributions are a key method for disseminating design-related academic knowledge, opportunities, and challenges with the broader public as they provide accessible and practical instances of novel concepts that may resonate well with the broader public, and in turn may function as design reference or inspiration for future design and research. For instance, the artifact contributions of this design research - project A Breathtaking Journey and project Permanent - followed a research about design approach to explore and exemplify the design of socially aware persuasive games that strategically combine an appeal to empathy and the employment

of immersive technologies to persuade players. A research for design approach is employed in the design explorations described in this dissertation, as a method to explore persuasive opportunities and to increase the likelihood of the final designs to resonate with the intended players.

Concluding, in following these three approaches to design research, and in particular research through design - with a theoretical, practical, and explorative perspective - the aim is to provide insights into the design and designing of (socially aware) persuasive games, illustrate the opportunity of combining an appeal to empathy and the use of immersive technologies, and output practical design opportunities to advance the design of persuasive games. However, it must also be noted that design research is typically discussed in terms of particular cases, and it is important to recognize that designers frequently have to deal with problems for which no immediate or correct solution exists, and certainly not one strategy that works in all cases. Ultimately, design projects are subjected to varying situational and contextual factors throughout development and thus also require a custom adaptation of the work described in this dissertation. This perspective to disseminating persuasive game design knowledge resonates with the philosophy of design research and education as described by Stolterman (2008, p. 61), arguing that

> designers can be prepared-for-action but not guided-in-action by detailed prescriptive procedures. When a designer is in a complex design situation, she has to act on that situation with a regard for all of its richness and complexity, and in a way that is appropriate for the specifics of that situation. [...]. If someone is not prepared to handle such complexity, methods and techniques cannot with any 'guarantee' guide anyone through such situations.

The production study with the team members of 11 bit studios, about their persuasive game This War of Mine, as discussed in chapter 4, also underscores this concept, with designers continuously being influenced by, and having to deal with both planned-for and unplanned-for events, contexts, and situations, as well as various unexpected sources of inspiration. Certain opportunities and challenges may provide initial direction and insight for design, but actual implementations always require a discretionary approach to make sure the design resonates well with the targeted context, situation, and players.

1.5 Design Research Contributions

The contributions of this work can be categorized as a survey, theoretical, artifact, and empirical contribution within the design research spectrum of Human-Computer Interaction (Wobbrock, 2012). This design research provides a survey contribution by reviewing the landscape of persuasive game design, uncovering "emergent themes and trends, identifying gaps where new opportunities lie" (Wobbrock, 2012, p. 5). By synthesizing related theoretical and practical work this design research aimed to provide a perspective on contemporary persuasive games design, resulting player experiences, and still unexplored opportunities and challenges for persuasive game design and development. This design research provides a theoretical contribution, which concerns "new or improved concepts, definitions, models, principles, or frameworks" (Wobbrock, 2012, p. 3), by weaving together theories into a conceptual model that describes the persuasive gameplay experience, offering a definition for persuasive games, and by developing a framework that delineates three perspectives to empathic engagement in persuasive games using immersive technologies. This framework has been developed over the course of this design research, and outlines three distinct perspectives to empathic engagement that designers and developers may leverage in their goal to arouse specific empathic states. Furthermore, this framework functions as a compass for the artifact and empirical contributions. An artifact contribution may be described as

> inventions, which include new systems, architectures, tools, techniques, or designs that reveal new opportunities, enable new outcomes, facilitate new insights or explorations, or impel us to consider new possible futures. Artifact contributions are, by definition, dependent upon never-before-seen inventions that are instantiated as prototypes, sketches, mockups, demos, or other envisionments, and are often but not always at least partially functional. (Wobbrock, 2012, p. 2)

The artifact contribution of this design research can be found in the applied explorations of fostering empathy through the design and development of socially aware persuasive games using immersive technologies, consisting of both the work resulting from the student persuasive game design projects as well as the two artifacts A Breathtaking Journey and Permanent. The latter artifacts are the result of a research through design approach, which aims to produce

> design artifacts as outcomes that can transform the world from its current state to a preferred state. The artifacts produced in this type of research become design exemplars, providing an appropriate conduit for research findings to easily transfer to the HCI research and practice communities. (Zimmerman et al., 2007, p. 493)

The artifact contributions of this design research act as illustrative cases for the design of socially aware persuasive games that strategically combine an appeal to empathy and the employment of immersive technologies. Furthermore, the artifacts act as illustrative example cases for the distinct perspectives to empathic engagement, as outlined with the aforementioned framework. As such, the artifact contributions may also be regarded as illustrative example cases for 'strong concepts', in that they present "design elements abstracted beyond particular instances which have the potential to be appropriated by designers and researchers to extend their repertoires and enable new particulars instantiations" (Höök & Löwgren, 2012, p. 5). The artifact contributions are also important for disseminating the insights generated through this work among the public, thus outside of academic communities, where they may help illustrate research concepts, highlight potential capacities, and act as inspirational cases for fellow makers.

The empirical contribution of this work is twofold, with both qualitative empirical insights into the production of persuasive games through interviews with persuasive game designers and with the deployment of qualitative studies focusing on player experiences and rationales concerning their interactions with the artifact contributions presented in this dissertation. While no significant causal relationship between specific designed aspects of the artifacts and resulting empathic or attitudinal effects can be deduced, the empirical studies do provide a an evaluation of the artifacts, highlight what designed aspects may have caused particular player experiences and rationales, and aid in uncovering yet unconsidered design opportunities and challenges for future research and design.

1.6 Overview of Chapters

This dissertation is structured with the intent to increase overall readability and ease of navigation while keeping the publication-based chapters as close to the original publication as possible. Therefore, not all work is presented in the chronological order in which studies were published. Furthermore, some publication-based chapters use the 'we'

pronoun to reflect the collaborative nature of some of the work.

While this dissertation is best read from start to finish, chapters can be read individually as they reiterate important concepts and theories. Readers who are new to the concept of persuasive games may want to start with chapter 2 for an introduction. Readers who are familiar with persuasive games but like to have a primer to persuasive game design may want to briefly skim chapter 2 and start at chapter 3. Readers who are only interested in a professional perspective on persuasive game production may want to skip to chapter 4. Readers who are primarily interested in strategically appealing to empathy and employing immersive technologies in the design of socially aware persuasive games, or enjoy reading about the research through design projects A Breathtaking Journey and Permanent, may want to skip to chapters 5 to 7. What follows is a summary of each chapter.

Figure 3 (↑)
A player decided to drop a bomb on a populated city in the classic persuasive game September 12th: A Toy World (Frasca, 2003) to eliminate terrorists, but ends up killing civilians too. Nearby civilians mourn the deceased, and in turn join the terrorist group. As a result, the player ends up with more terrorists than before the bomb was dropped.

Chapter 2 dives into the field of persuasive games and provides an overview of persuasive game developments and research over the past decades, driven by the first design research question (RQ1) formulated as: What are persuasive games, how do players interact with them, and how are they designed? This chapter first provides a general introduction to the concept of persuasive games as part of the broader landscape of persuasive communications, games, and Human-Computer Interaction, along with the detailing of a design-oriented definition for persuasive games that has functioned as a guideline throughout this design research. Second, the characteristics of persuasive games are discussed along with a selection of illustrative persuasive game cases, such as September 12th: A Toy World (Frasca, 2003; see Figure 3). Third, based on related theories on persuasive communications, a conceptual model is introduced outlining how players interact with, and experience, persuasive games. Finally, this chapter concludes with mapping out several novel areas of persuasive game design and research, and therein preliminarily addresses the second research question (RQ2), formulated as: What are the current approaches and novel opportunities for persuasive game design?

Chapter 2 has partially been peer-reviewed and published as Kors, M., van der Spek, E. D., & Schouten, B. A. M. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the Foundations for Digital Games 2015 Conference.

Chapter 3 moves from a theoretical to a practical perspective on persuasive game design, and provides insight into a variety of techniques and approaches to designing games with persuasive intent, and primarily contributing to the first two research questions (RQ1 and RQ2). First, documented practical persuasive design opportunities and challenges are discussed, covering both work related to persuasive games as well as other fields of interactive persuasive design and research that resonate well with persuasive game design. This includes work that explores the use of a game's mechanics to pack arguments as well as the focus on particular player experiences that may be conducive for persuasion.

Chapter 3 has partially been peer-reviewed and published as Kors, M., van der Spek, E. D., & Schouten, B. A. M. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the Foundations for Digital Games 2015 Conference and Kors, M. (2015) Towards Design Strategies for the Persuasive Gameplay Experience. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play CHI PLAY '15, 407-410. https://doi.org/10.1145/2793107.2810281

Chapter 4 offers a commercial perspective on persuasive game design with the deployment of a production study with several members of the design and development team behind the widely acclaimed game This War of Mine (see Figure 4). While this study - as a multidisciplinary collaboration - did not focus on factors that pertain to persuasive game design exclusively, it does offer insight into the design for player experiences that are conducive for the shaping of attitudes, such as moral and empathic experiences. Furthermore, this chapter offers a unique perspective on persuasive game design beyond the focus on implementable design aspects or aims to achieve certain player experiences, and addresses the situational and contextual factors that govern production. For instance, this chapter uncovers the processes of professionals for designing and evaluating their work, explores where ideas and inspiration come from, and highlights the emotional toll that may come with the design of games that portray the suffering of others. This chapter primarily addresses the first two design research questions (RQ1 and RQ2).

Figure 4 (↑)
The player is confronted with a moral dilemma in the game This War in Mine (11 bit studios, 2014a).

Chapter 4 has been peer-reviewed and published as De Smale, S., Kors, M. J. L., & Sandovar, A. M. (2017). 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.

Chapter 5 distills the work discussed thus far and maps out a novel opportunity space, following the previous chapters addressing the second research question (RQ2) formulated as: What are the current approaches and novel opportunities for persuasive game design? The outcomes of this distillation formalizes the third research question (RQ3), formulated as: How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?, which focused and guided the consecutive design research. The distilled novel opportunity space lies at the crossroads of persuasive games, immersive technologies, and empathic engagement. Empathy and immersion are concepts frequently discussed in relation to the recent wave of affordable and commercially available Head-Mounted Displays, often in relation to applications pertaining to shaping how players think and feel about issues in reality. At the same time, both empathy and immersion are still underexplored concepts - in terms of persuasive capacities - in persuasive games and persuasive game design. This chapter first offers a brief recap of strategically combining empathic engagement and immersive technologies in the design of socially aware persuasive games to ground the third design research question (RQ3). Second, a framework is introduced that delineates three perspectives to empathic engagement (when using immersive technologies) - the observer, partaker, and victim perspective - which guides the two research through design projects presented in consecutive chapters: A Breathtaking Journey and Permanent.

Chapter 5 has been peer-reviewed and published as Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A.M. (2018). You; the Observer, Partaker or Victim. Delineating Three Perspectives to Empathic Engagement in Persuasive Games using Immersive Technologies. In Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts (pp. 493-501). ACM. https://doi.org/10.1145/3270316.3271547

Chapter 6 follows the design research framework - delineating three perspectives to empathic engagement - introduced in the previous chapter, and is the first of two chapters to hands-on explore the strategic combining of empathic engagement and immersive technologies in the design of socially persuasive games. Through a research through design project, focus is given on gaining insight into the employment of a victim perspective to empathic engagement. The result of this project is 'A Breathtaking Journey,' an embodied and multisensory mixed reality persuasive game providing a first-person victim perspective of a refugee's journey. Along with the presentation of the persuasive game

Figure 5 (←)
A player is holding his breath to avoid detection in the game A Breathtaking Journey.

as a standalone artifact contribution, a qualitative study was conducted with a thematic analysis to tease out empathy-arousing characteristics, and to chart the novel persuasive game design space. This chapter provides insights into the employment of a victim perspective and related player experiences, as well as reflects on what challenges and opportunities can be drawn from this exploration.

Chapter 6 has been peer-reviewed and published as Kors, M. J. L., Ferri, G., van der Spek, E. D., Ketel, C., & Schouten, B. A. M. (2016). A Breathtaking Journey. On the Design of an Empathy-Arousing Mixed-Reality Game. Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play, 91–104. https://doi.org/10.1145/2967934.2968110.

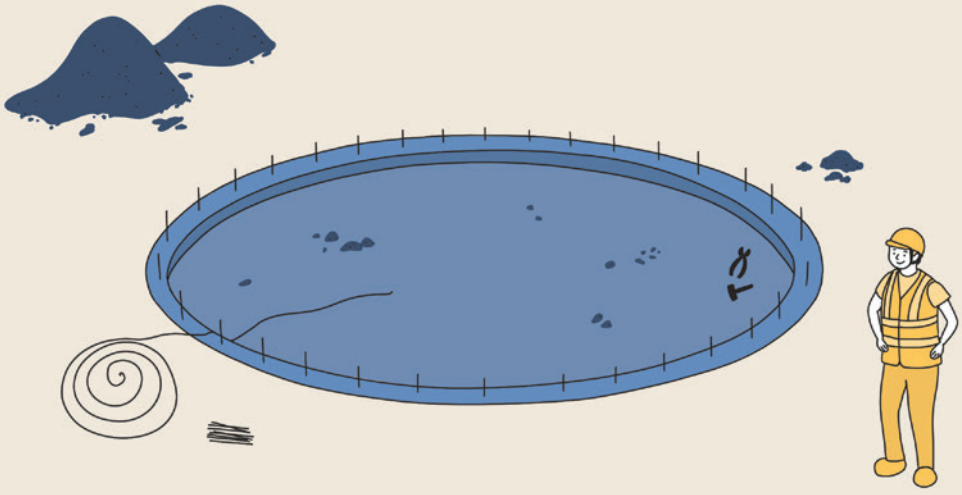
Chapter 7, like chapter 6, follows the design research framework presented in chapter 5 and is the second of two chapters to explore the novel design space of strategically combining empathic engagement and immersive technologies in the design of socially aware persuasive games. This chapter focuses on gaining insight into the employment of a partaker perspective to empathic engagement through a research through design project. This project resulted in 'Permanent,' a first-person exploration virtual reality game about the evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan (see Figure 6). Along with the presentation of the persuasive game as a standalone artifact

Figure 6 (→)
A player is exploring Watanabe's temporary house in the game Permanent to gain insight into the life of an evacuee from the 2011 Fukushima Daiichi nuclear disaster in Japan.

contribution, a qualitative study was conducted to gain insight into player experiences and to evaluate what design aspects may have contributed to the observed empathic states. This chapter concludes with offering several recommendations for future design and development, and in particular how other-oriented empathic states may be fostered through socially aware persuasive games.

Chapter 7 has been peer-reviewed and published as Kors, M. J. L., van der Spek, E. D., Bopp, J.A., Millenaar, K., van Teutem, R. L., Ferri, G., and Schouten, B. A. M. 2020. The Curious Case of the Transdiegetic Cow, or a Mission to Foster Other-Oriented Empathy Through Virtual Reality. CHI Conference on Human Factors in Computing Systems (CHI '20). https://doi.org/10.1145/3313831.3376748

Chapter 8 offers an overview of all the work carried out and reiterates the major contributions categorized by survey, artifact, empirical, and theoretical contributions. Furthermore, a compilation of design opportunities and challenges is offered for the future research and design of socially aware persuasive games. Finally, this chapter concludes the dissertation and reflects on the design research carried out, summarizes insights gained, and provides a closing text on socially aware persuasive game design.



Chapter 2

Persuasion through Games

This chapter has partially been peer-reviewed and published as Kors, M., van der Spek, E. D., & Schouten, B. A. M. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the Foundations for Digital Games 2015 Conference.

2.1 Introduction

Increasingly, games are designed not exclusively for entertainment purposes but to enable players to playfully engage with real-world issues as a means to gain insights and generate possible solutions, including cases that address aspects such as city planning (Schouten et al., 2017), crisis management (Van der Spek et al., 2011), and protein folding (Cooper et al., 2010). In the same vein, some games are designed with the particular intent to shape how players think and feel about issues in reality (thus focusing on affecting players' attitudes), with cases ranging from the advertising of products and services (De la Hera Conde-Pumpido, 2014), the aiding of political manifestos and activist agendas (Bogost, 2007), to the addressing of social and humanitarian issues (Belman & Flanagan, 2010). Many of these 'attitude shaping' games inherit their persuasive function from their classical namesakes. For instance, Raessens (2006) argued that there is no reason to exclude games from the documentary form, along with its possible functions of preserving, analyzing, expressing, and indeed persuading. In the same vein, one sees games designed with the intent to shape attitudes being categorized as advergames, political games, or empathy games. However, to simplify the matter, this work groups all these different categories of games in line with Bogost's (2007) concept of persuasive games, thus denoting them by their core function of persuasion.

The idea to use games for persuasive ends is not new in itself and perhaps best illustrated with the Landlord's Game, which inspired the more modern game of Monopoly. The Landlord's Game was designed by Elizabeth Magie in 1904 to intentionally promote the social ideas behind the Single Tax Movement and address the issues of a monopoly on land ownership (Flanagan, 2009). Regardless of the relatively long history of games designed specifically for persuasive means, only a few - concentrated over the past decade - have explored and documented approaches to designing persuasive games. This dissertation has been focused on furthering this exploration and to offer practical approaches and recommendations for persuasive game design. However, before diving into the design of persuasive games it is crucial to paint the contemporary landscape of persuasive games and situate the studies carried out.

This chapter provides an introduction to the field of persuasive games, highlighting both theoretical and practical advancements coupled with illustrative cases that helped shape the persuasive

game design and research space. In effect, this exploration addresses the first parts of research question 1 (RQ1), formulated as: What are persuasive games, how do players interact with them, and how are they designed? Structurally, this chapter first provides a general introduction to the concept of persuasive games as part of the broader landscape of both persuasive communications and games, along with a definition that paints the boundaries of this work. Second, the salient characteristics of persuasive games are discussed along a selection of illustrative persuasive game cases that capture the past and present of persuasive game design. Third, based on related theories on persuasive communications, a conceptual model is introduced - and its components explained - that outlines how players interact with, and may experience, persuasive games. Finally, this chapter concludes with mapping out several yet-unexplored areas of persuasive game design and research, which in turn act as a springboard for the formulation of novel persuasive game design opportunities, approaches, and recommendations.

It should be noted that this introduction to persuasive games is primarily meant to establish a theoretical foundation that enables the exploration of current approaches and novel opportunities for persuasive game design. For work specifically focused on dissecting persuasive game channels or the validation of persuasive games, one can look into work published by De la Hera Conde-Pumpido (2014) and Jacobs (2017) respectively.

2.2 Persuasive Games

Similar to oral presentation, written text, photos, and film, games are capable of presenting persuasive arguments embedded by their designers (Bogost, 2007). However, unlike traditional media, games offer several unique affordances that introduce new dimensions to the existing repertoire of strategies for persuasion through media, primarily rule-based interactive and immersive properties. Traditional media is typically passive in nature and leaves little opportunity for the audience to actively engage or interact with the offered arguments, test their own hypotheses, and formulate conclusions based on their own choices and experiences. In contrast, games generally require an active stance from audiences to explore the embedded mechanics and narratives, and to gain more insight into how a game's system may work or to progress a storyline. In his seminal book "Persuasive Games, The Expressive Power of Videogames", Bogost (2007) laid down the groundwork for a

unique form of persuasion that can be leveraged through games, which he coined procedural rhetoric. Procedural rhetoric was defined as "the art of persuasion through rule-based representations and interactions rather than the spoken word, writing, images or moving pictures" (Bogost, 2007, p. ix), or simply described as "the practice of using processes persuasively" (Bogost, 2007, p. 3) to point at the capacity of games to shape attitudes of players through an intentional bias in the rules to generate an argument. In underscoring the importance of procedural rhetoric, Bogost (2007) subsequently defined persuasive games as "games that mount procedural rhetorics effectively" (p. 46).

With this definition, (Bogost, 2007) prioritized the unique feature of using rules and procedures to persuade players as a core feature of persuasive games. A persuasive game designer can structure the rules and procedures of a game in such a way that interacting with the game mechanics essentially forms a covert persuasive argument. For example, a racing game commissioned by a car manufacturer will make sure that their cars are presented in a positive light with excellent handling, performance, and reliability (see Figure 7). The game does not have to tell the player through audiovisuals that the manufacturer's cars are superb, but rather offers an interactive experience from which players may draw the conclusions that this is indeed the case. Not in vain, as manufacturers have noticed that these brand-oriented persuasive games do indeed contribute to an increase in brand rating, purchase consideration, and brand recommendation (Wilson, 2012).

Persuasive Channels

Bogost's definition of persuasive games focused primarily on the role of procedural rhetoric, but this is not the only way in which games can persuade players. Several scholars have argued that persuasive games

Figure 7 (←)
A Ford Fiesta effortlessly overtakes the Ford EX concept buggy on loose sand, in the off-road racing game 'Ford Racing: Full Blown' (Razorworks, 2006). As a result, players may generate a particular fondness towards the hatchback that may trickle over into real life.

may persuade equally well through more traditional audiovisual and story elements, and that the design of persuasive games is not limited by the use of procedures and rules alone (Frasca, 2007; De la Hera Conde-Pumpido, 2013; De la Hera Conde-Pumpido, 2014). In turn, while unique, the use of procedural rhetoric should not be a primary metric for categorizing games as persuasive games. In fact, the rules and procedures require other channels to function properly, with Frasca (2007) commenting that "even though I agree that rules are an essential aspect of game rhetoric, they cannot work independently from objects, ideas, texts, sounds and images" (p. 87). For instance, take Frasca's own game September 12th: A Toy World (Frasca, 2003) as an example. September 12th: A Toy World addresses the United States of America's war of terror after the 9/11 terrorist attack in New York. As a player, one is offered a bird's eye view of a Middle Eastern looking city, inhabited by regular civilians dressed in blue as well as several terrorists dressed in black and white and carrying weapons (see Figure 8).

The player is presented with a controllable crosshair and the ability to launch an airstrike at the flick of a button, with the objective of eliminating terrorists walking among the civilians. However, regardless of how well the player aims and precisely times the launch, each airstrike solidifies that airstrikes are not precision weapons, and result in, next to the terrorists, many civilian casualties. The result is that other civilians mourn the deceased civilians and join the terrorist organization in their anger towards the United States of America, spawning even more terrorists as a result. This traps the player in a vicious cycle that simply cannot be escaped from, or won, resulting in the underlying procedural argument that it may have been better not to launch an airstrike in the first place. In the case of September 12th: A Toy World (Frasca, 2003), the rules and procedures of the game are indeed important for constructing this persuasive argument, but without the audiovisual elements, the procedural rhetoric would likely not be understood by its players. For instance, if one would change the audiovisual elements to represent the dropping of food supplies instead of airstrikes, the buildings from turning into rubble to being decorated with colorful ornaments, and the mourning civilians into thankful and flourishing families, the game's procedural argument may be interpreted vastly differently by its players. And yet, in this

Figure 8 (↓)
In September 12th: A Toy World (Frasca, 2003) the players quickly discover that any attempt to eliminate terrorists using imprecise weaponry is futile, as civilians mourn the innocent casualties and in turn pledge allegiance to the terrorist organization.

case the setup of the procedural rhetoric would need no alteration to support this alternative argument.

To gain a broader perspective of the possible ways through which games can persuade, De la Hera Conde-Pumpido (2013) offered a set of dimensions through which games can channel persuasion, and mapped these dimensions into a conceptual model along three levels: the signs, the system and the context. The signs deal with a persuasive game's visual persuasion, sound persuasion, haptic persuasion, and linguistic persuasion. This level connects with the study of semiotics, and is described by Salen and Zimmerman (2004) as how games convey meaning (through the interrelationship between signs presented within the same system). One level higher, De la Hera Conde-Pumpido (2013) described the system in which the cinematic persuasion, procedural persuasion, and narrative persuasion is situated. This level relates to the presentation of the signs and their relationship with other signs. This is where interaction with the game's rules or the following of the narrative creates meaning and presents persuasive arguments. On the highest level, De la Hera Conde-Pumpido (2013) described the context of the game, including social persuasion, tactical persuasion, affective persuasion, and sensorial persuasion, which relate to contextual aspects that may influence how the player interprets the game and its persuasive message.

The delineation of these persuasive dimensions are useful for analyzing and deconstructing persuasive games to uncover what dimensions were used by designers to channel persuasive arguments (De la Hera Conde-Pumpido, 2014). For designers, it may also function as a tool for reflecting on their own design, to identify how their persuasive arguments are channeled, as well as for spotting areas of imbalance between persuasive dimensions. Above all, this work illustrates the multitude of ways in which persuasive games can persuade players beyond the use of procedural rhetoric alone.

This also means that a more holistic definition for persuasive games is required to include the various types of persuasive games, the use of multiple channels, as well as to signify the primary intent of such games. In turn, this work follows with describing persuasive games as interactive rule-based entertainment media designed with the intent to shape players' attitudes towards an object or issue in reality, of which aspects will be discussed in detail over the following two sections.

Persuasion

The first part of the concept of persuasive games refers to the process of persuasion, which will be unpacked in this section. Among the first studying concepts related to persuasion was Aristotle, a philosopher in Ancient Greece, who emphasized the values and use of rhetoric (Aristotle, 350 BCE/2004). Aristotle defined rhetoric as "the faculty of observing in any given case the available means of persuasion" (Aristotle, 350 BCE/2004, p. 6), meaning that it is the art of understanding and developing arguments through the spoken word, aimed at influencing others' thoughts and feelings. Aristotle further presented three modes of persuasion, also referred to as rhetorical appeals, that describe a speaker's appeal in persuasive communication:

> There are, then, these three means of effecting persuasion. The man who is to be in command of them must, it is clear, be able (a) to reason logically, (b) to understand human character and goodness in their various forms, and (c) to understand the emotions-that is, to name them and describe them, to know their causes and the way in which they are excited. (Aristotle, 350 BCE/2004, pp. 7-8)

The three rhetorical appeals are also labeled as logos, ethos, and pathos, with logos as the appeal to logic, ethos as the appeal to credibility, and pathos as the appeal to emotion (Higgins & Walker, 2012). Thus, a good persuader must appear credible (ethos), reason logically (logos), and emotionally (pathos) in a way that resonates with the target audiences. This, however, does not describe what the intended influence is as the result of a good persuader, persuading the persuadee. Perloff (2008) provided an answer to this question in describing persuasion as "a symbolic process in which communicators try to convince other people to change their attitudes or behaviors regarding an issue through the transmission of a message in an atmosphere of free choice" (p. 17). In simple terms, one may thus consider persuasion as a means to influence the attitudes or behaviors of others, by arguing credibly, logically, and emotionally.

Perloff (2008) pointed out that persuasion is distinct from concepts such as manipulation and deception, even though they are often used synonymously. For instance, in his popular book Influence: The Psychology of Persuasion, Cialdini (2009) provided various sales tactics using persuasion to get a yes from the opposite party. Such tactics, for example, include the concepts of reciprocity, which leverages the human

condition to give back to others when they feel indebted, or scarcity, as it is in the human condition to want things that are rare, exclusive, and limitedly available. Indeed, the art of persuasion has a long and prominent history in sales and marketing, but the concept itself is far less entangled with such practices than often thought. The way persuasion has been used in this dissertation also has little to do with smooth sales tactics that trick people into buying products or services. In line with Aristotle's work, Perloff (2008) discussed persuasion as a slow process of arguing as to why a particular opinion, situation, or condition is more desirable, rather than a process defined by leveraging psychological shortcuts to get to a yes:

> Contrary to popular opinion, persuasion does not happen with the flick of a switch. You don't just change people's minds—snap, crackle, pop. On the contrary, persuasion takes time, consists of a number of steps, and actively involves the recipient of the message. […] Persuaders are seen as tough-talking salespeople, strongly stating their position, hitting people over the head with arguments, and pushing the deal to a close. But this oversimplifies the matter. It assumes that persuasion is a boxing match, won by the fiercest competitor. In fact, persuasion is different. It's more like teaching than boxing. Think of a persuader as a teacher, moving people step by step to a solution, helping them appreciate why the advocated position solves the problem best. (p. 17)

While both perspectives are considered persuasion depending on the field of study, the work presented in the dissertation follows Perloff's (2008) perspective with the understanding that persuasion is a slow verbal or nonverbal process of arguing as a means to increase the acceptance and appreciation for the advocated point of view. This also means that the persuasive effects of the discussed designs, as part of this work, may not be immediate, and might only contribute a fraction towards the intended attitude formation. In pulling everything together in relation to persuasive games, persuasive game designers thus focus on providing credible, logical, and emotional arguments through the game's elements and mechanics as a means to intentionally change the players' attitudes or behaviors in real life.

In further unpacking the definition for persuasion offered by Perloff (2008, p. 17) one can observe several distinct components of persuasion. First, Perloff (2008) described that persuasion is "a symbolic process"

(pp. 17-18), meaning that persuasion involves the use of culturally rich verbal or nonverbal communication, using images, words, sounds, and so forth. Second, Perloff (2008) explained that persuasion is a process in which "communicators try to convince other people to change their attitudes or behaviors regarding an issue" (pp. 17-19). This is an important component in defining persuasion as it addresses the question as to whether a persuasive game should still be categorized as a persuasive game if it fails to actually persuade its players. Similar to how games are categorized for their intention to entertain or educate, persuasive games should be categorized by the goal for which they are designed. In the end, not all educational games are educational, and not all entertainment games are entertaining, but they are labeled as such because their designers did intend them to be either way. If a player of an educational game doesn't learn anything from playing, we more likely would refer to it as a mediocre educational game, rather than immediately stripping it from its categorization. In terms of persuasive games a similar pattern is applied, and thus categorization happens based on the intent rather than the effect.

Next, Perloff (2008) described that, through persuasion, communicators try to change attitudes or behaviors. While attempting to change certain attitudes or behaviors may indeed be the end goal of persuaders, this aspect of the definitions requires some nuance. First, persuaders do not actually change the attitudes or behaviors of persuadees; instead, persuadees persuade themselves when fed with the right arguments. One cannot force people to change, but one can provide them with the right arguments that may cause existing attitudes to strengthen or weaken (Perloff, 2008).

Furthermore, this dissertation describes persuasion as a means to shape attitudes rather than to change attitudes, a subtle difference which works better in describing that persuasive games can both change and reinforce attitudes. The second aspect that requires some nuance is the difference between persuasive end goals and persuasive processes. While a persuader may want to cause a behavioral effect through persuasion, this cannot occur without first shaping an attitude of the persuadee, else it is coercion. Persuasion should happen in "an atmosphere of free choice" (Perloff, 2008, p. 17), and thus persuadees must be aware of, and free to accept or refuse, an argument before they can act in accordance with their updated attitudes. This 'attitude precedes behavior' perspective has been repeatedly theorized,

illustrated with the Theory of Reasoned Action (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (Ajzen, 1991), and the Attitude to Behavior model (Fazio & Zanna, 1981). Similarly, O'Keefe described the following in arguing that persuasion primarily involves "influencing another's mental state" (O'Keefe, 2002, p. 5), in which the "mental state" is synonymous to an attitude:

> Thus even when a persuader's eventual aim is to influence what people do (to influence, say, how people vote to what products they buy), at least in paradigm cases of persuasion that aim is ordinarily seen to be accomplished by changing what people think (for instance, what people think of the political candidate or of the product). That is, persuasion is ordinarily conceived of as involving influencing others by influencing their mental states (rather than by somehow influencing their conduct directly). (O'Keefe, 2002, p. 5)

Accordingly, the work described in this dissertation was carried out with the understanding that persuasion is the intentional attempt to shape attitudes of people as the primary focus, not their behavior. Furthermore, persuasion is the gradual process of gaining appreciation for a certain perspective, situation, or solution in an atmosphere of free choice.

Attitudes

With persuasion described as an intentional communicative process to shape the attitude(s) of others towards an issue, a logical follow-up question pertains to the purpose and construct of attitudes. People typically hold many attitudes for a variety of reasons, of which some are structured more positively or negatively, and some stronger or weaker. An attitude can be defined as "a learned, global evaluation of an object (person, place, or issue) that influences through and action" (Perloff, 2008, p. 59). An attitude is a "predisposition, a tendency, a state of readiness that guides and steers behavior in certain predictable, through not always rational, ways" (Perloff, 2008, p. 59). This description again attests to the 'first attitude, then behavior' relationship discussed in the previous section.

People are not born with attitudes, but they are learned through both teaching and experience. Eagly and Chaiken (1998) further articulate that "individuals do not have an attitude until they first encounter the attitude object (or information about it) and respond evaluatively to

it" (Eagly & Chaiken, 1998, p. 270). Attitudes are global emotional and cognitive evaluations of objects, meaning that they help one to (quickly) gauge the positive or negative value of a novel object based on one's encounters with similar objects in the past (Perloff, 2008). Attitudes are like shortcuts that make navigating life easier, as they help to quickly make decisions when people encounter new and unfamiliar objects. Maio and Haddock (2009) described that an important aspect of having attitudes is their function as "energy-saving devices that make judgments easier and faster to perform" (p. 7). When a new object somewhat fits within a category, one has an immediate point of reference to choose appropriate actions, often instantly, rather than having to evaluate each and every object individually each and every time again and again. Attitudes help people to quickly make sense of the world around them, perform better when faced with unfamiliar situations and events, obtain rewards and avoid punishment, adjust to social settings as a means to 'fit in', and to communicate who they and what they aspire to (Perloff, 2008). Yet, keep in mind that attitudes may not always align with reality as memories of one's past may be factually inaccurate, especially when formed based on only a small sample size of the attitude object.

Attitudes, following the expectancy-value perspective as theorized by Fishbein and Ajzen (1975), are structured as a "combination of what you believe or expect of a certain object and how you feel about (evaluate) these expectations. […] attitude is a multiplicative combination of: (a) strength of beliefs that an object has certain attributes and (b) evaluations of these attributes" (Perloff, 2008, p. 69). In short, an attitude is the combination of how one thinks about an object, and how one feels about this. To summarize, when we talk about persuasion we talk about the intentional attempt to shape another's beliefs, and evaluations thereof, regarding an object (i.e., person, place, or issue).

Games

With the former part of persuasive games addressed in the sections above, we can move on to the latter part of games. Scholars and practitioners alike have long attempted to formulate a unified description of games, but to date no single time-resilient definition has managed to fully encompass what is both scholarly, practically, and publicly considered to be a game. Like with persuasion, definitions differ from one design/research field to another. For instance, whereas some consider persuasion as a way to primarily motivate behavior,

others consider it as a means to primarily shape attitudes. Beyond a general theoretical justification for adopting the latter perspective in this dissertation, it was also chosen as it best represents the aim and work discussed in this dissertation. Similarly, games are described in a way that is theoretically grounded but also representative for the work presented in this dissertation. The aim is not to generate a new or single definition for games, but to highlight concepts that resonate with the games presented in this work. Some salient definitions for games discussed in this section propose attributes that will position several of the games included in this dissertation as borderline cases, but given the current landscape of defining games this is perhaps inescapable. Some even argue that, in part due to games being a social phenomenon that changes over time, we may never see (or perhaps want) a single meaningful consensus on what games actually are (Arjoranta, 2014; Wittgenstein, 1968). Regardless, to form a basic concept of games, several descriptions are offered in this section, with aspects highlighted and discussed in terms of their specific applicability for this work in particular.

As a first step for understanding the concept of games and play we looked at the historically salient perspective offered by the Dutch historian Huizinga (1974):

> Naar de vorm beschouwd kan men dus, samenvattende, het spel noemen een vrije handeling, die als 'niet gemeend' en buiten het gewone leven staande bewust is, die niettemin de speler geheel in beslag kan nemen, waaraan geen direct materieel belang verbonden is, of nut verworven wordt, die zich binnen een opzettelijk bepaalde tijd en ruimte voltrekt, die naar bepaalde regels ordelijk verloopt, en gemeenschapsverbanden in het leven roept, die zich gaarne met geheim omringen of door vermomming als anders dan de gewone wereld accentueren. (Huizinga, 1974, p. 13)

In breaking down the quote above, Huizinga first articulated that a game has to be a "vrije handeling, die als 'niet gemeend' en buiten het gewone leven staande bewust is, die niettemin de speler geheel in beslag kan nemen" (p. 13), which states that playing a game is a voluntary activity outside of ordinary life, that may fully absorb the player. With "waaraan geen direct materieel belang verbonden is, of nut verworven wordt" (p. 13), Huizinga described that from the activity of playing a game players cannot directly gain material interest or purpose. Next, with

"die zich binnen een opzettelijk bepaalde tijd en ruimte voltrekt, die naar bepaalde regels ordelijk verloopt" (p. 13), Huizinga pointed out that players are bound to a predetermined time and space, in which players orderly follow certain rules. Finally, Huizinga described that a game "gemeenschapsverbanden in het leven roept, die zich gaarne met geheim omringen of door vermomming als anders dan de gewone wereld accentueren" (p. 13), which means that a game brings to life social communities that gather either in secrecy or present themselves as distinctly different from the real world.

Huizinga (1974) provided a useful perspective on what it means for something to be a game, albeit somewhat complicating the matter in using the Dutch word of "spel," which can mean both play and games. Still, distinctive aspects of games are articulated with it being a free activity bound to rules and outside of ordinary life. Particularly the argued difference between two distinctive universes, one that belongs to the game and one that belongs to ordinary life, is both important and problematic for persuasive games. Huizinga (1974) primarily pointed at this difference to clarify that what happens in the game should not have a direct influence on real life, such as that firing missiles in the game September 12th: A Toy World (Frasca, 2003) does not actually result in casualties, more terrorists, or the player being convicted of murder in real life. However, it is problematic in the sense that the ultimate aim of persuasive game designers is to actually design a game that has an effect on players' attitudes in real life. Thus, Huizinga (1974) articulating that players do not gain material interest or purpose from playing a game partially conflicts in terms of persuasive games, and as such is an aspect that cannot be borrowed in full for describing games in this dissertation.

Another historical perspective on playing games was offered by Suits (2005) in his work "The Grasshopper: Game, Life, and Utopia," arguing that playing a game is "the voluntary attempt to overcome unnecessary obstacles" (p. 55). Suits's definition, while more compact, articulates similar aspects also mentioned by Huizinga (1974). For instance, both articulated the need for a game to be a free and voluntary activity. However, also similar to the description offered by Huizinga (1974) is the conflict when it comes to the effects on real life. While not necessarily mentioning that games do not have an influence on real life, the notion of overcoming unnecessary obstacles is debatable. Indeed, many games involve activities that may, in themselves, be considered useless, but when an activity teaches a person new skills or attitudes that they can

employ in real life it may not be as unnecessary as it seemed at first glance.

A more contemporary perspective on games was offered by Salen and Zimmerman (2004) and Juul (2011). In their seminal book Rules of Play, Salen and Zimmerman (2004) defined a game as “a system in which players engage in an artificial conflict, defined by rules, that result in quantifiable outcomes” (p. 80). Similar to the description offered by Huizinga (1974), players are bound by rules that determine the effects of their efforts. This aspect is important as it separates games from freeform play. Furthermore, the notion of an artificial conflict overlaps with the idea discussed above that whatever happens inside the game is not ‘real’, and actions should have no immediate effect on real life. However, in terms of persuasive games, a useful nuance offered with the definition by Salen and Zimmerman (2004) is that while the offered conflict is indeed artificial, it may still bear an actual effect on real life. Thus, while a conflict presented in September 12th: A Toy World (Frasca, 2003) is artificial, it may cause players to think and feel differently about the represented situation in real life. The mention of quantifiable outcomes marks a clear difference with the aforementioned definitions, as neither (Huizinga, 1974) or Suits (2005) argued the need for a game to have quantifiable outcomes. Salen and Zimmerman (2004) described that a quantifiable outcome means that at “the conclusion of a game, a player has either won or lost or received some kind of numerical score. A quantifiable outcome is what usually distinguishes a game from less formal play activities”(p. 80). As Salen and Zimmerman (2004) further articulated, this aspect of the definition does work for most of what would commonly be considered games, but certainly not for all. While certain role-playing, survival, or construction and management games may have performance metrics, they do not always have to end with a quantifiable outcome. In such cases, Salen and Zimmerman (2004) considered the micro quantifiable outcomes that happen within the overarching game, such as the additional abilities players acquire throughout the game or the achieving of goals set by players themselves, as quantifiable outcomes as well. This is important for the perspective on games used in this work as not all cases have clearly defined win or loss states, but all do include small intermediate states consisting of positive or negative feedback.

Lastly, we consider the work offered by Juul (2011) on delineating several features of games, distilled from analyzing previous definitions

including those offered by Huizinga (1974), Suits (2005), and Salen and Zimmerman (2004). Juul (2011) described games as "a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome, and the consequences of the activity are negotiable" (p. 36). The feature of "fixed rules" (p. 36) describes that games have a defined set of rules that players agree upon and are enforced by the game's system. The feature of "variable and quantifiable outcome" reflects that the rules of a game provide different possible outcomes and that these outcomes are clear and beyond discussion. The feature of "valorization of the outcome" (p. 36) dictates that some of the outcomes of a game are better than others and that better outcomes are often more difficult to achieve. The feature of "player effort" (p. 36) describes that a player can influence the game state and game outcome, and that interactivity is required to make progress. "Attachment of the player to the outcome" (p. 36) describes that players are emotionally attached to the outcome of the game. Finally, the feature of "negotiable consequences" (p. 36) describes that games can optionally be assigned real-life consequences. Many of these features, as they are distilled from definitions discussed above, should be familiar and not need further explanation. However, the feature of "negotiable consequences" (p. 36) is an important feature for the work of persuasive games as it allows games to have an effect beyond the boundaries of the game. Persuasive games, as discussed in detail in the next paragraph, are fundamentally designed with the intent to have real-life consequences, whether this involves users buying a product, voting for a politician, donating to a charity, or becoming more empathic with the plight of others. These consequences entail a change of attitude in real life that, in turn, could lead to a change of behavior in real life. Furthermore, Juul (2011) also articulated that these six features may also lead to borderline cases, which attests to the difficulty of producing a concise definition that will clearly frame games.

Given the complexity of defining games and the limited scope of this dissertation in regards to this, other than analyzing the work above no perfect definition can be offered. Nevertheless, for positioning the work presented in this dissertation it makes sense to briefly provide a personal perspective on why the designed artifacts in this dissertation should be considered as games. First, games include rules that present users with unnecessary obstacles to overcome, and require voluntary participation. Second, games have emotionally attached outcomes, which could exist

only on a macro level or set by the users themselves. For instance, users of a theme park building sim may set their own objective of constructing a marine themed park, which has no benefit for game progression, but results in an enjoyable experience on completing a design that fits nicely within this overall theme. Finally, while the majority of interactions with a game's system have no effect outside of the fictional universe, games may have actual consequences for real life. For instance, a racing game may influence a user's choice of car brand when shopping for a car in real life. In addressing the real-life consequences of games the concept of serious games may come to mind as well, as these games are primarily aimed at gaining and improving real-life knowledge.

This section provides some grounding in regards to games, but given the complexity of the matter, with sometimes convoluted definitions as a result, for concisely describing persuasive games - while referencing all the work above - games will be described as interactive rule-based entertainment media. This description captures most of the most important aspects, including that games are a type of mediated communication (media) that requires player effort to progress and receive feedback (interactive), that this player effort is evaluated based on a set of rules (rule-based), and that games are played voluntarily, out of own interest, typically for enjoyment, but without necessarily ruling out real-life consequences (entertainment).

Describing Persuasive Games

Following the discussion about persuasion, attitudes, and games above, this work continues describing persuasive games as interactive rule-based entertainment media designed with the intent to shape players' attitude towards an object or issue in reality. In which reality refers to the extrafictional universe. In line with the broader concept of persuasion, this means that a persuasive game is categorized following the persuasive intent held during its design and development. Because attitudes are learned, persuasive games are thus designed to teach their players attitudes, which can take the form of both shaping existing attitudes to be more positive or negative, or the teaching of new attitudes along with the introduction of a novel attitude object or issue (for which the player did not form an attitude yet). Another important aspect to this definition is that a primary objective of persuasive game designers is to influence attitudes towards objects or issues that exist in reality. A game that influences only attitudes held towards fictional

objects or issues - for example how players think and feel about a certain fictional character - without the end-goal to have players think or feel differently about the represented character in the real physical universe should not be categorized as a persuasive game.

However, it is true that many games do include arguments that may reflect well on reality, whether this is from how the First World War played out according to how it is portrayed in Battlefield 1 (DICE, 2016), to how one can design a city in reality following a design that works well in a game such as SimCity (Maxis Emeryville, 2013). While gray areas are unavoidable, the primary criteria for whether a game is a persuasive game or not comes down to the intention behind its design. If the game was designed to shape attitudes about an object or issue in reality, then it is a persuasive game. This also means that if the designers of SimCity (Maxis Emeryville, 2013) made the intentional decision to make nuclear seem like a dangerous and unfavorable source of energy compared to other energy sources as a primary objective, then SimCity could be considered a form of persuasive game.

The focus on shaping attitudes as the primary outcome of persuasive games also situates persuasive games distinctively from other areas of persuasion research and design within the Human-Computer Interaction landscape, such as persuasive technology and gamification. Fogg (2003) coined persuasive technology as "interactive computing systems designed to change people's attitudes and behaviors" (p. 1). Indeed, to a large extent this definition does overlap with the definition formulated for persuasive games above. In presenting the multiple dimensions of persuasive technology using Fogg's Functional Triad, the medium category of this model described that "simulations can persuade people to change their attitudes or behaviors by enabling them to observe immediately the link between cause and effect" (Fogg, 2003, p. 63). This medium approach to persuasion resonates with Bogost's (2007) perspective to persuasive games as "the art of persuasion through rule-based representations and interactions rather than the spoken word, writing, images or moving pictures" (p. ix). However, there are also fundamental differences between persuasive games and persuasive technology. Most of Fogg's work focused on gaining user compliance or motivating user behavior, rather than focusing on the shaping of users' attitudes (Fogg, 2003). This perspective to persuasion contradicts work on persuasive communication previously discussed, with persuasion seen as the shaping of attitudes as a precursor for behavior, rather than as

a means for changing behavior directly (Maio & Haddock, 2009; O'Keefe, 2002; Perloff, 2008). In the same vein, Bogost argued that "Captology [Persuasive Technology] is not fundamentally concerned with altering the user's fundamental conception of how real-world processes work [...] persuasive technology works in the service of existing material ends, rather than the reasons one would want to pursue those ends" (2007, p. 60-61). Thus, while the concepts of persuasive games and persuasive technology overlap, they are different in the latter being primarily focused on shaping attitudes and the former being primarily focused on motivating behavior.

Finally, another concept that is often mixed in the discussion on persuasive games, is gamification. Gamification has been defined "as a process of enhancing services with (motivational) affordances in order to invoke gameful experiences and further behavioral outcomes" (Hamari et al., 2014, p. 3026) or "the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 9). Regardless of the differences in definitions used across the Human-Computer Interaction landscape, a commonality is the focus on motivating behavior, particularly in the context of commercial applications (Deterding et al., 2011; Hamari et al., 2014), rather than the focus on attitudes as distinct in the discussion on persuasive games. While gamification could serve as a supporting actor in performing certain behavior, it does not fundamentally focus on shaping the underlying attitudes that drive the targeted behavior. Thus, persuasive games mark a specific concept of games that may be defined as interactive rule-based entertainment media designed with the intent to shape players' attitude towards an object or issue in reality, and is distinct from concepts such as persuasive technology and gamification. In the next section this definition is further illustrated with several example cases.

Persuasive Game Cases

With defining persuasive games as interactive rule-based entertainment media designed with the intent to shape players' attitude towards an object or issue in reality, we may start to paint the landscape of persuasive games with several illustrative classic and contemporary cases. Among the classic cases are persuasive games that, in part, helped define the early landscape of persuasive games and often form the basis for scholarly work on persuasive games. This includes work such as September 12th: A Toy World (Frasca, 2003), Darfur is Dying

Figure 9 (↑)
The player has to hide from the Janjaweed militia while collecting water for his community in the game Darfur is Dying (Ruiz et al., 2006).

(Ruiz et al., 2006), and The McDonalds Game (Molleindustria, 2006). Among the more contemporary cases are persuasive games that clearly illustrate how much the field has grown over the past decade, with clear advancements in terms of both quality and reach. This includes games such as This War of Mine (11 bit studios, 2014a) and Hellblade: Senua's Sacrifice (Ninja, 2017).

As was mentioned earlier in this chapter, September 12th: A Toy World (Frasca, 2003) is designed with the intent to illustrate the failing approach of the United State of America's war on terror, vividly showing that airstrikes do not solve the problem but actually make the situation worse. As the player interacts with the game, launching airstrikes, the rules of the game signal the player that the best outcome may perhaps have been achieved by not playing the game at all. Darfur is Dying (Ruiz et al., 2006) is another classic persuasive game, about the crisis in the Darfur region of Sudan. As a player, one plays as one of the Darfuri refugees trying to collect enough water and help sustain the camp while under a continuous threat from the Janjaweed militia (see Figure 9). Darfur is Dying (Ruiz et al., 2006) is often categorized as a serious game or newsgame, but as the game included an intentional objective to have players feel for the refugees and include a call to action to help stop the crisis in Darfur, it fits the label of a persuasive game as well.

Figure 10 (↓)
In the McDonald's Video Game (Molleindustria, 2006) players are tasked to keep the company profitable. As an anti-McDonald's this goal requires players to engage in unethical activities.

Another popular exemplar persuasive game is The McDonalds Game (Molleindustria, 2006), which, contrary to what the name may suggest, is not an advergame published by McDonalds. If anything, The McDonalds Game (Molleindustria, 2006) is an anti-McDonalds game in which the player has to engage in unethical behavior to keep the company McDonalds profitable (see Figure 10). Players have control over four different sections of the company, including the farm, slaughterhouse, corporate office, and restaurant divisions. The game starts easy and players can run the company without too much hassle, but quickly realize that they have to engage in unethical behavior to keep the company profitable. Players may, for instance,

engage in the deforestation of areas where indigenous people live to increase the production of crops, or corrupt a nutritionist to disprove that obesity is linked to fast food. The rules over time present the argument that a company like McDonalds simply cannot be profitable without engaging in unethical behavior.

Another type of persuasive game is Hush (Antonisse & Johnson, 2013). Hush is simple in its approach and while still rule-based, is focused on an experience derived from its audiovisual cues. In Hush, the player plays as a Rwandan Tutsi mother soothing her baby to avoid being detected by Hutu soldiers. Similar to many rhythm games, players have to soothe the baby by slowly tapping keys as words of a lullaby are displayed on the screen (see Figure 11). If you fail to soothe the baby, crying increases, and both mother and baby are prone to being discovered by Hutu soldiers. The overall experience tries to capture part of the distress of Rwandan Tutsi, and urges players to take action via human rights organizations.

Figure 11 (↓)
In Hush (Antonisse & Johnson, 2013) players type along with the words as they appear on the screen to soothe the baby and avoid being discovered by Hutu soldiers.

Other persuasive games also focus more on the audiovisual experience, rather than the rules, to deliver the persuasive message. For instance, in the game Auti-Sim (Kadayifcioglu et al., 2013) players play as an autistic child on a playground. As the player approaches other children, vision becomes grainy and a chatter noise increases exponentially (see Figure 12). As a result, players may better understand the overstimulation that autistic children experience. While some may be swayed, Auti-Sim has received both praise and criticism. Some players argue that its oversimplification and inaccuracy is offensive for people on the autistic spectrum, followed by the developers openly apologizing for this: "As the developer of the game I apologize to people who think their condition is not accurately portrayed in this interactive experience" (Kadayifcioglu et al., 2013, para. 2). While the developers likely had good intentions, this perhaps more than anything stresses the value of involving experts on the subject throughout production, like in the later discussed case of Hellblade: Senua's Sacrifice (Ninja, 2017).

Figure 12 (↑)
The player experiences heavy audiovisual distortion in when approaching other children in Auti-Sim (Kadayifcioglu et al., 2013), in an approach to audiovisually represent the difficulty of socialization for some people on the autisic spectrum.

At the same time, more and more high-quality production cases that fit within the definition of persuasive games have been published over the past decade. For instance, games such as Spec Ops: The Line (Yager Development, 2012), Hellblade: Senua's Sacrifice (Ninja, 2017), and This War of Mine (11 bit studios, 2014a) may be primarily designed with an entertainment focus in mind, they are also designed with the intent to have players think and feel differently about the actual issues addressed in the games. At first glance Spec Ops: The Line (Yager Development, 2012) may seem like a run-of-the-mill shooter, in part driven by the typical 'American hero against middle eastern bad guys' theme and familiar first-person shooter mechanics. While Spec Ops: The Line indeed provides a system and gameplay that fits into this typical category, the narrative increasingly conflicts with the game's system, hinting that the player is not a hero at all. This ludonarrative dissonance causes an uncomfortable player experience that critiques both the player's actions and the current state of the first-person shooter genre in general. At a certain point the game holds up a mirror for the player, illuminating the immoral choices the player willingly made (see Figure 13).

Another contemporary persuasive game in which the designers managed to blend entertaining and persuasive goals is Hellblade: Senua's Sacrifice (Ninja Theory, 2017a). The game Hellblade: Senua's Sacrifice is an action-adventure game in which the player is cast into the role of Senua, a Pict warrior who embarks on a journey through Helheim to rescue the soul of her dead lover from the goddess Hela. Hellblade: Senua's Sacrifice first presents itself as an entertainment-focused game, but quickly unfolds as an unsettling journey of the protagonist struggling with psychosis (see Figure 14). This is not a coincidence, as Hellblade: Senua's Sacrifice's design team Ninja Theory describes that this setup allowed them to offer players both an entertaining experience as well as

Figure 13 (→)
"Do you feel like a hero yet?". On the surface Spec Ops: The Line seems like a run-of-the-mill shooter game; however, it will make players question their own choices as well as the state of the modern first-person shooter genre.

one that would raise awareness on the struggles of living with psychosis (Antoniades, 2017; BAFTA Guru, 2018). Furthermore, On their website, Ninja Theory (2017b) communicates that "if you've been affected by any of the issues you've seen in Hellblade: Senua's Sacrifice and want to talk to someone or find out more, select your country from the drop down to find your local support" (para. 1), to guide players who recognize Senua's thoughts and feelings in themselves or others around them, to take appropriate action.

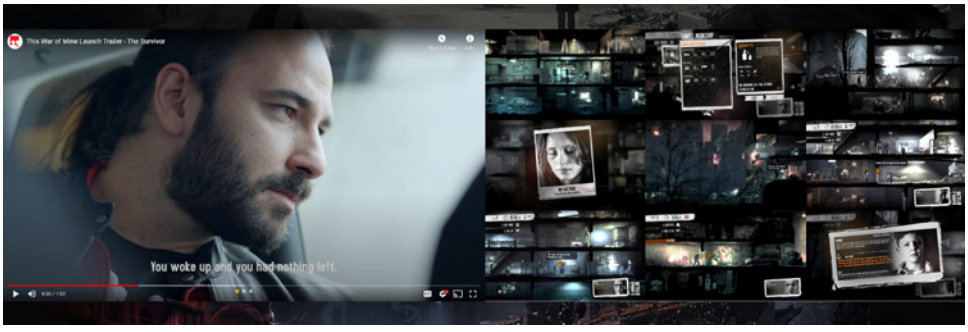
Lastly, This War of Mine (11 bit studios, 2014a) is another example of a commercial persuasive game that focuses on offering players both an engaging experience and one that will leave players with something to think about after the game ends, particularly the hardships of civilians that were - or are now - caught in war zones. This War of Mine is a survival-themed game that offers players the opportunity to control a group of civilians trying to survive under the harsh conditions of war (see Figure 15). The player's group of civilians is far from the powerful squad often seen in war-themed games, but consists of average people that have never fought in a war before. As a result, the game is less about fighting one's way through war, but more about hiding and keeping one's group safe, scavenging for food and items, and meeting others to improve the overall situation for one's group. A particularly interesting aspect of This War of Mine's gameplay can be found in how it deals with topics that pertain to the psychological stress of having to survive as a citizen during times of war. Many of the confrontations with other characters in the game are not about fighting, but challenge the player with various dilemmas for which often no best option is presented. Examples of such dilemmas include the decision to steal from defenseless elderly, or deciding whether to stop a heavily armed aggressor who is about to commit rape. Decisions made in the numerous scenarios like these do not only have an effect on the mental wellbeing of characters, but ultimately also require players to ask themselves questions as to what is right and wrong.

The resulting persuasive message is multifaceted, but more than anything pertains to how emotionally taxing living in a war zone actually is for the average civilian - on top of the already physically heavy conditions - and that people should avoid this to happen in reality at all costs. Parallels to reality are drawn both in-game as well as through auxiliary media, such as a trailer on the official This War of Mine website in which an experience experts talks about his past (see Figure 16; 11

Figure 14 (→)
Senua, the protagonist in the game Hellblade: Senua's Sacrifice's (Ninja Theory, 2017a), has to deal with psychoses throughout the game. This is a deliberate design choice, not only for offering a complex character and unique gameplay, but also to help raise awareness on the disorder.

Figure 15 (↓)
In This War in Mine (11 bit studios, 2014a) the player guides a group of civilians in a city under siege, trying to keep them safe at all costs, sometimes resulting in morally difficult scenarios.

Figure 16 (↓)
Drawing connections between the extrafictional (real) and fictional (game) universes on the official This War of Mine website (11 bit studios, 2014a).



bit studios, 2014a). Aside from this attitudinal shift that the designers sought, they also hope it will motivate players to donate to organizations such as War Child (War Child Gaming, 2019) and indirectly help citizens who are currently experiencing war. Ultimately, This War of Mine was a huge success, both in terms of profits for the company 11 bit studios who designed the game, selling more than 4.5 million copies worldwide, as well as collecting over $500.000, - in donations for charity (Brown, 2019). Chapter 4 offers an in-depth perspective on the production of This War of Mine.

Following an understanding of what persuasive games are, including the offering of a definition along with several example cases, the next section explores how players interact with, and experience, playing persuasive games. This perspective offers insight into the mechanisms that contribute to the persuasiveness of persuasive games, and as a steppingstone towards persuasive game design opportunities and challenges.

Persuasive Game Design Student Portfolio

Alongside the studies presented in this dissertation, a student design project was initiated to generate a series of small persuasive games to explore the persuasive game design space, as well as to help illustrate some of the theories and approaches discussed in this dissertation. While no formal analysis has been carried out to generate insight into the exact implementation of theories or approaches, nor an evaluation of player experiences, these persuasive games help in materializing some of the theories and approaches. This Persuasive Game Design project was deployed in 2014 and 2015 at the Industrial Design department of the Eindhoven University of Technology in Eindhoven (the Netherlands), the MediaLab of the Amsterdam University of Applied Sciences in Amsterdam (the Netherlands), and the ICT & Game Design and Technology department of the Fontys University of Applied Sciences in Eindhoven (the Netherlands). The developed persuasive games have been introduced along the main text of this dissertation, as a means to illustrate theories and highlight design aspects discussed in the main text. This project spanned two semesters and attracted a variety of self-motivated students from both Bachelor and Master courses, following the project brief below:

> Playing is learning. As we play, we immerse ourselves in alternate realities and take on different roles. In this safe and friendly environment, we learn to operate with given or negotiated alternative rules, create elaborate what-if scenarios and test out hypotheses. By making decisions in someone else's shoes, getting moved through engaging stories, learning about the underlying systems and forming optimal game strategies, the play activity can become impactful. We reflect on our worldview and can be 'persuaded' into attitudes and behavior that improve our quality of life. […]. In this project, you will design a game or playful activity that lures a person in (how do you design something that evokes curiosity and persuades people to start playing?), engages them fully (how do you motivate people to persist in an activity and become fully engrossed by it?) and through play changes their attitude. How to design for attitude change is also still very much an open question. Should the message be overt or covert, explicit or allegorical, emerging from playful mechanics, etc.? [The focus is on] games (intelligent systems) that improve the quality of life, for instance in the health care domain and for an aging population, in societal contexts such as education or human rights, and the preservation of energy.

Students were offered a presentation at the start of the project on the theoretical grounding of persuasive games, based on the publication Kors, M., Van der Spek, E. D., & Schouten, B. A. (2015) A Foundation for the Persuasive Gameplay Experience. It was published in the proceedings of Foundations of Digital Games (FDG) Conference Series. Along the design and development process, students were guided by mentors who were familiar with the overarching Persuasive Gaming in Context Project (including the author of this dissertation, as well as several of the co-authors of publications included in this dissertation). While the student persuasive game design projects are presented separately from the main text throughout this dissertation, they are located in a manner so that they address some of the concepts discussed in the surrounding main text.

Below, the first student persuasive game, Mr. Powerful, is presented:

Mr. Powerful

Students: F. Gramberg, L. Maier, R. Gulekov, and R. Boerman
Client: Amnesty International
Coach: L. Bogers

Mr. Powerful is a persuasive game designed with the objective to show how Amnesty International takes action against the violation of freedom of speech and aims to sway players to contribute to this cause in the form of supporting Amnesty International. As a player, one takes on the role of an oppressor (see Figure 17), who is criticized by the media and protesters for violating human rights.

Figure 17 (↑)
In the game Mr.Powerful, players play as an oppressor trying to fend off critique delivered through demonstrations, media, and petitions.

Through a repeating series of three mini-games the player has to deal with various channels via which criticism is given to them, namely the media, protests, and petitions (see Figure 18). This series of mini-games is repeated as the intensity of each increases, making it gradually more difficult to ignore the criticism (see Figure 19). Mr. Powerful adopts a similar procedural rhetoric approach as September 12th: A Toy World (Frasca, 2003), in which a challenge that seems simple at first turns out to be far more difficult. In fact, like with September 12th: A Toy World, players quickly figure out that there is simply no way to actually win the game.

Figure 18 (↑)
In one of the three mini-games players try to stop a protest and change protesters' minds.

A primary difference in Mr. Powerful is that players play as the character who causes harm to others rather than the one who fights for them. The concept behind this is that this will provide players a perspective to understand that criticism vented through media, protests, and petitions is an effective means to put pressure on oppressors. In this sense, the game also explores the raising of empathy as a means of persuasion.

In turn, this drives home the message that people should support these actions in reality to help against the actual violation of freedom of speech, and one way of supporting this cause is by contributing to Amnesty International (see Figure 20). A possible downside to this approach, as none of the depicted actions of the oppressor are harmful, could be that players actually develop empathy for the oppressor rather than for those who are being oppressed. This in turn may unintentionally dampen the seriousness of the message and its persuasive effects.

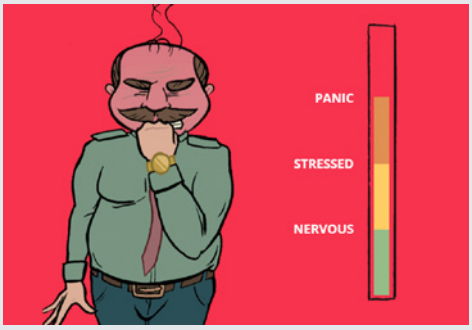


Figure 19 (←)
Once the outside pressure gets too much, Mr. Powerful cannot keep up anymore and experiences a mental meltdown.

Figure 20 (←)
The game ends with the argument that with Amnesty International's efforts, players can make a true difference by petitioning or donating.

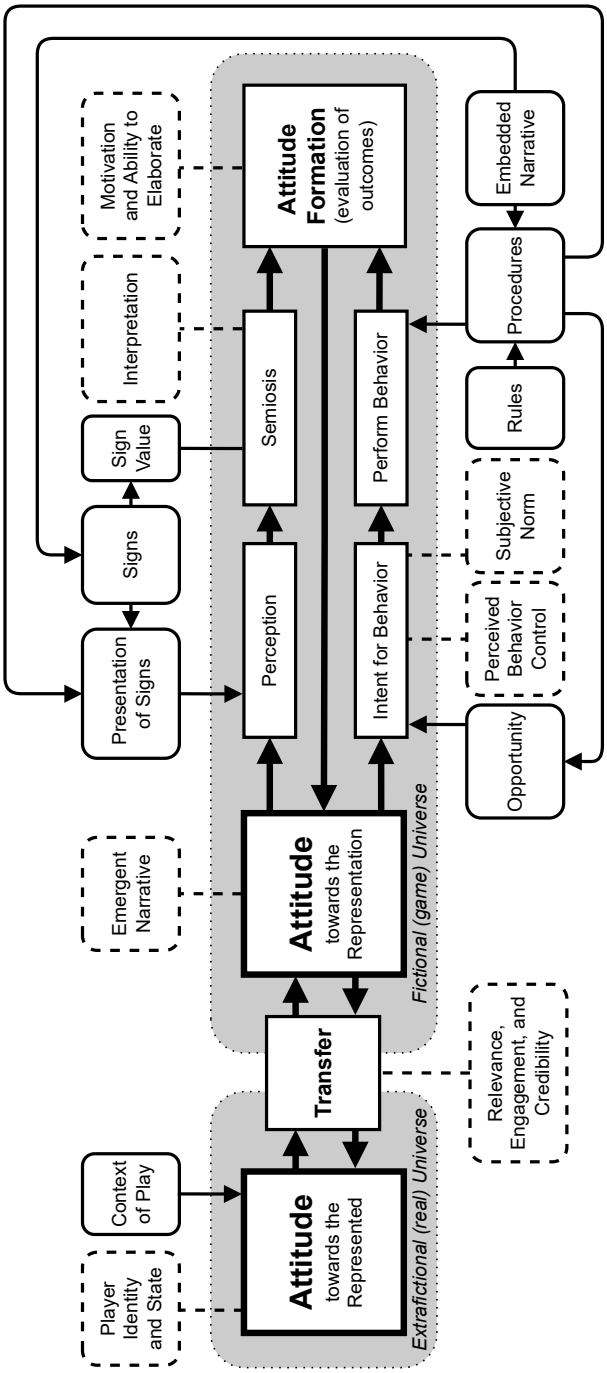
2.3 Persuasive Gameplay

Whereas the previous sections tackled questions that pertain to what persuasive games are, this section dives deeper into the gameplay processes that players go through when playing persuasive games. This is useful as it provides an overview of specific influences that matter in the objective of shaping attitudes, which in turn provide designers with possible aspects to focus on in the design of persuasive games. Figure 21 visualizes aspects related to persuasive gameplay, including game elements, psychological processes, and the distinction between the extrafictional (real) and fictional (game) universe. It must be underlined that this model is primarily meant to visualize related theories on persuasion and games, as a conceptual springboard for understanding and further exploring persuasive gameplay, rather than as a standalone aid in designing or evaluating persuasive games. Readers who are interested in a model describing the various persuasive dimensions in persuasive games are suggested to explore the work by De la Hera Conde-Pumpido (2013), and readers interested in a model specifically designed for the evaluation of persuasive games are suggested to explore the work by Jacobs (2017).

The Attitudinal Gameplay Model

A first key aspect of the model presented in Figure 21 is the delineation of two separate universes, marked with the light gray areas, representing the extrafictional and fictional universe. Attitudes held by the player in the extrafictional universe may transfer to the fictional universe, and vice versa, which in turn may influence how players deal with situations in either of the two universes accordingly. For instance, when players develop attitudes towards the representation of an attitude object or issue when exploring the fictional universe, these attitudes may transfer and sustain beyond the boundaries of the fictional universe and develop into attitudes towards the actual represented object or issue in the extrafictional universe. This influencing of attitudes held by the player in the extrafictional universe is ultimately the objective of a persuasive game. There are various factors, beyond the design of the persuasive argument, that may influence the transfer of attitudes between universes. These factors are discussed in greater detail later in this section. Within the light gray area on the right, marking the fictional universe, a basic interaction loop is depicted, illustrating that players can be persuaded following two different pathways; one as the result of

Figure 21 (→)
The Attitudinal Gameplay Model



semiosis and the other as the result of behavior. In actuality, designers have two channels that can be used to present their persuasive arguments, either through the signs (e.g., visuals, audio, etc.) or through the rules (i.e., mechanics) that evaluate players' behavior - and provide feedback to players through the signs. Both signs and behavior may influence players' attitudes in the fictional universe. Surrounding both the extrafictional and fictional universes (the light gray areas), the psychological (dashed border) and game factors (solid border) areas are positioned. The psychological (dashed border) area represents the possible moment-to-moment mental state of the player, which typically vary from player to player and are difficult to design for in specific, unless personalization is part of the design. The game factors (solid borders) area represents the factors that persuasive game designers can influence through their design, and include aspects such as the context in which the game is played and what narrative is presented to the player. The next paragraphs address the different sections of the overview in more detail.

Semiosis Route

Semiosis is the process of meaning-making (Chandler, 2007). One makes sense of the environment around one by attaching meaning to the things one sees, hears, smells, and feels. Chandler (2007) explained that "anything can be a sign as long as someone interprets it as 'signifying' something - referring to or standing for something other than itself" (p. 13). From a designer's perspective, it is important to understand that everything implemented in the game can convey something, whether intended or not, and not just the signs meant to support the persuasive message. Not taking into account what other signs may convey could potentially cause issues for the successful interpretation and effect of the persuasive message. As such, in designing a persuasive game it is important to understand what all signs in the game mean, and how they could possibly affect the strength of the persuasive message (De la Hera Conde-Pumpido, 2014).

The semiosis route consists of two phases, namely Perception and Semiosis. Perception is used to indicate the ability of the player to perceive a sign, as a player can only make meaning of a sign when it can be perceived. The perception of a sign is, outside of personal factors of the player, influenced by the designer's choice on how to present the signs (or the affordances of the player that restricts or enables

perception). The presentation of signs is determined by the placement of signs in the fictional universe, their prominence, cinematic treatment or through cut-scenes. Semiosis follows the perception phase. Saussure indicates that a sign has no absolute value independent from its relation with other signs in the same system (Chandler, 2007). As such, it is important for the designer of a persuasive game to take the value of a sign into account, understanding what relation it has with other signs and how it is influenced by the context in which the game is presented. Peirce (1958, as cited in Salen & Zimmerman, 2004), defined a sign as "something that stands for something, to somebody, in some respect or capacity" (p. 37), and in relation to games Salen and Zimmerman (2004) further described that a sign's meaning (or collection of meanings) is the result of the interpretation by the individual player, and thus depends on the player's identity, context of play, and the emergent narrative. Taking the value of a sign into consideration is important as it can guide the interpretation of the player, likewise influencing the persuasive message. Next, there are two types of narrative: one that can be controlled by the designer and one that only exists in the player's mind. Whereas the embedded narrative is a detailed planning of signs and procedures to tell a particular story, the emergent narrative is the internal narrative that only exists in the player's mind and is influenced by what the player does in the fictional universe.

Behavior Route

The second route illustrated in the overview is named the behavior route. The reason for Bogost (2007) to heavily focus on the procedural rhetoric, as persuasion through the game's rules and procedures rather than through signs, is not surprising as it related to a game's unique abilities that legacy media cannot offer. Furthermore, it has been argued that attitudes generated through direct experience are robust and more likely to predict consequent behavior (Aronson, 1999; Maio & Haddock, 2009). The implementation of behavior in the overview is based on the Theory of Planned Behavior (Ajzen, 1991; Maio & Haddock, 2009) and the Motivation Ability Opportunity Behavior model by Ölander and Thøgersen (1995), two models that describe how attitudes - and other aspects - may lead to specific behaviors.

The semiosis route and behavior route have to work in synergy in persuasion, as the rules and procedures mean very little if there are no signs to support the same persuasive message (as earlier illustrated

with the game September 12th: A Toy World; Frasca, 2003). Based on an attitude, the player is able to develop an intent for behavior, often coming from the semiosis route. The Opportunity dependency is based on whether the procedures of the game provide the right situational conditions for the player to perceive a behavior as possible (and thus requires a synergy with the semiosis route; Ölander & Thøgersen, 1995). The opportunity can also serve as a trigger to stir up an intention to initiate a behavior (Fogg, 2003). The designer can place specific opportunities throughout the game to influence the player in making specific attitudes actionable. Also, the designer can use false opportunities to present an indirect persuasive message on why certain extrafictional universe processes are potentially flawed. A good example of this is Frasca's September 12th, first providing a sense that one can defeat the terrorists, but quickly introducing the concept that engaging in the most obvious behavior only escalates the issue further (Frasca, 2003).

The perceived behavior control dependency is based on the beliefs of the player concerning their ability to perform a particular behavior (Ajzen, 1991). In the Motivation Ability Opportunity Behavior model, this dependency also hints to the concept of building habits through the repetitive performance of a particular behavior (Ölander & Thøgersen, 1995). The subjective norm (Ajzen, 1991), also referred to as the social norm in the Motivation Ability Opportunity Behavior model (Ölander & Thøgersen, 1995), is described as "the perceived social pressure to perform or not to perform the behavior" (Ajzen, 1991, p. 188). Although the fictional universe offers more affordances for behavior that might not resonate with the subjective norm (in comparison to extrafictional universe behavior), one cannot completely factor it out of the equation. In multiplayer games (in particular in their analog form), for instance, a player's behavior is still influenced by the subjective norm, depending on the relationship with other players, and relevant for maintaining a pleasant experience with these other players. A designer should keep in mind that the behavior of the player may be strongly influenced by his or her direct social environment, which is particularly important when persuasive games are focused on a dialogue among players. For example, some players might be more comfortable in presenting their opinions than others, and others may want to follow the crowd rather than thinking about their own points of view. For designers, it is important to understand that this might have implications for the persuasiveness of the persuasive game, and how one could possibly influence, for example

ease, the subjective norm for participating players.

Next, depending on how well the intent for behavior developed, a player performs (or not) an intended behavior. The performance of the behavior is determined by the rules (embedded in the procedures) of the game, providing feedback about this behavior in return. The outcome results in a specific consequence (e.g., success, no effect, or failure). Based on the outcome of behavior, the player may reflect on whether a belief concerning the outcome of the behavior was correct or not. In some cases, an unexpected feedback might result in cognitive dissonance (Festinger, 1957), which may also be considered a persuasive strategy. Cognitive dissonance refers to a situation in which the player holds conflicting beliefs or feelings (Festinger, 1957; Perloff, 2008). By influencing the performance of the players through the rules of a persuasive game, a designer may actively create a discrepancy in the players' beliefs of how things work, geared to resonate with the persuasive message. Because people are likely to reduce such tension by changing their attitudes (Maio & Haddock, 2009), it may be an effective strategy for creating persuasive gameplay. The outcome of this behavior flows into the attitude formation, in which the player evaluates the outcomes of the behavior (Ölander & Thøgersen, 1995). The behavior route is an important asset for persuasive game designers as such experience may feel like a form of self-persuasion to the player, a type of persuasion that is frequently considered more effective compared to direct forms of persuasion (Aronson, 1999).

Attitude Formation

The next section of the model deals with the attitude formation, the mental process of players evaluating the outcomes of either the semiosis route or the behavior route and relating them to existing thoughts and feelings. The Elaboration Likelihood Model (ELM) by Petty and Cacioppo (1986) provides a detailed process overview describing how likely one would be to change attitudes based on persuasive messages. The ELM indicates that there are two dependencies (motivation and ability) that influence the likeliness a player elaborates on a given persuasive message (a higher elaboration and ability is said to result in a stronger attitude change; Maio & Haddock, 2009; Petty & Cacioppo, 1986; Perloff, 2008). Both dependencies have several sub-variables that influence how likely it is that one will elaborate on a message; some are part of the player's identity while others may be influenced by the designer.

Footprint

Students: R.C.F.M. van der Velden, G.A.G. Verhoeven, K.K. Voeten, and R.M.J. Tomassen
Coach: E.I. Barakova

Footprint is a persuasive game designed to shape attitudes towards climate change by highlighting how a neglect of the environment now will affect everyone negatively later. The player takes on the role as a wildlife photographer tasked to go on an expedition to take photos of a polar bear. While traveling to the intended destination the player has to make choices on a budget, each affecting the environment differently (see Figure 22).

Figure 22 (↓)
The player is casted into the role of a wildlife photographer, on an expedition to take a photo of a polar bear. To get to Antarctica the player is prompted with various budgeting choices

Once the player arrives at the destination, the perspective switches to that of a polar bear. Depending on how environmentally unfriendly the past choices made by the player as a photographer were, the more difficult it is to survive as the polar bear (see Figure 23). Ultimately, the polar bear and the photographer meet, with the monetary compensation for the photos taken by the photographer depending on the health of the polar bear. This last part drives home the message that choosing the less environmentally friendly options may be beneficial now, but they likely backfire in the end. Similar to Spec Ops: The Line, Footprint leverages concepts of empathy and cognitive dissonance to drive home the persuasive message, telling players that they should be more conscious of the environment now as it will affect their future (as cause-effects relationship is not immediately noticeable). Furthermore, in connection to the main text, the game shows a delayed action-feedback loop that should spur players to reflect on their own actions and how they actually negatively impact eventual performance, and in turn what this may mean for reality.

Figure 23 (↑)
Upon arrival to Anctartica the player switches perspective to that of a polar bear, which in turn has to navigate a landscape affected by how environmentally conscious the choices were during the player's journey to Antarctica.

Kolas

Students: H. Lu, S.R. Schippers, and L.L.A. Sonnemans.
Coach: G.J. Jacobs and S.I.Lucas
Client: Amnesty International

Kolas is a top-down role-playing persuasive game about the influence of big companies on the reporting of news. In Kolas, the player takes on the role of a technology-focused reporter, with the objective to collect and write about interesting topics for his blog (see Figure 24). During the game, the player is increasingly manipulated to write more positively about certain companies, and in turn unknowingly experiences suppression to unbiased reporting (see Figure 25).

In the end of the game, the player is confronted with this biased reporting as the game unpacks as a metaphor for the violation of freedom of speech, hinting at how news is manipulated and propaganda is spread. This, in turn, drives home the urgency to fight against the violation of freedom of speech through supporting Amnesty International.

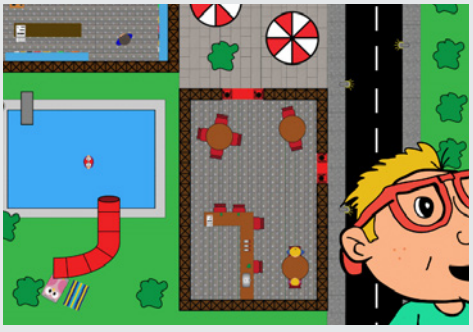


Figure 24 (←)
Kolas casts the player into the role of a technology-focused reporter.

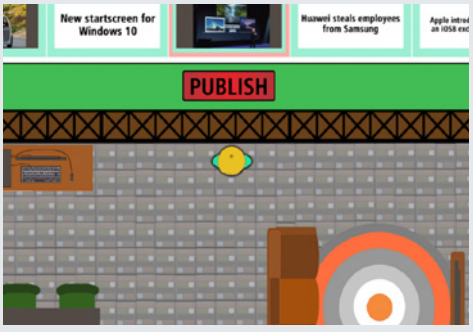


Figure 25 (←)
The player decides what is published, unknowingly being manipulated regarding what choices can be made.

Motivating aspects are relevance, need for cognition, and responsibility (O'Keefe, 2002; Perloff, 2008). Need for Cognition is dependent on the player's tendency to think deeply about things, which is typically a personal trait.

Although relevance and responsibility can partly be transferred from the extrafictional universe, the designer can also improve the relevance of a persuasive message within the fictional universe itself. An example would be by presenting the persuasive message that is important for the player's progression in the game, which likely influences the motivation of the player to elaborate on the message. Aspects for the ability to elaborate are the player's knowledge and understanding of the matter, available time, distraction, and repetition of the persuasive message (O'Keefe, 2002; Perloff, 2008). Knowledge and understanding are personal aspects when they are transferred from the extrafictional universe, but can be influenced in the fictional universe by providing specific knowledge and skills presented throughout prior events in the game. Available time can be provided after exposure to a persuasive message and distractions can be managed through the presentation of signs that construct the persuasive message. When certain signs are important for the argument, the designer might want to avoid other distracting signs that could cause the player to miss the signs responsible for delivering the persuasive message. Repetition can be managed as part of the embedded narrative of the game, providing multiple moments of exposure to the persuasive message throughout the game. In the event of a successful persuasive attempt, the player's attitude components are strengthened or weakened as intended by the designer. In case of an unsuccessful persuasive attempt, the attitude components remain unaffected, or shaped in a way not intended by the designer.

After the attitude formation, one returns to the central attitude hub where the cycle is repeated depending on the presentation of (new) signs, or the opportunity to develop a new intent for behavior. While persuasive game designers may want to take into account the aforementioned aspects as part of the ELM, it must be noted that research on entertainment persuasion argues that an analytical approach to persuasion may not fully account for all the persuasive effects of persuasive messages embedded in entertainment-oriented media (Shrum, 2012; Slater & Rouner, 2002), including games. This topic is discussed further in section The Factor of Engagement.

Transfer of Attitudes between Universes

An important aspect of the overview is the distinction between attitudes that are held, and formed, by the player in the extrafictional universe and attitudes that are held, and formed, by the player in the fictional universe. When designing persuasive games, beyond the embedding of persuasive arguments, a key objective for the persuasive game designer is to create gameplay experiences that increase the likelihood of attitudes formed in the fictional universe to actually transfer to the extrafictional universe. When fictional representations of objects or issues in the fictional universe are unrealistic or cannot be matched to their intended equivalent in the extrafictional universe, players may still be persuaded in relation to the fictional objects or issues, but the resulting attitude change may not be reflected in the attitudes that the player holds towards the extrafictional objects or issues as targeted by the designers.

Pulling the two universe-related attitudes apart allows the designer to identify gameplay qualities that may improve the transfer of attitudes between both universes, beyond designing persuasive arguments alone. At the same time, this may also avoid confusion when certain embedded persuasive messages do not have the expected results, as the bottleneck does not always have to be the actual quality of the persuasive message itself. This is why relying on procedural rhetoric alone - thus without taking care of the signs - may not have the intended persuasive effects, when players misinterpret its underlying meaning. The concept of a transfer process between universes is not entirely novel, as it has previously been described in a similar fashion by Visch et al. (2013) as the "effect of user experienced game-world on forming, altering, or reinforcing user-compliance, -behavior, or -attitude, in the real-world" (p. 3), who argued that the transfer process is often neglected in the design process of persuasive games (Visch et al., 2013). Following preliminary research, three aspects may serve as possible overarching mediating factors in stimulating the transfer of attitudes between universes. In the following paragraphs three preliminary factors - namely relevance, engagement, and credibility - are explored in further detail.

The Factor of Relevance. Relevance deals with how pertinent the topic of a persuasive game (including the attitude object) is to the player. According to O'Keefe (2002), "as a given issue becomes increasingly personally relevant to a receiver, the receiver's motivation for engaging in thoughtful consideration of that issue presumably increases" (p. 141).

Furthermore, Hamby et al. (2016) elaborated that

> the relationship between absorption (and exposure to information in the story world) and externalization (comparison with individual's real-world mental model) is moderated by the personal relevance of story content. The higher the personal relevance, the more likely the information gained through absorption will influence the real-world mental model, and, subsequently, the beliefs, attitudes, and actions of the self in the real world. (p. 119)

Relevance is, in part, determined by a player's identity (culture, interest, etc.), state (mental and physical), and the context (including situational aspects) in which the persuasive game is played. Some of these aspects thus encompass personal aspects, which may be difficult to design for specifically, but oftentimes relevance may also stem from more commonly held interests or values within a community or society.

For instance, designers can take into account whether the majority of targeted players are part of a collectivist or individualistic culture, as certain persuasive game design choices may be more suitable for either of the two (Khaled et al., 2006; Khaled et al., 2009). Similarly, a persuasive game may be designed differently to appeal to different age groups. The designer is, to a certain extent, also capable of making the attitude object or issue more relevant to the player by highlighting important aspects of the attitude object or issue that the player might not have considered before, or by drawing connections to aspects that are already important to the player.

Furthermore, portraying fictional characters, who share traits with the player (e.g., occupation or values), may further increase a persuasive game's relevance. This identification with characters in stories has been shown to aid persuasion in narratives (De Graaf et al., 2011; Hoeken et al., 2016; Perloff, 2008). In a broader sense, relevance may also serve as a factor in the ability for players to correctly correlate the fictional representation of the attitude object or issue to the represented attitude object or issue in the extrafictional universe. While persuasive game designers may not be able to increase relevance on a per-player basis, a focus on commonly held interests or values may help to increase the overall persuasiveness of the embedded persuasive messages.

The Factor of Engagement. A primary objective in the design of games is to create engaging player experiences, that will attract players to begin

playing as well as to keep them playing over extended periods of time. Broadly speaking, engagement may be described as "the subjective experiences and enjoyment of games and motives for playing games" (Boyle et al., 2012, p. 772). This definition articulates that engagement consists of several aspects, with the subjective experiences relating to other concepts such as flow (Csikszentmihalyi & Csikszentmihalyi, 1992) and immersion (Brown & Cairns, 2004), enjoyment to factors such as suspense (Boyle et al., 2012), and motives to motivational factors such as autonomy, competence, and relatedness (Ryan & Deci, 2000).

Outside of factors that pertain to the attraction to start playing, engagement is most commonly related to concepts like involvement, engrossment, and as the first stage of immersion (Brown & Cairns, 2004). Concepts like engagement and immersion have been identified as mechanisms in research on persuasive games (Lu et al., 2012; Ruggiero, 2015), and are considered key components in narrative persuasion (Carpenter & Green, 2012; Green & Brock, 2000; Green, 2006; Green & Brock, 2002; Van Laer et al., 2014). In fact, the inclusion of engaging mechanisms is argued to decrease the likeliness for counterarguing (which is often considered a barrier in persuasive communication; Slater & Rouner, 2002), and often seen as "a more effective way to influence attitudes and behavior than traditional persuasive messages by arousing less resistance to the persuasive messages contained within a narrative" (Moyer-Gusé, 2008, p. 408).

In narrative design, engaging experiences are often described in terms of audiences being transported into a fictional universe - by means of a gripping narrative - and are characterized as particularly immersive experiences that generate the feeling being there in the fictional universe. A common denominator for these concepts can be found in the audience experiencing an undivided focus on the events or tasks at hand and a loss of awareness of immediate surroundings (e.g., like mentally leaving the extrafictional universe behind; Brown & Cairns, 2004; Nilsson et al., 2016). In conceptualizing immersion, Murray (1997) described it as

> a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our

attention, our whole perceptual apparatus. (p. 98)

Immersion may be seen as an umbrella term, categorized by intensity and supporting mechanisms (Brown & Cairns, 2004). Based on a qualitative interview with gamers, Brown and Cairns (2004) described the concept of immersion along three levels of intensity, namely engagement, engrossment, and total immersion. Engagement is the first level of involvement with a game, in which players become focused on the events that take place in the fictional universe and attention is given to overall progress. Engrossment is a level up from engagement in terms of immersion and refers to the moment in which players become emotionally involved with the game and start experiencing emotional reactions to fictional events and characters (Brown & Cairns, 2004). The final, and highest, level of immersion is named total immersion, which is similar to the concept of presence, and is typically characterized with a player's complete disconnect from the extrafictional universe while experiencing an undivided attention and strong emotional attachment to the events and characters in the fictional universe (Brown & Cairns, 2004). Not all immersive experiences are evoked equally and through the same mechanisms. Nilsson et al. (2016) delineated three different ways through which players may experience immersion in fictional universes, namely (a) system immersion, (b) challenge-based Immersion, and (c) narrative immersion.

The stimulation of immersion by means of a narrative, thus narrative immersion, has also been identified as a key component in narrative persuasion (Green & Brock, 2002; Van Laer et al., 2014). Furthermore, similar concepts, such as engrossment, have also been identified to play a significant role in persuasion through narratives (Slater, 2002). Research on narrative persuasion is a particularly interesting field for understanding persuasion through games for two reasons. First, many games employ narrative elements to increase engagement, and in some games the narrative is a core aspect of the player experience. Second, narratives are studied extensively as part of the field of entertainment persuasion (Moyer-Gusé, 2008), to which games - as entertainment media - belong.

While the ELM (Petty & Cacioppo, 1986) has been implemented in the overview, it is worth pointing out that scholars have argued that an analytical approach to persuasion may not fully account for all the persuasive processes and effects of persuasive messages embedded in

entertainment-oriented media (Shrum, 2012; Slater & Rouner, 2002; Van Laer et al., 2014). For instance, Shrum (2012) argued that "people process entertainment (narrative) and promotional (rhetoric) information differently" (p. 7), pointing at driving the focus away from the argument rather than to it. To accommodate for the differences in processing, Slater and Rouner (2002) remodeled the ELM to account for the factors of persuasive narratives and proposed the Extended Elaboration Likelihood Model (E-ELM). The E-ELM highlights how aspects such as absorption and identification with story characters are particularly important factors for the impact of embedded persuasive messages, and thus contrary to how the ELM evaluates persuasive impact based on the attention given by the receiver to a persuasive topic or message (Petty & Cacioppo, 1986). This aspect of entertainment persuasion may indicate that it is important for persuasive game designers to focus on creating engaging and absorbing experiences - that holistically embody the persuasive arguments - rather than to focus on having players scrutinize the embedded persuasive arguments.

The other types of immersion, system immersion and challenge-based Immersion, have been explored to a lesser degree in terms of persuasion, but may open novel and captivating design spaces for persuasion as technology can assist in experiencing immersive fictional universes that offer more fidelity than mental imagery alone (Biocca, 2003; Carpenter & Green, 2012; Green et al., 2004). challenge-based Immersion stems from players' interaction with the fictional world and the overcoming of given challenges (Nilsson et al., 2016). As players mentally focus on overcoming these challenges, they may lose awareness of the extrafictional universe and become absorbed in the fictional universe instead. This counts both for challenges that require attention and skills to overcome, as well as for choices introduced with a branching narrative. For instance, it has been argued that players of interactive narratives who make decisions for their fictional character based on how they themselves would have made the choices were it the extrafictional universe, experience greater persuasive effects (Green & Jenkins, 2014). This type of immersion is, like procedural rhetoric, rather unique to games as no other medium offers a system in which players are challenged to perform actions and receive feedback based on these actions.

Lastly, system immersion has been recognized as the third category of ways players may experience immersion in fictional universes. Technological advancements over the past few years, particularly

One of the Eight

Students: W. Herk, B. Bogaerts, S. Khalil, and E. Disbergen
Coach: R. Duindam

One of the Eight is a role-playing persuasive game designed for children to help them recognize signs of domestic violence, and motivate them to take action when they recognize patterns of domestic violence in peers. One of the Eight employs a narrative-oriented approach to persuasion in which players follow a fictional storyline about a group of dwarfs, of which one displays weird and aggressive behavior (see Figure 26). The story unfolds as players try to discover the reasons behind the particular behavior of this dwarf, to discover that domestic violence may be in play. The designers described focusing on creating a bond between the characters and the player as an important aspect of the design, as a means to evoke identification, and to increase the likelihood the fictional story would resonate with reality. Further, it also related to the factor of relevance. Hopefully few will actually find relevence in the topic of domestic violence, but for some this game may become relevant over time as they start to recognize the displayed behaviors from real life.

Figure 26 (→)
In One of the Eight players discover that one of the dwarves shows symptoms of domestic violence.

Face the Sun

Student: Y. Song
Coach: B.A.M. Schouten

Face the Sun is a persuasive game designed to shape how players think and feel about depression, particularly focusing on a cross-understanding of people who suffer from depression and those who do not. The story-driven gameplay motivates players to explore the environment through a game mechanic that offers players the ability to switch between a positive and negative perspective when interacting with the elements presented in this environment (see Figure 27 and 28). In turn, these interactions will determine the reactions the player receives from the environment, learning to both understand and embrace both positive and negative sides.

This positive and negative character is displayed as a lighter and darker character (the latter being the shadow of the former), which upon switching determines how the fictional universe looks and reacts. Following the embedded story, the player essentially starts and ends at the same location, showing that depression is not a journey from one place to another, but a transition into seeing immediate surroundings in a more positive light. While the mechanism helps to explore both sides, Face the Sun employs an interactive variant of narrative persuasion, through the dialogue system, as a primary means to contextualize the game mechanics and present the intended argument.

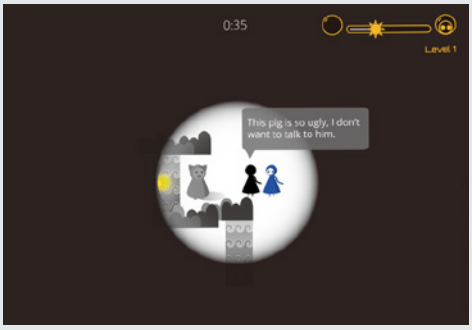


Figure 27 (↓)
In Face the Sun, players are confronted with the negative thoughts that may lead to depression.

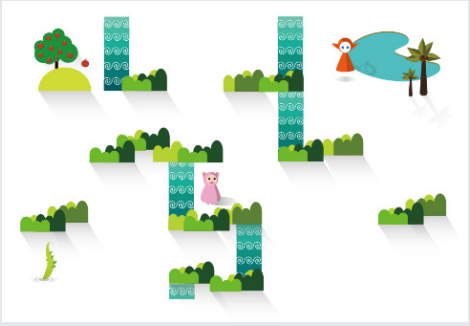


Figure 28 (→)
Players are able to switch between positive (as shown above) and negative perspectives.

highlighted with the rapid diffusion of commercially available Head-Mounted Displays such as the Oculus Rift (Oculus, 2014), have made system immersion more affordable for the average consumer than ever before. Unlike narrative immersion and challenge-based Immersion, by immediately providing players technologically generated audiovisuals that closely match the human's natural perception, experiences using system immersion require far less mental effort of players themselves to reach a state of immersion. However, for entertainment persuasion - and persuasive games in specific - the use of system immersion is relatively novel, with only few studies to date that describe its persuasive capacity and potential design space (Ahn et al., 2011; Ahn et al., 2014; Ahn et al., 2013; Chittaro & Zangrando, 2010; Grigorovici, 2003). Altogether these studies provide preliminary evidence that engagement, or any level of immersion, plays a key role in the persuasiveness of persuasive games.

The Factor of Credibility. Perceived credibility is an aspect in persuasive communication that pertains to the degree a receiver thinks and/or feels whether the presenter of an argument is trustworthy or believable (O'Keefe, 2002, p. 181; Perloff, 2008), and may be defined as "the attitude towards a source of communication held at a given time by the receiver" (McCroskey, 2001, p. 83). As such, credibility is similar to Aristotle's appeal to credibility, named Ethos (Higgins & Walker, 2012; Perloff, 2008).

Whereas pathos and logos are aspects that often pertain to the design of the argument, ethos can also be seen as a more holistic, contextual factor of persuasive communication. For instance, Ethos may be evoked through the framing of a persuasive game and the knowledge or stance of the designers regarding the attitude object or issue as perceived by the player before, during, and after playing the game. Whether a persuasive game about nutrition is openly designed by an independent university or by a commercial beverage company can have a stark difference. An important observation is that designers should not only focus on providing arguments that are credible, but also position their persuasive game as a credible representation of the extrafictional universe. If the intentions of the persuasive game designers are not clear or questionable, players may not find them trustworthy or credible, which in turn hurts the persuasiveness of a persuasive game. Several methods are at the designer's disposal to increase credibility, such as by incorporating multiple perspectives on issues, and to reason why one is preferred (Perloff, 2008). Furthermore, production quality has been

recognized to positively influence the credibility of video news, and may as well form a similar driver for increasing the credibility of persuasive games (Cummins & Chambers, 2011). In conclusion, the more credible an offered experience is perceived by its players, the more persuasive it likely is.

2.4 Conclusion

This chapter offered a multidisciplinary perspective and approach to understanding and exploring persuasive games and persuasive gameplay. In light of design research question 1 (RQ1), formulated as: What are persuasive games, how do players interact with them, and how are they designed?, this chapter offered several answers.

First, a brief history of persuasive games was provided, followed by describing the overarching concept of persuasive games, highlighting both characteristics that are unique to persuasive games and those that are shared with other forms of persuasive communications. Second, the concept of persuasive games was defined in detail and illustrated with several classic and contemporary persuasive game cases. Third, with the Attitudinal Gameplay Model, relevant theories on persuasion were merged and contextualized in terms of persuasion through games, along with highlighting how players may experience such persuasive gameplay. The Attitudinal Gameplay Model highlights the - for persuasive game design - crucial aspect of stimulating a transfer of attitudes between the fictional and extrafictional universe, as persuasive game designers typically seek to affect attitudes in the extrafictional universe rather than attitudes in the fictional universe alone. Along with the concept of transfer, this work generated a set of factors that may play a role in the transferability of attitudes, namely credibility, engagement, and relevance, some of which are explored in further detail to distill novel approaches for persuasive game design. The next two chapters focus on exploring the design-oriented aspect of design research question 1 (RQ1).

The Moral Racket

Student: D. Mighell
Coach: B.A.M. Schouten
Client: Stop the Traffik

The Moral Racket is a boardgame designed to raise awareness on human trafficking and change attitudes towards brands that are involved in these practices. Players focus on building an empire of companies and factories as they move around the board, played in a way that somewhat resembles the game of Monopoly (see Figure 29). However, in The Moral Racket people are seen as a primary commodity for trade, and the exploitation of these people is a key to being successful in the game. As players have to engage in the unethical practice of human trafficking in order to win, play sessions have been shown to spark conversations among participants into the ethical handling of fellow players. Thus, aside from being an illustrative example of procedural rhetoric, in part this game may also somewhat illustrate the employment of an emergent dialogue approach to persuasive game systems (an approach discussed in chapter 3). The data used to back up the shocking numbers is nonfictional, but the logos of companies included in the game are slightly altered (but still recognizable) as a way to prevent legal issues (see Figure 30). The link to reality is clear and may even shock some players when they find out that a preferred brand engages in human trafficking. This is part of the appeal, but it does require the designer to be able to back up the claims made as any discrepancies with reality could be seen as slander (although the use of 'fictional' names for companies may prevent this). Furthermore, like the case with The Moral Racket and Mr. Powerful, teaming up with a respected charity will likely increase how credible the game is perceived.

Figure 29 (↓)
In The Moral Racket, players exploit people as commodities for building their empire.

Figure 30 (↑)
The Moral Racket used nonfictional data, but used fictional names and logos to represent the companies. Still, someone familiar with the logos will immediately recognize the company that is being referred to.

whereIF

Student: A. Ruiter
Coach: A. Jacobs
Client: Amnesty International

whereIF is a multiplayer game designed to teach players about the violation of human rights across countries (see Figure 31). The game provides an abstract representation of countries and numerous simple examples as to how much countries differ from one another in terms of human rights related topics, such as the regulations related to the crossing of borders. The game's persuasive capacity is strengthened through two components. First, players only discover near the end of the game that the presented situations are not fictional, but actually happen on a day-to-day basis in represented countries (therein also creating an opportunity to transfer attitudes to the extrafictional universe) . Second, players are actively invited to engage in a conversation about the topics discussed in the game. In relation to the main text, this latter aspect resonates with the idea of stimulating an emergent dialogue among players, which helps in reflecting on the presented issues in reality. An important aspect with persuasive games that represent actual situations, especially when this involves statistics, is that the game has to be perceived as trustworthy and credible. Designers in such cases will likely benefit from highlighting the research that went into it, what their stance is on the presented situations, and if there are other perspectives on the matter.

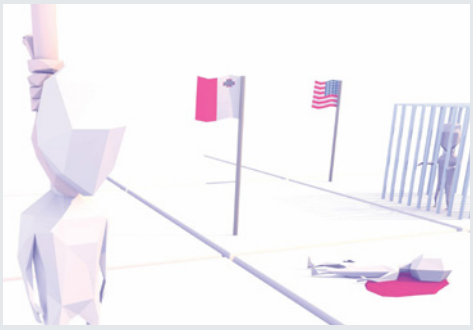
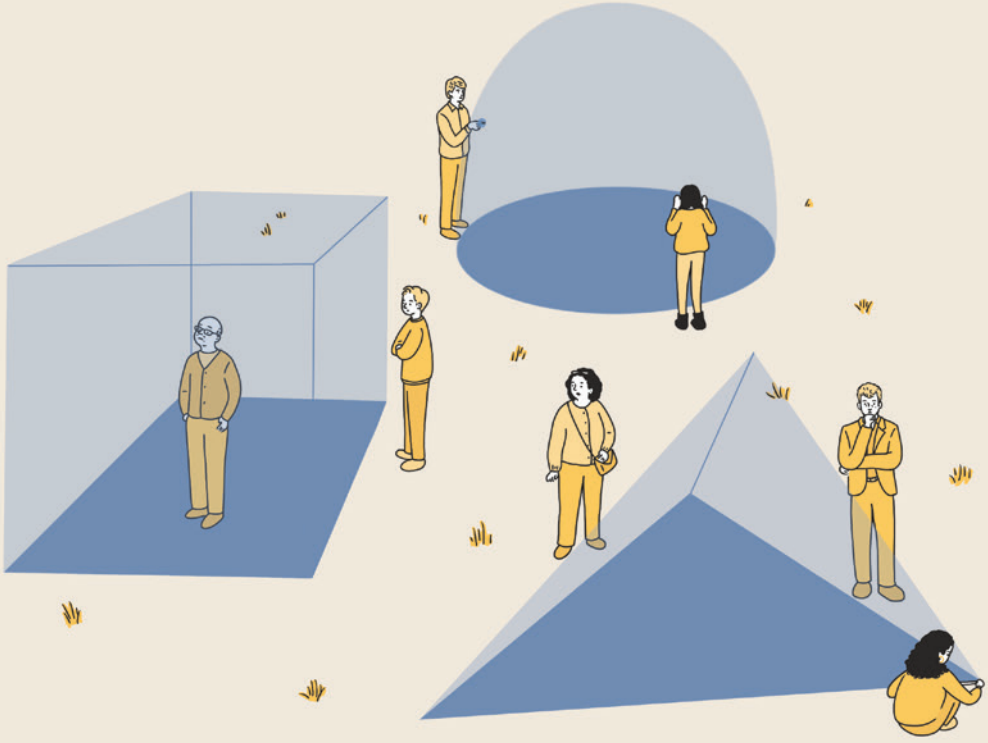


Figure 31 (→)
In WhereIF, players discover the differences between various countries on the topic of human rights.



Chapter 3

Persuasive Game Design

This chapter has partially been peer-reviewed and published as Kors, M., van der Spek, E. D., & Schouten, B. A. M. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the Foundations for Digital Games 2015 Conference and Kors, M. (2015). Towards Design Strategies for the Persuasive Gameplay Experience. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play CHI PLAY '15, 407-410. https://doi.org/10.1145/2793107.2810281

3.1 Introduction

Following a theoretical grounding for the study of persuasive games, this chapter offers a more practical and design-oriented perspective on persuasive games. From designing persuasive games with a focus on procedural rhetoric to an interest in appealing to particular emotions, scholars and designers alike have explored a multitude of persuasive design approaches over the past decade to design games that sway their players. As De la Hera Conde-Pumpido (2013) and Frasca (2007) argued, persuasive games can employ a broad variety of dimensions for persuasion, both persuasive dimensions that are unique to games as well as many of the more traditional means to persuasion. For instance, persuasive game designers may employ legacy approaches such as the use of double-sided messages (O'Keefe, 2002), visual rhetoric (Barthes, 1977), or even cognitive dissonance theory (Festinger, 1957). We can see the latter approach used in a game like 'Spec Ops: The Line' (Yager Development, 2012), in which players are confronted with their past actions that may not rhyme with their beliefs, thus creating a dissonance that may trigger an attitude shift.

This chapter is focused on persuasive design approaches that have been documented in relation to the design of persuasive games and interactive experiences. This includes the range of approaches that use a game's mechanics - its rules and procedures - to persuade, as well as opportunities that pertain to the growing body of work related to interactive narrative design (e.g., Koenitz et al., 2015) and entertainment persuasion (e.g., Carpenter & Green, 2012; Green & Jenkins, 2014). As the boundaries between games and interactive narrative design continue to blur, illustrated with games such as Dear Esther (The Chinese Room, 2012) and Depression Quest (Quinnspiracy, 2013), many of the approaches described in relation to narrative persuasion translate well to the field of persuasive game design. Furthermore, both persuasive games and persuasive interactive narratives are often characterized as forms of entertainment persuasion (Moyer-Gusé, 2008), which operates on the players' suspension of disbelief rather than the scrutinization of offered persuasive arguments (Shrum, 2012; Slater & Rouner, 2002).

Structurally, this chapter can be divided in three parts, with the first part addressing the use of a game's system persuasively, the second part focusing on specific player experiences that are conducive for persuasion, and the third part focusing on the design processes that may support in the design of persuasive games. In light of design research

question 1 (RQ1), formulated as What are persuasive games, how do players interact with them, and how are they designed?, this chapter is specifically focused on addressing the design-oriented aspect. Beyond offering a brief overview of contemporary approaches for persuasive game design, this chapter subsequently charts the persuasive game design landscape for novel and underexplored design approaches, zooming in on the second design research (RQ2), formulated as What are the current approaches and novel opportunities for persuasive game design?

3.2 Persuasive Systems

Over the past decades, several design approaches have been proposed for using a game's system persuasively. Tanenbaum et al. (2013) offered a categorization of three distinct design approaches: the Information Deficit Model, the Emergent Dialogue Model, and the Procedural Rhetoric Model. While these approaches are not specifically labeled in terms of persuasive game design approaches, the focus on attitude change in each of the presented models makes them particularly relevant to the design of persuasive games.

Information Deficit Approach

Tanenbaum et al. (2013) first presented the Information Deficit model for the design of games that seek attitudinal or behavioral change, which posits that providing prestructured information may change a player's values, which consequently drives changes in attitudes, and in turn may result in changes in behavior.

Designing persuasive games using this model means focusing on providing information, usually in the form of facts, to educate the player on certain topics. Persuasive games using the Information Deficit model may, for instance, employ quiz-style types of interactions in which players' input results in a clear right or wrong feedback from the game's system (Antle et al., 2014). For instance, a quiz about the impact of green areas in cities on the wellbeing of citizens may ask the question whether more trees significantly increase happiness, with the only correct answer being affirmative. The information embedded in the game is often fixed and offers little room for exploring alternative outcomes, which could hurt persuasive performance as players may never feel as if the outcomes are the result of their own actions. At the same time, however, this approach does offer designers a high level of control over

the player experience and the presented arguments in the game, and may mitigate the 'simulation gap.' The simulation gap is described as the "gap between rule-based representation and player subjectivity" (Bogost, 2007, p. 43), and is related to the possible discrepancy between the player's subjective understanding and the underlying intended persuasive arguments.

Procedural Rhetoric Approach

Second, Tanenbaum et al. (2013) discussed the Procedural Rhetoric model, grounded in the work by Bogost (2007) as discussed in detail in the previous chapter. In following the Procedural Rhetoric model, the arguments are not presented through signs but rather through a game's mechanics. The arguments are embedded in the rules and procedures of the game, and through a series of cause-and-effect cycles players may gain understanding about the effects of their choices and actions as reflected by the game's feedback. Persuasive games designed following the Procedural Rhetoric model are often simplified simulations of real world systems, with variable outcomes that fit within the boundaries of the game's mechanics and arguments as intended by the designer. For instance, in a persuasive city-building simulator with the intent to persuade players about the positive impact of green areas on the wellbeing of citizens, similar to the topic of the quiz example for illustrating the information deficit model, the designer may choose to include the rule that citizens living in the proximity of a park with trees receive a significant increase on happiness levels (if this were a metric in the game). Of course, such game mechanics can be made more complex to make the direct cause and effect less overt. Bang et al. (2006) presented the game PowerHouse, a simulated environment in which players can explore the energy consumption of various activities of a household. Bang et al. (2006) described that they focused on providing players with the ability to explore various cause-and-effect relationships of different activities around the house, along with immediate feedback, as part of their persuasive game design strategy. They argued that this would reinforce learning about energy consumption in relation to both short and long-term behaviors.

While practical explorations of game system design approaches to persuasion are still scarce, a Procedural Rhetoric approach for persuasive game design has already resulted in several practical guidelines that persuasive game designers can employ in their design. For instance,

Ferrara (2013) offered five practical guidelines for persuasive game design.

The first guideline revolves around defining a strong core message to guide design decisions along the design and development process. This guideline is also implemented in the persuasive game design process described later in this chapter. The goal for the designer is to design the system's rules and procedures around this core message, while keeping it as inexplicit as possible.

The second design guideline is to tie the persuasive message to the strategy. Ferrara (2013) articulated that "games drive players to find the most efficient ways to win. If the message represents the ideal strategy, then the process of playing serves as a proof of its truthfulness." (p. 299). Thus, Persuasive game designers are encouraged, in designing the persuasive game design's system, to make sure that the strategy to overcoming obstacles in the game, and to get more favorable outcomes, involves player choices that resonate well with the persuasive intent of the persuasive game. Consider the McDonald's Video Game (Molleindustria, 2006), in which players progressively have to resort to unethical solutions to stay in business. While not explicitly stated, the game's system drives the player to the conclusion that a company like McDonalds couldn't possibly run profitably without engaging in the presented unethical behavior.

For a third guideline, Ferrara (2013) pointed out that a player's self-directed discovery is an important aspect for persuasive game designers to focus on, as well as to provide players a sense of ownership over their decisions and progress. If a persuasive game's system would only allow for one correct solution to a given problem (like in following the Information Deficit Model; Tanenbaum et al., 2013), players may feel as if the game spoon-feeds them with a particular conclusion rather than the conclusion being the result of their own choices and actions.

As a fourth guideline, Ferrara (2013) argued that players should be offered meaningful choices, and explained that "if there is no benefit to making the wrong choice, then there is no choice at all. If healthy foods exclusively offered advantages and unhealthy foods exclusively offered drawbacks, the game would offer no opportunity to learn." (p. 301). Thus, persuasive game designers should allow players to engage in successful solutions and decisions that are counter to the persuasive argument in the short run, while making sure that these solutions and

decisions are actually less favorable in the long run.

Lastly, Ferrara (2013) argues that persuasive games should "keep it real". With this guideline, Ferrara (2013) argued that when persuasive games represent real world situations, they should also stick closely to how the real world operates. If certain choices have unrealistic effects or are not consistent with real world systems, it likely hurts credibility, and in turn may affect persuasive effects. Furthermore, this may also make it easier for players to relate experiences in the game to experiences in the real world, and thus be a factor in the transfer of attitudes between the fictional and extrafictional universe.

A downside of the Procedural Rhetoric model is that arguments require a player's interpretation as the arguments are often covert. This interpretation, depending on the context and complexity of rules and outcomes, may result in interpretations or conclusions different than intended by the designer. This is, as mentioned above, referred to as the simulation gap (Bogost, 2007). For instance, in the example of the fictional city building game, players may think that simply less buildings, are what causes the increase in happiness levels among citizens, rather than the presence of parks. This omitting of a clear persuasive argument could therefore hurt performance of a persuasive game, as its argument could be misinterpreted. Later in this chapter an iterative persuasive game design process will be introduced, which should help in honing the persuasive message. Yet, even with numerous player tests it may still be difficult to make sure that the covert arguments are understood correctly by all players, given that many external cues could change one's interpretation and understanding.

Emergent Dialogue Approach

Third, Tanenbaum et al. (2013) presented the Emergent Dialogue model, which focuses on the participation of, and interaction between, players rather than the direct offering of information or arguments embedded in the persuasive game itself. The Emergent Dialogue model is perhaps the most open-ended of the three models in that the outcomes are not immediately predetermined by the designer, but emerge from the dialogue between players while interacting with the game. Tanenbaum et al. (2013) elaborated that "from this perspective, the goal of public engagement is not to educate people about correct or incorrect behavior but instead to motivate people to generate their own views about the type of world they want to live in" (p. 3391). For instance, by providing

players with a sandbox environment in which they are asked to build a city from the ground up - with only few formal rules - the dialogue and negotiation between players may result in a change of attitude towards certain aspects of city building. In this case, the game lays the foundation for argumentation among participants, with participants trying to persuade each other as they work on the game's challenges. While this approach allows unanticipated outcomes and possible solutions to issues that are applicable outside of the fictional universe, it does significantly limit the control of the designer to direct the resulting attitudinal effects.

3.3 Conducive Experiences

A persuasive design approach may also entail focusing on designing for specific experiences that have been shown to be particularly conducive for persuasion through traditional media, among which are experiences stemming from empathizing with fictional characters and the feeling of being immersed in a fictional universe. A focus on designing games with the player experiences as starting point rather than a game's mechanics has been popularized over the past decades, with work such as the Mechanics-Dynamics-Aesthetics (MDA) model (Hunicke et al., 2004) which advocates for working from the experience level. In the next sections both empathy and immersion are explored as player experience conducive for persuasion.

Empathy

A unique feature of games is the player's ability to belong to, and take part in, another world with actors that acknowledge the player's presence, rather than being a spectator, as is often the case in traditional media. This capacity allows players not only to interact with the world and fictional characters, but also to inhabit another character or act based on a given fictional role. This opportunity of role taking has been addressed in relation to persuasive games and described as a "cognitive process by which an individual temporarily imagines or pretends that he or she is another person so as to gain insight into the other person's thoughts, attitudes, intentions, and behaviors in a given situation" (Peng et al., 2010, p. 724), resulting in both empathy and helping behavior (Peng et al., 2010). Likewise, a study by Bachen et al. (2012) demonstrated that the simulation game Real Lives, in which players can act out lives of other people around the world, fosters empathy

and increases overall interest in learning about the countries of their character. Empathy, one of the resulting effects, is usually recognized as a primary building block for human societies and social interaction (Segal et al., 2012; Waal, 2009), and valuable for nursing (Brunero et al., 2010) and Human-Computer Interaction practices (Wright & McCarthy, 2008). However, empathy has also been recognized as a robust persuasive appeal. For instance, in research on conflict resolution, interventions, and educational programs, empathy is often considered a key aspect in changing minds (Batson & Ahmad, 2009; Batson, 2009; Batson, 2011; Batson et al., 2002). Furthermore, empathy has been distinguished as a core component for driving narrative persuasion (Carpenter & Green, 2012; Green, 2006, 2008; Green & Brock, 2002).

Batson and Ahmad (2009) delineated four distinct psychological states called empathy in the intergroup relations literature, each with distinct aspects, outcomes, and relation to other empathic states. Batson and Ahmad (2009) first made a distinction between affective and cognitive empathic states. The two cognitive empathic states revolve around imagining. Imagine-self perspective is described as "imagining how one would think and feel in another's situation or 'shoes'" (p. 144) and imagine-other perspective is described as "imagining how another person thinks or feels given his/her situation" (p. 144). The two affective empathic states pertain to feelings. Emotion matching is described as "feeling as another person feels" (p. 144) and empathic concern is described as "feeling for another person who is in need" (p. 144).

While the concepts of role-taking and identification define their own fields of research, it is possible to find overlap with certain empathic states. For instance, identification in narrative persuasion (e.g., Cohen, 2001; De Graaf et al., 2011; Hoeken & Fikkers, 2014; Hoeken et al., 2016) is described as "an imaginative experience in which a person surrenders consciousness of his or her own identity and experiences the world through someone else's point of view" (Cohen, 2001, p. 248) and role-taking as a "cognitive process by which an individual temporarily imagines or pretends that he or she is another person so as to gain insight into the other person's thoughts, attitudes, intentions, and behaviors in a given situation" (Peng et al., 2010, p. 724). These experiences may also be categorized as the empathic state of imagine-self perspective and Imagine-other perspective respectively. Identification with fictional characters in traditional media has frequently been identified as a supporting factor in narrative persuasion (De Graaf et al., 2011; Hoeken

et al., 2016; Hoeken & Sinkeldam, 2013). For instance, the ability to identify with game characters has been employed in the design of PowerHouse, in which the designers discussed various archetypes with their target group as a means to generate appealing game characters for their game (Bang et al., 2006). While identification has been addressed in game-related research - including the previous examples and those in relation to immersion (Ermi & Mäyrä, 2005) or empathy (Tanenbaum & Tanenbaum, 2015) – still, little is known about its particular workings in persuasive games. It is not within the scope of this dissertation to explore the exact overlap and differences between identification and certain empathic states, but their resemblance and common benefit for persuasive games generates interesting pursuits for future research.

The distinction of four psychological states called empathy is useful for designers as it offers them an initial direction in terms of how empathy arousal may be implemented in their persuasive games. While each empathic state has the capacity to shape attitudes, focusing on one over another may result in a better match given the particular preferences and circumstances of a project. In relation to intergroup effects, Batson and Ahmad (2009) described several distinct features of each empathic state. In regards to the cognitive states, imagine-self perspective may lead to "reduced stereotyping and more positive evaluation of (1) the out-group member in whose situation one imagines oneself and (2) the out-group as a whole" (p. 150) and imagine-other perspective may result in an "increased situational attribution for plight of the specific out-group member; increased empathic concern for him/her; more positive attitudes toward the out-group as a whole; increased readiness to help the out-group" (Batson & Ahmad, 2009, p. 150). In regards to the affective states, emotion matching may result in "more negative evaluation of those causing other's plight; more positive feelings toward the out-group" (Batson & Ahmad, 2009, p. 150), and finally empathic concern may lead to "increased valuing of welfare of the specific out-group member for whom empathic concern felt; more positive attitudes toward the out-group as a whole; increased readiness to help the out-group" (p. 150).

Their work also illustrates that the arousal of one empathic state may lead to another, in turn triggering other related effects. For instance, studies have shown that the empathic state of Imagine-other perspective may lead to the empathic state of empathic concern (Batson et al., 1997). This insight provides designers with a starting point and additional control

over how attitudes are shaped. For instance, in a persuasive game about refugees fleeing a corrupt regime, with the underlying intent to arouse negative emotions towards that regime, designers may take the empathic state of emotion matching as a starting point for their design. However, if the designers of the same game want to focus on reducing stereotyping of refugees, the empathic state of imagine-self perspective may be more interesting. Alternatively, if designers specifically want their persuasive game to increase players' readiness to help, an other-oriented state may be a suitable option to explore.

Empathy has been studied in relation to persuasive games to some degree, particularly in relation to the more socially aware variants of persuasive games. For instance, Belman and Flanagan (2010) described that

> empathy is involved in gameplay [...] To make progress [...] players have to consider the perspectives of a variety of stakeholders, rather than only that of their own side. [...] The game requires one to think carefully about the perspectives of a wide range of stakeholder groups [...] Policy decisions that agitate a stakeholder group too much can potentially derail the peace process. (p. 12)

While Belman and Flanagan (2010) did not describe the focus of their work in terms of persuasive games, they did frequently mention the use of empathy as a means to intentionally shape players' attitudes and behaviors, which overlaps with the primary objective of persuasive games. Belman and Flanagan (2010) offered a set of guidelines as to how game designers may foster empathy through their games. First, Belman and Flanagan (2010) articulated that the game should explicitly ask players to empathize or subtly nudge them to adopt a more empathic stance. Second, Belman and Flanagan (2010) argued that players should be given recommendations as to how they may act on their empathic experience in the real world. This recommendation partially relates to the transfer of attitudes between universes, how players acquire attitudes during gameplay and turn them into attitudes that map to objects present in the extrafictional universe, and eventually turn into actionable behavior in the extrafictional universe. For instance, following the game with a debriefing to discuss how the game experience may reflect on real life, or ending the game with asking the player to consider helping a charity, may be viable options. Third, Belman and Flanagan (2010) recommended to focus on fostering

both affective and cognitive empathic states through the game. They argued that, while affective empathy may work if no significant shift in the players' beliefs is required, a form of cognitive empathy may need to be fostered to support in the process of actually understanding the situation and conditions of the other with whom the player is asked to empathize. Belman and Flanagan (2010) provided the example of a player who believes that being poor is the result of laziness. For such players to significantly change their attitudes on the matter, it may not be enough to offer them an experience that only makes them feel for the characters; they also need an experience that offers them a direct perspective into the underlying situations and conditions that clarifies why laziness may not be the primary cause of poorness. Lastly, Belman and Flanagan (2010) recommended to emphasize points of similarity between the players and those with whom they are asked to empathize. The idea is that when players are able to relate - whether this may be based on attitudes, values, personality traits, demographics, and so forth - with the fictional character in distress, it may be easier to understand their situation and appreciation for their choices. This final principle, while described in terms of empathy, may equally well be defined as the evoking of the first type of identification.

Furthermore, Plewe and Fürsich (2018) illustrated that a common trait of many newsgames, which have strong overlap with persuasive games in that they, too, are often designed with a persuasive intent in mind, is likewise empathy. Plewe and Fürsich (2018) elaborated that "the superior motive of the games is clearly advocatory and emotional: directing the player towards sympathizing with the refugees and migrants, and encouraging the development of empathy for them to gain a better understanding of their position" (p. 2477). Not all persuasive games have a strong focus on fostering empathy as a means to attitude change, nor is it required, but it is a common trait that can be found among the more socially aware persuasive games - including the majority of persuasive games described in this dissertation and the illustrative cases discussed in the work of Belman and Flanagan (2010). When discussing social awareness in the context of this dissertation, the primary focus is on the form of awareness related to empathy (Hoover et al., 1983), as the capacity to think or feel with or for another (Batson & Ahmad, 2009; Hojat et al., 2002). These persuasive games often highlight the hardships that characters in distress have to endure, portraying "occurrences that are generally agreed on as non-appropriate or immoral treatment of people for violating basic human rights" (Plewe & Fürsich, 2018, p. 2478).

In line with the recommendation by Belman and Flanagan (2010), Plewe and Fürsich (2018) described the value of fostering both cognitive and affective empathy, as well as to highlight similarities between the player and the other in distress. Plewe and Fürsich (2018) argued that the games

> emphasize the similarities between players and the refugees while excluding potential dissimilarities. This strategy makes it easier to identify with the refugees, since players can easily connect to the refugees' drastic experiences and perceive migrants as fellow humans instead of members of a specific political, religious or ethnic group (p. 2478).

Tanenbaum and Tanenbaum (2015) also highlighted the value of empathy in discussing the concept of transformation in games, as "the mechanism that allows narrative to communicate different perspectives and experiences, to transcend solipsism and empathize with each other" (p. 6), and argued that a transformation can be persuasive as it allows players to experience contexts and circumstances outside of their daily lives. Lastly, creating empathic experiences is not only beneficial for persuasion, it is also an engagement factor as it strengthens the affective connection with fictional characters (Lankoski, 2007). While the intentional focus on fostering empathy as a means to shaping attitudes is a relatively novel concept within the realm of persuasive games, it is a known and considerably robust strategy for persuasion through more traditional media such as books and film (Shelton & Rogers, 1981), as well as through interpersonal communications (Batson & Ahmad, 2009). Shelton and Rogers (1981), for instance, described a study in which one group of viewers of a prosocial film about whale hunting were instructed to imagine how the depicted whale would feel and think in the given situation while the other group was not. The study not only demonstrated that empathy-arousal facilitated the shaping of attitude, but also that the resulting motivation to help extended towards the many others in the same plight as those who were depicted in the film (Shelton & Rogers, 1981). Furthermore, designers may also want to increase empathy for fictional characters as this has shown to increase a sense of relevance (Basil et al., 2008), as well as credibility (Peters et al., 1997), which were both identified as possible factors for the transfer between fictional and extrafictional universe.

Empathy has also been identified as one of two components - the other

being mental imagery - through which players are transported into a fictional universe (Van Laer et al., 2014), a concept which has been theorized as a persuasive process by Green and Brock (2002) under the umbrella of Transportation Theory (Green & Brock, 2002; see also Carpenter & Green, 2012; Green, 2008). The concept of transportation - as the basis of Transportation Theory - is based on the metaphor of physical travel as described by Gerrig (1993, pp. 10-11) which encompasses six elements: (a) Someone ('the traveler') is transported, (b) by some means of transportation, (c) as a result of performing certain actions; (d) the traveler goes some distance from his or her world of origin, (e) which makes some aspects of the world of origin inaccessible, then (f) the traveler returns to the world of origin, somewhat changed by the journey. This description of transportation finds stark overlap with concepts such as absorption (Slater & Rouner, 2002) and immersion (Nilsson et al., 2016), which are concepts that will be addressed in more detail later in this chapter. Having players feel transported into a fictional world has several benefits for persuasion. For instance, transportation into fictional worlds is likely to result in a temporary suspension of disbelief, which in turn will suppress counterarguing. This is an important quality, as counterarguing - which is described as the "the generation of thoughts that dispute or are inconsistent with the persuasive argument" (Slater & Rouner, 2002, p. 180) - is often considered a key obstacle in persuasive communication (Slater & Rouner, 2002; see also Petty & Cacioppo, 1986).

Beyond the persuasive capacity of transportation, it is also a understood as a particularly enjoyable experience (Green et al., 2004; Moyer-Gusé, 2008), helping "book publishing, television, and film industries continue to thrive, supported by a mass audience eager to escape into alternate universes for at least a few hours each day. […] A common complaint from individuals who have watched a bad movie or read a dull novel is that they 'just couldn't get into it.'" (Green et al., 2004, p. 314).

Green et al. (2004) provided several reasons as to why transportation, as the experience of temporarily leaving everyday life and immersing oneself in a fictional universe, is often considered such an enjoyable experience by many. Transportation, for instance, allows players to safely experience a range of situations without real-life consequences, engage in empathic relationships with fictional characters, leave real life worries and public self-consciousness behind, as well as experience transformation that may endure in everyday reality (Green et al., 2004).

While enjoyment may not have an immediate effect on the persuasiveness of the embedded persuasive messages, it will increase the likelihood players continue their involvement with the persuasive medium, and thus prolong their exposure to the embedded persuasive messages (Moyer-Gusé, 2008). Furthermore, it may be that transportation also increases realism, with Green et al. (2004) arguing that "transported individuals feel as if they know media characters and, in some sense, may think about them as if they were real people" (p. 318). With empathy established as an opportunity area for the design of persuasive games, the concept of transportation - and its persuasive powers in narrative persuasion - hints to the possible persuasive capacity of feeling immersed into a fictional universe of persuasive games.

Immersion

The previous section briefly addressed the concept of transportation, along with its two key components of empathy and mental imagery (Green & Brock, 2002), as a salient theory of narrative persuasion. In many ways the concept of transportation, as the absorption into narrative universes (Green & Brock, 2002; Van Laer et al., 2014), overlaps with the commonly used concept of immersion in game-related fields (Brown & Cairns 2004, 2016). Interestingly, Brown and Cairns (2004) identified two barriers to the highest form of immersion, total immersion, namely the lack of empathy and atmosphere. Brown and Cairns (2004) reported that participants who did not feel totally immersed in the game talked about the lack of empathy and a transfer of consciousness. This observation is interesting for two reasons.

First, empathy is also identified as a key component for transportability. Second, the other key component of transportability - mental imagery - finds overlap with the concept of atmosphere as described by Brown and Cairns (2004). Brown and Cairns (2004) explained that

> atmosphere is created from the same elements as game construction. The graphics, plot and sounds combine to create this feature. What makes atmosphere distinct from game construction is relevance. The game features must be relevant to the actions and location of the game characters. (p. 1299)

Mental Imagery, on the other hand, is described as the evocation of imagery by the mind in the absence of immediate sensory input, metaphorically sometimes referred to as "in the mind's eye" (Green &

Brock, 2002, p. 1). With the lack of direct imagery when reading a text-based book, for instance, our brain typically generates mental imagery that matches the descriptions of the environment and characters, which in turn stimulates an immersion in the fictional universe. However, in contrast to written text, the vast majority of games immediately provide players with high fidelity sensory input, thus offering a rich atmosphere, and may leave little need for players having to imagine when it comes to the fictional universe. Since both atmosphere and mental imagery play a role in the ability to experience rich fictional universes, they may have similar persuasive effects as well (Carpenter & Green, 2012). It has been argued that immersion may be strengthened when designers focus on the empathic attachment to characters as well as a high-fidelity audiovisual fictional universe for players to explore (Brown & Cairns, 2004). Similarly, Green and Jenkins (2014) also described that designers should focus on players' feelings of responsibility for characters' choices, as this may be a key aspect in facilitating the shaping of attitude.

The observation that immersion may be valuable for persuasion has also raised an interest along the influx of system immersion, a field typically characterized by Head-Mounted Displays, as it may even more mitigate the need for players to feel immersed by means of effortful mental imagery (Carpenter & Green, 2012). It has been theorized that spaces generated from mental imagery are inferior to those generated by system immersion (Biocca, 2003; Nilsson et al., 2016). Coincidentally, with the inception of the current wave of commercially available system immersion options for the masses, artists like Milk (2015) have argued that virtual reality may be the 'ultimate empathy machine', and that "we can change minds with this machine" (Milk, 2015, 08:05). And indeed, recent studies have indicated that empathic encounters in virtual reality can indeed influence behavior in the extrafictional universe (Ahn et al., 2014).

Furthermore, Grigorovici (2003) argued that

> a medium that is closer to direct experience in terms of user's immersion or engagement will have differentially powerful effects on structural bases of attitudes (such that the most effective medium could be the one providing highly and more affective, automatic, and accessible attitudes). (p. 7)

As such, using system immersion to present persuasive arguments, whether through the narrative or rules of the game, may offer an

AllRight

Students: M. de Rond and E. Wabeke
Coach: G.J. Jacobs

AllRight is a toolkit aimed to educate children about the concept of human rights, particularly focused to provide insight into their own rights as a stepping stone to standing up for the human rights of others. The toolkit comes with a booklet and a set of physical blocks (see Figure 32), educating children about human rights in text as well as metaphorically through the objective of building a tower using the blocks. However, some of the blocks are literally bugged, designed with a system that will create imbalance, thus making it easier for towers with the bugged blocks to collapse. Some children would have more stable blocks than others to create their tower, representing how some are more privileged than others (when translated the blocks to aspects such as access to education, healthcare, etc.) to build a future, metaphorically packed as being able to build a higher tower. This shows children what their own human rights are and that this influences how strong one's foundation for life is, and in turn motivates them to support others who may not have the same basic human rights. This understanding itself is a display of empathy as it requires either a reflection on their own situations, that of others, or both.

Figure 32 (←)
In AllRight, players stack blocks to create the highest tower. However, some blocks are less stable than others and some are rigged, each representing an aspect of human rights, making it very difficult for some to build a large tower.

GRASP

Student: C. van Kessel
Coach: A. Jacobs

GRASP is a persuasive game designed to raise awareness on how some people may see the world differently than others, particularly positioned within the context of autism. In GRASP, the player controls a sphere through a maze of puzzles, each designed to purposefully come with a solution that does not immediately fit a conventional way of thinking (see Figure 33). GRASP essentially switches roles around, and has players experience how it is constantly having to think in ways that may not come naturally. This is done as a means to raise empathy and shift attitudes related to the handicap that some may face in everyday life, but at the same time it also covertly presents the persuasive message that this may also be a strength for solving unconventional problems. GRASP employs a procedural rhetoric approach in turning conventional solutions as states of a failing strategy and the unconventional solutions as a winning strategy, but at the same time appeals to empathy in the sense that it offers players a perspective into the way someone with autism may see the world - albeit on an abstract level.

Figure 33 (→)
In Grasp, the player has to navigate a ball through a maze that requires unconventional thinking to pass. This experience is used as a metaphor for how people on the autistic spectrum have to navigate the 'conventional' world, which may not always feel natural to them.

Cornered

Students: A. Candido, K. Damen, K. van Gaalen, and A. Faro
Coach: R. Duindam

Cornered is a story-driven persuasive game designed to offer players a glimpse into the journey of a homosexual person who is dealing with the struggles of a still non-accepting society. The story revolves around a cylindrical shaped character named Pat (see Figure 34), who discovers that his best friend Sam is suddenly missing, only to find out that he left to a rather mysterious camp. In search for this camp, Pat is challenged to overcome emotional struggles related to depression, suicide, and jealously, in search for his best friend, and eventually learns that his friend was sent away to transform from a cylinder to a square (an abstract representation used to represent the characters' identity). Upon overcoming the emotional challenges and finding Sam, Pat realizes that Sam has changed.

The game ends with Pat reminding Sam of their past and their relationship, confessing their love for one another. In contrast to persuasive game cases like Mr. Powerful or The Moral Racket, Cornered leverages a more narrative approach to persuasion, as players find the opportunity to slowly learn more about the situations and conditions of the characters, and are empathetically engaged with their plight. Furthermore, Cornered implements various techniques to have players reflect on what the game's message means for reality, with references scattered across the fictional universe. For instance, elements that hint to the existence of re-education camps, as well the design of levels that describe struggles, including a hospital that symbolizes the misperception that being homosexual is an illness and a religious district that hints to the taboo related to being homosexual in certain religions.

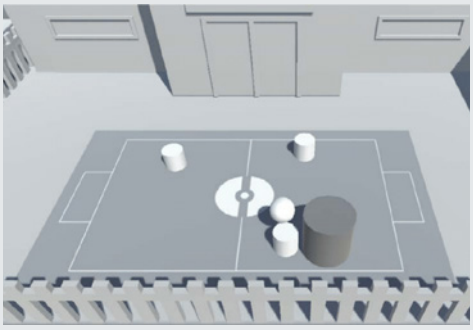


Figure 34 (←)
In Cornered, players play as a homosexual character in a non-accepting society.

immediate persuasive edge in designing persuasive games.

Over the past decade, several recommendations have been offered for using system immersion as part of a persuasive game design. For instance, Chittaro and Zangrando (2010) recommended that designers focus on creating emotional experiences, and in doing so not to avoid negative experiences such as those related to human suffering or death. As a future focus of design and research, Chittaro and Zangrando (2010) also pointed at the importance of facilitating a transfer of the persuasive effects to the real world, but does not provide practical recommendation how to do so. Grigorovici (2003) also offered several recommendations - described as application areas - for using system immersion as part of a persuasive strategy.

First, persuasive messages should be embedded unobtrusively in the virtual universe or as a natural part of the experience. Second, designing believable acting characters that naturally present arguments in line with the overall persuasive message, and with whom the player may develop a social bond over the duration of the game, could increase persuasive effects. Third, the design should include the ability for players to inhabit a character that matches their own person and have them experience the effects of certain situations or conditions to their virtual body. Lastly, while implementations of system immersion are often characterized with the focus on visuals through the use of Head-Mounted Displays, immersion can also be supported by means of other sensory feedback. This feedback includes binaural audio or force feedback, but may also encompass the use of more embodied systems to augment the fictional universe. For instance, Gerling et al. (2014) explored how embodied systems support positive attitudes towards wheelchair players by having players play a game using an actual wheelchair as a controller.

3.4 Persuasive Game Design Process

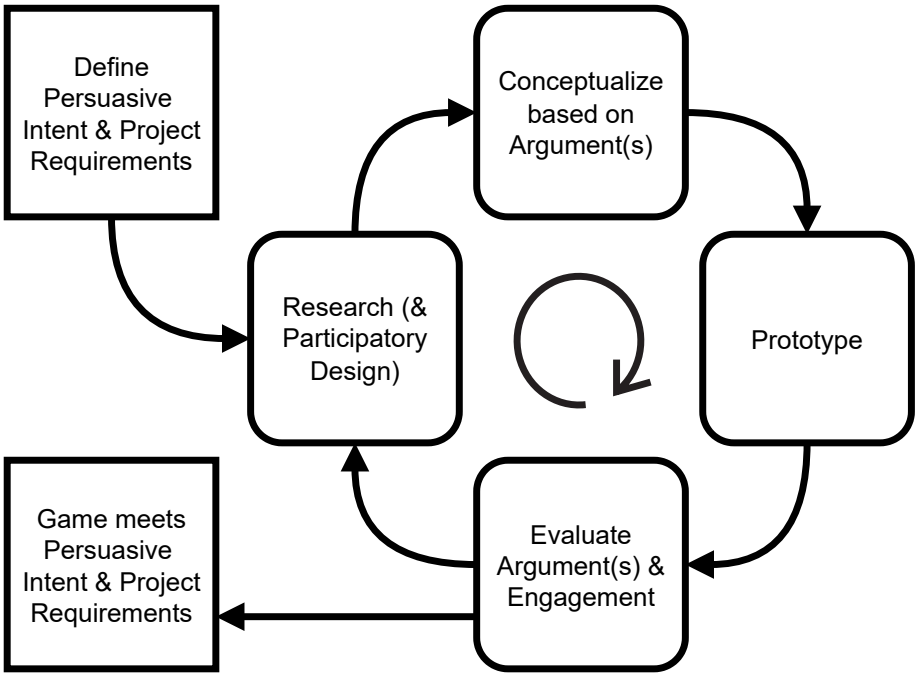
Beyond the exploration of design approaches that focus on the specific design elements or aspects of persuasive games, designers may also consider optimizing their overall persuasive game design and development process. For instance, persuasive game designers may adopt a user-centered design approach to evaluate the impact of their persuasive game throughout development to find a better fit for the intended target audience. A user-centered design approach has been common practice in field such as Human-Computer Interaction and is increasingly employed as a possible standard for game production as

well (Fullerton, 2008; Hunicke et al., 2004; Rankin et al., 2008), with the main goals to keep the player experience as a top priority throughout the entire production process. Please note that this is by no means the only game design process that may support persuasive game design, but as discussed later in this section, this particular setup covers many of the aspects argued to be particularly suitable for the design of persuasive games. In adapting the user-centered game design process conceptualized by Rankin et al. (2008) to persuasive game design terminology, one may construct the diagram in Figure 35.

This diagram is characterized by an iterative design process of research, conceptualization, prototyping, and evaluating implementation, until the game resonates with the persuasive intent and the project requirements as determined by the persuasive game designers (Kors, 2015).

At the start of each persuasive game project, the designers define their persuasive intent and project requirements (Ruggiero, 2013), similar to how designers of nonpersuasive games would discuss the goals and scope of their game (Fullerton, 2008). Next, the designers follow an

Figure 35 (↓)
A game design process adapted for designing persuasive games (Kors, 2015).



iterative cycle that typically involves four steps. First, game designers explore and discuss the topic and attitude object they plan to address, and draft initial arguments that may form the core of the persuasive message. In some cases, this may involve the participation of (external) experts to help crystallize the core persuasive arguments and support a credible representation, in part to create consistency and to "keep it real" (Ferrara, 2013, p. 302). Furthermore, participatory design may also support in designing for the values and expectations of the different stakeholders involved in the project, including designers, players, and domain experts (Mildner & Mueller, 2016).

Second, persuasive game designers conceptualize designs based on the arguments formulated in the previous step and explore ways to combine entertainment and persuasiveness. Third, promising concepts are selected and prototyped, or improved upon over the course of each iteration. Prototypes can be anything from role-play sessions to playable digital setups, as long as they help to explore the concepts. Fourth, the prototype is played to evaluate if it meets the expectations, which is typically done internally first with simple prototypes and gradually includes more high-fidelity prototypes as well as the involvement of external participants who are unfamiliar with the persuasive game. Evaluating persuasion games - in particular the measuring of an attitudinal change in players - is not without challenge. For instance, studies have shown that attitude change may not always be immediate (Ruggiero, 2015), which could render direct pre- and postmeasurements unreliable. For a comprehensive study on validating persuasive games, readers are advised to look at recent work by Jacobs (2017), a fellow Persuasive Gaming in Context member focused on validating persuasive games. The evaluation will eventually indicate whether the persuasive intent and project requirement are sufficiently satisfied. If this is not the case, designers will use the result of the evaluation as a basis and input for new consecutive design iterations until the persuasive intent and project requirement are sufficiently satisfied.

To support persuasive game design, Rugiero (2013) offered three recommendations for the design of more socially aware persuasive games that resonate with the process shown in Figure 35, albeit described as 'social impact games.' First, Ruggiero (2013) argued that it is important to define intended outcomes at the beginning of a persuasive game design project, as it "enables the designers to create elegant solutions to facilitate learning within the gameplay" (p. 4). An

intended outcome not only includes the attitudinal effects, but also aspects such as the intended target group. Ultimately, these objectives influence the design of a persuasive game beyond the embedding of persuasive messages alone. Thus, formulating persuasive game design strategies and the embedding of persuasive arguments without taking into account the context and conditions of the intended target group may hurt persuasive performance of a persuasive game. Next, Ruggiero (2013) argued the importance of employing domain or experience experts throughout the design, development and testing phases of a persuasive game design project, as they "play a large role in the game's persuasiveness, credibility, and potential for influence" (Ruggiero, 2013, p. 5). Furthermore, albeit in relation to serious games rather than persuasive games in specific, Mildner and Mueller (2016) likewise argued the value of involving domain experts, in particular for ensuring a proper balance between entertainment and seriousness. Chapter 4 provides further insight on this matter, with the team behind This War of Mine describing their experience in dealing with this intricate balance. Lastly, Ruggiero (2013) pointed out that persuasive games should make use of the fuzzy nature of wicked problems. Wicked problems are typically characterized as problems for which no correct or single solution exists. Persuasive games, in contrast to more traditional media such as books and film, afford more interaction, and thus allow players to more freely explore the difficulty of issues and progressively gain insight into why certain problems are difficult to solve. For instance, take Frasca's (2003) game September 12th: A toy world. This persuasive game addresses the topic of the United States of America's war on terror after the September 11, 2001 terrorist attacks, and offers a game system without an end state. The solution to the given situation seems simple at first, eliminate all the terrorists, but as players do so the situation turns out increasingly worse. With no end in sight, players can only accept that their participation actually made the situation worse and thus the only solution at this point would be to stop playing, or continue playing endlessly and make the situation increasingly worse. The clever design of engaging players with an unsolvable issue is the argument, and works particularly well for issues that are more complex and wicked than they may seem to be on a surface level.

Next, it is frequently argued that persuasive game designers should make design decisions that resonate best with their target audience, which in turn influences the choice and implementation of persuasive strategies. For instance, Khaled et al. (2006) argued that "the design of

a persuasive game should account for the background culture of the game's intended audience" (p. 220), and presented a study indicating the differences in interaction and interpretation between two different cultures. In a later publication, Khaled et al. (2009) expanded on these ideas and outlined several persuasive design strategies employed to specifically cater to a more collectivist culture. For instance, the offered persuasive game design strategies for collectivist cultures include the focus on "providing users with opinions of other ingroup members" and "rewarding or reprimanding a group of users for the actions of an individual user" (Khaled et al., 2009, p. 7). Outside of persuasive game design, the value of taking into account the differences between cultures and backgrounds in the design process has also been argued, with a variety of methods offered to address this. For instance, Lachner et al. (2015) introduced cultural personas, a tool that informs UX-Designers with country-related information to identify culturally sensitive factors throughout production. In conclusion, external influences such as culture impact the focus and approach that designers should take in the design of the persuasive aspects of their persuasive game.

Finally, content quality and appeal have been identified as a factor for the persuasiveness of persuasive experiences, with absorption as an intermediary (Green et al., 2004; Moyer-Gusé, 2008; Slater & Rouner, 2002). Production quality and content appeal relate to aspects such as how enjoyable and engaging a game is for players, how gripping and meaningful the narrative is, how immersive the game loop is, how natural and realistic game characters feel, how well the game satisfies players' needs and motivation (e.g., think in terms of intrinsic and extrinsic motivation; Ryan & Deci, 2000), how detailed and beautiful the fictional environments are created, and so forth. PowerHouse, for instance, was designed with the particular focus on designing a "nice-looking user interface and attractive characters" (Bang et al., 2006, p. 128) and to offer players immediate feedback to keep them motivated (Bang et al., 2006). And while probably no designer would purposefully jeopardize production quality or content appeal, the influence thereof should not be understated as a factor in the design of persuasive games as it may indirectly influence the success of persuasive methods employed.

Furthermore, high production quality is beneficial for persuading players to become interested or engaged with the game in the first place. The appeal of many successful persuasive games, such as This War of Mine (11 bit studios, 2014a; Brown, 2019), has, in part, to do with their

high quality of production and content appeal. However, little is known about the persuasive effects of production quality and content appeal in persuasive games, and few studies have looked into how persuasive game designers balance the engaging aspects of their game whilst keeping an eye on the persuasive intent.

3.5 Conclusion

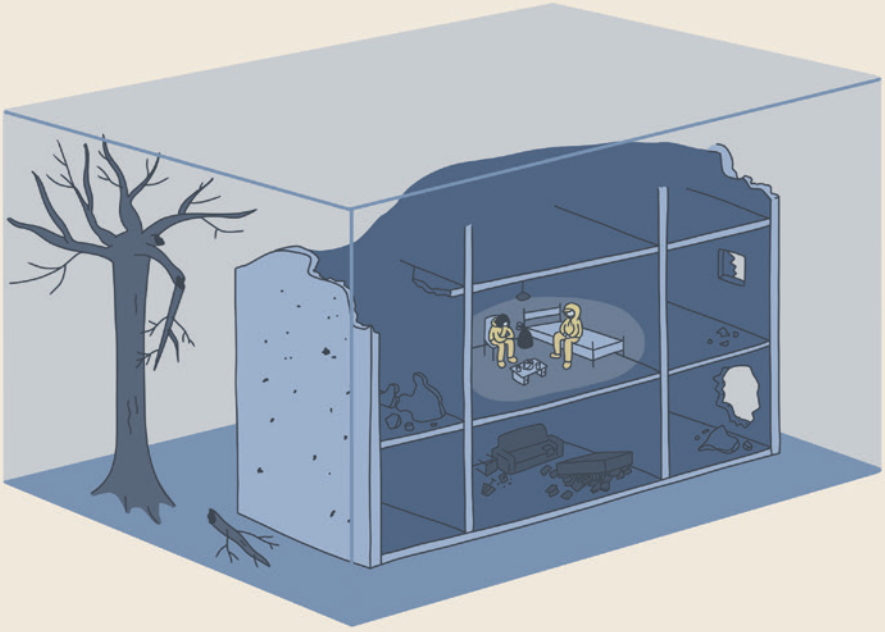
This chapter presented a selection of theories, opportunities, methods, and approaches for creating persuasive games, as documented or identified by recent scholarly work, thus addressing the design-oriented aspect of research question 1 (RQ1), formulated as follows: What are persuasive games, how do players interact with them, and how are they designed? Beyond offering a brief overview of contemporary approaches for persuasive game design, this chapter subsequently charted the persuasive game design landscape for novel or underexplored design approaches in addressing the second design research (RQ2), formulated this way: What are the current approaches and novel opportunities for persuasive game design? Based on this overview, several observations can be devised.

First, some of the opportunities focus on implementing traditional approaches to persuasion in the design of persuasive games, whereas others focus on aspects that are particularly unique to games in terms of persuasive possibilities, and yet others focus on evoking specific player experiences that are particularly conducive for persuasion. Some of these more novel approaches stem from the increasing interest in interactive narrative design, whereas others focus on the use of system immersion due to its overlap with key components of Transportation Theory. However, despite the positive outlook of these new developments, design research explorations related to these areas are still scarce.

Next, the production's contextual and situational factors were mentioned as they could influence the course of a persuasive game design project and may render certain opportunities or particular implementations more or less effective for persuading players. In part, an iterative game design process - of researching, conceptualizing, prototyping, and testing - could help designers in exploring what possible approaches work best given the situation and condition of both designers and players. However, design process and production are ultimately also limited by a team's resources, tacit knowledge, skillset, and culture,

impacting design choices, production quality and content appeal, which in turn have been identified as factors for persuasiveness.

The next chapter offers a production perspective on persuasive games. Most work focusing on persuasive game design aims at gaining insight into the inner workings of persuasive games and to highlight what designs may work or not, but few zoom out and look at the broader context in which persuasive games are designed. Ultimately, persuasive games are not merely the combination of elements that are found to contribute to intended effects, but also the end result of a person or a group of people working together to create the best possible persuasive game in a specific context and situation. Shining a light on how persuasive games grow from an initial idea to a final product uncovers the many, often unplanned-for, aspects that determine how a persuasive game will eventually pan out. As the next chapter will underscore, persuasive game production is so much more than simply the sum of individual game elements.



Chapter 4

Persuasive Game Production

This chapter has been peer-reviewed and published as De Smale, S., Kors, M. J. L., & Sandovar, A. M. (2017). 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.

Figure 36 (←)
This War of Mine (11 bit studios, 2014a) presents a civilian perspective on war rather than the more typical military perspective, of which the contrast is clearly presented in many of the promotional materials.

4.1 Introduction

Following a theoretical foundation attention is shifted to address the professional production of persuasive games as a means to gain insight into how professionals approach persuasive game design. As such, this chapter provides an answer to the latter component of research question 1 (RQ1), formulated as: What are persuasive games, how do players interact with them, and how are they designed? Furthermore, insight also highlights contemporary persuasive game design, and thus addresses research question 2 (RQ2), formulated as: What are the current approaches and novel opportunities for persuasive game design?

This professional perspective on persuasive game design is explored through interviews with team members of 11 bit studios, regarding their game This War of Mine (11 bit studios, 2014a). This War of Mine is a widely acclaimed digital persuasive game (Independent Game Festival, 2015; Peckham, 2014; McWhertor, 2015) in which players take control over a stranded group of civilians trying to survive in a besieged city, thereby providing players with a first-hand account of the hardships one may endure during war conflict (see Figure 36).

The player experience offered with This War of Mine thus starkly contrasts with the player experience that is offered with the majority of war-themed games, in which players typically adopt a soldier role to fight the bad guys. In This War of Mine players play as citizens, who are underpowered, do not possess special skills nor powerful weaponry, and on top of that are prone to developing psychological issues (see Figure 37).

While the fictional universe of This War of Mine subtly hints at events in the extrafictional universe through its visual styling and narrative

(De Smale, 2019), it is the auxiliary media - including promotion videos and interviews - that provide a direct connection between This War of Mine and extrafictional events such as the siege of Sarajevo (11 bit studios, 2014b), Leningrad and Monrovia, and the Warsaw Uprising (11 bit studios, 2014b; Kowalczyk, 2015; Sterczewski, 2016). Furthermore, 11 bit studios also point at the game's relevance for players in regards to possible future conflicts. For instance, on the official website it states that "In the 21st century one thing is inevitable. War can break out anytime, anywhere. And if your city gets under siege, be sure you were not prepared for it." (11 bit studios, 2014a, para. 2). Similarly, in one of This War of Mine's launch trailers named 'The Survivor', Emir Gerimovic is talking about his childhood during the siege of Sarajevo, ending the video with: "I know one thing, it might happen to anyone. War always happens at somebody's doorstep" (11 bit studios, 2014b, 1:17) (see Figure 38).

11 bit studios not only received critical acclaim and commercial success with their game This War of Mine (Yin-Poole, 2014), they also managed to raise well over half a million dollars in donations up to late 2018 for the nongovernmental organization War Child to help support war victims

Figure 37 (←)
A character expresses regret over what he did. This is an example of the psychological struggles that players are confronted with when playing the game This War of Mine.

Figure 38 (↑)
Emir Gerimovic talks about his experiences as a child during the siege of Sarajevo in one of This War of Mine's promotional videos offered on the official This War of Mine website.

(11 bit studios, 2018; War Child Gaming, 2019). This collaboration, too, strengthens the connection between events portrayed in the fictional universe and those with similar conditions in the extrafictional universe.

Insight into the production of a recent and high-quality production persuasive games is rare, but invaluable as it provides a contemporary perspective on persuasive game design and development, and underlines the day-to-day influences of contextual and situational factors on production. These insights not only provide perspective into the contemporary design and development of persuasive games, they also highlight yet unconsidered design opportunities for the future research and design of persuasive games. Similar to work by Basballe and Halskov (2012), an interest in research through design partially lies in aspects related to design processes, rather than the design alone, as they are equally important for design outcomes. In deploying research through design projects we may employ documentations tools like the Process Reflection Tool (Basballe & Halskov, 2012) throughout production to help uncover and disseminate aspects related to design and development; however, in most commercial persuasive game cases - including games such as This War of Mine - the designers have unfortunately not perform this kind of detailed documentation throughout production.

When a game has already been produced this method cannot be employed anymore and researcher have to look for different ways to gain insight into persuasive game design and production. A typical approach at this point would be to perform an analysis on the finished persuasive game to generate insight into game elements that contributed the game's persuaisve factors. While this approach indeed works for uncovering factors related to design it won't provide a perspective on the factors that relate to production; to understand why and how designers designed the game and what contextual and situational cues influenced them throughout production.

However, to gain insight into the production of a finished game like This War of Mine, a production studies approach offers a suitable solution (O'Donnell, 2014; Sandovar, 2017). Such an approach may help to uncover personal, situational, and contextual factors that direct the design and development into unplanned-for territory, sometimes resulting in previously unconsidered ideas and opportunities, other times resulting in complex solutions for which no correct solution exists

(Gaver, 2012; Stolterman, 2008). In other words, the aspects of design that cannot be uncovered when analyzing the final product alone.

Scholars have pointed at the value of uncovering production processes for gaining insight into how and why artifacts - like games - came into existence (e.g., Basballe & Halskov, 2012; Cross, 2011), providing a rationale for iterations and final implementations, from which fellow designer and researchers can learn and improve own design processes.

This chapter is the last in a series of three foundational chapters, as a triangle between a perspective on theory, design, and production, each focusing on the approaches, opportunities, and challenges of persuasive game design through a different lens. This field study was carried out to gain insight into all aspects of production and not persuasive game design alone, primarily to satisfy the different interest and research fields of each co-author. However, as This War of Mine is considered a persuasive game in light of this work, even aspects that do not immediately relate to design implementations for persuasion are invaluable insights for persuasive game production as well. This includes how designers themselves are influenced by the design process and how morality became a core aspect of This War of Mine's player experience.

4.2 Study Summary

This chapter reports on a study with 11 bit studios and their game, This War of Mine (11 bit studios, 2014a). Rather than a formal analysis of the game, the objective was to situate the research in game production studies by documenting the design context (gamework) and designer perceptions about the game that inform morally complex gameplay. The research was conducted with four team members of 11 bit studios: a senior game designer, a writer, a senior writer (with stakes in marketing), and a quality assurance lead. We employed reflective interviewing techniques and visual methods to better understand how moral gameplay was designed. Our analysis illustrates the roles underlying narratives in the design process and balancing everyday work negotiations play in the design of moral gameplay, how a designer's research informs the vision to create emotional realism in the game, and the importance of a player centered iterative design process to produce morally engaging gameplay.

4.3 This War of Mine

It is my second night out scavenging; I approach a deserted residence. I am short in resources. The people that I care for are hungry and we need food to get through the next day. As I enter, I notice an older couple sitting in the living room. I sneak inside quickly to scavenge whatever I can find. The couple hears me in their basement. The older guy asks what I am doing. His wife is sick, and they both look scared. As I continue to rummage, I think that he might become violent but he just stands there. He begs me to leave. I feel uncomfortable with my actions, but I need food for my people to survive. I stop searching through all the rooms and run toward the entrance. As I run past the elderly couple, I drop part of my loot. I feel ashamed by my actions. I wanted to play as a moral person, but the situation is harsh, am I bad? Days later I still wonder, do they feel safe in their home, are they still scared, and most importantly, are they still alive? (see Figure 39)

The above vignette demonstrates the moral nuances present within This War of Mine, a single-player war survival game released in 2014 by Polish game company 11 bit studios (11 bit studios, 2014a). Unlike games which are played from a military perspective, such as Call of Duty (Infinity Ward, 2003) or America's Army (United States Army, 2002), This War of Mine is played from the civilian perspective of war. The game takes place in a civil war setting where a player must keep a mixed group of playable characters called survivors alive by scavenging for resources to ensure their safety, as well as maintaining their physical and mental health. As the game progresses, resources become scarce. During scavenging sessions, the player encounters conflicting choices as illustrated in the vignette above. Ambiguous choices in the game creates a moral gameplay experience that reflects the disorientation and difficulties of being a civilian in wartime. To achieve a realistic moral experience of war, the designers of This War of Mine incorporated certain game mechanics not often found together in conventional military war games[1].

First, the gameplay provides ambiguous moral choices. Altruism costs the player time and resources, but returning without resources can mean death to non-player characters and the loss of the game. Second, the game does not have an onboarding process. To parallel a civilian's

1. By conventional, this article is referring to first- and third-person shooter war games such as Call of Duty, Medal of Honor, or Gears of War, whose commercial success has been dominating the current war game genre.

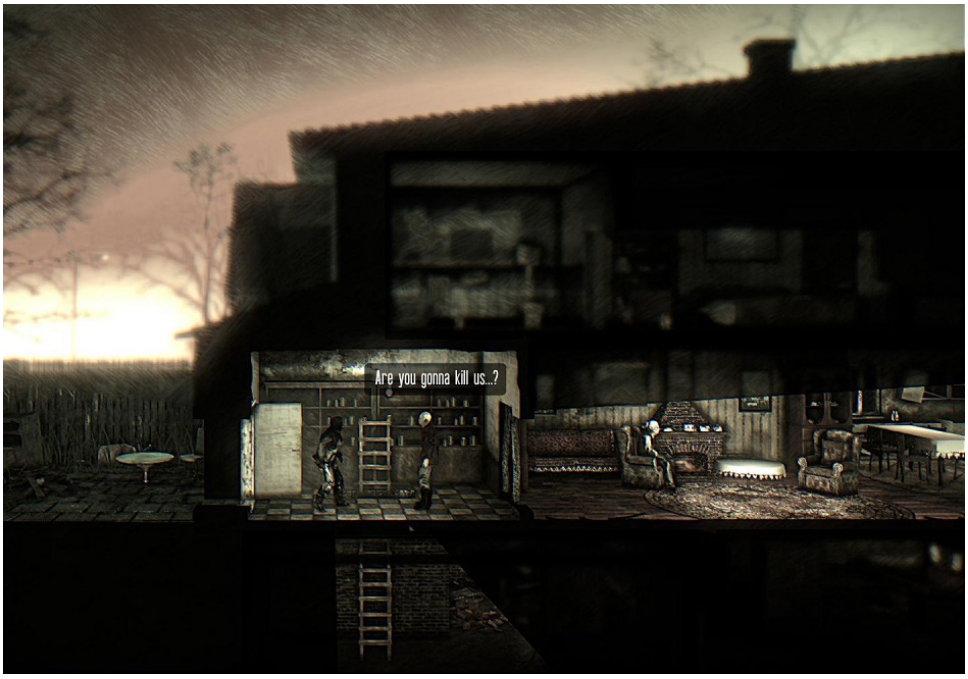


Figure 39 (↑)
Quiet House Location in This War of Mine (11 bit studios, 2014a). The player is confronted with a moral dilemma upon entering a house occupied by an elderly couple.

Figure 40 (←)
Once a character is deceased, they are permanently gone.

experience of war, the player must learn to survive without instructions. There are no guides coaching the player to learn as she plays. Third, there is no respawning. Once a playable character is dead, she cannot be brought back to life (see Figure 40).

By incorporating permanent death, the game simulates the precariousness of life in war and the psychological trauma that occurs to survivors of war. Finally, the gameplay includes children and infants[2]. In most war games, children are absent in the design, while in war, children do exist and must be cared for. Omitting these aspects of war is one way in which conventional military war games selectively filter the reality of conflict (Pötzsch, 2015). The inclusion of these elements of innocent civilians, suffering, trauma, and children incorporates elements normally filtered out of military war games (see Figure 41). The successful integration of these elements, as well as the critical acclaim 11 bit studios received, supports a deeper exploration of the moral gameplay in This War of Mine[3].

To better understand This War of Mine's moral gameplay, the conditions under which the game was designed must be explored. We analyzed how designers at 11 bit studios reflected on the design process and on the many factors that informed their design choices. Our claim is that designing better moral gameplay goes beyond a consideration for ethical play (Zagal, 2009), or the actions defined by the game for the player (Fullerton, 2008; Sicart, 2009). We build on game ethics scholarship by asserting that designing better moral gameplay includes an exploration of the conditions under which games are produced (Bourdieu & Johnson, 1993; Julier, 2006), including business ethics (Zagal, 2009), the context of design (Sandovar et al., 2016), the designer's responsibility (Julier, 2006; Lawson, 2005; Sicart, 2009), and game-work culture (O'Donnell, 2014). A closer exploration of the social and technical context within which morally complex games are created can illustrate the dilemmas faced by designers (O'Donnell, 2014). Our aim is to highlight the importance of the designer context (gamework) and designers' perspectives as a dimension not included in existing

2. Here, we are referring to the original game This War of Mine (11 bit studios, 2014). In an expansion of the game: This War of Mine: The Little Ones (11 bit studios, 2016), 11 bit studios incorporated child survivors as playable characters. The actions of these playable characters are limited. For instance, these children cannot guard, barter, or defend themselves.

3. For This War of Mine, 11 bit studios has won a variety of national and international awards, for instance, Games for Change best gameplay award (Games for Change, 2015) and the Independent Games Festival audience award (Independent Game Festival, 2015).

Figure 41 (→)
A child asks his grandfather; "Grandpa, why do people kill other people?"

research on morally complex gameplay. Literature on ethics focuses on the artifact and business models not on the production of the game. In This War of Mine, this could include an understanding of the impact that traumatic events, such as war, have on a design team.

In this research, we set out to explore the design process and designer perceptions of morally complex gameplay in This War of Mine. To showcase the importance of such a production studies context, the structure of this chapter is divided into several sections. First, we present current discourses in games ethics and war game literatures, and position how this research is a step toward filling an empirical gap. Then, we define important considerations in the production studies field relevant to the study of moral game design by building on reflective design literatures (Julier, 2006), production literatures (Bourdieu & Johnson, 1993; Nieborg, 2011; O'Donnell, 2014), and ethical design practices (Sandovar et al., 2016; Sicart, 2009; Zagal, 2009). Lastly, after a short consideration of the methodological challenges and limitations of a focus group interview, we focus on the main results of our analysis.

Games Ethics and Morality

In this section, we signal the need to position a production studies perspective in the study of war games and ethical gameplay. Current research on morality and games is focused on the game's content, the player as a moral being, or organizational ethics. Sicart (2009) and Zagal (2009) provided the initial foundation for the consideration of ethics in games. Sandovar et al. (2016) built on Sicart and Zagal's definitions to include the design context and designer's perceptions. While Sicart and Zagal did advocate for designers' responsibility and acknowledge networks of agents outside of game design play roles in game development, these were not explicitly stated in their variables.

For Sicart (2009), game ethics includes three variables: (a) ethical game design— the object and its components, (b) the ethical experience—ethical values projected into an experience from which agents can make a choice; and (c) the ethical player—the capacity of the player to play with moral reason. Similarly, Zagal (2009) included aspects of the cultural artifact and the frameworks that define the ethical experience. He did not define the ethical player per se but rather referred to the experience of ethical play: what it means to play fairly. Zagal (2009) also included one variable not discussed by Sicart, that of business ethics (what it means to develop a game ethically). These components are critical, as they highlight the multiplicity of factors that inform game ethics. In particular, Zagal's (2009) business ethics aspect reflects on the importance of the organizational entity in the design of games.

Sandovar et al. (2016) reflected an information ethics perspective when they claimed that technologies carry the values and beliefs of those who design them (Flanagan & Nissenbaum, 2014). For this reason, they advocated that designers' perspectives be included as variables in game ethics. Also proposed was the inclusion of the designer context—the context within which games are built. Although not explicitly outlined in their paper, their inclusion of contexts advocates for an integration of production culture—the culture of work in which games are produced (O'Donnell, 2014) —as part of the design process. In this chapter, we wish to include all the differing aspects of game ethics as part of the design of moral gameplay. To understand moral gameplay, all aspects of a game, including ethical game design, ethical experience, ethical gameplay, business ethics, designer context (gamework), and designer perceptions, must be understood. We focus specifically on the designer context and designers' reflections in the design of war games that deal with morally complex gameplay.

Morality in Games on War

Including the designers' context and their lived experience could augment existing war game research. These discourses describe the relationship between war and the military. Most war games, for example, America's Army (United States Army, 2002), Call of Duty (Infinity Ward, 2003), and so on, are played from the military perspective. As such, these texts critique the ideological and technical structures that exist between the U.S. military and the game industry. War games that diverge from using dominant representational strategies known in the war game

discourse, such as Spec Ops: The Line (Yager Development, 2012) and This War of Mine, are positioned as critical alternatives to the military war game genre (Pötzsch, 2015). Currently, there are three prominent perspectives from which to examine the relationship between war and games.

The first set of literatures addresses meaningful play within a conflict simulation and wargames as a sociotechnical system of warfare (e.g., Crogan, 2011). This material perspective, which can be traced back to the Toronto School of Communication, studies the physical aspects of war games, such as computer simulation technology, and examines how the technology has developed historically in relation to the military industry. The second set of texts focuses on the economic and political relationships that exist between the game industry and the military industry (e.g., Dyer-Witheford & De Peuter, 2009). For example, Dyer-Witheford and De Peuter (2009) examined the imperial tendencies of the U.S. war game industry, including the role war games play in the global economy. The third set of literatures addresses the relationship between in-game representations and ideological warfare. These portray the main characters, their enemies, and the conflict within the game (e.g., Schulzke, 2013). From this semiotic perspective, moral games are analyzed through a textual reading. Although these war game literatures are theoretically sound cultural critiques, these texts do little to highlight the designer intention for these strategies. Thus, war game literatures do not include production aspects that could inform the final design. Finally, war games literature does not offer critical examinations of the moral and ethical components of war games. In the section that follows, we explore three main aspects of production: (a) production contexts, or the contexts under which texts are produced; (b) industry contexts, the various actors, networks, and relationships that inform game production; and (c) gamework context, which is game development work culture and respective practices[4].

Production Contexts

To understand how images and media texts inform society, the contexts in which these texts are made must be understood (Bourdieu & Johnson, 1993; Thompson, 1995). Moral games are produced by a diverse team

4. Gamework was originally coined by Kerr (2013) to describe the socially constructed work practices in game development that result from interactions between human and nonhuman actors. This term is in opposition to gameplay practices. Later, this term was expanded upon by O'Donnell (2014) to reflect upon the specific aspects of game development work culture, including secrecy and instrumentalization.

that includes writers, designers, programmers, play testers, and external stakeholders. Both sociologists John Thompson and Pierre Bourdieu argued that focusing solely on the internal analysis of a text without consideration for the larger forces that created the text leads to inaccurate interpretations. For Thompson (1995), such an interpretation required an understanding of (a) the social and historical conditions in which texts are produced, (b) the way they are received by real people, and (c) and how people perceive what is familiar to them. This study addresses the specific social and historical conditions under which This War of Mine was produced.

To understand how images and media texts inform society, the contexts in which these texts are made must be understood (Bourdieu & Johnson, 1993; Thompson, 1995). Moral games are produced by a diverse team that includes writers, designers, programmers, play testers, and external stakeholders. Both sociologists John Thompson and Pierre Bourdieu argued that focusing solely on the internal analysis of a text without consideration for the larger forces that created the text leads to inaccurate interpretations. For Thompson (1995), such an interpretation required an understanding of (a) the social and historical conditions in which texts are produced, (b) the way they are received by real people, and (c) and how people perceive what is familiar to them. This study addresses the specific social and historical conditions under which This War of Mine was produced.

For Bourdieu, the production of texts required two aspects, habitus and field. By habitus, he meant the attitudes that individuals absorb over time through their social world. Bourdieu argued that these attitudes are often aggregated and used unconsciously. As the habitus can reflect unconscious attitudes, and unconscious attitudes have been argued to be embedded in design (Flanagan & Nissenbaum, 2014), design therefore suggests reflexivity by the designer (Sicart, 2009). Social working conditions and designers' individual attitudes play a role in decisions about the kind of moral dilemmas that are included in gameplay (discussed later in this chapter). Not only is the designer a member of society, but she possesses knowledge which through her designs informs aesthetic and political aspects of our world (Julier, 2006). As cultural opinion makers, designers have a large role in shaping culture (Sicart, 2009).

Bourdieu's reference to 'field', by which he meant the conditions

under which an individual produces a text, is particularly important to digital games. These conditions inform and influence how attitudes are incorporated in texts. Solely studying the moral gameplay without including the social and historical forces that inform the design (context of design) and the perceptions of those who create the texts (designers' perceptions) misses the cruciality of why moral gameplay contains those choices.

Industry context

To address moral gameplay, it is necessary to explore the complexity of the industry. The design of games is informed not only by the designer and the technology but also by the culture's studio, and the variety of relationships the studio may have with the publisher, the marketers, and the platform. These three aspects in the industry are relevant to the study of game design in the following ways.

First, tension between creativity and profit often drives aspects of design and development in games (Nieborg, 2011). Like any product-based industry, having a skillset and an idea is not sufficient to be successful; capital is critical for production. Decisions about the design of a game may be driven by profit rather than by the game mechanics that best fit the vision of the game.

Second, game development is precarious in the sense that software development is more of a nonlinear process than a straightforward method. Even before the code is handed to the publisher, setbacks can occur in programming, or when integrating art and sound during play testing, or even during distribution (Dyer-Witheford & De Peuter, 2009). For example, a developer of the game Half-Life described the many difficulties they encountered while implementing specific events into the game that were designed to be fun until they adopted a more iterative design process (Birdwell, 1999). The lack of management structures and varied-sized teams across the different studios can affect deadlines and the design of the game (Dyer-Witheford & De Peuter, 2009).

Third, dependencies in the industry inform design indirectly through game-work organizational structures. Hierarchical structures based in networks of secrecy and professional recognition become barriers to entry and remaining in the industry. This dependency supports hierarchical work structures that leave little room for creative autonomy (Deuze et al., 2007; O'Donnell, 2014) and instead produces debilitating

periods of unreasonable work hours. These factors demonstrate that the game design process is not isolated to the designer and the game itself. Rather, the game design process exists within a larger context that requires exploration.

Gamework context

Until recently, gamework research centered on data derived from direct interviews with game developers outside of work settings, with scant exploration of the working conditions within companies (Kerr, 2013). Of the few reviews in the United States that have explored the day-to-day lives of game developers, most of the findings emphasized the console and its respective production network, or aspects of game developer culture, de-emphasizing data about the reflective experience of game developers. Reviews of game developers' day-to-day lives are limited, as it is difficult for researchers to enter into the inner sanctum of a game studio, mainly due to game studios' hesitancy to share company secrets and the need to protect their intellectual property (Kerr, 2013; O'Donnell, 2014).

One of the few reviews of gamework that teases out the lives of game developers was by O'Donnell (2014). In his ethnographic study, O'Donnell (2014) explored (a) the creative collaborative practice of developers; (b) the manner in which developers negotiate underlying social, technical, and conceptual systems; and (c) the challenges developers face in the production process. Through his research, O'Donnell (2014) discovered developer dilemmas: the tensions that exist between gamework and industry's hierarchical structures. One dilemma refers to the negotiation between game professionals (and their tools) in the preproduction phase of a game. This negotiation plays a role in the design choices and the implemented gameplay and showcases the difficulties game developers face that inform games' content. Such negotiations raise questions as to what extent these negotiations also inform moral game design.

Designing Moral Experiences

Having discussed the context of design, the next important issue is a reflection on ethical design. Sicart (2009) argued that ethical games ought to be designed for play, instead of being designed to create an ethical experience. His claim was that a game with an ethical system creates a richer play experience. For example, in Papers, Please (Pope, 2013), the play is primarily about shifting documents around in search

for discrepancies, but the experience is enriched for the player through the impact her choices have on the lives of other characters in the game.

Sicart (2009) described two types of ethical game design: an open design where the values of the community and the player can be implemented and a closed design where the player cannot implement values beyond constraints. The design of This War of Mine could be considered closed, though player decisions exist that appear to drive the game's main narrative. The game does create the two types of closed experiences outlined by Sicart (2009). As a subtracting experience, the game mechanics allow the players to draw their own conclusions. In This War of Mine, a player can delve into her thoughts and perceptions about a situation (i.e., what happened to the elderly couple). As a mirroring experience, This War of Mine also forces the player into ethical decisions, which yields uncomfortableness. For example, the decision to steal resources from the older couple leaves the player feeling uncomfortable and questioning herself, her identity.

Sicart (2009) stated that most players think strategically because the play is instrumental, not moral. So he suggested that to make moral play, games should be designed with a pause to force players to think differently, which he called Ludic Phronesis. This is not an immediate choice but is included in the sequence of play. If a design asks of the player to think differently, then it arouses the ethical agent within the player. He also suggested that for a player to pursue moral reasoning, the player must be presented with wicked problems. Giving players a good or evil meter does not help develop morality. By contrast, having players face ill-defined problems asks players to be responsible for their choices and supports their development as moral agents. The requirement to scavenge for resources in This War of Mine places the player in constant reflection about her actions and choices within a war experience. This is a perfect example of a wicked problem, because it offers imperfect information without clear outcomes. Lastly, he suggested designing technology such that players cannot save a particular state or start over from a certain point. This is exactly the mechanism employed in This War of Mine when the playable character cannot be respawned. If a player chooses to restart the game, the conditions are different each time. This means that the same gameplay can never be repeated. Sicart's claim for a play-centric approach to the study of moral games is complementary to current design approaches that advocate something similar.

Game design scholars have expressed the importance for the player experience to be at the center of the design process (Fullerton, 2008; Salen & Zimmerman, 2004). As predicting player experience is difficult, placing the player at the heart of the design supports better outcomes for the design (Salen & Zimmerman, 2004). Often the iterative game design process is suggested as a tool for creating player experiences, involving the cyclical periods of conceptualizing, prototyping, and evaluating (Fullerton, 2008; Kors, 2015; Salen & Zimmerman, 2004). To understand this process and the perspectives that informed the design, this study turned to a qualitative approach to studying the game's production.

4.4 Method

For this qualitative study, we drew from two approaches. To better understand perspectives on game production (Kerr, 2011), gamework (O'Donnell, 2014), and designers' reflective experience (De Smale, 2016), we used a focus group format to interview four members of 11 bit studios. Focus groups are supportive of examining participants who "have all been involved in a particular concrete situation" (Eklund, 2015, p. 134). The focus group format engages all participants in discussing a shared experience. Sharing perspectives of a common experience supports exploration of novel ideas (Eklund, 2015; Kitzinger, 1995) and supports rich descriptions about social norms and shared values in a dynamic collaborative process. Although Eklund (2015, pp. 134-136) utilized the method to explore the experience of coordinated gameplay by players, the strength of a focus group to examine the same situation supports its use in game development settings. As not all participant voices may be heard equally, we also employed visual methods, specifically drawing (Cross, 2011; Sandovar, 2017). Visual methods support understanding of symbolic composition and visual components that inform the game design process, further contributing to our understanding of the development of This War of Mine.

Data Collection

To prepare, the authors participated in focus group training. The structure of the interview (Eklund, 2015, pp. 134-136) as well as an open-ended questionnaire were based on previous production studies (Guevara-Villalobos, 2011; O'Donnell, 2014; Sandovar, 2017). The questionnaire addressed the designer's vision of the game, the design process (including drawings), and moral choices during the design.

The data were collected in a 2-hr semistructured interview with four members of the studio's team (a senior game designer, a writer, a senior writer with stakes in marketing, and a quality assurance [QA] lead) on September 29, 2016, in Warsaw, Poland. Diverse studio roles provided differing perspectives about the development process.

Limitations

While the focus group was arranged to include a variety of team members to represent the different perspectives on the production process, their perspectives might not be representative for all members of 11 bit studios who worked on This War of Mine. As the interview was conducted roughly 2 years after the release of the original This War of Mine, narrative reflections may have been distorted over time. Another issue was that the interviews were conducted in English rather than in the participants' native language, Polish. Although the language did not appear to hinder participants' reflections, some nuances could have been lost in translation. Finally, this was a short study, not an ethnographic study conducted over a longer period of time, which would likely yield more in-depth perspectives about production culture.

Analysis

To identify, analyze, and report patterns within the data, a thematic analysis was employed (Braun & Clarke, 2006). The objective was to generate detailed insights in relation to the development of This War of Mine. While the goal was not to develop a theoretical framework, grounded theory provided a clear structure to follow, including (a) in vivo coding, (b) open coding that led to core categories, (c) memo writing, and (d) selective coding, which related categories together to form three larger themes. The recorded interview was professionally transcribed and imported to a qualitative research software. First, each researcher coded the interview separately. To confirm the type of in vivo coding implemented, researchers met to discuss the in vivo codes. The first session yielded over 300 in vivo codes. After the first discussion, each researcher re-coded the interview, employing active verbs that described the elements in the interview. Researchers met for a second time to discuss these open codes. This next phase yielded a combined 100 codes. Together the team discussed the codes and agreed how to relabel these codes in relationship to one another. The codes were reorganized into 25 codes and added to a spreadsheet. Over a series of meetings,

these codes were re-coded into categories, which also included the relationships codes had with one another. In the final coding session, these categories were further reduced to 10 main themes. After this, the authors collaboratively grouped the 10 themes in 2 parts: themes related to gamework and themes related to game design.

4.5 Results

As mentioned above, the final coding yielded two groupings: aspects related to game- work and elements of game design. Gamework includes underlying narratives within game development (habitus) and creativity and sustainability (the field). Game design includes vision (emotional realism) and gameplay is the language. These results reflect the elements that defined the design of This War of Mine and its moral gameplay.

Gamework

The first category of themes relates to the design culture at 11 bit studios. We included the hidden narratives that influenced the development as well as themes that reflected the balance between creativity and sustainability.

Hidden narratives

There were two underlying stories that occurred in the team's work culture. The first reflects their cultural memory (the habitus, as referred to by Bourdieu and Johnson, 1993) and proximity to Eastern Europe, and how this proximity informs what they design.

> You need to keep in mind that it [the game] was from European perspective and mostly Western European. So for people from South America it was like European story in general. And we set it in this setting, not other, because it was easy for us to make a coherent one. Because we are from Eastern Europe so we know how to recreate buildings, the look, the feeling, the look of people—that kind of thing. (John, senior writer and marketing, September 29, 2016)

The second narrative referred to the emotional impact the subject of war had on the team. Difficulties and challenges in studios are also highlighted in game production studies (Nieborg, 2011; O'Donnell, 2014; Sandovar, 2017); however, these did not extend to exploration of

emotionally charged design topics.

> And after a week of research I had to take a break because it was taking a toll on me. No matter what—I had some knowledge of history beforehand. No matter what I wanted to incorporate I was able to find something even more extreme that did happen actually. There were some scenes that were deemed by us too violent, too hard to witness even in the game, in a fictional setting to include them. (Dave, writer, September 29, 2016)

Creativity and sustainability

Similar to other production scholars, our research also found a tension between creativity and sustainability (Nieborg, 2011). As the game was not funded by an external party, This War of Mine had to sell well to break even. Though the intention for the game was to provide a serious perspective to the war game genre, ultimately their goal was to become financially sustainable. The designers described the tension:

> We don't need to struggle every day to get salaries. Because on one hand you are the artist. On the other hand and probably represented by me in this group—the businessman. Because we need to make a living out of it. Otherwise it will be horribly tough. (John)

Despite their need to become financially sustainable, their discourse reflected concerns about monetizing from war. This concern may also be related to their cultural memory. The justification extended to a comparison with a similar struggle in representing the Holocaust in films:

> Well, Polanski was a victim as well. And same goes to Schindler's List by Spielberg or any other message that is about war. In the end you either make a living out of it or you need to do something different to make a living because we have wives and families. (John)

Game Design

The second category refers to aspects in game design, including (a) the vision the designers held throughout the development, (b) the unique language of gameplay to convey messages, (c) the value of iterations, and (d) the continuous negotiation between seriousness and entertainment.

Vision

The vision for the game was to provide an emotionally realistic experience of war from a civilian perspective. We termed this designed experience emotional realism. To create emotional realism, the designers of This War of Mine included conditions civilians face, such as famine, sickness, death, suffering, and boredom. The emotional experience conveyed closely resembles what cultural theorist Williams (1977) called structure of feeling. For Williams, this structure captures a feeling or an emotion that is specific to a place, group, or period. Emotional realism for This War of Mine was expressed through their detailed research of civilian perspectives of war and their attempt to balance seriousness and entertainment. They reflected on other war experiences as central to their vision for the game:

> You know that there is fighting and you can believe that it is for the right cause and our guys, those who we support, are right. But it doesn't change the fact that people are suffering there as long as the fighting is going on. In war games you have invariably the bad guys and the good guys and in This War of Mine there are us and there are many with guns. I learned about this term reading about massacres in Colombia. What the right wing militias and the left wing revolutionaries were doing. And people who lived in those villages that were visited in this side and the other side, they have a name for both sides. Men with guns. They didn't care about what kind of ideology they professed. (Dave)

To achieve emotional realism, the designers conducted extensive research on aspects of war related to civilians. Specifically, they investigated the historical background and also interviewed people who were survivors of war.

> But we wanted to have an extensively researched background so when we built up the game we think up new events and scenes we can check them against our background to see if they fit. If something like that could happen in the game. And, the inspiration behind the events that transpire in the game are found in history. All those events are inspired by actual memories of the victims of armed conflict. And during the—after a week of researching because I wanted to root the story in actual stories in history so I can point when asked about some particular aspect of the game I can point to a time and place when something like that actually happened. (Dave)

Although the designers' goal was not to represent a real conflict, the game could easily be contextualized by the player, as pointed out in other studies (Kors et al., 2015). Because of this, they described their responsibility not to misrepresent history:

> If we set the game as a recreation of particular conflict we would have to take sides. And even if we didn't we would be accused of it. We would be accused of presenting historic events in some wrong way and so on. So, the game could have been attacked from the start as inaccurate. And secondly, we didn't want it to talk about any particular conflict. (Dave)

Negotiating between entertainment and seriousness

Another code relating to emotional realism in This War of Mine is how the team negotiated between entertainment and seriousness.

> It was one of the very few proofs that games can be a serious media or a serious muse. Another muse. (John)

An emotionally realistic experience meant creating gameplay that would be a meaningful gameplay experience of what it was like to be in war:

> Even when it was a very bare bones experience, what is obvious from the start is that it's serious. When you play a survival game about a zombie apocalypse you are starting from the premise that

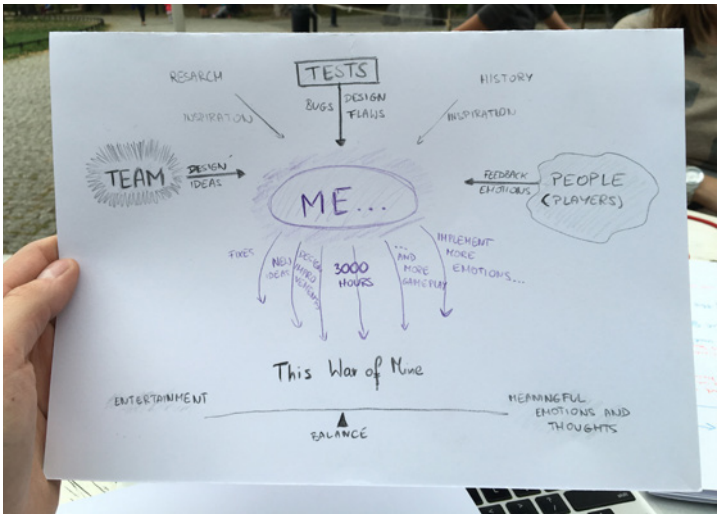


Figure 42 (→)
Drawing of quality assurance-lead Tim on his role in the development process of This War of Mine.

> this is a fantasy. This is something that cannot happen. That makes it a safe experience. And here we wanted to show something that can happen, that does happen right now and it can happen to you. And that changes both the emotional impact of the game and the requirements that it places on the developers because there is very little humor in the game. (Dave)

As seen in the drawing by Tim (see Figure 42), the quality assurance lead, a constant concern was to find a balance between entertainment and meaningful gameplay.

> A game that can be enjoyed, because people wouldn't play This War of Mine if they didn't take some kind of enjoyment from it, of overcoming obstacles, of seeing things through the end, of saving the people they were given the care of. (Dave)

Gameplay is the language

The interactive nature of games provides players with the opportunity to actively engage with the message through gameplay. For the designers, this is seen as a unique language that might make games more convincing than movies and, possibly, more effective in spreading messages.

> My point was that games are capable of covering every story, be it controversial or whatever, as long as the gameplay is good. Because gameplay is the language. It needs to be engaging. Maybe not more successful than movies but maybe a little more convincing because they put you in the middle of the experience but they're interactive. That's why they can be effective when it comes to spreading the message. (John)

Gameplay revolves around making morally ambiguous choices in social dilemmas. In the game, dilemmas materialize as special events during nighttime. For example, in the supermarket location, one such event is the Girl in Peril scenario, where a young woman is being sexually assaulted by a soldier. Here, the player is forced to make the decision whether or not to intervene.

> You can visit a supermarket and you can peek what you want to do. Either way, there is no good choice. There is no white and black. There is only gray. (John)

Such ambiguity creates a dissonance, which begs the player to reflect on her actions in the game. This strategy arouses what Sicart (2009) referred to as the ethical agent within the player. As in real life, there are no rewards or punishment for everyday actions. The game rather presents the question 'What would you do?' in this situation, given the difficulties that a civilian might encounter in war:

> There are some situations in the game where you don't have any good recourse. It's just shit happens. You can just deal with it or sometimes die. (Dave)

Other arguments are more overt, including those presented as a direct evaluation of how well the player performed.

> The endings depend on the amount of trauma they experience during our gameplay during the war. (Rick, designer, September 29, 2016)

Game Design Elements

Although the designers did use several techniques to increase what Galloway (2006) termed realisticness, their intention was to create an emotional experience[5].

The characters have been modeled on real people, the animations are motion captured, and in-game objects are based on their real-life counterparts. However, this kind of realism was not the most important, and the designers stated that it was not their intention to have everything as realistic as possible in terms of visuals and simulation. What mattered for the team was to humanize the experience of war. Players' resources were named our things instead of the typical inventory found in other war games. Also, the character's health status was displayed with terms of affect (i.e., sad, depressed) instead of a numerical indication. The designers' intentions were to move the player away from what Sicart (2009) called the strategic gameplay mode that instrumentalizes play:

> We need to think of people as people not as resources. The moment you start to treat them as resources you don't really care because they could be a resource, gold, oil, coal—whatever. (Dave)

The team incorporated realities of conflict usually filtered out of

5.Realisticness, a term adopted by Galloway (2006), elaborates on the way in which games use not only (photorealistic) digital imagery but also socially realistic behavior, such as character movement, to create an immersive gameplay experience.

conventional war games. For instance, in the introduction of children as part of the game:

> If you look up The Little Ones in the game perspective, how they [children] fit into the equations, they really don't. They shouldn't be there. They are a burden. Not a big one.Not to the point of breaking the game because they can help a little bit but they really don't belong here. Our city is actually in a war zone. (Dave)

One of the ways they did this was to create the experience of war, taking it to the edge but not including everything that is real about war.

> There were some scenes that were deemed by us too violent, too hard to witness even in the game, in a fictional setting to include the game. (Dave)

Particularly when it came to violent content, these realities of war were filtered. For instance, in discussing whether or not children could be killed in the game:

> If you start to kill children in a war game it stops to be an action game, right? It becomes a slaughterhouse. That's not what you want to achieve. On the contrary, in our game you have children but they cannot be killed as well. Because we didn't want to make it a gore game. (Rick)

Another technique used to create emotional realism required the player to establish an emotional connection with the game's playable characters. The aim of this move was to stimulate feelings of discomfort:

> We wanted to create an emotional bond between the player and the characters in putting the players in an uncomfortable situation, [...] pushing the player out of his comfort zone. (Dave)

They described the strength of the bond that one player experienced as follows:

> And the guy said that he played for nine days in game and one guy has starved to death, the second one was sick, and the third hanged himself. And he couldn't handle the game anymore because it was his fault they died. He wanted to play the game. He will return to the game. But he can't for now. It's too much. He will come back in a couple of days. (John)

One technique that supported emotional realism was the experience of boredom. Through their research, the designers discovered that war is not a constant stream of traumatic events; sometimes there are long uneventful periods. Another design decision to note in regard to emotional realism is the lack of tutorial. Part of creating emotional realism is matching the disorientation that occurs during war. In war, no one is prepared. There is no guide book, no instructions on how to navigate the everyday. The designers utilized this technique to recreate the experience of disorientation.

> There is no hand holding. And when you start the game you just have to survive and you have to figure it out when you start. You are dropped into the deep end and you just have to figure out what to do, what not to do. You learn not to fight if you can avoid if very quickly. You learn that wood is more important, especially in the beginning, than the weapons which is—we wanted in a way we wanted the player to feel helpless and lost initially. Because people who find themselves in this situation they get no tutorial, no cliff notes on war. (Dave)

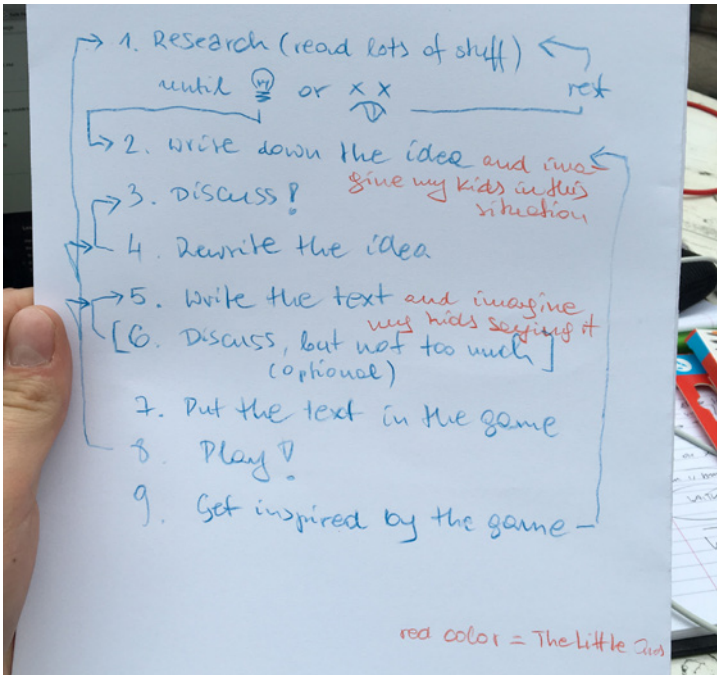


Figure 43 (→)
Sketch of writer Dave on his role in the development process of This War of Mine.

Iterative design

How the player will respond to the gameplay experience is uncertain. The designers pointed to the importance of the iterative design process. In the sketch drawn by Dave (see Figure 43), the writer, we see the clear cyclical nature of his work. He included smaller iterative cycles that refined each step before moving on to the next cycle. Also, he described that including gameplay (as part of the iterative design process) can be helpful in generating ideas.

In explaining this iterative design process, the designers highlighted player testing as central to recreation of emotional experiences.

> For me it's mostly, like I said, I've been in the middle of everything so it came from the whole team of designers, programmers, research, history, where we were searching for facts or testing people where they gave the feedback and emotions on everything. And giving a small adjustment to make as good bonds between entertainment and meaningful gameplay. (Tim, quality assurance lead, September 29, 2016)

The importance of play testing was particularly important in relation to the game's moral design. After playing the game over and over, the designers noticed that they started to feel an emotional numbness, which made it difficult to evaluate the emotional experience themselves.

> The tests - people from the outside, at least for me it was a big deal because I remember that after some time you start to lose that emotional bulk with people. Especially when we added children. I didn't feel they were children. But, when we took people to test they started to play differently, act differently, and make safer decisions to reassure that they will come back to their children to the shelter, etcetera. (John)

Because of this moral desensitivity, the designers pointed toward the importance of play testing with different testers who hadn't played the game before. "It's very important to make tests on new people" (Rick). "Yeah, new tests because the guys who test games are also becoming a bit jaded" (John). Taken together, participants' reflections describe design aspects and gamework narratives that cannot be surmised by evaluating texts only. Not including the context of design and designers' perceptions limits the understanding required to develop moral gameplay.

4.6 Discussion and Conclusion

Through a focus group study with 11 bit studios, we examined This War of Mine by including designer perceptions and the design context as aspects that inform the design of moral gameplay. A focus group format supported an understanding of the different development roles in the production process. The data yielded two thematic groupings: gamework narratives and game design. In what follows we discuss the application of these findings to moral game design.

Defining Moral Gamework Narratives

We defined gamework narratives as the underlying stories present throughout the design of This War of Mine. The first theme reflects the team's habitus (Bourdieu & Johnson, 1993; Julier, 2006) — the manner in which the designers perceived their own lived reality — and how these perceptions motivated the vision for the game. The designers' geographical location (Eastern Europe) informed the game's visual aesthetic. The vision of the game, that of war, is deeply imbedded in Polish history (Sterczewski, 2016), particularly the Warsaw Uprising, which has been used as a central theme in other Polish games. Thus, the habitus illustrates that designers' cultural heritage informed the game design (Sandovar, 2017).

The second refers to Bourdieu's concept of the field (conditions under which a text is produced). Specifically, the data reflect two of O'Donnell (2014) developers' dilemmas. The first is the tension between creativity and profitability (Nieborg, 2011). Bourdieu and Johnson (1993) also referred to the struggle between art and money, and the manner in which this tension "structures the field of power" between the "symbolically dominant 'pure art,'" and "economically dominant 'commercial art'" (Johnson, 1993, p. 250). Although the game is defined by designers as an art form, their responses also reflected the demands of the market. A closely related dilemma referred to the tension between entertainment and the capitalization of war. Although the team at 11 bit studios articulated the goal to design a game with a message against war, they also explicitly expressed the importance of creating a game for entertainment. They justified their work by naming war films, such as The Pianist (Polanski, 2002) and Schindler's List (Spielberg, 1993). These critically acclaimed films are not only based on real stories and address the inhumanity of war but are also dramatized to captivate audiences and ultimately generate a profit.

A final gamework narrative included the hidden costs of designing a game with morally complex content, such as killing innocent civilians or sexual violence. We found that the designers were aware of their position of power in shaping the eventual moral gameplay experience, and expressed reflexive responsibility (Sandovar, 2017; Sicart, 2009). The expression of this reflexive attitude was found in the team's extensive research for the game. In part, the extensive research for the game was conducted to understand the experiences civilians face in war. Exploring conditions such as famine, illness, death, and boredom affected the designers. One respondent described the emotional toll of studying civilian experiences in wartime. Later in development, the cost of this responsibility manifested itself differently. Designers felt apathetic during gameplay, having lost the connection to the traumatic experience. The gameplay represents emotional realism absent in other war games; however, creating engaging moral gameplay also has hidden costs.

Designing Moral Experience through Emotional Realism

To create moral gameplay, the team needed to balance emotional realism and entertainment. Although the setting for the game required the civilian experience of war, a game's entertaining properties are of equal importance to create good gameplay. The designers reflected that games convey messages; as such, the game itself is the language. This War of Mine was designed to stimulate discomfort as did Spec Ops: The Line. Including other design elements, such as boredom and the lack of tutorial, are nuances that, although designed intentionally by the designers, might not be noticed in a classical critical reading of the game as text. These elements were based on the designers' experiences with the research as well as their cultural history. This illustrates the importance of including designers' perspectives in understanding moral gameplay. The role of play testing was essential in the design of This War of Mine's moral gameplay. Understanding player experiences through play testing is crucial to the development of a balanced play experience (Sicart, 2009). The play testing was central in the design of elements, such as the inclusion of children, unclear moral decisions, the lack of tutorial, and the use of boredom. The role of testers was acknowledged by Ash (2012). He conducted ethnographic research to understand how game designers make use of feedback sessions to test the positive or negative affective encounters they design for.

The designers of This War of Mine also stressed the importance of continually testing with new players, because desensitization toward the emotionally engaging gameplay happens over time. An iterative design process means that gameplay is in constant negotiation. This could indicate that the moral value system is not fixed, but rather a combination of many factors influenced by many agents (Sicart, 2009). From our findings, several suggestions can be proposed for the design of moral gameplay. A player-centric iterative design process refines the player experience. This is particularly relevant for gameplay containing moral content, as the design process tends to desensitize designers during development. In regards to persuasive game design, this is where adhering to an iterative persuasive game design process likely benefits persuasive capacity. From a critical perspective, the moral value system is a culmination of all these different iterations, where different player reactions informed gameplay.

Another finding from our study was that the importance of conducting elaborate background research about a subject for a game (such as war) supports game-world coherence. At the same time, designers should be aware of the various underlying narratives of their work environment, as they could unconsciously influence the design.

Furthermore, the theme of morality is particularly interesting for persuasion. First, an appeal for morality can be observed in other persuasive games as well, such as Spec Ops: The Line (Yager Development, 2012), which questions players about the wrongs and rights of their choices throughout the game. Second, morality may help players in reflecting on their in-game actions, which could increase the impact on attitudes held in the extrafictional universe. Lastly, empathy was previously identified as a novel opportunity for persuasive games, which is noteworthy in the context of this study as empathy is considered a crucial component for morality (Decety & Cowell, 2014; Masto, 2015).

In conclusion, this work illustrates that confronting players with moral choices as a core part of the gameplay may be a fruitful approach for persuasive game design, and therein contributes to design research question 2 (RQ2): What are the current approaches and novel opportunities for persuasive game design? Furthermore, from a design process, this work highlights that production is continuously influenced by contextual and situational cues, an aspect that persuasive game designers may not always be aware of but one that has a noticeable impact on the actual outcome of a project.

Chapter 5

Empathic Engagement and Immersive Technologies

This chapter has been peer-reviewed and published as Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A.M. (2018). You; the Observer, Partaker or Victim. Delineating Three Perspectives to Empathic Engagement in Persuasive Games using Immersive Technologies. In Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts (pp. 493-501). ACM. https://doi.org/10.1145/3270316.3271547

5.1 Introduction

The first part of this dissertation provided a theoretical, practical, and commercial perspective on persuasive games and persuasive game design, primarily addressing the first two design research questions (RQ1 and RQ2). This chapter ushers in the second part of this dissertation and focuses on distilling a novel opportunity space as a springboard for further hands-on explorative design research.

The different perspectives offered in the first part of this dissertation yielded a unique insight into designing persuasive games, and highlighted how game designers frequently focus on designing for particular player experiences as a means to achieve intended persuasive goals. This observation is in line with the increasingly common approach to game design to keep the player experience as a central focus point throughout production, and away from focusing on mechanics alone, as a means to increase the probability of generating rewarding game experiences (Fullerton, 2008; Hunicke et al., 2004).

For instance, chapter 3 discussed the focus on creating conducive player experiences that are immersive and empathic, and chapter 4 highlighted how the team of This War of Mine focused on creating morally engaging player experiences. Overall, discussions related to designing for player experiences seem more prominent than discussions about how the persuasive arguments are actually implemented, which may be due to an understanding of the differences in processing of entertainment persuasion compared to traditional persuasion (Slater & Rouner, 2002).

In distilling all the work carried out thus far, two emerging trends in the design of persuasive games can be observed, which are the focus on empathic and immersive experiences. This is evident from the discussed perspectives, including the commercial perspective with the game This War of Mine (particularly with the understanding that empathy is a crucial component of morality; Decety & Cowell, 2014; Masto, 2015). As highlighted in earlier chapters, empathy and immersion are concepts frequently discussed in relation to the recent wave of affordable and commercially available immersive technologies, especially in relation to ideas pertaining to shaping how players think and feel about issues in reality. Still, both empathy and immersion are novel factors as part of an approach to designing persuasive games, and the strategic combining of the two still presents a largely unexplored design space.

Structurally, this chapter first offers a brief recap of strategically combining empathic engagement and immersive technologies in the design of persuasive games - based on what has been addressed in previous chapters. Second, the third design research question (RQ3) - How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? - is introduced along with a framework that delineates three perspectives to empathic engagement (when using immersive technologies). Third, a brief introduction is offered to the consecutive design research carried out to address the third design research question (RQ3), particularly through the A Breathtaking Journey and Permanent projects.

5.2 The Factors of Empathy and Immersion

A described in chapters 2 and 3, through an appeal to empathy (and indirectly through morality) game designers aim to have players feel and understand the struggles of other characters in the intradiegetic universe through their design (i.e., the game world) as a means to raise congruent empathy and attitudes towards represented objects or issues in the extrafictional universe (i.e., the real world). Appealing to empathy is considered a robust, and often-employed, persuasive appeal in face-to-face interventions (Batson et al., 2002) and legacy media including books and television shows (Batson & Ahmad, 2009; Carpenter & Green, 2012; Shelton & Rogers, 1981).

In relation to games, this translates to explorations of embodied persuasive games (Gerling et al., 2014) and the employment of immersive technologies to virtually inhabit another (Yee & Bailenson, 2006). Similarly, a growing public interest in immersive empathy-arousing games can be observed, partially fueled by the rapid diffusion of affordable Head-Mounted Displays and claims of Virtual Reality being the ultimate empathy machine (Milk, 2015). A common setup follows the 'standing in another's shoes' maxim, of virtually positioning the player in the position of the other in distress with the idea that one can best understand the struggles of another when one experiences the world through their eyes.

However, while presenting a story from a particular standpoint on an issue is indeed considered a persuasive mechanism, producing congruent attitudes (De Graaf et al., 2011; Hoeken et al., 2016), it does not mean that the player actually has to virtually stand in the

shoes of the other in distress as well. In fact, this setup describes only one of the several empathic states that fit under the umbrella term of empathy (Batson & Ahmad, 2009). In persuasive games like Wheelhouse (Nerurkar, 2017) and Auti-sim (Kadayifcioglu et al., 2013) the player does indeed stand in the shoes of the intradiegetic victim. However, in a few persuasive games like Injustice (Cho et al., 2016), the player inhabits a separate intradiegetic actor in the intradiegetic universe (i.e., story world) who partakes in events - and socially interacts - with the intradiegetic victim(s) through their intradiegetic role. And in other setups, like in Project Syria (Emblematic, 2013) and Clouds over Sidra (Arora et al., 2015) the player observes the intradiegetic victim as an outsider viewing in (i.e., from the extradiegetic universe), without actively partaking in any occurring events in the intradiegetic universe itself, nor adopting a particular intradiegetic role. Each of these unique perspectives to empathic engagement - the victim (first-person), partaker (second-person), and observer (third-person) – empathetically engages the player in a different way and is expected to involve and produce different emotional and cognitive empathic states.

At the same time, each case still allows for the presentation of a standpoint on the issue that is congruent with the designer's persuasive intent. Persuasive game designers are not limited to implementing only one of these perspectives, as several persuasive games demonstrate the use of multiple perspectives to empathic engagement. For instance, in This War of Mine (11 bit studios, 2014a) the player will actively play as a character dealing with depression at one moment, whereas at another moment the player encounters nonplayable characters who experience depression (thus switching from a victim perspective to a partaker perspective). In short, the focus of the following design research is to explore the various opportunities and challenges of empathy and immersive technology in the design of persuasive games, starting with a delineation of the unique perspectives to empathic engagement - which in turn will serve as a framework for the research through design projects.

5.3 Design Research Framework

With the objective to further explore the novel persuasive game design approach of strategically combining an appeal to empathy with the employment of immersive technologies, a more specific design research question may be devised accordingly. The third design research question

(RQ3) is formulated as: How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? It guides the design research explorations presented in the next two chapters. Next, a framework that delineated the different perspective to empathic engagement is introduced to structure these explorations. An understanding of the different perspectives to empathic engagement and the presence of a gap between realities can be insightful for persuasive game designers and helps to advance the understanding of this novel design space. In following sections, the three perspectives to empathic engagement are explained and illustrated with several example cases.

Figure 44 illustrates the positions of the extrafictional player and victim(s). The blue circle illustrates the extradiegetic universe and the red circle illustrates the intradiegetic universe. The thick purple line surrounding the fictional universe (i.e., both diegetic universes) indicates the gap between realities, highlighting that attitudes raised in the fictional universe do not seamlessly transfer (green dotted arrows in Figures 48, 50 and 51) to the player's extrafictional universe, and vice versa. Figure 45 indicates the position of the intradiegetic victim(s) to

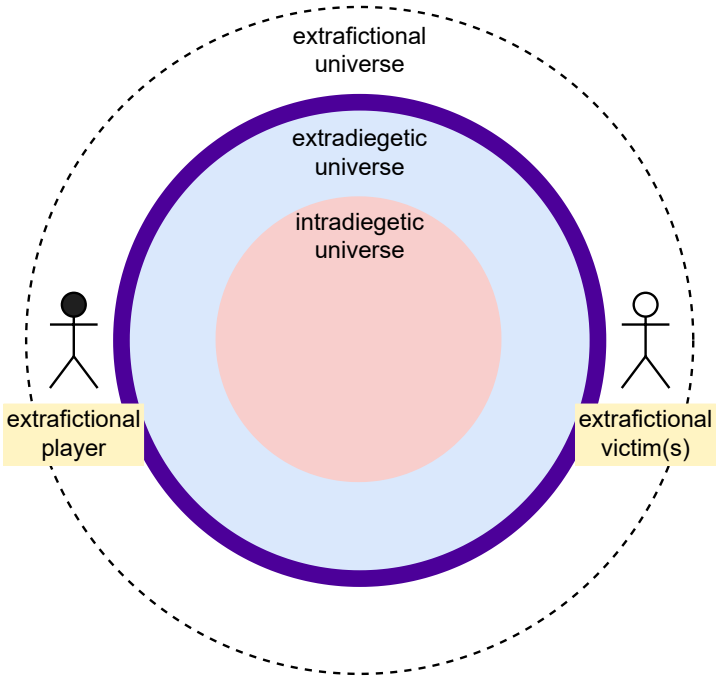


Figure 44 (→)
The diegetic location of the extrafictional player and extrafictional victim(s).

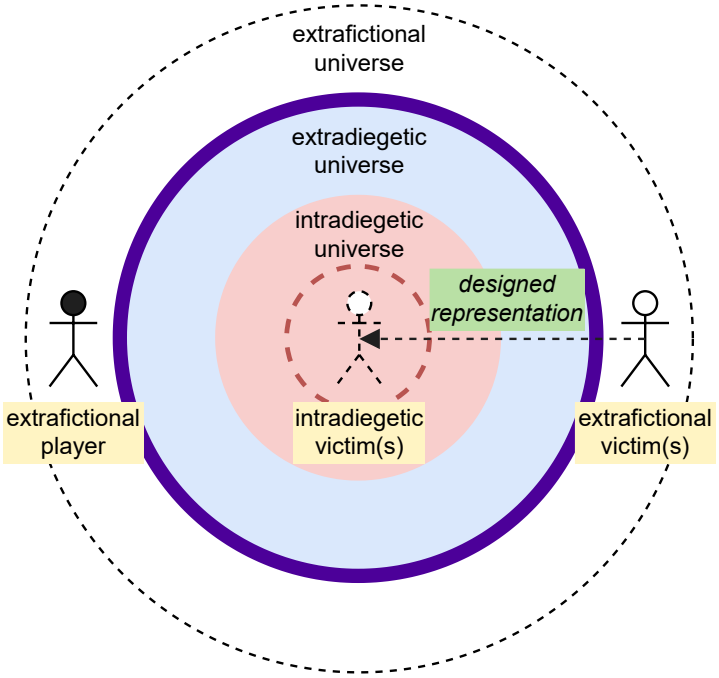


Figure 45 (←)
The diegetic location of the intradiegetic representation of the extrafictional victim(s). This representation is the work of the designers who designed the experience, and thus embodies their interpretation of the extrafictional universe combined with their persuaisve intent. In other words; the intradiegetic victim(s) is not the actual extradiegetic victim(s), but merely a customized reflection thereof.

represent victim(s) in the extrafictional universe. Keep in mind that this representation is the work of designers who created the fictional universe. The dashed line surrounding the intradiegetic victim(s) illustrates the intradiegetic victim's personal perspective and standpoint in the intradiegetic universe. Next, we will position the three player perspectives to empathic engagement - the observer (third-person), partaker (second-person), and victim (first-person) - in the framework.

The observer perspective

In an observer perspective, the player is an extradiegetic observer (see Figure 48). As an extradiegetic observer, the player is only able to observe (illustrated with a one-way solid arrow), and lacks the ability to socially interact with the intradiegetic victim(s). The player does not adopt an intradiegetic role, is limited to parasocial interaction (Moyer-Gusé, 2008), and is typically ignored by intradiegetic objects. This perspective is therefore sometimes referred to

Figure 46 (↓)
In Clouds over Sidra (Arora et al., 2015) the player observes children who are playing soccer in the Za'atari refugee camp in Jordan.

Figure 47 (↑)
In Project Syria (Emblematic, 2013) the player observes the plight of Syrian children in refugee camps, displaced in the Syrian civil war.

as 'being a ghost' (TechCrunch, 2016) and may therefore cause the uncomfortable 'Swayze effect' (Burdette, 2015; Vosmeer et al., 2017), in which "the absence of viewer agency creates an invisible wall between you and the virtual environment. The actors ignore you, the world remains indifferent to your presence, and yet you are so undeniably there" (Burdette, 2015, para. 10). Despite this issue, an observer perspective is most interesting for its ability to address complex and abstract situations with multiple standpoints on the issue as it isn't bound to the restrictions of the intradiegetic universe, nor a particular role. This is useful as it can help cognitive awareness of conflicting interests (leading to different appraisals and decisions in a situation) and subsequently a more nuanced empathy, while still fostering a standpoint that is congruent with the designer's persuasive intent. Furthermore, since this is a perspective that puts the spotlight on empathizing with another, this perspective may also be more responsible for generating other-oriented empathic states (Batson, 2009). Projects like Clouds over Sidra (Arora et

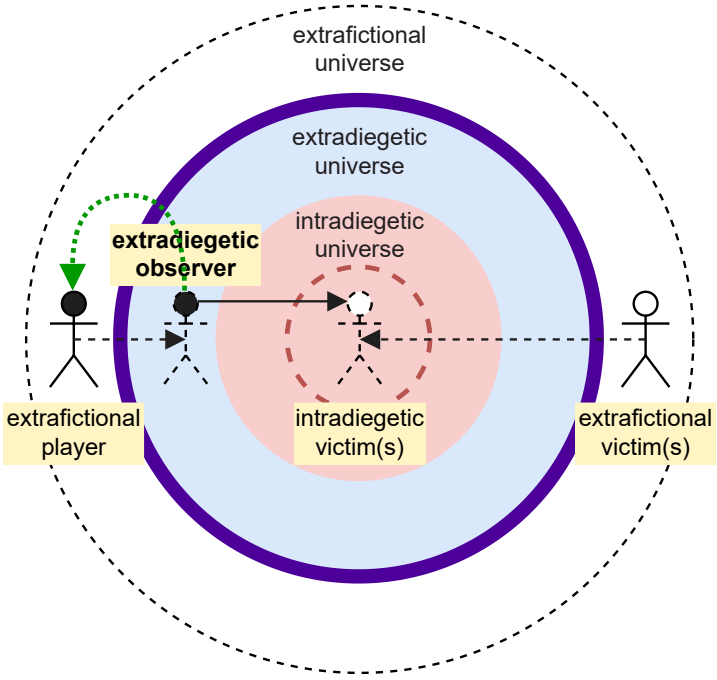


Figure 48 (→)
The observer perspective. The diegetic location of the extradiegetic observer.

al., 2015; see Figure 46), Project Syria (see Figure 47; Emblematic, 2013) and A journey to the Arctic (MediaMonks, 2016) employ an observer perspective.

The partaker perspective

In a partaker perspective, the player participates in the intradiegetic universe by adopting an intradiegetic role, with both spatial presence and the ability to socially interact with intradiegetic object(s), including the intradiegetic victim(s) (see Figure 50). Although this perspective is similar to real face-to-face empathic engagement, it is rarely deployed. A possible explanation for this could be the complexity of establishing a believable social interaction between the player and other intradiegetic actors (Stuart, 2016), to "create a coherent cognitive and emotional experience" (Hall et al., 2005, p. 731) required for an empathic relationship. A partaker perspective is most interesting for its capacity to actively involve the player in the represented issue by stimulating role-related responsibility and enactment in presented situations (which is considered valuable in real face-to-face empathy; Wiseman, 1996). Like the observer perspective, the partaker perspective typically focuses more on arousing other-oriented empathic states as it presents another to empathize with from the get go. Furthermore, it stimulates the player to question their own attitudes when interacting with intradiegetic objects, possibly resulting in more personally relevant conclusions. Projects that employ a partaker perspective are, for instance, Injustice (Cho et al., 2016) (see Figure 49).

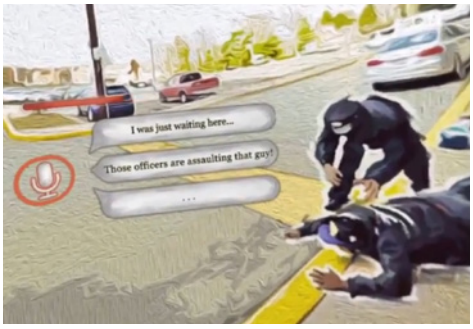


Figure 49 (↑)
In Injustice (Cho et al., 2016) the player inhabits a passerby who witnesses "an act of racial discrimination happening in front of them, forcing them to make moral and ethical decisions on the spot." (Cho et al., 2016, p. 33).

The victim perspective

In a victim perspective, the player inhabits the body, role, frame of reference, and typically the standpoint of the intradiegetic victim (see Figure 51). This perspective more literally follows the notion of standing in another's shoes, in which the player experiences the intradiegetic universe through the intradiegetic victim's senses, along with perhaps feelings and thoughts. Similar to a partaker perspective, a victim perspective offers the player a sense of spatial presence and the ability to socially interact with other intradiegetic object(s). A victim perspective

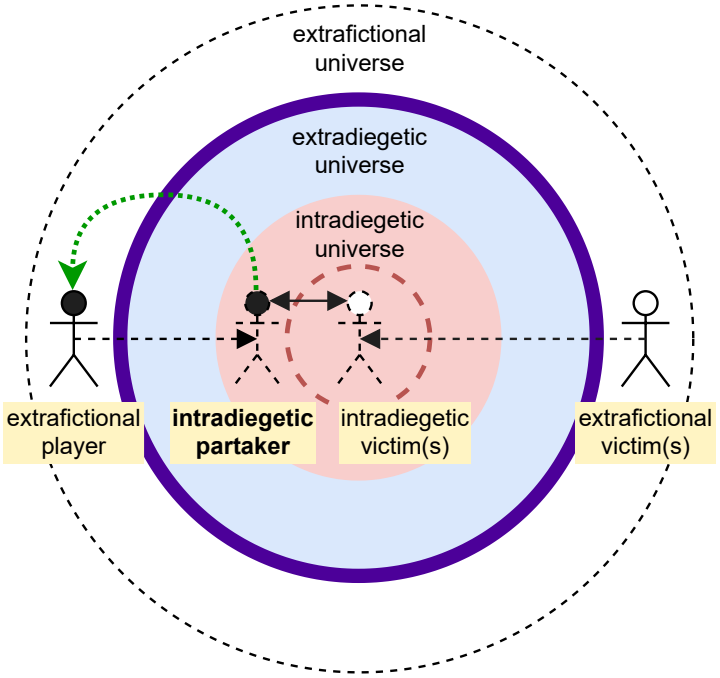


Figure 50 (→)
The partaker perspective.
The diegetic location of the intradiegetic partaker.

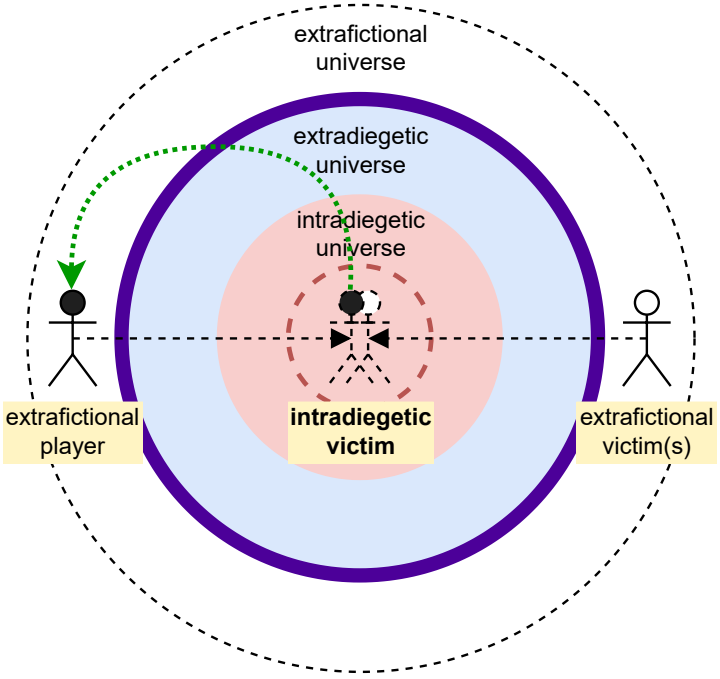


Figure 51 (→)
The victim perspective.
The diegetic location of the intradiegetic victim.

is most interesting for its ability to provide players with an experience that matches that of an extrafictional victim's lived experience, and drives players to question: What would I do myself, in this situation? (Batson & Ahmad, 2009; Kors et al., 2016a; Tanenbaum & Tanenbaum, 2015).

Accordingly, in contrast to the other two perspectives to empathic engagement, a victim perspective has a setup that may be more conducive for self-oriented empathic states as it seeks to provide players with an experience that mimics the experience of the other in distress. However, while such affective experiences can be powerful in terms of shaping attitudes, this matching of an extrafictional victim's lived experience also raises ethical questions as it might lead to an unsettling experience for the player. As technological advancements help games become increasingly more realistic, so may the intensity of unsettling events. Projects that employ a victim perspective include Wheelhouse (Nerurkar, 2017; See Figure 52) and Interu_psy (Manders, 2015).

Figure 52 (↑)
In Wheelhouse (Nerurkar, 2017) the player navigates through a house with obstacles, while seated in a wheelchair.

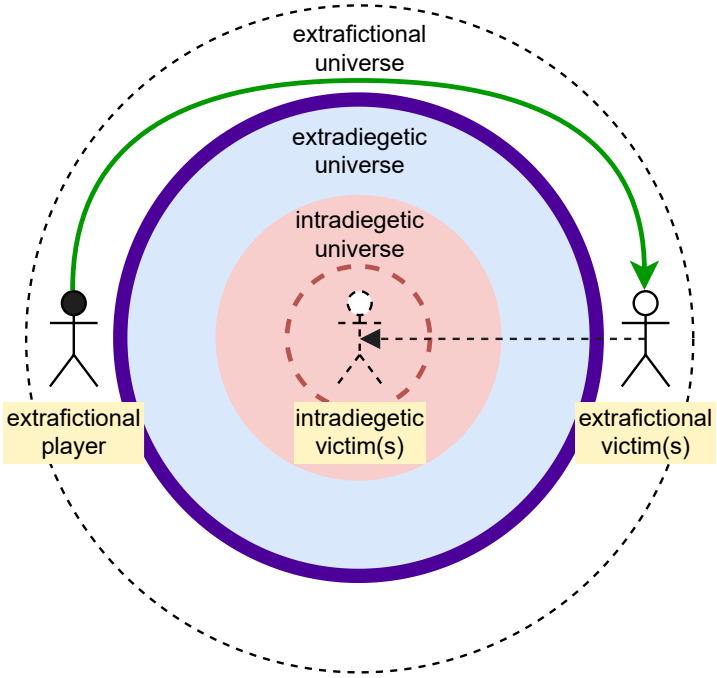
Extrafictional Effects

In following a persuasive intent, empathizing with the intradiegetic victim(s) is not enough. Ultimately it is the objective of persuasive game designers to support the adoption of thoughts and feelings generated in the fictional universe into the extrafictional universe, and towards the intended extrafictional victim(s) or related issue (illustrated with the solid green arrow in Figure 53).

5.4 A Springboard for Further Design Exploration

The delineation of three unique perspectives to empathic engagement, along with the deployment of immersive technologies, each potentially arousing different empathic states - as a means to persuasion - will form a framework for the design research explorations in the following chapters. The A Breathtaking Journey research through design project (see chapter 6) explores the victim perspective and the Permanent research through design project (see chapter 7) explores a partaker perspective. These perspectives to empathic engagement may be regarded as form of 'strong concepts' (Höök & Löwgren, 2012), with the two projects being illustrative example cases in which these concepts are materialized.

Figure 53 (→)
The adopted thoughts and feelings used towards the intended extrafictional victim(s) (or related object/ issue).

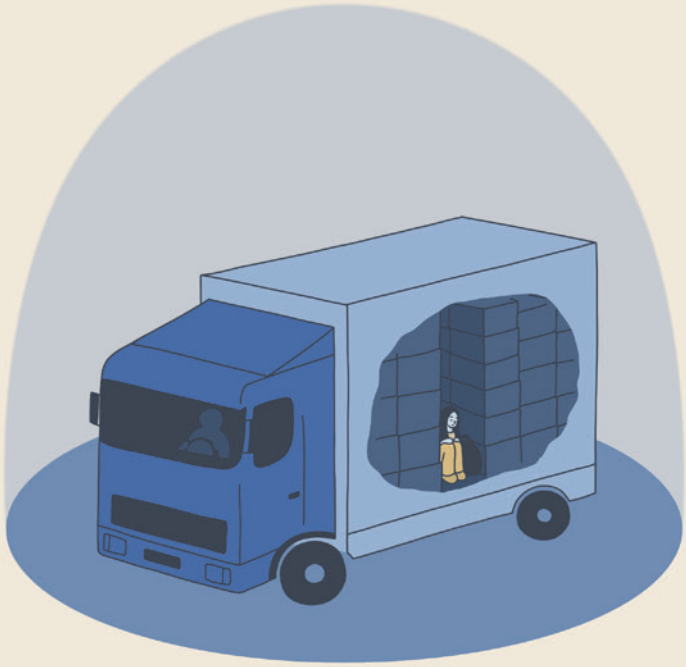


The projects were designed consecutively, and as a result, the design insights from A Breathtaking Journey influenced the design of Permanent. However, both projects were uniquely designed around either of the two perspectives and in turn spur related design insights respectively. With the focus on persuasive games, an observer perspective is less insightful as it typically does not involve an interactive component with rules and procedures in which players can assert an influence; rather, interaction is often limited to the player's navigation through space. Therefore, this perspective to empathic engagement has not been used as a primary starting point for one of the research through design projects. However, in terms of empathic orientation an observer perspective is likely similar to that of a partaker perspective as they both position the player as a separate entity from the character designed to empathize with. In turn, the insights generated through exploring a partaker perspective to empathic engagement should also offer ample design insight applicable to the employment of an observer perspective.

5.5 Conclusion

This chapter presented a framework that delineates three player perspectives to empathic engagement with intradiegetic object(s), with whom the player is positioned to empathize - the observer, partaker, and victim - and illustrate the gap between the diegetic and extrafictional universe, which could affect the impact that persuasive games have on extrafictional attitudes. The work also illustrates that the often-sought-after first-person victim perspective is not necessarily the only way to arouse empathy in persuasive games using immersive technologies. As such, designers are encouraged to carefully evaluate which perspective is most suitable for their objectives, and explore ways of increasing the likelihood for intradiegetic empathic relationships to have an actual impact on the players' attitudes in the extrafictional universe.

While some preliminary design opportunities were discussed too, the following chapters will shed more light on the particular differences and effects of these distinct perspectives to empathic engagement, guided by design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?



Chapter 6

A Victim Perspective to Empathic Engagement

This chapter has been peer-reviewed and published as Kors, M. J. L., Ferri, G., van der Spek, E. D., Ketel, C., & Schouten, B. A. M. (2016). A Breathtaking Journey. On the Design of an Empathy-Arousing Mixed-Reality Game. Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play, 91–104. https://doi.org/10.1145/2967934.2968110.

6.1 Abstract

Following the Design Research Framework introduced in the previous chapter, delineating three distinct perspectives to empathic engagement along with the employment of immersive technologies, this chapter focuses on employing a victim perspective to empathic engagement. This exploration is done hand in hand with addressing design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? As this chapter is based on a peer-reviewed and published article, the introduction section of this chapter reiterates previously discussed topics, theories, and concepts.

As discussed over the previous chapters, persuasive games exist for a wide variety of objectives, from marketing, to healthcare, and activism. Some of the more socially aware ones cast players as members of disenfranchised minorities, such as migrants, prompting them to see what they see. In parallel, a growing number of designers has recently started to leverage immersive technologies to enable the public to temporarily inhabit another person, to sense what they sense. From these two converging perspectives, we hypothesized a still-uncharted space of opportunities at the crossroads of games, empathy, persuasion, and immersion.

Following a research through design approach, we explored this space by designing A Breathtaking Journey (see Figure 54), an embodied and multisensory mixed reality game providing a first-person victim perspective of a refugee's journey. A qualitative study was conducted with a grounded theory/open coding methodology to tease out empathy-arousing characteristics, and to chart this novel game design space. As we elaborate on our analysis, we provide insights on empathic mixed reality experiences, and conclude with offering three design opportunities: visceral engagement, reflective moments, and affective appeals, to spur future research and design.

6.2 Introduction

According to a recent meta-analysis, American college students exhibit a relatively sharp decline in empathy since the early 2000s, especially in relation to the abilities of empathic concern and perspective taking (Konrath et al., 2010). While the possible causes for this decline are manifold, a part of it might be related to the media and technology

Figure 54 (↑)
The A Breathtaking Journey demonstrated at the Dutch VR Days in Amsterdam, the Netherlands (2015).

people increasingly expose themselves to (e.g., social networks, reality TV, or digital games; Konrath et al., 2010). Furthermore, there is a concern that, though contested (e.g., Przybylski et al., 2014), repeated engagement with the content of violent video games may lead to lower empathy (Anderson et al., 2010). At the same time, however, evidence has emerged that games can also influence real-world attitudes towards more desirable outcomes (or at least desirable to the designers of such games; Wouters et al., 2009). These games, more commonly known as persuasive games, could therefore potentially also be used to improve the empathic abilities of the players. The underlying mechanisms, especially in terms of how to design for empathy-arousing experiences in games, are still poorly understood however. With a research through design approach (Zimmerman & Forlizzi, 2014) and a thematic analysis (Braun & Clarke, 2006), this chapter aims to shed light on how multisensory immersive experiences, and the subsequent identification with the game's protagonist, could be used to arouse empathy. Finally, we propose a set of design opportunities to guide future design and research endeavors.

Persuasive Interactions

The use of games for persuasion has gained widespread acceptance. A subset of these leverages persuasion not for expressly commercial or promotional purposes, but to temporarily put players in the role of specific characters – for example the disadvantaged, marginalized, or dispossessed – to communicate how it feels to be in certain conditions. In parallel, many Human-Computer Interaction solutions have been developed over the years exploring empathy as a desired outcome, for instance, game-based training aids for people on the autistic spectrum. Here we aim to connect these two sets, namely: (a) games that foster empathic connections to promote attitude change, and (b) Human-Computer Interaction artifacts designed to elicit empathy as a main objective, often through playful interactions. In the following paragraphs, we further unpack these two points of view on empathy and digital artifacts. The first one is slightly more functionalistic and foregrounds empathy as a desirable means to leverage in persuasion. The second brings aesthetic experiences to the forefront, and explores artifacts aiming at altering players' perceptions, thus producing empathic effects. The two perspectives are not mutually exclusive, as they situate the same phenomena (empathy-induction) in different contexts (applied games and aesthetic artifacts). We outline these two views before presenting a device situated in the middle ground.

Empathy-Oriented Persuasive Games

As was seen in previous chapters, the use of empathy-arousal as persuasive appeal in legacy media is not uncommon, presenting struggles or happiness (e.g., people fleeing from a war torn-country or someone overcoming an illness), and has been effectively used to change or reinforce related attitudes and behaviors (Escalas & Stern, 2003; Jones, 1997; Shelton & Rogers, 1981; Shen, 2011). Although games might not have received the same amount of attention as other forms of media when it comes to empathy, they do present a unique array of opportunities to foster empathy (Belman & Flanagan, 2010; Bogost, 2011; Flanagan, 2009; Iacovides & Cox, 2015).

Through their interactivity (Steinemann et al., 2015), goal-driven nature (Lankoski, 2007) and various opportunities for role taking (Peng et al., 2010), games already present a compelling toolkit for stimulating empathy. As Boltz et al. (2015) argued, "well-designed empathy games can also encourage [players] to evaluate choices and consequences,

and to question the system a game represents" (p. 8). Games that use empathy-arousing appeals to change or reinforce attitudes belong to the field of persuasive games. Bogost (2007) coined the term persuasive games to describe digital games "games that mount procedural rhetorics effectively" (p. 46). However, this definition was quickly contested for being too narrow, by ignoring other possible persuasive dimensions games can encompass (De la Hera Conde-Pumpido, 2013). We therefore settled for a more widely applicable description and refer to persuasive games as interactive entertainment designed to shape how the player thinks and feels about reality, which is in line with the belief that shaping attitudes is considered a primary intent when designing persuasive games (Kors et al., 2015).

Current research in game design and education (Boltz et al., 2015; Gotsis et al., 2010; Smethurst & Craps, 2014) has been exploring how game systems may stimulate the cognitive and affective aspects of empathy. This may empower players to explore alternate points of view and foster a sense of shared similarity and empathic concern for individuals and groups with whom they may not have direct contact (e.g., experiences of trauma, illness, migration, war, etc.). Belman and Flanagan (2010) pointed at PeaceMaker (ImpactGames, 2007) as an exemplar artifact that is at the same time a game:

> Cognitive empathy is involved in gameplay [...] To make progress [...] players have to consider the perspectives of a variety of stakeholders, rather than only that of their own side. [...] The game requires one to think carefully about the perspectives of a wide range of stakeholder groups [...] Policy decisions that agitate a stakeholder group too much can potentially derail the peace process. (p. 12)

Games such as PeaceMaker (ImpactGames, 2007), Darfur is Dying (Ruiz et al., 2006), Hush (Antonisse & Johnson, 2013), and more recent games such as This War of Mine (11 bit studios, 2014a) and Spec Ops: The Line (Yager Development, 2012) do not only ask players to empathize with certain game characters, they also present the player with arguments that might cause one to think and feel differently about the people, events, or situations represented in these games (Kors et al., 2015).

Several possible qualities have been named to increase the impact of such persuasive gameplay on a macro level, including factors such as engagement (and immersion), credibility and relevance (Kors et al., 2015). For our current research on persuasive games, it is in particular the

design of immersive gameplay (i.e., degrees of engagement, absorption, or involvement with a game; Brown & Cairns, 2004; Nilsson et al., 2016) that presents captivating qualities for persuasion through games (Kors et al., 2015). Similar immersive experiences have already been shown to be conducive for changing or reinforcing attitudes in other fields, particularly in the design of persuasive narratives (Carpenter & Green, 2012; Moyer-Gusé, 2008; Slater & Rouner, 2002), with evidence for empathy as a mediating component (Batson & Ahmad, 2009; Green & Brock, 2002; Van Laer et al., 2014) and as a factor to increase the likelihood such fictional experiences lead to real world prosocial behavior (Johnson, 2012). While engagement and immersion can be strengthened through narrative immersion in games (Lu et al., 2012), one might also employ other types of immersion like system immersion (i.e., through immersive technologies; Nilsson et al., 2016) to foster similar persuasive experiences (perhaps in conjunction with narrative immersion; Carpenter & Green, 2012; Grigorovici, 2003).

Through system immersion (e.g., Head-Mounted Displays) one can provoke a sense of presence in an alternate reality, tricking the brain into thinking that one is somewhere other (a virtual world) than the physical world one's body actually resides in (Bystrom et al., 1999; Nilsson et al., 2016; Steuer, 1992). With the feeling of being somewhere else, the feeling to stand in someone else's shoes becomes possible following a victim perspective, which in turn presents ample opportunity to also think and feel like this other person. Although little is known about the effects of a system immersion on persuasion, the concept is captivating and perhaps resulting in similar effects to that of narrative immersion (Carpenter & Green, 2012), and increasingly relevant for the field of persuasive games in light of the recent rise in popularity of virtual reality (VR) and Augmented Reality (AR).

Empathy-Oriented Playful Human-Computer Interaction

Similarly, to game design/game studies, empathy is not a new concept for researchers in some domains of Human-Computer Interaction. In this part, we focus on artifacts that – while not being full-fledged games – still leverage a degree of playfulness in engaging their players (Blythe et al. 2005; Schouten et al., 2010). Specifically, the interplay between system immersion and phenomenology is opening new design spaces: the rapid and widespread diffusion of VR, AR, and wearables has made it feasible and relatively affordable to create a variety of artifacts making

one experience someone else's phenomenological perceptions. Design research has drawn upon pragmatist phenomenology to argue that interacting with technology in society "requires us to understand the experiences of [a] person in relation to ourselves and it is [there] that we identify empathy" (Fiore et al., 2005, p. 131). To illustrate this, we propose here two approaches to empathy-oriented playful Human-Computer Interaction: first, immersive journalism, and then wearable devices that modify the perception of one's own body. As we present our selected examples, we categorize them as playful inasmuch they are not games, but they are not functionalistic tools either: as Lucero et al. (2014) argued, "playfulness is a mindset whereby people approach everyday, even mundane, activities with an attitude similar to that of paidia" (p. 36).

De la Peña et al. (2010) discussed the possibilities of 'immersive journalism', a form of mediated first-person experience of a journalistic reportage, "[allowing] the participant to actually enter a virtually recreated scenario representing the news story [that] affords the participant unprecedented access to the sights and sounds, and possibly feelings and emotions" (pp. 291-202). In this vein, Arora and Pousman developed Clouds Over Sidra (Arora et al., 2015), a 360° film in partnership with the United Nations, following Sidra, a twelve-year-old girl, living in the Za'atari camp in Jordan. Codirector Arora described: "by leveraging breakthrough technologies, such as virtual reality, we can create solidarity with those who are normally excluded and overlooked, amplifying their voices and explaining their situations" (Kamen, 2016, para. 3).

And, indeed, filmmaker and digital artist Chris Milk (2015) has recently argued for VR constituting an 'ultimate empathy machine'. When playing Clouds Over Sidra,

> you're sitting there in [Sidra's] room, watching her, you're not watching it through a television screen, you're not watching it through a window, you're sitting there with her [...] when you look down, you're sitting on the same ground that she's sitting on [...] and because of that, you feel her humanity in a deeper way: you empathize with her in a deeper way. (Milk, 2015, 7:41)

In addition to using technology to alter the viewpoint of the viewer, technological devices can also be used to stimulate the other senses and thereby alter one's own bodily perception, with the objective of literally

feeling what someone else might perceive through a victim perspective. Marshall et al. (2011) and Benford et al. (2012) have experimented with devices built around military-style gas masks, fitted with wireless breath sensors and cameras. Marshall et al. (2011) reported on a horror-themed maze visited by volunteers wearing sensor-equipped gas masks, who were remotely observed by other participants through their video feeds and breathing sounds. Semistructured interviews showed the remote participants experiencing heightened fear, arguably because of their empathic bond with the volunteers inside the horror labyrinth. In a later study, Benford et al. (2012) presented Breathless, a physical installation for three participants wearing breath sensors. Breathless prompts one participant to sit on a swing, another to control its rhythm, and the last one to observe them from afar - and they all had to synchronize (in different ways according to their role) their breathing and their movements. Qualitative analyses of the collected data points described an empathic relationship created between the participants by means of their shared perceptions.

Immersion, Empathy, and Persuasive Games

As discussed in chapters 2, 3 and 5, the examples and literature suggest that system immersion, or technologically induced presence, may be conducive for persuasion (Kors et al., 2015). As such, it is surprising that immersive technologies, particularly in combination with empathy-arousal as persuasive appeal, were still largely absent from the repertoire of games designed to persuade when carrying out the study reported in this chapter. On one hand, we have seen a variety of applied games following the footsteps of PeaceMaker (ImpactGames, 2007), fostering empathy by presenting carefully simulated sequences of strategic actions and reactions. At the same time, Marshall et al. (2011) and Benford et al. (2012) exemplified an approach to empathy that is more grounded in playful system immersion and in the sense of presence it produces. There are both the technical opportunity and the urgent need for merging these approaches and examining the design of immersive applied games for empathy that employ a victim perspective. For these reasons, an exploratory research through design (Zimmerman et al., 2007) project was launched to examine the problem space, produce relevant concepts, and test them on an experimental artifact, on which we report in the following section.

6.3 A Breathtaking Journey

A Breathtaking Journey is a mixed reality game designed by Cas Ketel and Martijn Kors, and meant to arouse empathy and improve attitudes towards refugees through a victim perspective to empathic engagement. A Breathtaking Journey was born of a project with Amnesty International the Netherlands in 2014 and 2015, in which we set the objective to explore how interactive entertainment could help motivate people to change or reinforce attitudes towards human rights related issues (Kors, 2015). The design of A Breathtaking Journey draws inspiration from empathy-supporting games for change such as Hush (Antonisse & Johnson, 2013) and Madrid (Frasca, 2004), from art games such as The Graveyard (Tale of Tales, 2008), as well as from unusual immersive experiences such as Taphobos (Brown et al., 2015). A Breathtaking Journey places the player in the shoes of a refugee who is fleeing from a war-torn country, hiding in the back of a truck, to reach a safe haven (see Figure 55).

The virtual experience of A Breathtaking Journey, delivered through a head-mounted display and over-the-ear headphones, is augmented with a range of physical elements including a mask (housing a breathing

Figure 55 (→)
The player is wearing a head-mounted display while being seated in a physical contraption that closely matches the claustrophobic contours of the virtual lorry. Here the player's primary task is to hide behind virtual crates and remain undetected when the truck is inspected by border patrol.

Figure 56 (→)
The player is wearing an Oculus head-mounted display, a pair of stereo headphones, and a custom gas mask attachment that diffuses scents as well as registers in/ex -halation used to control the game.

Figure 57 (←)
The physical contraption is built from wooden pallets with a metal backplate to mimic the materials and contours of the virtual environment. The whole cabin is placed on a set of car tires to allow for a degree of rocking motion in all directions. A heavy duty saw motor with an eccentric load attached is fitted in the bottom compartment of the cabin to generate the rocking motion, which is controlled by the game to match the virtual truck's movement.

sensor and a scent diffuser; see Figure 56), a tangible contraption mimicking the inside of a truck, an unbalanced motor to simulate movement, and a controlled shutter to drop objects on the player during the game.

The combination of both virtual and real elements effectively positions A Breathtaking Journey as a Mixed-Reality (Benford & Giannachi, 2011) game and overlaps with the concept of Augmented Virtuality, which is situated towards the Virtual Reality end of Milgram and Kishino's (1994) Reality-Virtuality continuum. Augmented Virtuality refers to the integration of real world objects into a predominantly virtual world, as opposed to Augmented Reality, where virtual elements are integrated into a predominantly real world (Milgram & Kishino, 1994). Although the term Augmented Virtuality is seldom used (and, when it appears, it often refers to the integration of live visuals from reality into a virtual world), one could also consider the inclusion of live physical elements, such as the use of real-world gravity, acceleration, wind, mass, materials, scent, and temperature as possible augmentations of the virtual world. This particular format affords the creation of an alternate (virtual) world, authored by the designer (through computer-generated visuals and audio), all the while supplemented with real physical elements (that are still difficult to fabricate digitally) to address additional senses, enhance the experience, and most importantly increase the player's sense of presence (Dinh et al., 1999). As a research through design (Zimmerman et al., 2007) project, A Breathtaking Journey addresses the aforementioned gap between applied games and empathy machines by designing a game that (a) generates a sense of presence through embodied and multisensory elements, (b) suggests complex emotions and visceral reactions, and (c) stimulates players to interpret the embedded told narrative.

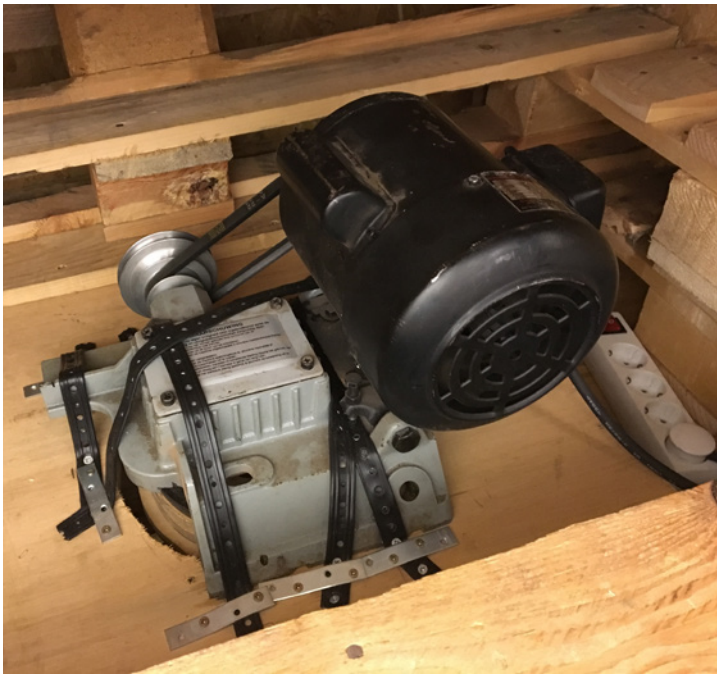
Technology

In what follows, we describe how A Breathtaking Journey provides players with outputs that are (a) audio-visual; (b) tactile, vestibular, and proprioceptive; and (c) olfactory. For that last point, we also address the use of an anemometer as a novel input device. For audiovisual stimuli, we used an Oculus Rift Development Kit 2 head-mounted display (Oculus, 2014), providing the player with low latency head/positional tracking and a stereoscopic visual of the virtual environment. It was combined with isolating over-the-ear Audio Technica ATH-M40x (Audio-

Figure 58 (↑)
The virtual environment (truck scene) at the moment the border patrol opens the lorry, seen from the player's point of view.

Figure 59 (←)
The virtual environment (truck scene) in which the player is seated.

Figure 60 (→)
A modified heavy-duty table saw motor driving an enclosed eccentric load that can be controlled through the game engine via a microcontroller to imbalance the wooden contraption in sync with the movements of the virtual truck. This setup generates the sensation of a truck's mass displacement during accelerating and decelerating, as well as the sensation of driving over uneven ground.



Technica, 2014) headphones, providing simulated spatial audio. Tactile, vestibular, and proprioceptive elements required a more complex setup. By placing players in a wooden crate (roughly 120x100x140cm; see Figure 57), we were able to map the virtual world represented in A Breathtaking Journey with a player's physical surroundings (see Figures 58 and 59). By precisely superimposing the virtual environment onto the physical contours of the contraption, players are able to actually touch and feel what their avatars might perceive in the virtual world. To create a sense of movement we positioned the contraption on a suspension system, which simulates a realistic sense of driving via a custom heavy duty unbalanced motor situated in a protected compartment underneath the player (see Figure 60). Furthermore, to add an extra physical component to the installation, a pair of mandarins is automatically dropped on the player's leg, triggered by a specific in-game event. For olfactory stimuli, and to use the player's breathing as an input, we created a wireless device that closely resembles a gas mask (see Figure 61 to 64). The device houses two independently controllable ultrasonic scent diffusers. These diffusers use electronic frequencies to create fast vibrations that vaporize essential oils (mandarin in this case) into the player's air stream. The device also houses an anemometer (a wind sensor based on a hot-wire

Figure 61 (←)
A gas mask with a custom 3D printed attachment, housing two individually controllable scent diffusers and an anemometer, which communicate wirelessly with the game engine.

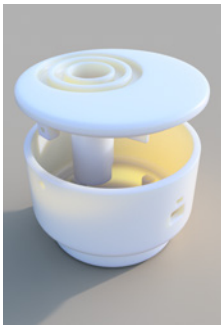


Figure 62 (←)
The CAD model for the 3D printed attachment.

Figure 63 (↑)
Inside the custom gas mask attachment, a pipe guides the player's air stream through an anemometer which measures air temperature (which is used to calculate whether a player inhales or exhales and at what speed)

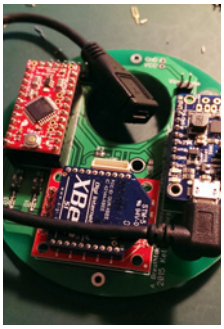


Figure 64 (← and ←←)
The PCB fitted into the 3D printed attachment, as well as a prototype using an Arduino, Xbee module, and LiPo charger breakout.

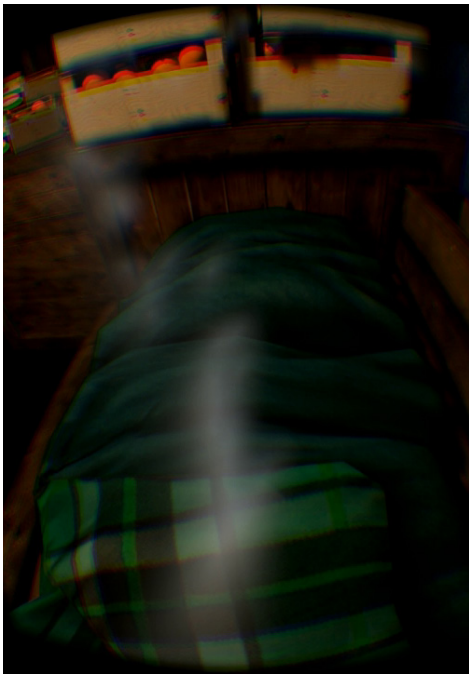


Figure 65 (↑)
The player's point of view in virtual reality. The player's breathing is measured using the anemometer located in the gas mask attachment, with the data represented in the game as a white smoke-like effect. This immediate feedback (alongside narrative cues) helps players understand that their breathing plays a key role in the game and is a vital part in remaining undetected when the lorry is inspected. Figure only shows the right side (eye) of the stereoscopic render.

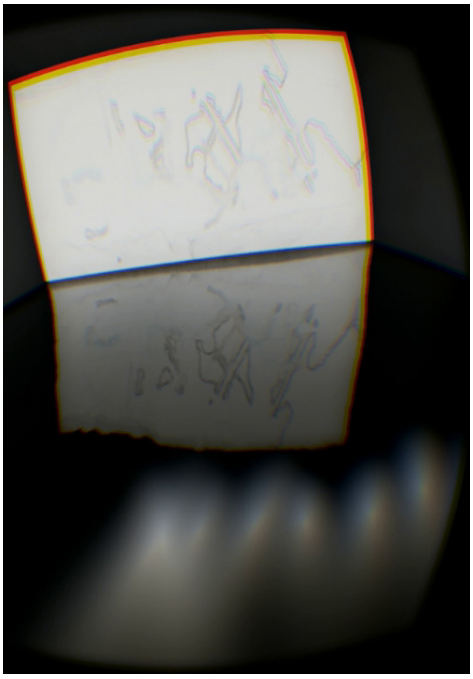


Figure 66 (↑)
The dream scene is more abstract than the truck scene, with stylized video flashes that match the protagonist's thoughts and feelings as she/he provides a background story. Figure only shows the right side (eye) of the stereoscopic render.

Figure 67 (←)
The dream scene has several intense moments too, such as the room filling up with water or flames such as shown in this screen capture. Figure only shows the right side (eye) of the stereoscopic render.

technique) to measure the player's breathing (see Figure 6.9). All sensors and actuators are interfaced to the computer over a (wireless) serial connection using an Arduino microprocessor (Arduino, 2015). We used Unreal Engine 4 (Epic, 2015) to drive the narrative, process interactions, facilitate the communication between sensors/actuators, and real-time render the virtual environment.

Gameplay

We created an embedded narrative to guide the experience, but, at the same time, we decided to keep it at a minimum to better foreground and explore the multisensory and immersive aspects of A Breathtaking Journey. The game is divided into two scenes, spanning five minutes overall. We refer to them as the dream scene (an autodiegetic narrative introducing part of the protagonist's background) and the driving scene (representing the protagonist hidden in a truck). During the entire game, the player is free to move and look around within the physical boundaries of the contraption, while subtle visual elements are rendered in sync with the input of the anemometer (see Figure 65). Although the game has a single script for the embedded narrative, the player's gender determines the gender of the protagonist and corresponding narration (the autodiegetic voice).

In the dream scene (see Figures 66 and 67), the player has no virtual body and floats midair in a dark room. A movie (with an outline filter applied) is projected on a white virtual wall, and an autodiegetic voice tells about a raid, kidnapping the protagonist's brother. Then, the movie shows a boat drifting off at sea, with the protagonist's voice telling how he/she escaped the country, how the boat he/she was on sank not far from shore, leaving the protagonist as one of the few survivors. The player sees water rising from below to above his or her head, as if being submerged and drowning, after which the environment turns black, and the protagonist explains that continuing the journey through an overland route is the only option left.

The driving scene (see Figures 68 to 70) begins with the player waking up, hidden in a truck that is transporting mandarins. The diffusers in the mask are activated and disperse the soothing scent of mandarins. A small window on the right side of the crate exists both in the physical and in the virtual worlds, and players can touch it and peek outside over a Middle Eastern/Balkan scenario (see Figure 69). After several minutes the truck is stopped, players hear a patrol questioning the driver, and

Figure 68 (←)
The player wakes up in the back of a lorry after the dream scene to the subtle scent of mandarins (released into the air stream of the player using the scent diffuser in the gas mask attachment). Figure only shows the right side (eye) of the stereoscopic render.

Figure 69 (↓)
As the player looks around the lorry a small opening provides players with a peek to the outside world. Figure only shows the right side (eye) of the stereoscopic render.

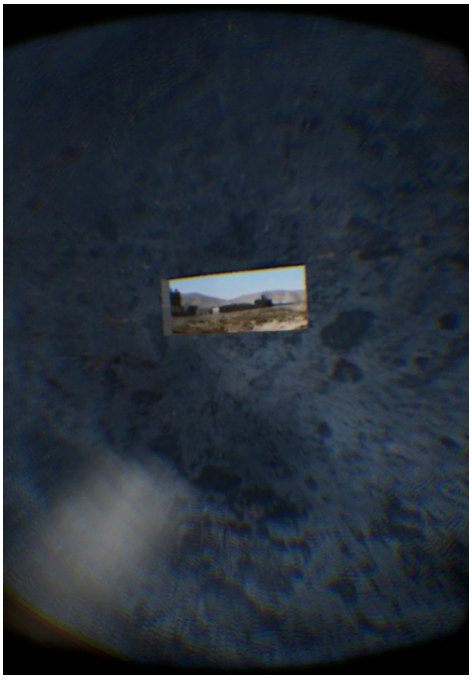


Figure 70 (↓)
A bright light fills the lorry as the door swings open. Players have to stay low and hold their breath to avoid being detected by the border patrol. Figure only shows the right side (eye) of the stereoscopic render.

an off-voice tells the player to be quiet and not to breathe. The door on the side of the truck swings open (see Figure 70), the cargo is being inspected, but nothing suspicious is found. When the door closes again, several mandarins fall down, alarming the patrol, who consequently inspects the truck a second time. This time, however, depending on whether the player is quiet and breathing, the system determines whether the protagonist is able to avoid detection, or not. For this study, both endings were virtually identical, fading the environment to gray, presenting the result of whether the player was caught or not (see Figure 71), and ending with the autodiegetic voice wishing a better future for those in a similar situation.

Figure 71 (↑)
If players manage to remain undetected after a second attempt of the border patrol to search the lorry, the door will close and the game will end with a few last words by the protagonist. Figure only shows the right side (eye) of the stereoscopic render.

6.4 Study

A Breathtaking Journey was deployed at three tech-oriented public events in Western Europe for a total of six days, between October and December of 2015 (see Figure 72). Of these events, one was free and two required only a small entrance fee. Furthermore, all three events had a focus on popularizing new technology, thus attracting a diverse population. This was an exploratory deployment study, with which we aimed at putting our research through design device in the wild to capture spontaneous reactions, with a Thematic Analysis / Open-Coding approach (Adams et al., 2008; Braun & Clarke, 2006). The objective was to probe reactions vis-à-vis empathy, embodiment, and persuasive emotional appeals, to inform the future design of empathic and persuasive experiences through immersion. The A Breathtaking Journey has been demonstrated at numerous other events after the required data was collected for the study presented in this chapter, simply to offer the public the opportunity to experience the game (see Figures 73 and 74).

We used an open-ended face-to-face interview protocol (Creswell, 2014), formulated for attitude measurement (Maio & Haddock, 2009; Perloff, 2008), in combination with a photo elicitation interview protocol (Harper, 2002). Interviews were conducted either in English or in Dutch. The

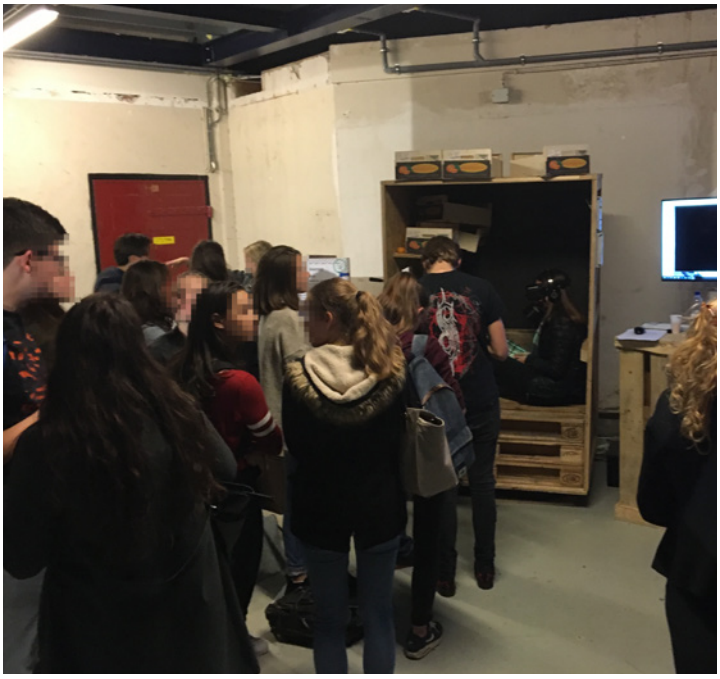


Figure 72 (←)
A Breathtaking Journey demonstrated at Night of the Nerds in Eindhoven, the Netherlands (2016). It was one of the locations where participants for the study were recruited.

Figure 73 (↓)
The A Breathtaking Journey demonstrated at De Culturele Zondag in Utrecht, the Netherlands (2016).

Figure 74 (↑ and ←)
A Breathtaking Journey demonstrated at festival deBeschaving in Utrecht, the Netherlands (2016).

interview script aimed at better understanding a participant's attitudes and empathy (or lack thereof) towards non-European migrants.

Photo elicitation was added specifically to frame the responses of participants in relation to the protagonist, a refugee, following the concept that empathy includes the communicating of one's own understanding within a particular perspective (Wiseman, 1996). Six creative commons portraits depicting middle-Eastern people were selected from Flickr by two researchers independently based on their diversity and low degree of emotional face expressions (see Figure 75).

Recruitment, Grouping, and Interview Scripts

Inclusion in this study required participants to be over 18 years old, and agree to be recorded during the interview. All participants included in the study were from Western-European countries, specifically the Netherlands, Belgium, Germany, and England. We randomly created two groups: prospective participants were approached either when waiting in line before experiencing A Breathtaking Journey (Group 1), or immediately afterwards (Group 2). Given the limitations of field

Figure 75 (→)
Sheets with six portraits were provided to participants as part of a photo elicitation protocol employed during the study.

studies (Presser et al., 2004), we were particularly cautious not to prime participants before playing A Breathtaking Journey, and therefore decided to only interview participants either before (Group 1) or after (Group 2) playing A Breathtaking Journey. Priming participants from Group 1, giving them opportunity to reflect on the plight of refugees or to spark a discussion with other participants waiting in line, before actually playing A Breathtaking Journey, could dilute our qualitative understanding of A Breathtaking Journey's effects on how participants elaborated on their experience afterwards. Group 1 was essentially our baseline group to assess the attitude of people who did not try A Breathtaking Journey towards refugees at the given time and place, whereas responses from Group 2, after playing A Breathtaking Journey, contribute to the qualitative evaluation of A Breathtaking Journey's effects.

A total of 70 people participated in the study. Group 1 had a total of 32 participants (13 females, 19 males) with an average interview duration of 59 seconds per participant. Group 2 had 38 participants (13 females, 25 males) with an average interview duration of 93 seconds per participant. The two sets are of different size as not all the people approached ultimately gave consent to be interviewed.

After participants from Group 1 selected one of the six fictional characters ("Whose journey do you want to experience?"), they were prompted to elaborate on the character's story, feelings, thoughts, hopes, and beliefs. The interview for Group 2 was identical, with modifications only to tenses (e.g., "whose journey did you just experience?"). We specifically inquired how the character would think and feel as a method to understand participants' self-expressed attitude from the perspective of a refugee (Maio & Haddock, 2009). In our case, an attitude's cognitive components refer to the beliefs, thoughts, and attributes held by participants vis-à-vis the refugee's narrative presented by our game. The affective components referred to the feelings and emotions assigned to this cognitive component (Perloff, 2008).

We do acknowledge that a field setting (vs. a controlled lab study) might include greater distraction for participants, but it also offers a more natural setting with greater realism and a more representative population sample (Presser et al., 2004). Because participants were completely isolated from the environment during the experience, we found the advantages of a field setting to outweigh the disadvantages.

Additionally, with a field setup we aimed for more accurate insights on future real-world application of empathy-arousing experiences as persuasive appeal (e.g., for NGOs and charities that promote their work at public events).

Analytical Procedures, Coding Schemes and Concepts

We used a qualitative form of analysis through thematic analysis / open coding (Adams et al., 2008; Braun & Clarke, 2006), informed by humanistic Human-Computer Interaction (Bardzell & Bardzell, 2015), and informed by narratological (Ryan, 2001, 2015) and pragmatist (McCarthy & Wright, 2004) analytical methodologies. The data resulting from the interviews is a combination of both English and Dutch voice recorded responses. The transcriptions were first coded according to participant's number, gender, choice of character, and whether a response belonged to either Group 1 or Group 2. After this coding, the responses were translated to English, and then we performed a thematic analysis on the textual data following a deductive approach (Braun & Clarke, 2006). Two researchers performed our preliminary coding independently, and we converged on four significant coding schemes to account for the recurring themes in our dataset (Socially shared Narrative Schemas, Post-hoc Narrative Interpolations, Emotional Markers, and Embodied Feelings). In the following, we present a brief outline of the theoretical grounding for each code.

Our study probed how participants recounted their experience as a refugee in A Breathtaking Journey (Group 2), or how they envisioned being a refugee would be (Group 1). Doing so, we aligned with Ryan's (2001, 2015) description of 'narrative quality' or 'storiness', which is understood as "a sort of cognitive template at work in many different media, [...] evoking specific cognitive effects in its interpreters' minds" (Koenitz et al., 2015, p. 75). In the wake of founding metaphors such as Janet Murray's holodeck (1997) or Brenda Laurel's (1991) computers as theatrical performances, the practice of computer game design has significantly evolved in the past decades and produced outstanding interactive artifacts that merge playful competition with nuanced storytelling structures. Indeed, there are several ways in which interactive experiences and games allow players to expand beyond the embedded told narrative (Jenkins, 2004). Specifically, we leveraged our interview questionnaires and photo-elicitations to tease out the different interpretations of the experience with A Breathtaking Journey

by different participants and, by coding and analyzing participants' responses, we looked for correlations between narrative effects and interaction.

We also examined markers signaling emotions in our participants' responses, with a specific interest in the cognitive and affective components (Maio & Haddock, 2009) used to describe a perspective on migrants either before or after the experience. We coded emotional statements with Power and Dalgleish's (2008) factor model for correlated basic emotions as it elaborates on the strong connection between emotions and goals, which in turn fits well within the often goal-oriented nature of games (Lankoski, 2007). Although we followed the categorization (both primary and secondary emotions) as presented by Power and Dalgleish (2008) as overarching structure, we also used the more complete list of secondary and tertiary emotions as introduced by Shaver et al. (1987) and Parrott (2001) for this coding. After coding the explicitly pronounced emotions we additionally decided to code several sentences that essentially described certain complex emotions inexplicitly (i.e., as a result of sentence structure).

We finally coded expressions of embodied feelings in our dataset. The notion of embodiment draws from a long tradition in philosophy and phenomenology: "our experience of ourselves and our world is always embodied and involves […] feelings that are typically unnoticed though […] indispensable for our proficient functioning" (Shusterman, 2014, para. 1). Generally, embodiment in Human-Computer Interaction indicates the feedback from a body interacting with an environment. Dourish (2001) understood embodiment as "grounded in and emerging out of everyday, mundane experience" which is "directed towards […] practical tasks" and providing "a source of meaning" (p. 125). In practice, we coded expressions in our data describing interactions between players and their environment, including quotes from participants telling about not only their own physical body acting upon parts of the device (e.g., the gas mask, the crate, etc.), but also about their avatar's simulated body interacting with the virtual environment.

Analysis

We now offer a qualitative analysis of the data collected throughout our study. As this was an exploratory deployment, we went in as much as possible as a blank slate, with the objective of capturing data for a study based in grounded theory. After transcribing and translating the

data, a preliminary open coding was performed (by two researchers independently). Here we report on four significant coding schemes that emerged from our reading (Socially Shared Narrative Schemas, Post-hoc Narrative Interpolations, Emotional Markers, Embodied Feelings), that we used as lenses to access our participants' experience through the narratives they produced.

Socially Shared Narrative Schemas

The themes of migration from Africa and the Middle East, and of refugees escaping war-torn countries have been significantly present in Western media in the past decades, often becoming a polarizing topic in social and cultural discourses. Expressly leaving aside the political implications of these subjects, as a first step in our study we probed for spontaneous narratives about migrants from a group of our participants that had not yet interacted with A Breathtaking Journey. With this first coding scheme, we teased out quotes from participants who produced coherent narratives about the experience of being a migrant without having interacted with A Breathtaking Journey. Participants in Group 1 (interviewed before interacting with the artifact) were shown a diverse set of photo portraits, and asked to choose one. In a short open-ended interview, they were asked to envision and tell a short narrative from the point of view of the selected character, including events, contexts, thoughts and feelings. The participants themselves acknowledged the influence of mass media – as Peter (pseudonym, #33, Male, Group 1, Portrait 4) noted: "This is of course […] borrowed from the news, so I don't really have an idea about her on a personal level..."

We observed some recurring narrative structures across these data – stories that, despite containing negative elements, were also about determination, willpower, and the fight for a better future. Emma (pseudonym, #37, Female, Group 1, Portrait 2) proposed:

> It looks like she is holding something. I think she is like a person who has demonstrated or up and against something in her country, and eh, and therefore she is kind of strong, will power and because of that, as a consequence, she has to flee her country. She might have some children, and a husband. Maybe her husband is dead, and eh, her children might already be somewhere and she is protesting and wants to change something in the country she comes from.

In addition, Kevin (pseudonym, #79, Male, Group 1, Portrait 2) elaborated:

> I think he is about the same age as I am, so I think he is a student and I think he is looking for the best future, just as we look at our future here in the Netherlands. He will seek this better future possibly in Europe or somewhere else where it's safe because I think you have the best chance to be secure, be safe, and have a better future in countries or states like the European Union or the United States or comparable countries.

Whereas some participants produced very short and generic descriptions, the examples proposed here show some articulated (albeit stereotypical) ones. There seemed to be a recurring narrative schema at work here, arguably ingrained in some mainstream media representation of migrants and refugees. Thematic nuclei in these archetypical structures included the escape from a war-torn country to avoid violence or persecution; embarking on a long, difficult, and stressful journey trying to reach a safe haven; worries about what the future might bring; and having to leave family behind in the process.

Let us now return to the embedded narrative programmed into A Breathtaking Journey. For the purpose of our study, that storyline was designed to be as generic as possible, without deviations from a canon of refugee stories. It mentions the protagonist's brother's abduction, the decision to flee the country, a dangerous journey by sea and a ride in the back of truck, hiding in a small space between crates – all elements that fit into the socially shared narrative schema outline above, of which Emma's and Kevin's quotes demonstrated an implicit knowledge. After having compared A Breathtaking Journey's narrative design with a genera,l basic, socially shared response to a narrative photo elicitation technique, we now proceed to examine how it was later reconceptualized by participants after having interacted with A Breathtaking Journey.

Narrative Interpolation

The concept of narrative interpretation, or the creation of a story-like account of first-person experiences, is not new in digital media and game studies (Jenkins, 2004; Ryan, 2001, 2015), and also constitutes the basis for a number of research methods leveraged in Human-Computer Interaction practice, from experience sampling to diary studies. In this section, we report on not only how participants narrated their experience interacting with A Breathtaking Journey, but also how they spontaneously interpolated it by adding extra details not explicitly present in the system.

In our data, we highlighted portions that clearly refer to the diegetic world represented in A Breathtaking Journey, but at the same time do not exist in the embedded narrative. Following the same protocol of Group 1, participants in Group 2 (interviewed after interacting with the artifact) were shown photo portraits, asked to choose one, and told that the person depicted was also the one they 'enacted' during the experience. Then, they were asked to tell a short narrative from the point of view of the selected character. Mark (pseudonym, #47, Male, Group 2, Portrait 3) produced these interpretations, not literally and immediately connected to the embedded narrative: "[It was] you make yourself very, very small, very insignificant, you sit in a corner behind boxes, your window is very small." Daniel (pseudonym, #31, Male, Group 2, Portrait 3) further expanded:

> Well, I guess that I felt how anxious it is to endure the journey, and constantly on the lookout to avoid being discovered, be sent back, or murdered […] Especially when it [the truck] was stopped. Because in the beginning I thought, it is going quite well, look a bit out of the window, and let everything just pass by. And when the door really opened it started to feel quite tense. It was the moment I was also pointed out to hold my breath when I thought, oh yeah, then I was suddenly totally pulled into the experience, oh yes, this is how it is, quite exciting what's happening here. […] I really thought, oh this is the moment that I should really remain quiet because otherwise I might soon be discovered.

These quotes demonstrate how our participants interpolated the narrative they experienced by adding details not originally present in the embedded script. Neither the narrating voice of A Breathtaking Journey, nor the on-screen action depicts the protagonist making himself/herself "very, very small" (Mark), or "being constantly on the lookout" or "[starting] to feel quite tense" (Daniel). And, yet, these interpolations do make sense within the overall narrative, and the two participants were arguably using them as a means to interpret and convey their own personal experience with A Breathtaking Journey. However, if we simply lumped these phenomena together, we risked keeping them opaque; to address them more effectively, we needed to isolate them and apply additional coding schemes specifically on that subset of data, thus teasing out other salient characteristics.

Emotional Markers

We discovered participants leveraging a broad variety of linguistic markers to indicate emotions within the narrative accounts/interpolations they produced of their A Breathtaking Journey experience. To examine them more in detail, we made a first broad pass coding emotional statements utilizing Power and Dalgleish's (2008) factor model for correlated basic emotions. This categorization includes happiness, fear, sadness, anger, and disgust as primary emotions, and was later expanded following Shaver et al. (1987) and Parrott (2001) to account for more complex ones (e.g., loneliness, despair, relief, distress, pride).

The following quotes present some examples of emotional markers we teased out from within parts that were clearly narrative interpolations. On the one hand, we observed a broad palette of markers, ranging from simple to ones that were more complex. For example, Emily (pseudonym, #12, Female, Group 2, Portrait 4) reported: "[it was] very exciting, tense, especially, yes, you especially are very vigilant, and pay attention. I did not quite know where [the character] came from, but with the water you feel some kind of shortness of breath." (note: she was referring to the part in A Breathtaking Journey representing water rising around the protagonist). Frank (pseudonym, #4, Male, Group 2, Portrait 3) mentioned an ambiguous condition: "Ehm. She was sad, but also happy. She was the only survivor of a ship which sunk. And then she was really just very anxious, and especially when she was almost discovered." Other participants similarly used "anxious, tense" (Benjamin, pseudonym), or scared (Brian, Anna, and Sarah, pseudonyms), "afraid" and "nervous" (Arthur).

In addition to this, we also observed other, more nuanced expressions that conveyed an emotional connotation coupled with other components that were rooted in physical and/or narrative contexts, such as "But the [interesting] experience is especially the part when you are locked up in that truck and that you are in her skin. Smell helps, and I felt that I was there, found that it works well" (Linda) or "you feel trapped" (Paul). Whereas the previous examples (e.g., feeling fear) may have emerged from a simple open coding, we needed to consider multiple dimensions to account for these more complex ones.

Embodied Feelings

As we temporarily collected all the strands of this analysis so far, we noticed – throughout many of the narrative interpolations produced by

our participants – an abundance of expressions pointing to one's own body, to body parts, and to bodily characteristics. This prompted us to apply another specific code to tease out how our participants leveraged embodied terms and expressions to better convey specific feelings, emotions, and perceptions.

A first recurring theme involving embodiment was the sense of being physically constricted, almost to the point of claustrophobia. Susan (pseudonym, #4, Female, Group 2, Portrait 4) mentioned, "If you are sitting there [note: hidden in a truck] for a whole day it should be awful; I never really realized, I never, it feels quite small, claustrophobic. […] I didn't really feel fear, it was more desperation." Others talked about being "locked up […] and […] in her skin" (Linda), "your contact with the outside world is minimal. Uh, yeah, and you feel trapped" (Paul) and "you realize how lonely one must feel […]this confined perspective" (Lily).

Different participants elaborated on being prompted by the installation to control their breathing, such as "It was the moment I was also pointed out to hold my breath when I thought, oh yeah, I was suddenly totally pulled into the experience, oh yes, this is how it is, quite exciting what's happening here" (Daniel). But breathing was also pointed out to be something on which the device and the embedded story have an indirect effect: for example, Emily referred to the scene in which the protagonist is getting submerged in water and reported that "[in] the water you feel some kind of short[ness] of breath" – it should be mentioned that the device worn by players was not actively restricting their airflow in any way. The emphasis that participants placed on bodily feelings and on physical sensations in their recounting of the experience is significant. It suggests how a first-person mixed reality experience may provide players with a repertoire of embodied feelings – even those not explicitly mentioned in the embedded narrative – over which they may elaborate.

The four coding schemes, and related observations, that emerged from our exploratory study were partially surprising. We found evidence of participants clearly situating their experience in the contemporary mass-media discourse (Code 1: Socially shared Narrative Schemas), and yet being well-disposed to interpreting freely and to the embedded narrative (Code 2: Narrative Interpolation). This suggests not only a promising level of engagement, but also the use of the immersive experience as an activator, some kind of a catalyst that players leverage to tell original stories about migrants. The third and fourth coding

schemes (Emotional Markers and Embodied Feelings) were interesting for their distribution, as they often co-occurred in our dataset. This suggests that emotions and physical stimuli, real or simulated, may mutually influence and reinforce each other. We observed many of the foundational components of empathic relationships emerging from the data we collected, further motivating the exploratory agenda of designing for empathic appeals with immersive technology. We point at these elements as an ideal middle ground between the two fields we outlined in the beginning – persuasive games for humanitarian empathy, and provocative aesthetic experiences – and we see further potential and a yet-understudied problem space at the overlapping of the two. We now extrapolate three design opportunities and related concepts, supported from our research through design process, deployment and analyses, which we offer to the design community as an input for future works.

6.5 Design Opportunities

Following our observations and analysis, we can discern three different game design opportunities to stimulate empathy arousal in virtual reality. These are visceral engagement, moments of reflection, and affective appeals.

Visceral Engagement

The concept of viscerality has already been explored in Human-Computer Interaction design, as exemplified by Norman (2005) describing the 'visceral level' of an artifact as its look, feel, sound and, more in general, its material components as they support and orient its intended functions. He argued that humans "are exquisitely attuned to receive powerful emotional signals from the environment that get interpreted automatically at the visceral level" (Norman, 2005, p. 65). This seems to derive from a metaphorical understanding of the term visceral as in the colloquial gut feeling, and it is not the only possible connotation we may assign to this concept. Stark reminded us of the etymology of visceral: "affecting inward feelings, and [stemming] from the Latin words visceralis or internal, and viscera, plural of viscus [which means] internal organ, inner parts of the body" (Stark, 2015, p. 2). For example, Benford et al. (2012), Levisohn et al. (2007), and Byrne et al. (2016) have already begun exploring aesthetic experiences produced by stimuli acting on players' bodily core, such as breathing, sweating

(Benford et al., 2012), and vertigo (Byrne et al., 2016).

Indeed, the data we collected demonstrate how our participants often conceptualized their experiences in peculiar ways, resonating with this second meaning of viscerality. This is clearly still a much underexplored design space, whose study has been made timely by the rapid diffusion of immersive, tangible, and wearable technologies. Our study and related literature point at clear opportunities for new designs; a design space characterized by viscerally engaging experiences that are insuppressible and intense, difficult to name, feelings that are excited from outside of our bodies, but are felt deep inside. The vertigo caused by the fear of heights, the uneasiness of gazing in a stranger's eyes, the sense of weightlessness and breathlessness in a roller coaster may be good examples of this opportunity space. We support this proposal by pointing at two moments in A Breathtaking Journey that have consistently been described through expressions denoting visceral engagement: the part where the player is submerged in water and the part where the player sits between crates, looking outside, while the truck is driving. Both parts provide multisensory experiences that go beyond the audiovisual (the proprioceptive feelings of breathing and of being constricted between crates), that have an inward directionality (inhalation, pressure), and are uncomfortable, if not threatening, to the player's avatar. For example, a participant said she experienced a shortness of breath when visually submersed in water, even though the mask did not restrict airflow. The other moment, when sitting in the truck, participants presented experiences that relate to the feeling of being trapped, cramped, and claustrophobic, some explaining that this made them feel very small and insignificant. Being able to create these intense moments provides a compelling case for using immersive technologies, and in particular multisensory/embodied mixed reality experiences, to explore complex feelings that are otherwise difficult to convey. This could indeed allow a deeper, more empathic relationship with the characters represented.

Although visceral engagement remains an underexplored area, we propose that one can stimulate visceral reactions by taking away players' agency of bodily freedom, creating a sense of confinement through physical space and objects, or acting of biofeedback during gameplay, for example analyzing the players' breathing to determine game progression. Discomfort and suspense are another aspect to consider. For example, we observed some of our participants waiting in

line before A Breathtaking Journey being (unnecessarily) worried about the game possibly restricting their airflow – an element that relates to the uncomfortableness of the Rising Action, first described by Benford et al. (2012).

A Moment of Reflection

Mixed-Reality experiences do not only offer the possibility to sense and feel being somewhere else, but also to sense and feel being someone else, in first-person experiences that are much more immersive than other screen-based media. Temporarily inhabiting other people's perspectives, sensing what they sense, and potentially feeling what they feel would seem to address most characteristics required for an empathic experience. However, a fundamental question emerges: when we adopt someone else's point of view through an immersive device, with whom are we empathizing? With the person we temporarily inhabit? With other people entering our field of view? Clouds Over Sidra (Arora et al., 2015), whose gameplay has been described as "you're sitting there in her room, [...] when you look down, you're sitting on the same ground that she's sitting on" (Milk, 2015, 7:41), clearly favors this second opportunity. We wondered whether there might be more potential in immersive technologies than what we are using now: can players empathize with their avatars? A Breathtaking Journey, an essentially solitary experience, has explored this specific opportunity. And yet, an issue surfaces: if empathizing is the process with which one understands nonjudgmentally the experiences, the feelings, and the difficulties of another person (Wiseman, 1996), as in the empathic states of empathic concern ("Feeling for another person who is in need;" Batson & Ahmad, 2009, p. 144) or imagine-other perspective ("Imagining how another person thinks or feels given his/her situation;" p. 144), then this is made more complicated by a first-person victim perspective which does not immediately provide the participants with someone to empathize with other than with oneself - and at best evokes an empathic state of emotion matching ("Feeling as the other person feels;" Batson & Ahmad, 2009, p. 144) - as Bob (pseudonym, #27, Male, Group 2, Portrait 2) mentioned, "I think I played as myself." This process would require reflection and introspection, to allow players to separate themselves from the character whom they are asked to empathize with. However, reflecting in games is nontrivial, as creating a rich experience leads to a flow paradox, where being more involved with gameplay can lead to less critical reflection (Squire, 2005). Does this mean that an immersive and interactive first-

person empathic experience that fosters empathy towards another, is unlikely? On the contrary, as a future design opportunity, we point at empathic relationship with one's own avatar as a still understudied possibility to examine. As a prerequisite, we emphasize the usefulness of leaving a moment of reflection to participants. We argue that this would give them the chance of using the material they experienced to empathize with the other. In our study, this chance was actively evoked through the postquestionnaire (to collect further data, a debriefing session would have been necessary; Garris et al., 2002) but in a natural setting these follow-up sessions are not easily organizable). But in lieu of a formal debriefing, we found that some participants spontaneously used the two minutes of A Breathtaking Journey when the protagonist just sits in the moving truck without any told narrative or challenges as an opportunity to reflect. Some participants reported that this moment offered a chance to drift away in thoughts, almost like a mindful experience. This might have actually also presented a moment of reflection and deeper processing; a moment in which participants had the time to relate their virtual experiences to someone else's experiences in reality, realizing how lonely and claustrophobic such a journey would feel for a refugee. Recently, a similar argument has been put forward by Marsh, in the context of learning about the great barrier reef (Marsh, 2016). We underline how the majority of narrative expansions and reported visceral reactions took place in that specific moment. We call for designers to create pockets of downtime, where people cannot (or, more preferably, do not wish to) do anything else than experience. The inclusion of mundane activities that create moments of apparently meaningless action could be a yet-underconsidered resource for these kinds of retrospection and introspection (Kors et al., 2016b).

Affective Appeals

About a decade ago, Bogost (2007) argued that games have unique persuasive powers mainly due to their capacity to make arguments through their rules and procedures – a characteristic he named Procedural Rhetoric. Procedural Rhetoric is "the art of persuasion through rule-based representations and interactions rather than the spoken word, writing, images or moving pictures" (Bogost, 2007, p. ix) focusing instead on "using processes persuasively" (p. 3). Although it is argued that games can use other dimensions for persuasion as well (De la Hera Conde-Pumpido, 2013; Frasca, 2007; Kors et al., 2015), none is as exclusive to games as procedural rhetoric. However, now with the

rapid diffusion of immersive technology there might be an additional - more emotionally engaging - aspect that is particularly suitable for games, which is the experience of a mediated presence. Our analysis suggests multiple ways designers can use mixed reality to strengthen the affective appeal of their games, in particular through embodied multisensory experiences. Tying back to Bogost's (2007) use of rhetoric, we wondered whether multisensory and affective persuasive appeals may function in the same way as visual enthymemes (Sosa-Tzec et al., 2015). For future designs, we point at the use of additional factors beyond immersive audiovisuals to increase presence, including the use of scents as a means of pulling players into the experience or even create discomfort by including less pleasant scents. Furthermore, affective appeals might particularly benefit from leveraging fear/terror as ways to set up a type of persuasive argument (enthymeme; Shelton & Rogers, 1981). However, with highly immersive multisensory experiences, saddening or frightening experiences can be overwhelming and perhaps even traumatizing, and designers should therefore be cautious to avoid events that could possibly cause great distress (Marsh & Costello, 2013). To illustrate, for an early prototype of A Breathtaking Journey we experimented with scents like smoke and mold, which we discontinued for the final prototype as it proved too unbearable to endure.

6.6 Conclusion

With the recent rise of virtual and mixed reality, many questions surfaced on the potential of immersive technologies to influence how people think and feel about reality, with in particular the captivating potential to foster empathy by having players inhabit another person's perspective (as a victim perspective entails). But despite the strong interest from industry, little research has actually focused on the arousal of empathy through immersive experiences, and subsequent persuasive processes. Following a research through design approach we created A Breathtaking Journey, a multisensory mixed reality game that provides the player with a first-person victim perspective of a refugee's journey. A qualitative study was conducted on three tech-oriented public events, followed with a open coding methodology to tease out empathy-arousing characteristics, and to chart this novel game design space. We observed reactions coherent with the characteristics of empathic responses, and formulated three design opportunities for further research and inclusion in an approach to designing persuasive games. We offer these - stimulating visceral reactions, introducing moments

of reflection, and leveraging affective appeals - as a contribution for future work and as contributions to design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?

The first design opportunity relates to the stimulation of viscerally-engaging experiences. Our study and related literature point to a design space characterized by visceral feelings, insuppressible and intense, difficult to name, sensations that are excited from outside of the body, but are felt deep inside. These feelings are difficult to mediate through legacy media and seem to require a sense of presence. The second opportunity space relates to a moment of reflection. Immersive technology can support the temporarily first-person inhabiting of another person's perspective, sensing what they sense and feeling what they feel. While signaling empathy, the observed experience seems limited to the self-oriented empathic state of emotion matching (Batson & Ahmad, 2009), and thus prohibiting a consideration of the actual other in distress. Our study points at a way to overcome this issue by introducing a moment of reflection, the inclusion of down time to temporarily slow down the pace of the experience, and offer players a mindful moment to acknowledge the other person they are inhabiting. At the same time, including such moments may stimulate players to reflect on what the virtual experience means in regards to reality, possibly contaminating real-world attitudes. The third opportunity space relates to the affective appeals of immersive technology. In our study, we found that participants primarily expand through emotions, rather than logic. This is partly due to the setup of the design, but also a clear indication that immersive technology is able to convey complex emotional experiences such as loneliness and insignificance quite effectively.

There is clearly much more research and design work to do in this application domain, whose opportunities are far from being exhausted. We exposed a still untapped potential for persuasive game design research and applied game design, presenting both an exemplar prototype and three opportunities to guide further design and research. In this vein, we urgently call for game designers, interaction designers, immersive journalists, and hardware makers to seriously consider the emerging opportunities of a more empathic way of designing immersive experiences.

Through Pink and Blue Glasses

Student: A. Muller, S, Janssen, and C.R. van Kessel.
Coach: E.D. van der Spek

Through Pink and Blue Glasses is a socially aware persuasive game designed to address issues related to sexism and gender stereotyping. Through the use of immersive technologies, a head-mounted display and a set of motion controllers, Through Pink and Blue Glasses offers the player the opportunity to explore various situations through the perspective of particular characters. The player starts in a dressing room and is instructed to select one of the eight possible characters on display, composed of characters of different genders and dressed up in a variety of clothing styles. Next, the player navigates through a series of environments that are common for stereotypical interactions, including a bar, an office, and a toy store (see Figure 76). The player's choice for a particular gender and dressing style influences the response of nonplayable characters throughout the game, triggering related audio fragments based on real-world stories from victims such as "Wow, she looks hot!" or "I would do her!" in the bar scene when players selected a female character at the start of the game.

Figure 76 (↑)
A player selects one of the available toys on display in the game Through Pink and Blue Glasses.

Towards the end of the game the player is requested to reflect on the matter to connect the experience to one's personal life. Like the A Breathtaking Journey project, Through Pink and Blue Glasses employs a victim perspective to offer players the experience of stepping into the shoes of the other's distress, experiencing how they experience particular situations and conditions, as a means to foster an understanding of the issues of sexism and gender stereotyping. Pink and Blue Glasses also implemented a reflective debriefing as part of the experience to support players to empathize beyond the fictional environment, as well as an opportunity to discuss personal experiences, which likely mitigated the risk of a player becoming absorbed by the experience and leaving without having thought about what the experience meant - similar to how some participants in the A Breathtaking Journey study reported experiences that seem limited to the empathic state of emotion matching.

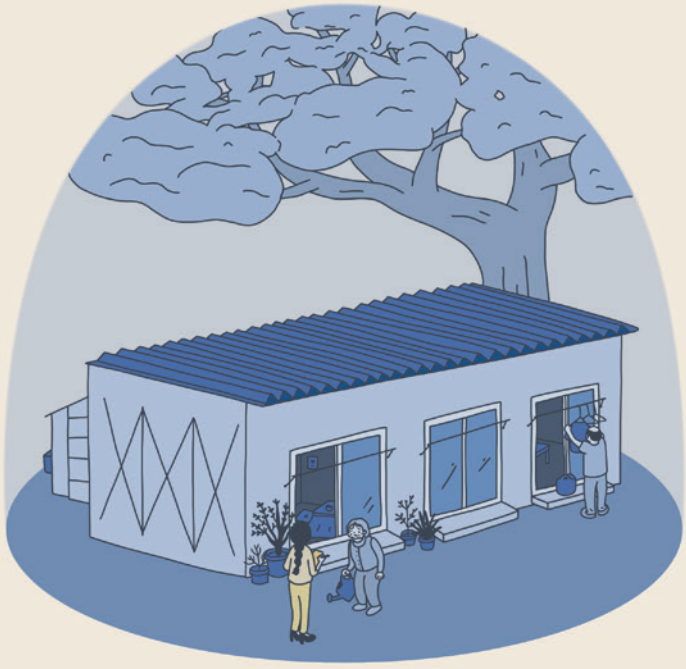
Exchanging Perspectives

Student: T. Loeffen
Coach: E.D. van der Spek

Exchanging Perspective is a persuasive game designed to address issues concerning the radicalization of people in the Middle East. Through the use of immersive technologies, the game begins with the player casted into the role of a parent (see Figure 77). The player starts in a living room, able to freely interact with other family members and objects around the room. Through this interaction, the player has the ability to take over the perspective of other family members to see the situation through their perspective.

After a series of mundane events, the player is confronted with antiterrorist actions outside of the room on the opposite side of the street, which unfortunately resulted in the injury of a family member. Hereafter, the player is challenged with the implications of either resisting or accepting the medical support of a terrorist organization, which at that point means supporting a terrorist organization in return for the survival of a family member. The designer explicitly described not wanting players to sympathize with people who join a terrorist organization, but rather that they often face the impossible choice of refusing medical or financial support and through this may end up indebted by the terrorist organization. Joining is not a rational choice, but one out of necessity to stay alive. In turn, this perspective should help players to understand that the recruitment for joining terrorist organizations is complex, one that does not always happen as a matter of personal or free choice. Exchanging Perspectives may be described as an interactive narrative and appeals to empathy as a primary means to sway players, but also leverages procedural rhetoric in the crucial decision to accept or deny the support of a terrorist group.

Figure 77 (↑)
The player starts in an abstract room as one of the parents, but is able to switch to the perspective of any of the other characters thereafter.



Chapter 7

A Partaker Perspective to Empathic Engagement

This chapter has been peer-reviewed and published as Kors, M. J. L., van der Spek, E. D., Bopp, J.A., Millenaar, K., van Teutem, R. L., Ferri, G., and Schouten, B. A. M. 2020. The Curious Case of the Transdiegetic Cow, or a Mission to Foster Other-Oriented Empathy Through Virtual Reality. CHI Conference on Human Factors in Computing Systems (CHI '20). https://doi.org/10.1145/3313831.3376748

7.1 Abstract

Following the Design Research Framework introduced in chapter 5 - delineating three perspectives to empathic engagement along the employment of immersive technologies - and the employment of the victim perspective to empathic engagement with the A Breathtaking Journey project as described in chapter 6, this chapter primarily focuses on employing a partaker perspective to empathic engagement. This exploration is done hand in hand with addressing design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? Through the deployment of a research through design project, this perspective is explored and illustrated, followed with practical design insights for future research and design. As this chapter is based on a peer-reviewed and published article, the introduction section of this chapter reiterates previously discussed topics, theories, and concepts.

Socially aware persuasive games that use immersive technologies often appeal to empathy, prompting players to feel and understand the struggles of another. However, the often sought-after 'standing in another's shoes' experience, in which players virtually inhabit another in distress, may complicate other-oriented empathy. Following a research through design approach, we designed for other-oriented empathy – focusing on a partaker perspective and diegetic reflection – which resulted in Permanent; a virtual reality game designed to foster empathy towards evacuees from the 2011 Fukushima Daiichi nuclear disaster (see Figure 78). We deployed Permanent 'in the wild' and carried out a qualitative study with 78 participants in the Netherlands and Japan to capture player experiences. Content Analysis of the data showed a predominance of other-oriented empathy across countries, and in our Thematic Analysis, we identified the themes of 'Spatial, Other, and Self -Awareness', 'Personal Accounts', 'Ambivalence', and 'Transdiegetic Items', resulting in design insights for fostering other-oriented empathy through virtual reality.

7.2 Introduction

Empathy is often considered the social glue that keeps human societies together and a primary building block for social interaction (Waal, 2009; Segal et al., 2012). Empathy has distinct benefits in areas such as nursing (Brunero et al., 2010), conflict resolutions (Batson & Ahmad, 2009), and

Figure 78 (↑)
As a reporter for a newspaper agency, the player is tasked with the objective to figure out what happened to Mr. Watanabe, a fictional evacuee from the 2011 Fukushima Daiichi nuclear disaster in Japan.

in Human-Computer Interaction practices (Wright & McCarthy, 2008). Accordingly, designers, artists, and researchers alike have keen interest in exploring ways to foster empathy using immersive technologies (Cho et al., 2016). A growing body of work focuses on virtual reality for its potential to be an 'ultimate empathy machine' (Milk, 2015). So far, the vast majority of interactive empathy-arousing virtual reality experiences gravitate towards the arousal of self-oriented empathic states, rather than other-oriented empathic states, typically by offering players the ability to virtually inhabit the other in distress, similar to the catchphrase of 'standing in another's shoes' (e.g., Herrera et al., 2018; Kors et al., 2016a; Muller et al., 2017; Yee & Bailenson, 2006).

While such experiences are viscerally engaging and may have players feeling the struggles of another, they also introduce the risk that players may think and feel as if the experiences are their own, rather than those of the other in distress (Kors et al., 2016a). Players then become self-absorbed with their own thoughts and feelings, and consequently may never actually consider the other in distress (Batson & Ahmad, 2009). This is unfortunate, as particularly the other-oriented empathic state of empathic concern is a primary source for producing altruistic motivation

to helping others in need (Batson, 2010; Batson, 2011; Batson & Ahmad, 2009) The few studies that have addressed or exemplified the arousal of other-oriented empathic states through virtual reality (e.g., Ahn et al., 2014; Cho et al.,2016; Kors et al., 2018) have not yet resulted in specific design insight or player experiences to engender other-oriented empathic states. Consequently, it is yet unclear how other-oriented empathic states may be fostered through virtual reality, how players experience such moments, and why they do so. Addressing these research gaps may not only help us better employ virtual reality games for fostering other-oriented empathic states, it may also help counter the relatively sharp decline in other-oriented empathic skills found among American college students since the early 2000s (Konrath et al., 2010).

We initiated a research through design project (Zimmerman et al., 2007; Zimmerman & Forlizzi, 2014), guided by the design research question (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? Considering the favorable effects of other-oriented empathic states (Batson & Ahmad, 2009) and to limit self-absorption as much as possible, a further objective of this project was to explore the arousal of other-oriented empathic states in particular. Our efforts resulted in Permanent, a narrative-driven exploration virtual reality game designed to foster empathy towards evacuees from the 2011 Fukushima Daiichi nuclear disaster. We deployed Permanent 'in the wild' at two public events in the Netherlands and Japan, interviewing 78 participants to assess their rationales and experiences, and to chart the design space for fostering other-oriented empathic states. The contribution of our work is twofold. First, we present the novel design of Permanent, as an illustrative case for fostering other-oriented empathic states through persuasive games employing immersive technologies. To foster other-oriented empathic states we employed a partaker perspective to immediately offer players another to empathize with, rather than the perhaps more conventional victim perspective in which players inhabit the other in distress. We also stimulated players to engage in reflecting on the conditions of the other in distress as a diegetic aspect of the game. Content Analysis (Stemler, 2001) of the interview data revealed that participants across countries reported other-oriented empathic states more than twice as often as self-oriented empathic states. This finding demonstrates the capacity of Permanent, and by extension virtual reality, to foster other-oriented empathic states besides self-oriented empathic states.

Second, we provide empirical insights on how participants experience Permanent by presenting four themes generated through Thematic Analysis (Braun & Clarke, 2006; Braun et al., 2014). These range from descriptions on where participants were, with whom they were, and who they were in the intradiegetic universe (i.e., the game world/universe) to participants' personal rationales for reporting on particular objects in Permanent, and from participants' thoughts, emotions and perspectives that contain both positive and negative aspects to how participants regularly, and effortlessly, bridged the intradiegetic universe and extrafictional universe (i.e., the real world/universe). With the last theme we noted participants' aptitude to address others, objects, and events beyond the intradiegetic universe of Permanent, showcasing the capacity of virtual reality games to influence thoughts and feelings towards extrafictional others, objects, and events. Based on these findings, we present a set of design insights to advance the fostering of other-oriented empathic states through virtual reality games.

7.3 An Appeal to Empathy

Like discussed earlier in this dissertation, appealing to empathy as a means to have people think and feel for or with another and as a steppingstone to shaping attitudes is not new. In fact, it is a considerably robust and often-employed persuasive appeal in face-to-face interventions and legacy media such as books and television (Batson & Ahmad, 2009; Batson et al., 2002; Green & Brock, 2002; Shelton & Rogers, 1981). In parallel, empathy is a well-known concept in Human-Computer Interaction, and not exclusively for its role in understanding players and their contexts (Wright & McCarthy, 2008), but also as a desirable outcome (Huck et al., 2015; Kors et al., 2016a; Muller et al., 2017). Particularly, designers and researchers have begun to explore the empathic capacities of games and virtual reality experiences (Adamo et al., 2017; Belman & Flanagan, 2010; De la Peña et al., 2010; De Smale et al., 2017; Greitemeyer et al., 2010; Kors et al., 2016a; Muller et al., 2017). However, we also discerned criticism regarding the employment of virtual reality for the arousal of empathy (Ramirez, 2018; Fisher, 2017; Sutherland, 2017). In this section, we elaborate on our understanding of empathy, address the criticism and challenges of fostering empathy through virtual reality games, and conclude with design considerations as input for our research through design (Zimmerman & Forlizzi, 2014) project.

Empathy

Empathy, despite its importance for human societies (Waal, 2009; Segal et al., 2012), is still an ill-defined psychological phenomenon that knows many conceptualizations (Cuff et al., 2014). These range from long all-encompassing definitions to short and narrow descriptions involving catchphrases like 'standing in another's shoes'.

For our work, we employed the work by Batson and Ahmad (2009), who delineated four distinct psychological states called empathy in the intergroup relations literature, each with distinct aspects, outcomes, and relation to other empathic states. Batson and Ahmad (2009) first made a distinction between affective and cognitive empathic states. The two cognitive empathic states revolve around imagining. Imagine-self perspective is described as "imagining how one would think and feel in another's situation or 'shoes'" and imagine-other perspective is described as "imagining how another person thinks or feels given his/her situation" (Batson & Ahmad, 2009, p 144). The two affective empathic states pertain to feelings. Emotion matching is described as "feeling as another person feels" and empathic concern is described as "feeling for another person who is in need" (Batson & Ahmad, 2009, p 144). These empathic states can also be grouped by self-oriented empathic states (imagine-self perspective and emotion matching) and other-oriented empathic states (imagine-other perspective and empathic concern) (Batson & Ahmad, 2009).

The distinction is important in light of the aforementioned study involving American college students, as it particularly highlighted the sharp decline in empathetic skills pertaining to other-oriented empathic states (Konrath et al., 2010). This is unfortunate, as the other-oriented empathic state of empathic concern is a primary source for producing altruistic motivation to helping others in need (Batson, 2010; Batson, 2011; Batson & Ahmad, 2009).

Possible causes for the decline in empathic skills are manifold, and might be related to the media and technology we increasingly expose ourselves to (e.g., social networks, reality TV, and digital games; Konrath et al., 2010). It is therefore important to explore how such media and technology – including virtual reality – could be employed to achieve the opposite effect, to foster empathy and in turn help counter the aforementioned decline.

Empathic Engagement in Virtual Reality Games

We discerned a growing interest in the employment of virtual reality to foster empathy (Wells, 2016), often resulting in virtual reality games that allow players to virtually inhabit another in distress as a means to address aspects of genderism (Muller et al., 2017), migration (Kors et al., 2016a), psychosis (Ninja Theory, 2017), and walking impairment (Nerurkar, 2017). The recent rise of empathy-arousing virtual reality games may have been fueled by the claims of an 'ultimate empathy machine' (Milk, 2015), with De la Peña arguing that it "is such a visceral empathy generator [...] it can make people feel in a way that nothing, no other platform I've ever worked in can successfully do in this way" (Volpe, 2015, para. 1). However, we also noticed criticism on the employment of virtual reality to arouse empathy (Ramirez, 2018; Fisher, 2017; Sutherland, 2017), with arguments that "the VR industry is operating with a muddy, unclear, superficial definition of empathy, one that is forgiving to truisms like 'standing in another person's shoes' " (Sutherland, 2017, para. 11).

Aside from the many conceptualizations of empathy that cause confusion, a possible issue with the often sought-after 'standing in another's shoes' experience lies in the resulting experience being self-oriented first, as the result of having players virtually inhabit the perspective of the other in distress. Such a victim perspective typically works by virtually replicating the other's distressing experience, allowing the players to experience a similar distress themselves (Kors et al., 2018). While this may result in an emotionally captivating and visceral experience (Kors et al., 2016a) leading to empathy, in some cases it may only arouse the self-oriented empathic state of emotion matching, while complicating the development of other-oriented empathic states (Batson & Ahmad, 2009). By inhabiting the phenomenological perceptions of another, "we may simply insert ourselves into the other's situation and focus on how we would think and feel, becoming self-absorbed and never considering what this information may tell us about the thoughts and feelings of the other" (Batson & Ahmad, 2009, p. 144).

While a self-oriented empathic state could act as a steppingstone to other-oriented empathic states (Batson & Ahmad, 2009), this process may require a form of cognitive thought or reflection to avoid self-absorption, with Nelson and Baumgarte (2004, p.392) arguing that "moving beyond an initial, self-oriented or egocentric emotional reaction and experiencing empathic concern for another person may

require a shift in perspective. Such a shift reflects the cognitive aspect of empathy". This issue may be compounded in games, where game designers often strive through challenges and immediate feedback to put the players into flow, an experience characterized by a loss of self-awareness and an intense focus on the moment (Nakamura & Csikszentmihalyi, 2014). Conversely, other-oriented empathic states may rely on metacognitive reflections on one's own experiences and the thoughts and feelings of others (Rameson & Lieberman, 2008), which the lack of self-awareness and intense focus on the moment renders difficult, thereby creating a "'flow paradox', where being more involved with gameplay can lead to less critical reflection" (Kors et al., 2016a, p. 99). Does this mean that stimulating other-oriented empathic states using virtual reality games is unlikely? On the contrary, we argue that these issues are not inherent to virtual reality games, but rather the result of offering players an immersive experience with little room for reflection on the given situation and conditions of the other in distress. These insights resulted in two design opportunities that may help to arouse other-empathic states through virtual reality games, focusing on offering moments for reflection along with a shift in perspective.

Design Opportunities

As a design opportunity for stimulating other-oriented empathic states we first point at the untapped potential of a partaker perspective, in which players adopt a role distinct from that of the other in distress while still partaking in the intradiegetic universe (Kors et al., 2018). While a partaker perspective may be less effective in offering players the visceral experience of the other's distress compared to a victim perspective, it does have the advantage of immediately offering players another to empathize with while reducing the risk of self-absorption (Kors et al., 2018). Early on in the conceptualization phase this project, as conclusions of the study with A Breathtaking Journey (Kors et al., 2016a) (as described in chapter 6) were being finalized, a victim perspective was explored in one of the very early prototypes of Permanent (see Figure 79). However, as players were casted in the role of a soon-to-be evacuee tasked to collect belongings and leave the disaster area, observations of absorption were in line with the conclusions of the A Breathtaking Journey study. While a

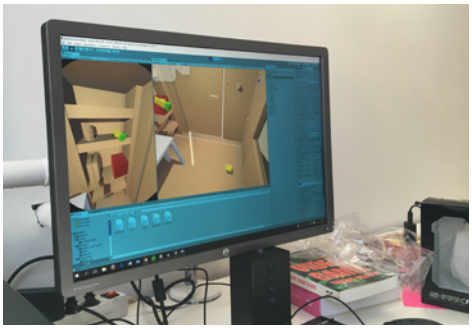


Figure 79 (↑)
Working on an early exploratory prototype in which players had to collect belongings before the mandatory evacuation in wake of a nuclear disaster.

different task may have yielded different results, this initial observation - as well as the formulation of the goal to specifically explore the partaker perspective to empathic engagement - stopped us from further pursuing this particular concept early on in the project.

A few other projects have employed a partaker perspective, such as Injustice (Cho et al., 2016), casting players in the role of a bystander who witnesses racial discrimination and are demanded to make moral decisions and decide whether or not to step up against those who discriminate. For Permanent we adopted a similar approach, with the slight difference that we cast players in a role (a reporter) particularly tasked to gain insight into the feelings and thoughts of the other in distress, rather than a role tasked to confront those who inflict this distress. Another implementation of a partaker perspective is described in the work by Ahn et al. (2014). Ahn et al. (2014) described a virtual reality experience promoting pro-environmental behavior by casting players in the role of a lumberjack, tasked to cut down trees. This role thus involves inflicting harm to the other in distress (i.e., the trees). In contrast, Permanent casts players in a more neutral role following the partaker perspective that had no active role in what caused harm to the other in distress.

As a second design opportunity, we point at the stimulation of diegetic reflection, as it may spur players to consider the situation and conditions of the other in distress during gameplay, and as an aid in understanding the meaning of the narrative as driver for extrafictional thoughts and feelings (Kors et al., 2016b; Hamby et al., 2017; Hamby et al., 2016). In A Breathtaking Journey (Kors et al., 2016a), for instance, players are reported to employ moments absent from narrative or gameplay to reflect on the given situation and conditions of the other in distress. The temporary 'stepping out' of a victim perspective may have helped players to reflect on what their visceral experience may have meant for the other in distress. However, these studies have not yet resulted in design insight or player experiences specific to other-oriented empathic states. Consequently, it is yet unclear how other-oriented empathic states may be fostered through virtual reality games, and how players experience such moments. To address this still-unexplored design space, we deployed a research through design project (Zimmerman & Forlizzi, 2008; Zimmerman & Forlizzi, 2014), resulting in our virtual reality game Permanent.

7.4 Design of Permanent

Permanent is a first-person exploration virtual reality game about the evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan. As the materialization of a research through design project (Zimmerman & Forlizzi, 2008; Zimmerman & Forlizzi, 2014), Permanent is an illustrative case in addressing design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?, albeit with the specific focus on fostering other-oriented empathic states in this project.

Design Considerations

In following a research through design approach (Zimmerman & Forlizzi, 2008; Zimmerman & Forlizzi, 2014) we engaged in an iterative design and development process – of exploring, implementing, and testing new ideas – to address our research question. We postulated two main design considerations for fostering other-oriented empathic states through Permanent. First, we employed a partaker perspective to immediately offer players another to empathize with. We materialized this design consideration by virtually casting players in the role of a reporter, tasked with interviewing evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan. This effectively creates an immediate empathic perspective that is other oriented. Second, we stimulate players to engage in reflecting on the situation and conditions of the other in distress as a diegetic aspect of the game. This design consideration was translated to having players, through their diegetic role, interview the other in distress and draft a report that highlights their most important findings. Along with the influences of design processes (Cross, 2011; Schön, 1983) we particularly considered the use of an interactive narrative as the basis for our design. Not only did this fit our concept of a reporter tasked with interviewing evacuees, it allowed us to tap into seminal research on empathy-arousal and attitude change through narrative-based entertainment, including the body of work related to narrative transportation (Carpenter & Green, 2012; Green & Brock, 2002; Johnson, 2012) and interactive narratives (Green & Jenkins, 2014; Hand & Varan, 2009). In the later stages of Permanent's current iteration, we also conceptualized the idea of bringing part of the game to the physical world, inspired by work on transreality games (Lindley, 2005). This was done partly to extend our approach to diegetic reflection, but it also

Figure 80 (↑)
Players start out in an office space at a newspaper agency where they are provided with an introduction to the game's controls and objectives, as well as the task to get in touch with Mr. Watanabe for an upcoming article about the 2011 Fukushima Daiichi nuclear disaster.

served a purpose in our ability to interview participants alongside their choice of objects and written reports.

Playthrough

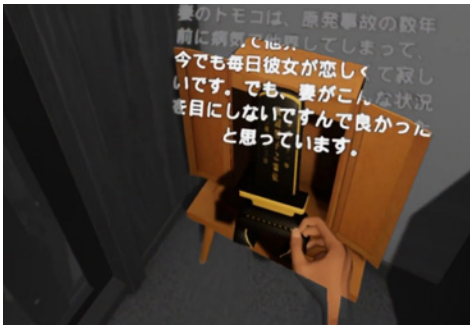
Before elaborating on Permanent's design and development we first present a typical playthrough. You start in a virtual environment that represents an office space at a newspaper agency, provided with the ability to freely walk around the office and interact with objects so as to get used to the virtual environment (see Figure 80). After a while the phone on the desk starts ringing. Once you accept the call, a character on the other end of the line introduces himself as your boss, elaborates on your role as a reporter, and the need for you to cover an interview today. Based on a phone interview, you are asked to draft a report concerning the situation and conditions of the evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan. The boss continues by explaining to you the interaction schemes through an interactive step by step tutorial of picking up or touching objects and checking remaining time on your wristwatch. Emphasis is given to the 15-minute time limitation for each interview, the need for you to carefully listen to the interviewee's story as it will help point out objects that keep the interview going.

The objective is to select objects that help you draft a consistent and high-quality report afterwards. The boss wishes you luck and ends the call. You then have a minute to reread a summary of the interaction schemes on a notepad, when the phone starts to ring again. On picking up the phone, you are greeted by Hiroshi Watanabe, who introduces himself as an evacuee living in a temporary house as the result of the 2011 Fukushima Daiichi nuclear disaster. As Watanabe explains who he is, where he comes from, and what his temporary house looks like, the office environment blurs to an empty temporary house, presented

Figure 81 (↑)
Watanabe's temporary housing. His temporary housing is inspired by a wide variety of actual makes of temporary housings found throughout the Fukushima prefecture, but created in such a way that it takes most use of the trackable walking area of the HTC Vive.

Figure 82 (↑)
As part of Permanent's universe, a temporary housing camp was virtually recreated based on actual temporary housing camps around Fukushima City in Japan. As a result, when players look outside of Mr. Watanabe's temporary housing they are presented with an environment that feels authentic.

in monochrome along with a mindful soundscape. As Watanabe continues to elaborate, related and discussed objects start to appear in color throughout the temporary house. When Watanabe finishes introducing himself, the environment turns full color (see Figure 81), enabling you to freely roam around the house, look outside (see Figure 82), and interact with objects (see Figure 83). When you



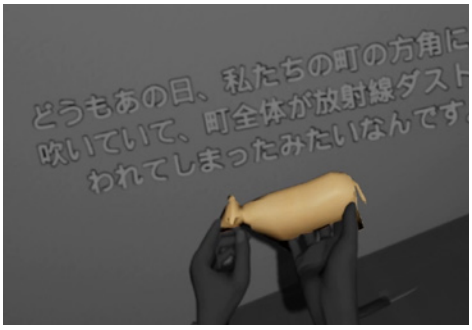


Figure 83 (↑)
The players can freely navigate Watanabe's temporary housing, and interact with objects that spawn based on past interactions with other objects. Interacting with an object will trigger a vignette in which Watanabe tells something about his past, current, or future situation or condition. Figure only shows the right side (eye) of the stereoscopic render.

Figure 84 (↑ and ↑↑ and ↑↑↑)
When players pick up an item everything but the item itself turns monochrome and they can listen and read (Japanese and English subtitles are available) to the triggered vignette. As part of the vignette Watanabe talks about related topics or details, which in turn will cause related objects to spawn around the temporary housing. When the vignette ends the environment turns back to full color, indicating that players may continue their exploration. Figure only shows the right side (eye) of the stereoscopic render.

interact with an object the environment turns monochrome again, a mindful soundscape starts playing, and Watanabe presents a vignette related to the object (see Figure 84). Meanwhile, new objects appear throughout the temporary house and become available for interaction after Watanabe finishes the current vignette. Only a few objects will be available at first, but as the game progresses the temporary house is slowly populated with more objects. By interacting with an object that closely relates to the previous vignette, you ask Watanabe to continue discussing a particular topic in more detail. You can also decide to direct the interview to a different topic by interacting with a less related object. There are various branches to follow, each represented by a collection of three to five related objects – discussing topics that range from the contamination of cattle, the discomforts of living in temporary housing, the joy of picking up hobbies, to the relationship with neighbors and family members. After ten minutes, your wristwatch will indicate that there are only five minutes left to complete the interview (see Figure 85). When 15 minutes have passed, Watanabe explains that he must leave for another appointment and finishes the interview by thanking you for listening to him, and ends the call. Simultaneously, the environment blurs to black as you are transported back into your office at the newspaper agency. After a couple of seconds your boss calls, congratulating you for your excellent interview and great work on collecting objects that can be used to draft your report. The boss explains that he will walk to your office to support you in the process. The environment blurs to black once again, during which researchers assist you in taking off the virtual reality equipment. Immediately thereafter you are given a stack of photos containing the objects that you collected during the interview. You are then guided to a whiteboard, and provided with the instructions to select three objects – write down next to each object how you think and feel about that particular object, and inform the researchers when you have completed this task. More details on this final part is provided in the Interview Protocol section of this chapter.

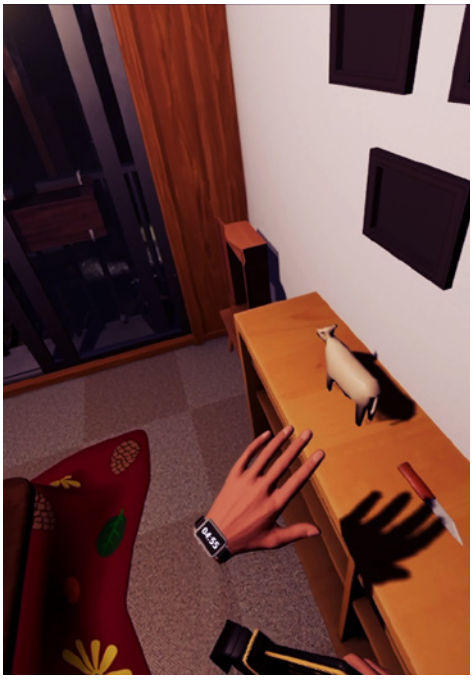


Figure 85 (↓)
The player can move objects around the house, and trigger related vignettes. However, interviews cannot take forever and the time is ticking (with the remaining time indicated through the watch), so players have to make decisions as to what topics they pursue. Some players may explore a broad range of topics whereas others may follow a chain of topic-related vignettes. Figure only shows the right side (eye) of the stereoscopic render.

Design and Implementation

Permanent was designed, developed, and deployed by Martijn Kors, Karel Millenaar, and Rutger van Teutem, with additional support from Maxime Bloemsma, Rian Goossens, Kim Hermsen, Haruno Ito, Noriko Ito, Yasuo Ito, Margot van Rutten, Alyea Sandovar, Ben Schouten, Ingmar Schuurman, Sachie Takagi, Erik van der Spek, and Takemi Wada. The majority of production took place between July 2016 and August 2017. The design of Permanent draws inspiration from first-person exploration games such as Gone Home (The Fullbright Company, 2013) and Firewatch (Santo, 2016) for their object-based and narrative-driven gameplay, the reflective and thought-provoking gameplay of editing a newspaper in The Republia Times (Pope, 2012), and empathy-arousing games such as Papers, Please (Pope, 2013), This War of Mine (11 bit studios, 2014a), and Injustice (Cho et al., 2016) for their use of a partaker perspective. In the following sections, we describe the design and development of Permanent.

Interactive Narrative Design

As illustrated in the playthrough, the player starts in an office of a newspaper agency, is presented with a step by step tutorial on how to interact with the environment, is given the role of a reporter, and tasked to draft a report. This part of Permanent is straightforward, as the interactive narrative provides no branching and must be followed in sequential order. The narrative presented to players in the temporary house is different, in that it consists of 34 independent vignettes attached to related objects (see Figure 86), each addressing a particular aspect of Hiroshi Watanabe's life: a 61-year old farmer who had to abandon his farm in the wake of the 2011 Fukushima Daiichi nuclear disaster, currently residing in a temporary housing camp north of Fukushima City, Japan.

The temporary house is near empty upon arrival, presented as the reporter's imagination, but is populated with objects along with Watanabe's narration (see Figure 87). The player, however, never actually gets to see Watanabe. In part, this fits well with the narrative of the game, but it also mitigates the need for the creation of a visually believable character.

A narrative branch typically consists of three to five linked vignettes that together address one major topic. Topics range from the contamination

Figure 86 (→)
A work-in-progress overview of a few of the topic-related vignette chains, with each item linking to either an item that provides more insight into the current chain (addressing the same topic) or to an item that is part of a different chain (addressing a different topic).

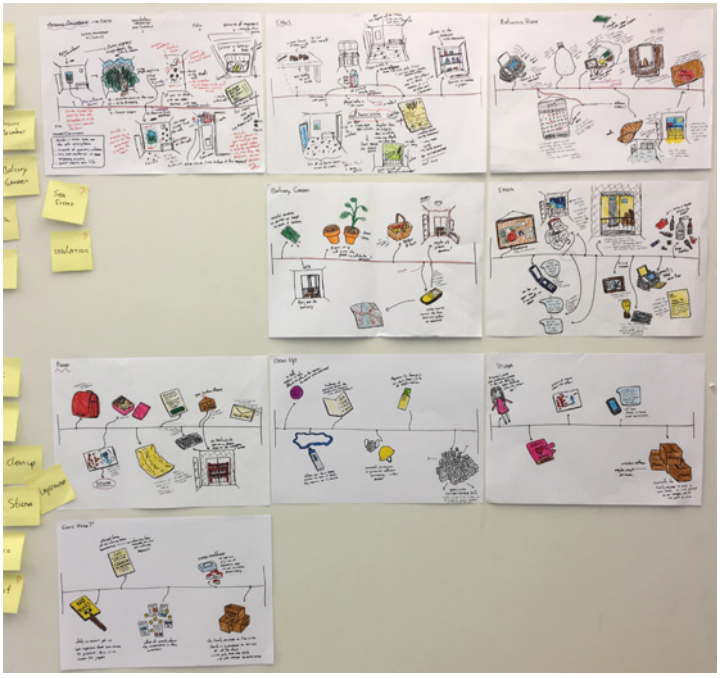


Figure 87 (←)
As players progress in Permanent, the virtual temporary housing populates with new items that can be explored. The screenshot shows the room in the Unreal Editor as we place the items (and vignettes) throughout the room. Cubes are used as a placeholder for the items that are not yet 3D modeled.

Figure 88 (→)
When new objects spawn they slowly appear in order for players to spot them more easily. For demonstration purposes, the image on the right shows multiple objects spawning at the same time.

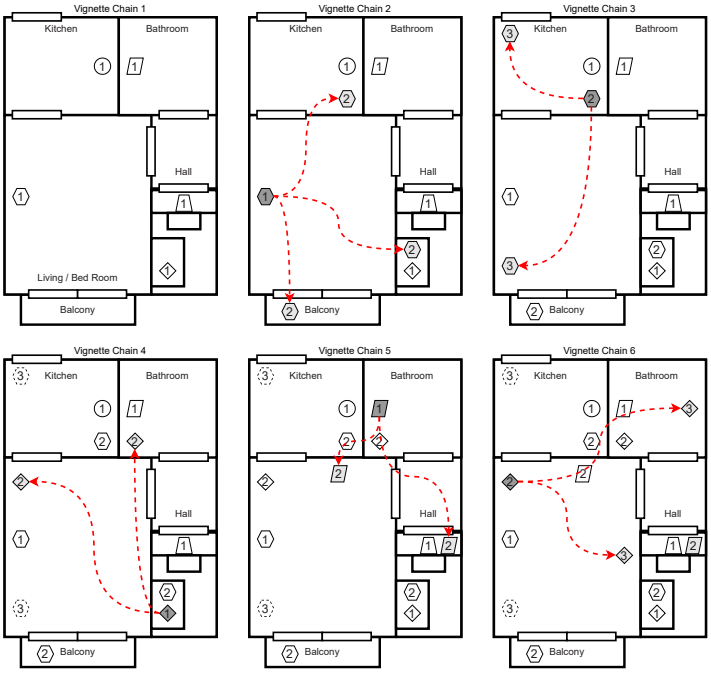


Figure 89 (←)
A mock-up of the item / vignette chain distribution in Watanabe's temporary housing. When the player picks up one of the items (shapes) a vignette is activated, and afterwards new related items are spawned throughout the temporary housing. Shapes represent items that are related by topic, and the numbers represent their depth on that topic. Since time is limited, players typically have to choose between breadth of insight (selecting various items related to different topics with lower numbers or depth of insight (selecting items related to the same topic with higher numbers).

of his cattle and vegetables, daily life in temporary housing, his return home, the torn apart family, to his relationship with the government and the community.

Picking up, or in some cases touching, an object will provide players with a vignette and subsequently spawns a new object (see Figure 88) of the same branch on a logical location around the temporary house (see Figure 89). In the case of interlocking narrative branches, a vignette may also produce an object of a different branch. Although selecting objects from the same branch one after another will generally produce a more consistent narrative, the vignettes are self-contained stories, and thus can be enjoyed in any order.

The stories underpinning the vignettes were collected by Martijn Kors through an ethnographic study in 2012 with evacuees, caretakers, and officials in the affected areas of the Tohoku region, Japan, and through consecutive interviews with researchers, evacuees, and nonprofit organizations in 2013, 2016 and 2017 (see Figure 90 to 93). A thematic analysis of these interviews generated themes that highlighted the conditions and situations of the evacuees, as well as a series of representative personas. In 2016 and 2017 these themes and personas were further developed with news articles and scientific publications that discussed the physical and psychological well-being of those affected by nuclear disasters (e.g., Bromet, 2014; Zhang et al., 2014). Next, the themes were collated on the walls of our pop-up game studio along with visuals to provide easy reference and an atmospheric representation of the situation and conditions (see Figure 94 and 95). Based on the themes and personas short vignettes related to frequently discussed objects and events were generated, with a focus on including both cognitive and affective arguments in each vignette.

In the deployed version of Permanent, as presented in this chapter we focused on the story of the fictitious Watanabe, with a list of all objects and corresponding vignettes provided in the supplementary material of the original publication (labeled Supplementary A).

Technical Implementation

Based on photos taken while visiting temporary housing camps across the Tohoku region, Japan (see Figure 96) – along with online references – we produced 3D models of a temporary housing camp, the interior of one of the temporary houses, and both interior and exterior objects (see

Figure 90 (↑ and →)
While radiation levels are normal (0,13 µSv/h) when measured away from the ground (↑), hot particles hidden in the soil give a higher than usual radiation reading (0,60 µSv/h)(80km away from the Fukushima Daiichi nuclear plant)(→).

Figure 91 (→)
Throughout Fukushima prefecture topsoil is removed to capture hot particles.

Figure 92 (↑)
One of the temporary housing camps in Fukushima prefecture where interviews with evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan were carried out.

Figure 93 (→)
An evacuee from 2011 Fukushima Daiichi nuclear disaster who was interviewed to help shape the fictional vignettes offered in Permanent. Evacuee is from a different temporary housing camp than shown above.

Figure 94 (↑)
Visual collection of stories from the ethnographic study, interviews, articles, news, publications, documentaries, combined with illustrative photos as grounding for the generation of the fictional vignettes.

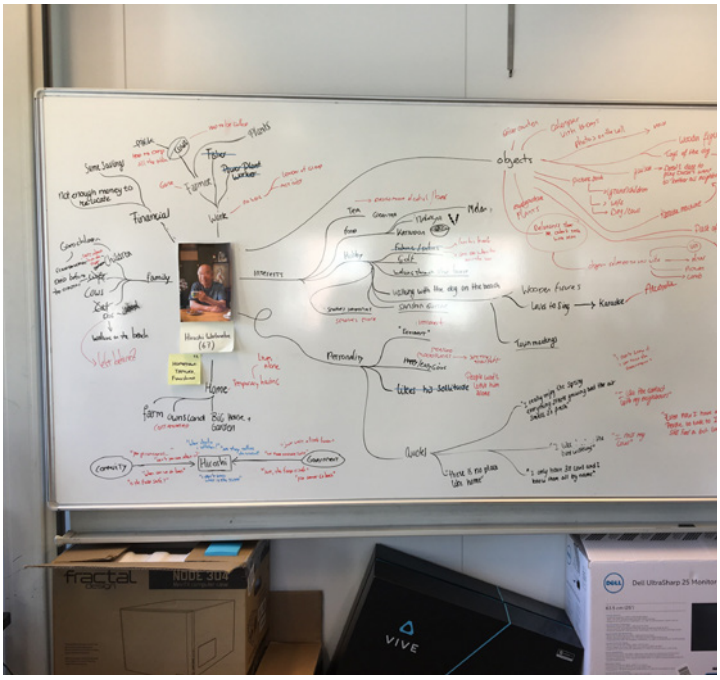


Figure 95 (→)
Development of Mr. Watanabe's persona as the basis to personify the collated stories.

Figures 97 to 99). We produced the 3D models and textures to maintain a consistent, semi-realistic, and flexible art style for Permanent.

A few decorative objects, with the majority used in the office scene, were acquired from the Unreal Marketplace (Epic Games, 2017b). We recreated the temporary house to fit within the boundaries of the walking area of an HTC Vive virtual reality headset (HTC Corporation, 2016) to avoid the need for teleportation. Based on the same measurements, we also produced an office environment for the start and ending scenes. The vignettes presented in the game were narrated in 2017 by a Japanese male from Fukushima City, Japan, in the same age category as Watanabe and with a Fukushima accent. The boss character was narrated by a professional voice actor with an American English accent. The background audio was recorded in Fukushima, Japan, to subtly include local ambient sounds, ranging from the siren of an ambulance to the soothing sound of a Fūrin (a Japanese wind chime) (see Figure 100).

The game is made available with both Japanese and English subtitles spatially displayed below objects, with the original English script translated to Japanese by a professional translator. We created the interactive and lighting aspects of the game using Unreal Engine 4 (Epic Games, 2017a), employing a combination of Blueprints and C++, to enable players to freely walk around the virtual environment, keep track of time using a wristwatch, interact with the environment and objects, and trigger vignettes to progress the interactive narrative at their own pace and desire.

In the presented version of Permanent the process of drafting a news report is carried out in reality via the whiteboard to facilitate the study, but a standalone version of Permanent included a prototype allowing players to generate their news article in-game (see Figure 101).

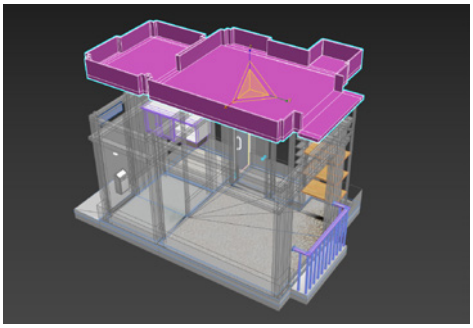
7.5 Deployment and Data Collection

This was an exploratory deployment study in a public showroom context, with which we aimed at putting our research through design game ‘in the wild’ across a geographical, cultural, and issue-relevant diverse population and capturing responses of participants. Assessing participants’ experiences with Permanent allowed us to address our research design question: How can we foster other-oriented empathic states through virtual reality games? The objective of this study was therefore to (a) capture responses vis-à-vis empathy and assess their

Figure 96 (↑)
One of the temporary housing camps in Fukushima prefecture that was visited during the development of Permanent. This temporary housing camp in particular was used as a primary source for the design of the virtual temporary housing camp in Permanent.

Figure 97 (↓)
Virtual recreation of a temporary housing unit using Autodesk 3DsMax.

Figure 98 (→)
Creating collision boxes for the temporary housing unit using Autodesk 3DsMax.



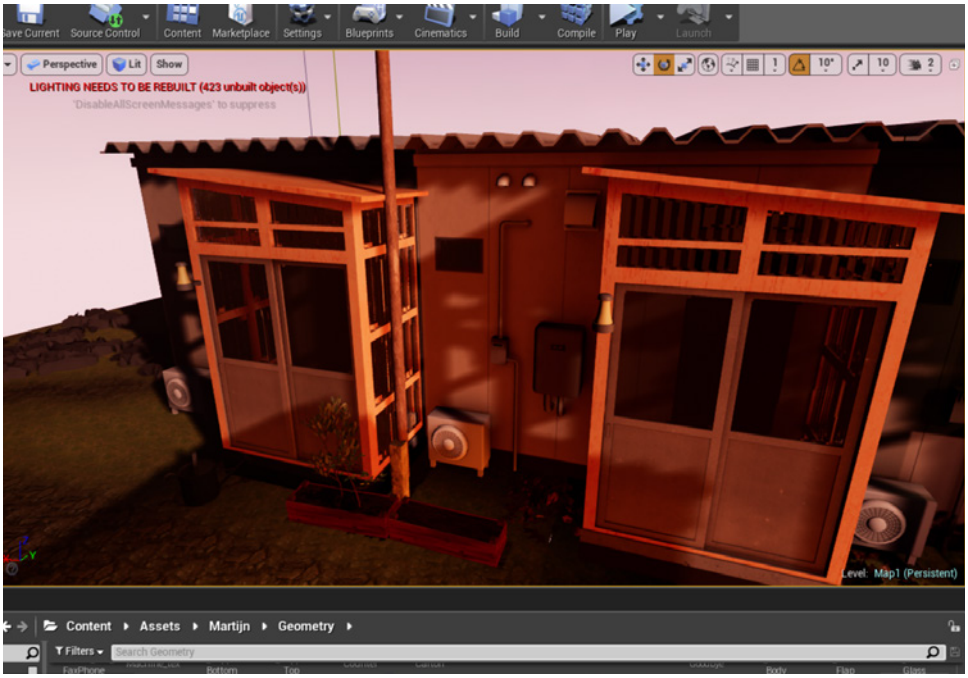


Figure 99 (↑)
Virtual recreation of a temporary housing camp in progress, here shown imported into the Unreal Engine 4.

Figure 100 (←)
Recording ambient audio in Fukushima city to capture realistic environmental ambient audio for Permanent.

Figure 101 (→)
A prototype for drafting reports in-game as part of a stand-alone version of Permanent, that would allow players to print their self-made article at home (for the study this feature has been replaced with the extrafictional drafting of a news article).

orientation, (b) gain insight into participants' experiences, and (c) reflect on Permanent's design and participants' experiences to inform the future design of empathy-arousing appeals in socially aware persuasive games using immersive technologies.

Context and Recruitment

Permanent was deployed at two public expositions in the Netherlands and Japan, for a total of eight and three days respectively, in the months of September and October, 2017. The exposition in the Netherlands was held in Eindhoven as part of the 2017 Dutch Design Week and the exposition in Japan was held in Tokyo as part of the 2017 Fukushima Film Festival (see Figure 102 and 103), with Permanent described as artwork - an interactive documentary - that shares stories of evacuees from the 2011 Fukushima Daiichi nuclear disaster.

Although both events had a similar setup (e.g., no entry fee required, having other (virtual reality) artwork on display, and promoted Permanent on their website), we did recommend visitors of the 2017 Fukushima Film Festival to reserve a time slot in advance, via the exposition's website. This was done to maximize interaction over the

fewer days available compared to the 2017 Dutch Design Week. However, we allowed visitors to interact with Permanent on the spot if the next time slot was unreserved. We decided to recruit in Japan because despite the CHI community having stressed the importance, and encouraging inclusion, of participants of varying cultural backgrounds (Sturm et al., 2015), to our knowledge, studies addressing Japanese players' game experience are scarce. Furthermore, because Permanent revolves around the 2011 Fukushima nuclear disaster, we deemed it suitable to include participants from Japan in the study. Visitors showing an interest in interacting with Permanent were informed that a play session would require approximately 30 minutes, but that they could quit any time and for any reason.

Approximately 104 visitors interacted with Permanent during the exposition days, as one piece of art among others. We did not capture, collect, or assess any player interactions or experiences with Permanent for study purposes up to the completion of the game. Rather, immediately after interacting with Permanent we informed players that we were also running a scientific study, followed with asking players' informed consent for a recorded interview about their experience. We

Figure 102 (↓)
Permanent presented to the public at the Virtual Reality Exposition organized as part of the Fukushima Film Festival 2017 in Tokyo, Japan.

explained our academic profile and that the study was deployed for scientific research purposes, particularly to gain insight into player experiences and to improve the design of Permanent.

We elaborated that the interview would be anonymized during collection, that participants could refrain from participation at any time and for any reason, and that the interview would include questions related to their choice of objects, the rationale behind their report, and their overall experience with Permanent.

In total 78 people (of the 104 who played Permanent), 51 in the Netherlands and 27 in Japan, interacted with (and finished) Permanent and consented to participation in the study. These were our participants. Both events attracted a diverse sample of the local population, reflected in participants aged 18 to 67, of which 41 were female and 37 male, along with varying backgrounds ranging from a college student, a senior director of a pharmaceutical company, to a survivor of the 1986 Chernobyl nuclear disaster.

Interview Protocol

The interview's objective was to capture how participants experienced Permanent, how they thought and felt about the topics discussed in it, and to probe for empathic experiences. The interview was designed to feel like a natural extension of Permanent's narrative and gameplay, both to ease the transition from interacting with Permanent to being interviewed and as a method to later help relate participants' responses to particular objects or aspects of Permanent's design. To recap, in the concluding part of Permanent players are asked to make a selection of three objects (from a stack of polaroid-like photos) (see Figure 104), and write down next to each object how they think and feel about that particular object on the whiteboard as a means to drafting their report (see Figure 105).

After consenting to the interview the researchers then asked participants (a) to communicate their age and gender (players below 18 years of age were excluded from the study), (b) to elaborate on their choices for the three objects they listed as part of their report on the whiteboard (which overlapped with the task given by the boss in Permanent) (see Figure 106), (c) to engage in an open discussion about their experience, (d) articulate their thoughts and feelings on the presented situation, and (e) to ask any questions of us about Permanent or the study (as part of

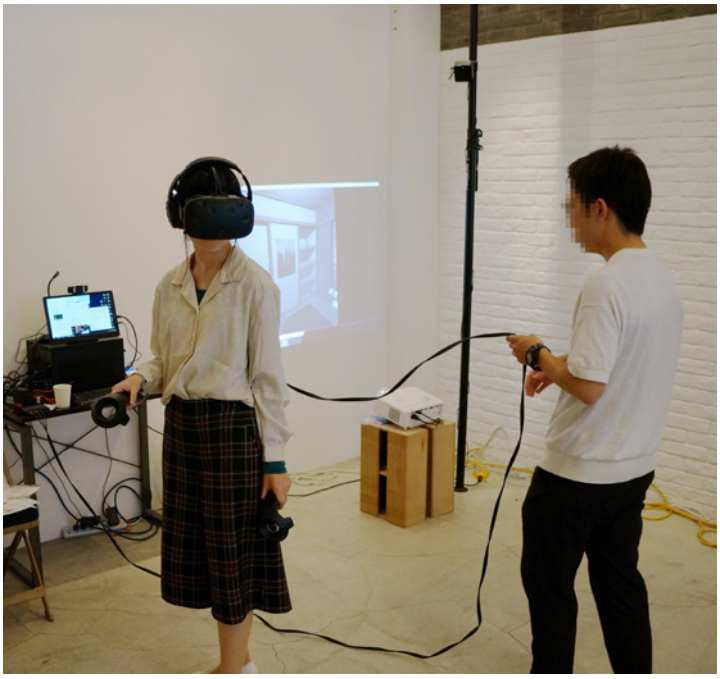


Figure 103 (→ and ↓)
Permanent presented to the public at the Virtual Reality Exposition organized as part of the Fukushima Film Festival 2017 in Tokyo, Japan.

Figure 104 (→)
A participant is handed over a stack of polaroid-like photos containing all the items he collected during his play session, and is asked to pick three.

Figure 105 (←)
A participant writes down how she thought and felt about each of the selected items and corresponding vignettes.

Figure 106 (↑)
A participant explains in detail why she picked each item/vignette that she attached to the whiteboard, and how they made her think and feel.

the debriefing). Afterward, participants were offered a card describing the project along with contact information, as we thanked them for their participation. Participants were asked to speak in either Dutch, English, or Japanese. Speaking in Japanese was aided by a live translator.

Data Processing

The raw data, consisting of recordings of participants' anonymized interviews and whiteboards, were centrally collected and tagged with corresponding metadata including participant number, gender, age, country, and spoken language during the interview. The raw data of the interviews with English as the main language were transcribed by the authors, and the interviews with either Dutch or Japanese as main language were transcribed and translated to English by professional translators. The data were distributed among participating analysts along with instructions for analysis.

7.6 Analysis

We now present a qualitative analysis of the collected data. The illustrative quotes by participants are labeled with the country abbreviation (NL,

JP), spoken language (D = Dutch, E = English, J = Japanese), participant number, their gender (M = Male, F = Female), and age. For instance, (NLD 39 F54) means the participant number 39 took part in the Netherlands, spoke in Dutch, was female, and 54 years of age.

Closed Coding of Psychological States Called Empathy

The objective of this closed coding qualitative analysis was to characterize the psychological states of participants called empathy. We took a Qualitative Content Analysis approach (Mayring, 2004), as we aimed to systematically analyze the empathic states reported by participants. To systematically code for empathic states we employed the delineation described by Batson and Ahmad (2009), which involved two other-oriented empathic states: imagine-other perspective and empathic concern; and two self-oriented empathic states: imagine-self perspective and Emotion Matching. Martijn Kors coded all interview data in advance. Sentences formed the smallest coding units. To ensure intercoder reliability, Julia Bopp independently coded for empathic states using the entire data.

As only two coders were involved in the coding process, and as one empathic instance could only be categorized to one empathic state (Stemler, 2001), Cohen's κ was calculated for each empathic state. Based on the suggestion by Landis and Koch (1977), the intercoder reliability was almost perfect (range $\kappa = .92$ to $\kappa = .98$). Overall, 205 empathic instances were identified, with participants from both countries reporting similar amounts of empathic instances. Participants reported other-oriented empathic states (n = 130) more than twice as often as self-oriented empathic states (n = 52). Imagine-other perspective was by far the most frequently identified empathic state (n = 85; e.g., "That man must feel so bad now" [NLD 33 F58]), followed by empathic concern (n = 45; e.g., "Felt sorry for this dude" [NLE 05 M24]). Imagine-self perspective was identified 39 times (e.g., "it seemed very scary to me to be there with all that radiation" [NLD 53 F18]), whereas emotion matching was barely mentioned (n = 13; e.g., "As if I could feel along, feel the homesickness a bit" [NLD 50 F61]). None of the participants reporting the empathic state of emotion matching reported the empathic state of empathic concern in their entire interview. Descriptions, frequencies, and examples of each code are provided in the supplementary material of the original publication (labeled Supplementary B).

Open-Coding of Player Experiences

The objective of this open coding was to uncover themes that characterized participants' rationales and experiences with the design of Permanent. To analyze, identify, and report patterns within the data, we employed an open coding inductive Thematic Analysis approach described by Braun and Clark (2006) and Braun et al. (2014). As we were interested in the themes characterizing participants' experiences with Permanent, the entire data were analyzed (rather than responses to specific questions), and with regards to the semantic content (i.e., what participants said). The authors Martijn Kors, Erik van der Spek, Julia Bopp, Gabriele Ferri, and Ben Schouten performed the open coding. Martijn Kors was involved in every step of the analysis. First, analysts read through the data to become familiar with the content, and casually noted down first ideas and observations. We asked the analysts to go in 'as a blank slate', and to keep their notes for themselves. Second, we instructed the analysts to iteratively generate initial codes that reflected the data and with sentences as the smallest coding unit. Thereafter the analysts discussed, reevaluated, and merged codes. These codes (n = 334) formed the basis for the generation of themes over three successive group discussion sessions. We concluded with performing rereads of the data to determine whether the salient themes meaningfully captured the data set in its entirety. The inductive Thematic Analysis resulted in four salient themes: Spatial, Other, and Self -Awareness; Personal Accounts; Ambivalence; and Transdiegetic Items.

Spatial, Other, and Self -Awareness

We named the first theme 'Spatial, Other, and Self -Awareness' (n = 46, 32 participants) to highlight participants referring to their awareness of the space, the other, and the self. Participants frequently described a sense of presence in the virtual temporary house and the spatial affordances they were offered, which we refer to as spatial awareness. For instance, one participant described feelings as if she were in the space: "it was quite the experience, let's say, that you are really 'in it'" (NLD 39 F54). While most participants described their spatial awareness in terms of 'being there', 'being in it' or 'being in the room', only participants in Japan repeatedly mentioned that this was accompanied with a sense of 'realness'.

Next, we observed that participants often used spatial awareness for their narrative interpretations, and for understanding the more spatially

oriented conditions of Watanabe and other evacuees. For instance, the following quote illustrates how participants use spatial awareness to interpolate the told narrative with aspects not expressly mentioned, such as the experience of 'going crazy':

> I thought it was a very small room and I also had something like, I would go crazy here. The whole time, I wanted to go outside. So, I thought, I can imagine, and there was no one to be seen, I think, I can imagine that you would like a drink, and indeed have little room to move and that you will gain weight because of that" (NLD 39 F54).

Other participants even engaged in role play to spatially experience the told narrative:

> "I took such a plaque with me and then I placed it inside of it [an altar] and then I did sort of pose, I was kneeling down to look at the text and trying to put it there, and doing that, it was kind of like being the character who's speaking, himself. Honoring the wife or just being part of this ritual that he probably did a few times himself was very powerful and it was also, so yeah just interacting with your environment that way. Well it just brought me a lot closer to the narrative that was being told" (NLE 49 M25).

Yet the described actions were clearly interpolations, as they were never actually mentioned in such detail in the told narrative. The quotes also illustrate participants' other awareness, in that participants considered Watanabe as another, separate from their own perspective or diegetic role, even in cases when participants like NLE 49 M25 engaged in seemingly self-absorbed role play. Particularly objects that insinuate interactive possibilities, such as the mortuary tablet and the altar, or the tomato seeds and the tomato plant, spurred role play activities.

This brings us to observations of explicit self-awareness, or rather the lack thereof, as only a few participants described their diegetic role. For instance, a participant articulated her diegetic role as a reporter indirectly by referring to Watanabe as an 'interviewee': "The interviewee had not yet said that his wife passed away, but I did have an expectation from the very start" (NLD 50 F61). Still, most participants refrain from describing their role and may have simply played as themselves:

> And secondly, I thought it was a little bit awkward to walk around the house of somebody else, especially if it is from an evacuee, his

> temporary house. And I found it, it was very strange and I wasn't sure if it is okay (JPJ 25 F46).

It is worth noting that participants who felt spatially aware but reported not to have listened to the told narrative reported no empathic state, and those who engaged in role playing along the told narrative were particularly responsible for reports on the empathic state of emotion matching.

Personal Accounts

We named the theme 'Personal Accounts' (n = 58, 27 participants) to highlight participants' rationales for listing objects on the whiteboard that reflected personal interests, values, or opinions. We start with the remarkable observation that no single participant's listing of three photos is alike. In part, this may be due to participants consciously following different narrative branches. For instance, one participant described her ability to choose objects at her own pace:

> "It came to me, into my head, more real, realistic, than simply watching it on TV, because I could decide what to do, choose what to pick up, and progress on my own pace. So in that way I could interpret and understand things better" (JPJ 15 F27).

We observed participants listing objects as an aid for understanding the conditions, thoughts, and feelings of Watanabe, or other evacuees: "These three objects were the things that helped me the most in understanding the pain of Watanabe-san" (JPJ 15 F27). Among the various rationales, many participants listed objects that highlighted the disaster's influence on daily life: "These were the objects that, actually, however small they are, they have the greatest impact on daily life. If you look at those seeds, that did something to me because it was a reminder of his wife" (NLD 38 F40).

However, we also observed a prevalence among participants to list objects that did not immediately reflect the diegetic objective, but were more personally motivated. That is, participants selected an object, most frequently the mortuary tablet and the no nuclear placard, as it reminded them of a personal experience. For instance, a participant listed the sleeping pills as he could identify with the use of antipsychotics:

> "I chose the first one because I found it partly tragic but partly also nice that the man was urged not to take antipsychotics straight away.

> I also use antipsychotics myself and it helps me to deal with the fears that they too are struggling with, but it is also nice that they are pushed in a different direction. I could identify with that in that way" (NLD 30 M22).

In a similar vein, we also observed participants who listed personally motivated objects that refer to aspects not mentioned in Permanent. For example, the cow statue was used to refer to other organisms affected by the disaster: "Well, I would translate it to the animals, and then automatically the plants, and different organisms, even those are affected. And, yes, that cow symbolizes all the organisms that are not human but are also affected" (NLD 31 M64).

Finally, some participants used the combined listing of objects as a steppingstone to telling ontological narratives. For instance, one participant described her experience with the Chernobyl nuclear disaster:

> "I can remember in '86 I was on my way to the cinema when Chernobyl happened. Then I went to a party, later. My friend was in another place and we both had itching on our skin, that was acid rain. [...] I just, actually, what was it, 9 years later I got leukemia, in '95. So, I am always thinking...'would that be because of that?', so that is very confronting to me, this story. I just thought, I just wanted to stay longer" (NLD 28 F55).

The cow statue, pinboard, family photos, and no nuclear placard were often used as proxies for describing personal experiences. Notably, even though participants reporting this theme were particularly driven by their own personal interests, values, or opinions, this did not hinder them in expressing other-oriented empathic states.

Ambivalence

We named this theme 'Ambivalence' (n = 44, 31 participants) as participants often referred to thoughts, perspectives, and emotions that contained both positive and negative aspects. Remarkably, participants from both countries pointed at this theme almost equally frequently. For instance, participants explained having experienced hope for the future despite the overall rather negative situation described by Watanabe. They typically associated the tomato plant and tomato seeds symbolically to hope, future, and life. An exemplar of this response was

this one:

> "Yes, the hope, the hope for, and the drive to go on. Picking up your life again and starting a new life based on old experiences and existing knowledge, from the farm. That one little bit that you hold on to and continue with it" (NLD42 F50).

These participants often did not state any empathic states.

Others emphasized the contrast between the happy past of Watanabe and his current situation, having lost everything due to the disaster. Typically, these participants picked objects representing Watanabe's life before the disaster, such as the box with personal belongings:

> "But that man also told me that he probably, in the past, he could remember things about the sea, [...] well those were some of which I think, 'those where happy moments' and he does not have them anymore, they are no longer there. So, people can have very simple memories, shows how important that is for people and how much they liked it" (NLD 33 F58).

Several participants explained having experienced mixed emotions – feeling both positive and negative emotions simultaneously. One Participant explained that the scenery outside the window evoked loneliness but at the same time he enjoyed it as it was so beautiful.

> "And there is this beautiful moment when you just get out of the window to look at the boxes and you feel the wind and you look at their houses and it's just, it's just, very immersive it's just very poetic and just looking around and looking at the, it really evokes the sense of loneliness but also beauty and poetry. And I really enjoyed it. Was. Just. Very. Beautiful" (NLE 49 M25).

Participants frequently discussed not only their own mixed emotional response but also Watanabe's mixed feelings:

> "He said that he was actually hurt, well that he was upset that his wife died but he also said something like; 'luckily she did not have to experience this'. Of course, that also says something about how he lives now, how he sees his life, the death as a soothing circumstance. That man must feel so bad now. That he experiences it that way. I thought that was very sad" (NLD 33 F58).

As this quote illustrates, mixed emotional instances were exclusively characterized by other-oriented empathic states. Interestingly, Watanabe's personal objects, such as the mortuary tablet, fruit basket, or tomato plant and tomato seeds, were chosen frequently. While the tomato plant and tomato seeds were also often associated symbolically with hope for the future, participants reporting mixed emotions focused on the story behind each object.

Transdiegetic Items

Lastly, we named the theme 'Transdiegetic Items' (n = 35, 28 participants) as participants referred to extrafictional objects or events when discussing diegetic objects or events, and vice versa. The current meaning of transdiegesis implies a contamination between the intradiegetic and extrafictional universe, which means that objects or characters exist at the same time inside and outside a story, or game, universe (Genette, 1983; McHale, 1987). In practical terms, transdiegesis takes place anytime characters or objects cross the boundaries into another narrative.

Participants from Japan discussed transdiegetic items more than twice as often as participants in the Netherlands, and participants who listed transdiegetic items were more inclined to describe other-oriented empathic states than self-oriented empathic states. Remarkably, participants who listed objects in their report that referred to extrafictional aspects reported four times more other-oriented empathic states than self-oriented empathic states. Particularly the knife, the cow statue, and the milk carton often spurred participants to refer, or even interpolate, their reports with extrafictional aspects. For example, one participant described that he already knew about the cows and the dumping of contaminated milk before playing Permanent, and so made no distinction between narrative universes:

> "Well actually I knew already the story of these kind of, the cow. So the guy was telling me the story of his, well he was, he had a lot of cows and it was a pretty devastating moment for him to see the dead ones, his cows. And actually, I do not know exactly what he said about this milk but, I already knew that they had to, well, contaminated milk, everything was contaminated, so they had to throw them away" (JPJ 09 M53).

In addressing objects or events from the extrafictional universe, we also

observed that participants inserted unmentioned emotions evoked by these objects or events into their narrative interpretations: “Looking at the map on the right evoked the anxiousness of the disaster in 2011” (JPJ 03 M33). Similarly, participants also used extrafictional aspects as an aid in better understanding Watanabe’s conditions. For instance, a participant described how a documentary helped her to better imagine what Watanabe was talking about:

> “That has to do with a documentary that I saw after the tsunami disaster in which I saw a horse in a meadow running very fast in a circle and then I saw the water that was approaching at a given moment, and that made a huge impact on me. So, I can imagine the things the man talks about, that, that the milk must all be thrown away, and the animals, and the suffering. That image had a very strong effect on me. [...] And now, now that you’re in that room, those images all come back again. It repeats itself, more of what I actually saw during that time” (NLD 33 F58).

Remarkably, as this quote illustrates, participants described that Permanent made them see things from the extrafictional universe, yet Permanent actually shows very little of what is described.

Participants also interpolated in reverse, inserting intradiegetic aspects into extrafictional narratives. Particularly the pinboard, neighbor noise and the no nuclear placard were listed when participants did this. For instance, one participant described how she realized that things are different from what she heard elsewhere with the listing of the pinboard:

> “Spreading around very untrue news regarding this incident. Because I didn’t even realize the extent that was going through because it seemed like everything was okay already. If it comes from a first-hand account it’s very different from what you hear. So yeah, that’s why I picked that one” (NLE 22 F26).

Similarly, for some participants this interpolation was characterized by reflecting on their own situation: “Yes...so...so shitty for those people. Very bad disaster [inaudible], bad disaster. And it can also happen here in the Netherlands. Not by a tsunami, but by something else, I don’t know” (NLD 35 M50).

Lastly, we observed participants projecting intradiegetic thoughts and feelings onto extrafictional objects or situations. For instance, one

participant described that things have to change in the extrafictional universe when concluding his report with the box with personal belongings and the no nuclear placard:

> "And I chose that box to not be a number, quantification, of 'so many Japanese', but that it has to do with a bit of humanity. There is one, and so many others. And finally, the third conclusion is then, where the piece also ends, is that you actually knew in advance that this kind of energy was not going well, and it is time that it's fucking going to change. 'God Damnit' with 'sorry' written underneath" (NLD 23 M67).

7.7 Discussion

We presented the design of Permanent and the findings on participants' experience thereof, guided by the design-research question: How can we foster other-oriented empathic states through virtual reality games? A close coding on empathic states revealed that participants reported other-oriented empathic states more than twice as often as self-oriented empathic states. Furthermore, through our open coding, we identified four themes characterizing participants' experience with Permanent. Notably, our findings underline the capacity of virtual reality games to foster other-oriented empathic states in addition to self-oriented empathic states. The novel design of Permanent provides an illustrative case for fostering other-oriented empathic states through virtual reality games.

Within the theme 'Spatial, Other, and Self -Awareness' we observed that while participants frequently referred to the presence of another (e.g., Watanabe, other evacuees, etc.), participants rarely articulated who they were, with a few hinting to be playing as themselves. While this does not reflect Permanent's intended role for players as a reporter, it represents an adoption of a partaker perspective (Kors et al., 2018). In contrast, participants who engaged in role playing as Watanabe were seemingly self-absorbed, and were also responsible for most of the reports on the empathic state of emotion matching. None of the participants reporting the empathic state of emotion matching reported the empathic state of empathic concern, which underlines the idea that taking up the role of the other in distress increases self-oriented empathic states and complicates other-oriented empathic states (Batson & Ahmad, 2009; Kors et al., 2016a).

Despite the observation that participants included personally relevant objects and engaged with their own past experiences in the theme 'Personal Accounts', they did not report more self-oriented empathic states than participants who did not. Personally relating an in-game event to a participant's own past experience was found to facilitate emotionally complex experiences (Bopp et al., 2016; Bopp et al., 2018), and in particular also to foster an emotional bond with the character in question (Bopp et al., 2019). Indeed, participants seemed to use their own experience for understanding the conditions, emotions, and thoughts of Watanabe, likely as a steppingstone to other-oriented empathic states. Thus, the inclusion of objects and narratives that help participants to identify with the other in distress may result in a better understanding of the other in distress. For example, objects associated with loss of family connections (the mortuary tablet and the family photos), seemed to resonate well with many of the participants and spur ontological narratives.

Regarding the theme 'Ambivalence', participants from both countries commented on Ambivalence equally frequently, contradicting recent work arguing Easterners experience mixed emotions more frequently (Miyamoto et al., 2017). Jørgensen (2010) discussed that players develop emotional bonds and empathize with in-game characters who are complex, and whose background story is presented step by step. In Permanent, Watanabe made references to both positive and negative aspects in each vignette, making him a more complex character (Miyamoto et al., 2017). As participants chose one object after another and listened to Watanabe's story, they slowly got to know him, especially with his personal belongings. These two design choices combined may have enabled players from both countries to regard Watanabe as a complex character separate from the self, evoking mixed emotions and fostering other-oriented empathic states.

According to Miyamoto et al. (2017), when Westerners experience ambivalent feelings, they try to increase positive emotions in order to decrease negative emotions. In our study, participants referring to an object symbolizing something (e.g., life, future) typically stated hope as an emotion, and seldom argued empathetically. This may have been, at least for Western participants, a way to increase positive emotion (i.e., hope) in an otherwise rather negative emotional experience. Thus, stories behind the symbolic objects may have been missed, and in turn not much empathy was experienced.

Regarding the theme 'Transdiegetic Items', participants in Japan reported more than twice as many descriptions of transdiegesis than participants in the Netherlands did. On the one hand, participants were observed to refer to, or insert thoughts and feelings from, the extrafictional universe in their reporting. On the other hand, participants were observed to adopt aspects from the intradiegetic universe into their thoughts and feelings towards related issues in the extrafictional universe. This is an important observation, as it illustrates that participants did not only empathize with Watanabe but effectively collapsed the narrative universes, and projected intradiegetic thoughts and feelings onto extrafictional objects and events. While participants seemed to effortlessly do this, it is argued that this may not be an immediate response. Scholars have pointed out that empathizing with intradiegetic characters does not immediately establish empathy for extrafictional characters (Fisher, 2017), yet transdiegetic items may serve as steppingstones for a transfer between universes (Kors et al., 2015; Kors et al., 2018). Aspects that stimulated diegetic reflection, such as the diegetic task to collect interesting objects and draft a report, may have accelerated this process. In Permanent's case, transdiegetic items are often objects or events that have had a prominent presence in other media, like the cow statue referring to documentaries about farmers in Fukushima or objects pointing at current events, such as the pinboard referring to the ongoing efforts to measure radiation levels. This observation may also explain why transdiegetic items were twice as often mentioned by participants in Japan than those in the Netherlands.

Based on our discussion of the findings we present the following design insights to foster other-oriented empathic states through virtual reality games:

- Provide players with a diegetic role, or have them play as themselves, but distinctly different from the other with whom they are asked to empathize (a partaker perspective to empathic engagement).
- Provide players with the opportunity to diegetically reflect on their experience and empathic engagement.
- Present a character's backstory step by step, and make the character emotionally complex in the sense of ambivalence.
- Include objects and events that are identifiable with objects or events in the extrafictional universe, such as common objects that

may be personally relevant for a majority of players, events that have had a prominence in media, or events that are still ongoing.

- Care should be taken when including objects that may have symbolic meaning, as these may distract players' attention from personal stories behind the object, and in turn impede empathizing with a character.
- Care should be taken when implementing interactive affordances that could support impromptu role play of the told narrative, as it seems to foster the self-oriented empathic state of emotion matching and may induce self-absorption.

7.8 Limitation

First, due to the explorative nature of the study, it is important to note that no causal relationship between players' experience and Permanent's design can be deduced. Yet, our findings provide first insights into design aspects prominently associated with other-oriented empathic states. Second, while a field study afforded a more natural interaction with the game world, we do acknowledge that a field setting also presents the risk of participants being influenced by situational and contextual cues. Third, while care was taken to translate the non-English interviews to stay as close as possible to the original, nuances may have been lost through the translation.

7.9 Conclusion

Empathy is often considered a primary building block for social interaction (Segal et al., 2012), with the other-oriented empathic state of empathic concern as a primary source for producing altruistic motivation to helping others in need (Batson, 2010; Batson, 2011; Batson & Ahmad, 2009). Yet the research so far does not clarify how players experience other-oriented empathic states in virtual reality games and how to design for such experiences. We present the design of Permanent, a virtual reality game aiming to foster other-oriented empathy with evacuees from the 2011 Fukushima nuclear disaster through the employment of a partaker perspective to empathic engagement. We analyzed interview data of 78 participants from the Netherlands and Japan regarding their experience with Permanent, and found that participants experienced other-oriented empathic states more than twice as often as self-oriented empathic states. We also identified four themes characterizing players' experience ranging from participants commenting on experiencing both

positive and negative feelings and thoughts, to participants interpolating their game experience with extrafictional objects or events, and vice versa. Our findings underline the potential of, and present novel design insights for, fostering other-oriented empathic states through virtual reality games. In turn, these results all together contribute to answering design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?

The Hunt

Students: J. Smets, J. van der Heide, J. Hamoen, C. Bos
Coach: E.D. van der Spek

The Hunt is a persuasive game designed to address illegal poaching in Africa, particularly raising awareness on the extinction of rhinos as the result of illegal hunting. The Hunt leverages immersive technologies to provide players with a first-person perspective of either the hunter (see Figure 107) or his companion, providing the player the choice between experiencing two different levels of involvement in the presented events, albeit both through a partaker perspective to empathic engagement. In the former perspective, the player carries a weapon and is tasked to hunt a rhino trying to escape, and in the latter perspective the player drives alongside the hunter to watch him chase and eventually shoot the rhino.

Figure 107 (↓)
The player joins a poacher to hunt down rhinos

Both perspectives can be labeled as a partaker perspective to empathic engagement as both are diegetic but distinctly different from the character in distress (i.e., the rhino). The designers of The Hunt described focusing on two aspects to increase persuasion, namely empathy through the narrative-driven aspects of the game and procedural rhetoric through the decisions that players can make in the game (particularly the decision to shoot the rhino in the end). There are, however, two other aspects that are worth mentioning. First, The Hunt expressly states the game's message textually at the end of the game describing that rhinos are near extinct. This reiteration may help clarify the game's intent and drive home the persuasive message. Second, because the player is confronted with the game's message after the player has engaged in 'unethical' behavior, one may argue that some players may experience a degree of cognitive dissonance.

Chapter 8

Conclusion

8.1 Introduction

This chapter connects all the design research carried out, reiterates the findings and major contributions, as well as offers a perspective into the future design and research of socially aware persuasive games that strategically combine an appeal to empathy and the employment of immersive technologies.

8.2 Recap of the Work

This dissertation can be broken down into two parts. The first part, comprising chapters 2 to 4, focused on understanding the broader field of persuasive games, described how players interact with them, and offered insight into persuasive game production. These chapters addressed the first research objective of mapping out the landscape of persuasive games and answered research question 1 (RQ1): What are persuasive games, how do players interact with them, and how are they designed? This first part also addresses the second research objective of surveying current approaches and novel opportunities for persuasive game design, with answering research question 2 (RQ2): What are the current approaches and novel opportunities for persuasive game design? The answer to RQ2 marks the start of the second part of this dissertation, which narrows down the focus on exploring the factors of empathy and immersion as a novel approach in the design of socially aware persuasive games. Part 2, comprising chapters 5 to 7, were in turn driven by research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? Below, a recap of each chapter is offered, after which an overview of the major contributions is presented.

The second chapter explored contemporary concepts of persuasive games, and subsequently defined persuasive games as interactive rule-based entertainment media designed with the intent to shape players' attitudes towards an object or issue in reality. Formulating this definition of persuasive games helps position this work within the broader design and research fields of games and persuasive communication, and highlights the important factors that persuasive games primarily aim to shape attitudes rather than behavior, that these effects are expected to transfer into reality by design, and that their categorization largely depends on the persuasive intent of their designers.

Based on this concept of persuasive games, along with describing several illustrative cases, the second chapter continued with exploring the body of literature related to persuasive communication, particularly the interaction between the game and the player, and concluded with offering a model that visualizes how players interact with persuasive games. This model connects the dots between existing literature on persuasive communication in relation to games and helps uncover still underexplored design spaces of persuasive game design and research. This includes the aspect of attitude transfer between the fictional and extrafictional universe for which immersion, personal relevance, and credibility are preliminarily identified as possible factors. Furthermore, the second chapter opened the exploration of technological advancements, such as immersive technologies, to offer a persuasive edge in the design of persuasive games.

The third chapter followed with a focus on the latter aspect of the first design research questions (RQ1): how are they (persuasive games) designed?, and presented a literature survey on aspects related to designing persuasive games, highlighting both opportunities and recommendations for designing persuasive games as well as challenges in the production of persuasive games. This chapter addressed both research focusing on the design of persuasive games, highlighting their unique persuasive design opportunities such as the use of procedural rhetoric, as well as the use of more traditional persuasive approaches known to the broader field of entertainment persuasion, but positioned within the context of persuasive games. This work addressed the second design research question (RQ2): What are the current approaches and novel opportunities for persuasive game design?, by offering a review of contemporary approaches, opportunities, and challenges for persuasive game design and by distilling novel design spaces. This work highlights that there are three overarching categories, namely approaches and strategies that pertain to specific game mechanics and elements, conducive experiences, and design processes. Among the distilled approaches, chapter 3 pointed at the possible persuasive capacity of persuasive game experiences that are both immersive and empathic, and marked this as a topic for further investigation.

The fourth chapter offers a perspective on the professional production of persuasive games. Through the deployment of a production study insight is gained on the design and development of the widely acclaimed persuasive game This War of Mine, through an interview and workshop

with members of 11 bit studios. A thematic analysis was carried out with the interview and workshop data, which generated a unique insight in the production of This War of Mine and concluded with describing several opportunities and challenges, among which the emotional impact that producing a war-themed persuasive game - based on real events - can have on its designers, that designing persuasive games requires an iterative process to realize intended effects, that balancing entertainment and seriousness is an intricate process, and that morality is explored as a core factor in creating an emotionally realistic experiences.

In the fifth chapter, the findings thus far were aggregated and scrutinized for a common point of interest to propel further design research, particularly as a basis for the two major research through design projects conducted as part of this work. This chapter elaborated on the particular focus on the current approach and novel opportunity to strategically combine an appeal to empathy and deployment of immersive technologies. Hand in hand with this focus a framework was presented that delineates three player perspectives to empathic engagement with intradiegetic object(s) - the observer, partaker, and victim - in socially aware persuasive games employing immersive technologies. Accordingly, the design research objective was further narrowed to the exploration of these perspectives to empathic engagement, to better understand their practical opportunities and challenges, empathic effects on the player, and ultimately their implications for future socially aware persuasive game design and research. This narrowing of the research focus led to the formulation of design research question 3 (RQ3): How to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players?

The sixth and seventh chapters were driven by RQ3 and accompanying framework, delineating the three perspectives to empathic engagements, which acted as a springboard for deploying two research through design projects. Chapter 6 specifically explored the victim perspective to empathic engagement, with the A Breathtaking Journey project as the first of two major research through design explorations presented in this dissertation. A Breathtaking Journey is a multisensory mixed reality game that provides the player with a first-person perspective of a refugee's journey. A qualitative study was conducted to gain insight into player experiences and helped identify the presence of empathic

states, and particularly the more self-oriented empathic states. Analysis of the qualitative data highlighted several design opportunities and challenges, including the value of viscerally-engaging experiences, the ability of mixed reality to support a victim perspective and in turn drive self-oriented empathic states, as well as the importance of down time as part of highly immersive experiences to offer players a moment to reflect on the given situation and condition. In turn, the latter aspect was identified as a contributing factor for the transfer of attitudes from the fictional universe to the extrafictional universe. Chapter 7 followed with a similar format as chapter 6, but focused on deploying a partaker perspective - rather than a victim perspective - to empathic engagement in the design of persuasive games using immersive technologies. Given the highly immersive and self-oriented empathic reports presented by players of A Breathtaking Journey, chapter 7 further explored the question as to whether highly immersive persuasive game experience may also be capable of fostering other-oriented empathic states aside from self-oriented empathic states.

Taking insights from the A Breathtaking Journey project into account, along with focusing on fostering other-oriented empathy, employing a partaker perspective, and exploring the notion of diegetic reflection, the persuasive game Permanent was produced. Permanent is a virtual reality game in which players are cast into the role of a reporter tasked to gain insight into the lives of evacuees from the 2011 Fukushima Daiichi nuclear disaster. A study affirmed the capacity of socially aware persuasive games using immersive technologies to foster other-oriented empathic states aside from self-oriented empathic states, and concluded with several recommendations that may help in achieving this effect. For instance, designers are recommended to provide a character's backstory step by step, and make the character emotionally complex in the sense of ambivalence, as well as the inclusion of objects and events that are identifiable with objects or events in the extrafictional universe, such as common objects that may be personally relevant for a majority of players, events that have had a prominence in media, or events that are still ongoing. Aside from the offered recommendations, the study also highlighted several challenges that may hinder the fostering of other-oriented empathic states in particular, such as the implementation of interactive affordances that could support impromptu role play of the told narrative. The eighth chapter presents a brief introduction to the second collection of student-designed persuasive games using immersive technologies,

offering a set of illustrative cases demonstrating how empathy may be fostered in persuasive game sousing immersive technologies, what perspectives to empathic engagement are employed, and how they are used as a persuasive appeal to shape how players think and feel about issues in reality. The next section of this conclusion chapter delineates all the major contributions of this design research work presented in this dissertation according to the categorization of contributions in Human-Computer Interaction by Wobbrock (2012), as introduced in the Design Research Contributions section of the Introduction chapter.

8.3 Design Research Contributions

As described in the Design Research Contributions section of chapter 1, the contributions of this work may be categorized as survey, artifact, empirical, and theoretical contributions within the design research field of Human-Computer Interaction (Wobbrock, 2012). Accordingly, this section of the conclusion chapter provides a recap of each individual major contribution offered with this design research work. This also includes related opportunities, approaches, challenges, and recommendations for appealing to empathy and using immersive technologies in the design and research of games to shape how players think and feel about issues in reality.

Survey Contributions

This work offers survey contributions by reviewing the landscape of persuasive game design and research, to uncover "emergent themes and trends, identifying gaps where new opportunities lie" (Wobbrock, 2012, p. 5). By synthesizing persuasive game-related theoretical and practical material, this design research aims to provide a perspective on contemporary persuasive games, player interactions, and still unexplored opportunities and challenges for persuasive game design and development. In general, two types of survey contributions have been offered as the outcome of this design research, with on the one hand the overview and review of the various perspectives to persuasive games and on the other hand the identification of novel and emerging persuasive game design spaces and trends. The major survey contributions offered as part of this work are concentrated in the second and third chapter of this dissertation. This survey yielded insight into how persuasive games may be defined, what other fields of research can contribute to the understanding of persuasive games, what design

strategies may be employed by persuasive game designers, and also what uncharted design spaces and emergent trends can be observed.

This work first explored the concept of persuasive games and the components that contribute to a persuasive experience. For instance, the concept of transfer was observed as the result of visually mapping related research on persuasive communication in connection to persuasive games, referring to the adoption of attitudes held in the fictional universe in the extrafictional universe and vice versa. For persuasive games, this aspect is fundamental as it reflects the core intention of persuasive game designers to shape how players think and feel in the extrafictional universe. Furthermore, the survey highlighted that persuasive games likely benefit from being engaging, credible, and relevant to the player, in terms of persuasive capacity.

In terms of uncharted design spaces and emergent trends, this work highlighted the two components immersion and empathy. Immersion has been found to be conducive for persuasion in traditional media and at the same time an often-sought-after experience in games. However, immersion has not been explored to great lengths in terms of persuasive games. Considering the difference in processing of persuasion through entertainment media compared to nonentertainment media, in terms of the attention given to arguments, a focus on immersion as supporting experience in persuasive games offers new persuasive opportunities. Furthermore, this focus on immersion as a factor in the design of persuasive games is also related to the emerging trend of using immersive technologies for games, which is partly evident through the recent influx of new and affordable commercially Head-Mounted Displays.

In relation to this, it is worth pointing out that many of the early explorations as part of the current wave of virtual reality were, in part, focused on the goal to offer players a new perspective on issues by offering a first-person perspective, and have them empathize with those affected by the issue. This immediately leads to the next novel design space, which is the fostering of empathic states as persuasive appeals in the design of persuasive games. An interest in the fostering of empathic states is threefold. One, as briefly mentioned above, empathy has been a core aspect of persuasive games that employ immersive technologies, despite the limited research on the effects of immersive technology on supporting certain empathic states. Two, across the literature,

empathy has been shown to be a strong mediator in the shaping of attitudes in communication ranging from interpersonal contact, books, and film. Three, empathy is one of two core components of the seminal transportation theory, the other being mental imagery, which has repeatedly shown positive results in terms of shaping attitudes through written narratives. However, despite the persuasive potential of empathic experiences, research is limited and only few have offered related practical design opportunities and recommendations.

Artifact Contributions

Second, this design research offers several artifact contributions. An artifact may be described as

> inventions, which include new systems, architectures, tools, techniques, or designs that reveal new opportunities, enable new outcomes, facilitate new insights or explorations, or impel us to consider new possible futures. Artifact contributions are, by definition, dependent upon never-before-seen inventions that are instantiated as prototypes, sketches, mockups, demos, or other envisionments, and are often but not always at least partially functional. (Wobbrock, 2012, p. 2)

The artifact contribution of this design research can be found in the applied explorations of persuasive game design, and particularly the fostering of empathy through socially aware persuasive games using immersive technologies. The artifact contribution consists of both the work resulting from guided student persuasive game design projects as well as the two primary artifacts of this design research, namely A Breathtaking Journey and Permanent. The latter artifacts are the result of a research through design approach, which aims to produce

> design artifacts as outcomes that can transform the world from its current state to a preferred state. The artifacts produced in this type of research become design exemplars, providing an appropriate conduit for research findings to easily transfer to the HCI research and practice communities. (Zimmerman et al., 2007, p. 493)

The artifact contributions of this design research act as illustrative cases for the design of socially aware persuasive games that strategically combine an appeal to empathy and the employment of immersive technologies, as dissemination within academia but also to the broader

public thanks to their approachable and tangible format, where they may help illustrate research concepts, highlight potential capacities, and act as inspirational cases for fellow makers.

First, the student projects, albeit small explorations, highlight various ways in which theory on persuasive games can be materialized. For instance, Mr. Powerful exemplifies a form of procedural rhetoric to present arguments, whereas Cornered a demonstrates a more narrative-driven approach, Footprint employs the concept of highlighting multiple perspectives on the same issues, Exchanging Perspectives provides insight into the use of more abstract representations, and AllRight illustrates the arousal of empathy between players as a steppingstone to the arousal of empathy towards the less privileged. Although studies have not been carried out with these projects, they are contributions that illustrate practical implementations of theory and may function as a source of inspiration for future research and design. Second, the research through design artifacts A Breathtaking Journey and Permanent are illustrative example cases that implement the generalizable concepts of a victim and partaker perspectives to empathic engagement, which in turn may be regarded as strong concepts (Höök & Löwgren, 2012).

Furthermore, the former project embodies design aspects that are particularly conducive for the fostering of self-oriented empathic states, whereas the latter project embodies design aspects that are particularly conducive for other-oriented empathic states. While both research through design projects should be observed holistically when taking the empirical studies into account, they also illustrate more specific design concepts. For instance, A breathtaking Journey illustrates how using the player's breathing pattern as input may support visceral engagement and how the moment in which players cannot do anything other than observing the scenery may have contributed to reflecting on the matter at hand. Thus, this design aspect is an exemplification of the theoretical concept that reflection supports persuasion.

Similarly, Permanent also offers several of such design aspects that may be employed as independent design concepts. For instance, reflection in Permanent was fostered through several design aspects, among which the offering of a role specifically tasked to find out what happened to the evacuee, one that also required players to draft their own report as part of the experience. Permanent also demonstrated the use of design aspects that may be conducive for a sense of personal relevance, which

include the ability of players to personally select the items they find most interesting or worth mentioning. This included the possibility of extending the virtual gameplay with a fitting exercise in the physical space, which may be used as a technique in future projects to support the bridge between the fictional and extrafictional universe. A selection of these specific design aspects are articulated in this design research, but part of the value of artifact contributions lies in their opportunity to function as a source of inspiration to fellow designers, researchers, and the broader public, even for design aspects that are not specifically articulated in this design research.

Empirical Contributions

Third, this design research offers an array of empirical contributions. Empirical contributions include "new findings based on systematically gathered data. Empirical contributions may be quantitative or qualitative (or mixed), and usually follow from scientific studies of various kinds (e.g., laboratory, field, ethnographic, etc.)" (Wobbrock, 2012, p. 1). In general, the empirical contribution of this design research is twofold, with on the one side qualitative empirical insights into the production of persuasive games through interviews with persuasive game designers and on the other side the deployment of qualitative studies focusing on player experiences as the result of interactions with the artifact contributions of this design research. While no significant causal relationship between specific designed aspects of the artifacts and resulting empathic or attitudinal effects can be deduced, the empirical studies do provide a holistic evaluation of the artifacts, highlight what design aspects may be related to particular player experiences and rationales, and aid in uncovering new unconsidered design opportunities and challenges for future research and design.

The production study carried out on location with the team behind the highly acclaimed game This War of Mine offers insight into the professional production of this commercial persuasive game. The thematic analysis of the interview data and process identified several unique insights valuable for the understanding of persuasive game design and development. First, the study offered a glimpse into the struggles that designers may face when working on a persuasive game, including the tension between creativity and profitability. Second, this study revealed the focus on designing for emotionally realistic experiences in an attempt to move the player emotionally, with morality

and as a central theme throughout the design and development. This also highlighted the hidden costs and responsibility of designing a game with morally engaging content as well as the complexity of balancing emotional realism and entertainment. Furthermore, it was underscored that emotional realism is perhaps more important than realism in terms of audiovisual quality to humanize gameplay. Third, the study uncovered how contextual and situational cues influence the design of a game and how an iterative design process helps to refine the eventual player experience.

Next, the empirical study with A Breathtaking Journey brought insight into the employment of a victim perspective, highlighting its value for stimulating self-oriented empathic states. The study carried out with A Breathtaking Journey highlighted how players experience visceral engagement, felt absorbed by the immersive experience to the point at which no other-oriented empathic states occurred, and how some players took dull moments as a way to reflect on how the represented victim may think and feel in the extrafictional universe. Whereas the former findings described the advantage of a victim perspective on intensifying the emotional experience, the latter may be considered as a key aspect to support the transfer of attitudes from the fictional to the extrafictional universe.

The empirical study carried out with Permanent brought insight into the use of a partaker perspective to empathic engagement as well as the specific focus on fostering other-oriented empathic states, particularly in regard to how players experienced the design considerations related to these factors. First, the thematic and content analysis of the interviews and whiteboards highlighted the influence role taking has on the possible types of empathic states players experience. Players who either inhabited the intended role of a reporter or described to play as themselves more frequently reported experiencing other-oriented empathic states, whereas those who role-played as the victim reported more self-oriented empathic states. In reflecting on the analysis with A Breathtaking Journey this underscored that it is not necessarily playing as oneself that inhibits other-oriented empathic states, but specifically playing as if one were the one in distress. In Permanent, the likelihood of players playing as the victim was limited by providing a role and experience that was distinctly different from the other in distress, thus resulting in more reports of other-oriented empathic states.

Second, the study pointed at how the inclusion of objects and narratives that help participants to identify with the other in distress may result in a better understanding of the other in distress. Participants seemed to use their own experience for understanding the conditions, emotions, and thoughts of the other in distress, likely as a steppingstone to other-oriented empathic states.

Third, other-oriented empathic states seem to be stimulated among players with the introduction of ambivalent and complex characters, meaning that a character makes references to both positive and negative aspects. This setup, along with the step-by-step introduction to this other in distress, seems to evoke mixed emotions and fosters other-oriented empathic states.

Fourth, on the one hand, participants were observed to refer to - or insert thoughts and feelings - from the extrafictional universe in their reporting. On the other hand, participants were observed to adopt aspects from the intradiegetic universe into their thoughts and feelings towards related issues in the extrafictional universe. This is an important observation, as it illustrates that players did not only empathize with the other in distress but effectively collapsed the narrative universes, and projected intradiegetic thoughts and feelings onto extrafictional objects and events. It is argued that this effect may be stimulated with the inclusion of objects or events that have had a prominent presence in other media, like in documentaries or ongoing efforts to solve the issue at hand.

Theoretical Contributions

Finally, this design research offers theoretical contributions, which concerns "new or improved concepts, definitions, models, principles, or frameworks" (Wobbrock, 2012, p. 3), by weaving together insights into conceptual models that describe players' experience and interaction, novel definitions to improve understanding of concepts, as well as opportunities, challenges, and recommendations for future research and design.

Concepts and Definitions

First, in terms of new and improved concepts and definitions, this design research offers a definition for persuasive games that is meant to be genre and approach agnostic, and particularly characterized by a

focus on shaping attitudes and the designers' intent as a starting point for design. This definition differentiates persuasive games from other related concepts such as gamification and persuasive technologies, and therein helps to better position persuasive games within the broader domain of Human-Computer Interaction. This novel definition was explained in detail in chapter 2 and describes persuasive games as interactive rule-based entertainment media designed with the intent to shape players' attitudes towards an object or issue in reality. Along with a theoretical and practical rationale for this definition, the field of persuasive games was explored and illustrative examples were offered to highlight aspects of this definition.

Furthermore, in reviewing the landscape of persuasive games the concept of transfer was introduced as an underexplored factor in the design of persuasive games, pointing at the bridge between the fictional and extrafictional universe. With further elaborating the concept of transfer, three preliminary factors were introduced for designers to focus on that may have an effect on the transfer of attitudes between the real and fictional universe, namely relevance, engagement, and credibility.

In terms of design, particularly the factor of engagement was highlighted as an area of interest that designers could leverage in the design of their persuasive games. The factor of engagement resonates well with work on entertainment persuasion claiming that engagement is effective for reducing counterarguing, which is often seen as a difficult aspect to overcome in any type of persuasive communication. Furthermore, it has been argued that persuasion through entertainment works differently than classic persuasion, with the engagement factor playing a key role in diverting attention from the arguments rather than highlighting them.

The other two factors of transfer also play an important role in persuasive game design, with credibility shown to increase trustworthiness of a message and fostered through statements or support of external experts, the collaboration with charities, and relevance to increase applicability through increasing an issue's urgency for players or by personalizing the persuasive game to resonate well with the intended target audience (e.g., taking cultural aspects into account when designing a persuasive game). However, the factors of relevance and credibility may differ per player or group of players, whereas engaging factors by means of a gripping storyline, tactical challenges, or through the employment of immersive technologies may be more universally enjoyed. Finally, the factor of

engagement was identified as a factor that offered a novel opportunity space for design, in part due to the recent developments related to immersive technologies (which technically induces immersion) and due to the key role engagement plays in works on narrative persuasion (e.g., transportation theory).

Models and Frameworks

In terms of frameworks this design research offers two contributions, one framework focusing on players' interaction with persuasive games and another delineating the different perspectives to empathic engagement as a means to foster empathy, which has been identified as a powerful persuasive appeal. The former framework, named the Attitudinal Gameplay Model, was generated as a means to visualize related theories on persuasive communication into a single overview and to dive deeper into how players interact with persuasive games. The model highlights the different routes to persuasion in persuasive games and is meant to support persuasive game designers in leveraging a variety of persuasive theories. Furthermore, the framework highlights the underexplored concept of transfer discussed above, indicating the position and bridging of real and fictional universes.

The latter framework focuses on delineating three different perspectives to empathic engagement in persuasive games using immersive technologies. This framework is the result of narrowing down the design research question to a focus on immersion and empathy as a means to offer a conducive environment for persuasion. The framework offers designers three perspectives - the victim, partaker, and observer perspective - which can be employed by persuasive game designers to stimulate the fostering of particular empathic states. In its early form, this framework was used as a springboard for the two research through design projects: A Breathtaking Journey (exploring the victim perspective) and Permanent (exploring the partaker perspective), and was further developed over the course of these projects. In turn, the two research through design projects act as exemplary projects to illustrate the framework and provide insight through the empirical studies. Both design explorations showed that multiple empathic states can be fostered through persuasive games using immersive technologies, but that a victim perspective seems particularly conducive for fostering self-oriented empathic states such as imagine-self perspective and emotion matching, and that a partaker perspective seems particularly conducive

for fostering other-oriented empathic states such as imagine-other perspective and empathic concern.

Principles

Finally, this design research generated several principles (in the form of challenges, opportunities, and recommendations) to support future persuasive game designers and drive new research. Due to the shift in focus following the literature study, these principles are primarily useful for those seeking to foster empathic experiences and leverage immersive technologies as an integral part of their persuasive game design. Some of these principles relate to the overall design process, whereas others describe more specific design issues or implementations. Regardless, as contextual and situational circumstances differ from project to project, designers are strongly encouraged to not employ these principles blindly, but rather use them as guidelines in their design explorations. What follows is a set of challenges that persuasive game designers may encounter, along with some pointers as to how to deal with these challenges.

Challenges. Persuasive game designers may encounter a set of challenges throughout the design and development of persuasive games, among which are the tension between entertainment and the capitalization of sensitive topics. Socially aware persuasive games often discuss issues that could be uncomfortable, controversial, or even painful to some, and may result in an emotionally difficult experience for both players and designers. The challenge, in part, lies with the notion that a game typically requires a certain degree of engagement to keep players interested, sometimes referred to as being hooked, perhaps more than any other form of media due to its active, rather than passive, player involvement.

This is particularly the case with commercial projects such as This War of Mine, with team members of 11 bit studios articulating the goal to design a game with a message against war, but also stating the importance of creating a game for entertainment as they needed to profit from its production. They justified their work by naming war films that are meant for entertainment too, but argued being aware that working with a sensitive topic like war brought extra tension to the table. Designers understand that a form of dramatization - often requiring the simplification, modification, and compression of actuality in order to avoid long, tedious, and perhaps boring gameplay - is part of

producing an engaging game, but at the same time value the creation of an experience that is true to life and respectful towards those affected by the issue at hand. In the two research through design projects, this tension was present, too, with on the one hand the intention to offer players an immersive and thrilling experience that would keep them engaged, while on the other hand the goal to deal respectfully with the topic at hand and the people involved, as well as to offer a narrative that resonates with actuality. While this tension may not be mitigated entirely due to the nature of such conditions (i.e., dealing with emotionally charged topics), there are some recommendations that may ease the tension. For instance, In This War of Mine the designers afforded themselves some flexibility by not addressing specific events or people in reality, but merely hinting to connections thereto (often through external media, like promotional material). This disconnected the game from reality, thus allowing more creative freedom. Still, the designers of This War of Mine point at their extensive background research on the topic, to make sure that the eventual emotional experience offered to players is realistic and true to life. Furthermore, the added advantage of using thorough background research on the topic to construct fictional worlds and character interactions - that are consistent with reality - is that players will likely also experience them as real and coherent, which in turn may support immersion and believability.

Similarly, in several of the student persuasive game design projects the concept of abstraction was employed as a method to afford otherwise unrealistic or simplistic ways of depicting possibly sensitive events in reality. In a Breathtaking Journey, story aspects such as the immersive dream scene and the implementation of a novel input device for breathing analysis are used to offer an extra engaging dimension without overdramatizing the told story itself. Like This War of Mine, the design of A Breathtaking Journey is fictional, but still based on the stories and experiences of real refugees. In Permanent the engaging properties of exploration, discovery, and the ability to follow a unique and personal route through the overarching story - with a role that drives exploration and understanding - helps keep players engaged, while the addressed events presented through the narrative and the audiovisual representations are true to life and not overdramatized. The interview setup in Permanent also prevents the need to oversimplify or shorten actual events, as a new story is created on the spot through an interview, which is naturally a more compressed and personal perspective of the actual events.

Related to the act of balancing entertainment and message, this work also brought to light the emotional challenges designers and developers face when working on a socially aware persuasive game. There are two ways in which this surfaced. First, the emotional impact of working with emotionally heavy background material, such as having to take in the very personal stories of victims along with all the hardships involved, may have an emotional toll on the designer. Second, the desensitization through overexposure of saddening events throughout play testing may negatively influence the accuracy of these play testing results over time. While no immediate practical solution for the former issue may be formulated based on this design research, the latter issue may be addressed with following an iterative design process that continuously includes new participants who have not played the game before (to avoid inaccurate evaluations caused by desensitization). Next, it is worth noting that persuasive game designers can expect the production of a persuasive game to be a persuasive journey in itself, as scrutinizing the issue at hand, taking in stories of real victims, and exploring emotionally charged gameplay may result in new thoughts and feelings concerning the issue.

In relation to the fostering of empathy and use of immersive technologies, designers may also encounter certain specific challenges. For instance, highly immersive experiences in which players inhabit the victim (adopting a victim perspective) may inhibit other-oriented empathic states as a victim perspective does not immediately provide the player with someone to empathize with other than with oneself. This is unfortunate as particularly the other-oriented empathic state of empathic concern is a primary source for producing altruistic motivation to helping others in need. A recommendation for cases in which designers seek to adopt the victim perspective (because this seems to produce more visceral engagement) while aiming for fostering other-oriented empathic states is to include a moment of reflection, in which players are able to connect their experiences to real events through reflection. This process includes the distancing of players from the character they inhabit in the fictional universe and relating it to those who are represented by this character in the extrafictional universe. Particularly in the A Breathtaking Journey project it was discussed whether players took downtime, a moment in which players had little to do other than to enjoy the scenery, as a cue to drift away and make the bridge to reality (i.e., thinking about the situation of those represented by the fictional character).

In learning from the insights gained with A Breathtaking Journey, the notion of reflection was brought to Permanent as a primary design aspect, in part implemented through having players inhabit the reflective role of a reporter as well as the task to construct an interesting draft for an article. A final challenge that designers may encounter with the use of immersive technologies is that it may cause emotional distress when fictional experiences feel too real, and thus designers are advised to evaluate whether certain experiences - particularly those meant to shock or scare - cause no discomfort to the player (in many ways, immersive technologies work as amplifiers) and may lead to players either distancing themselves from the content or may only ever get to experience the empathic state of emotion matching (thus never considering those represented).

Opportunities. Next, this design research yielded a number of opportunities, novel approaches, and recommendations beyond those that address the specific challenges mentioned above. First, following the strong focus on persuasion through rules and procedures - in other words, a game's mechanics - in past persuasive game design research, this design research recommends designers to also explore other means of persuasion, particularly the more affective appeals, as well as holistic experiences that are particularly conducive for persuasion. First, while both This War of Mine and A Breathtaking Journey offer arguments through their mechanics, a large part of the persuasive experience they offer is driven by appealing to emotions. For instance, This War of Mine appeals to morality and A Breathtaking Journey explores the notion of visceral engagement. Several scholars have argued that persuasion through entertainment, in contrast to more classic forms of persuasion, works by drawing attention away from the argument rather than to it.

As such, it comes as no surprise that experiences such as the feelings of being immersed in a fictional universe are beneficial for the shaping of attitudes. This experience has also been identified as a primary process for how narratives shape attitudes under the umbrella of transportation theory, which consists of the core components of empathy and mental imagery. In games, players are offered a high fidelity fictional universe from the get go (especially when employing immersive technologies) with little need to imagine this fictional universe based on text themselves. While Permanent offers a more balanced palette of cognitive and affective arguments, as well as giving and taking away attention to the arguments through gameplay, its virtual design is still

focused on offering players an immersive experience meant to foster a suspension of disbelief. The immersive player experience in both A Breathtaking Journey and Permanent is likely the result of using immersive technologies in their designs, through the use of immersive technologies. The responses of players indicate that the addition of multiple sensory input/output - beyond audiovisual stimuli, such as smell and movement - did help them to feel more immersed. However, the immersive experience may also partially stem from the narrative or interactive components of these games, as players regularly refer to being drawn in into the story or gameplay.

Furthermore, empathy - the former core component of transportation theory - has been identified as a novel approach in the design of persuasive games early on in this design research, and in turn guided the design of the research through design projects. As a result, various opportunities and recommendations can be offered in relation to the designing of socially aware persuasive games that appeal to empathy specifically. For instance, to support self-oriented empathic states, this design research points at the employment of a victim perspective to have players inhabit the victim and include multisensory experiences. This way, designers can offer a viscerally engaging experience that has players feel what the protagonist may feel in the given situation. Such a setup seems ideal to support the self-oriented empathic state of emotion matching, in which players match their own emotions with what the protagonist may experience.

However, the difficulty with this setup is the possibility of a situation in which players feel as if these emotional experiences were merely their own, and never consider how those who are represented may feel in the extrafictional universe. In order to overcome the issue of players never considering those represented, and thus have players reflect on the given situation in relation to reality, it is recommended to stimulate players to reflect on the situation. For instance, this can either be done by offering a dull moment in which players have nothing to do, a role that will actively require players to think about the situation from a different perspective, or by extending the gameplay with a task that requires players to draft their own ideas or preferences on the topic at hand. Additionally, a simpler way that would not significantly require a change of gameplay would be to clearly state the message at the end of the game. This latter design aspect was implemented in Permanent, and although no specific evaluation has been carried out in this specific case, other scholars

have pointed out that the inclusion of a closing message to clarify the stand points indeed offers a persuasive edge. In terms of arousing other-oriented empathic states, this design research also offers several specific opportunities and recommendations. First, other-oriented empathic states are supported with offering players a diegetic role, or have them play as themselves, but at least one that is distinctly different from the other with whom they are asked to empathize. Furthermore, in relation to this other with whom the player is asked to empathize, other-oriented empathy is stimulated by presenting this character's backstory step by step, and making the character emotionally complex in the sense of ambivalence.

The interest in the arousal of specific empathic states is not because one is necessarily better than the other, but they do bring distinct effects and characteristics to the table. For instance, studies on shaping intergroup attitudes have shown that an imagine-self perspective reduces stereotyping and that empathic concern increases the readiness to help. While this work provides a preliminary insight on the correlation between perspectives to empathic engagement and resulting empathic states, it does signal the opportunity for designers to design for specific empathic states and thus enjoy more control over how attitudes are shaped and what side effects can be expected (e.g., an increased willingness to help).

Another aspect of designing a persuasive game is to bridge the fictional universe to the extrafictional universe, as the game's effects should not have an impact on the attitudes held in the fictional universe alone. To stimulate the transfer between both universes, players are helped with including objects and events that are identifiable with objects or events in the extrafictional universe, such as common objects that may be personally relevant for a majority of players, or events that have had a prominence in media or are still ongoing. However, care should be taken when including objects that may have symbolic meaning, as these may distract players' attention from personal stories behind the object, and in turn impede empathizing with a character. Furthermore, because most games allow players to interact freely, this also means that interpretation of the underlying persuasive message can differ between play sessions. For this reason, it is advised to take care when implementing interactive affordances that could support impromptu role play of the told narrative, as it seems to foster emotion matching which may induce self-absorption.

General Design Recommendations. To conclude this section, several general persuasive game design recommendations may can be distilled based on the work presented in this dissertation. However, it must be noted that due to the explorative nature of the studies no causal relationship between the suggestions and specific empathic or persuasive effects can be deduced.

- Explore experiences that are conductive for persuasion, such as empathy, identification, and morality. Arousing empathy, in particular, will stimulate players to think or feel for or with fictional characters, increasing appreciation for their perspective, condition, or situation, and in turn help shape players' attitudes.
- Focus on creating experiences that are immersive, to have players lose themselves in a fictional universe that resonates with the designer's perspective on the issue at hand. Typically, such immersive experiences cause a temporary disconnect from the extrafictional universe, capturing a player's full attention to help arguments land, and creating a suspension of disbelief to reduce counterarguing.
- In the aim to offer players an immersive experience that will leave them completely disconnected from the extrafictional universe, a persuasive game's primary objective of transferring attitudes to the extrafictional universe may be inhibited. This is why persuasive game designers may want to focus on designing momentary bridges between the fictional and extrafictional universe, for instance, by including game aspects that players can easily relate to from the extrafictional universe, by purposefully designing gameplay that stimulates reflection (from within the fictional universe), or by offering pockets of down time.
- In appealing to empathy, persuasive game designers may want to start with evaluating what empathic state(s) fit their persuasive intent best based on the attitudinal effects they seek, and use that as a potential starting point for the design of their persuasive game. The choice to arouse a particular empathic state informs the perspective to empathic engagement that is best employed.
- Make sure that the design resonates with the intended target audience, not only to increase appreciation but also to explore ways to connect the fictional universe to the extrafictional universe.
- Understand that design and development may be a persuasive journey in itself that could influence designers along the way, in turn

influencing the design of a persuasive game. Furthermore, realize that designers are human too, and not immune to the emotional toll of working with sensitive, saddening, or shocking topics.

8.4 Wrapping Up

This section provides a final reflection on the design research carried out, and offers a perspective on possible future opportunities, approaches, and challenges for socially aware persuasive game design and research. The starting point of this design research was to gain insight into the design and development of persuasive games and to highlight novel approaches that designers may employ as well as the opportunities and challenges they may face throughout production. Based on emerging trends and the identification of uncharted design spaces, this initial research focus evolved into exploring the approach of strategically combining immersive and empathic experiences as a means to shaping attitudes. This, in turn, guided several student design projects and the two major research through design projects, namely A Breathtaking Journey and Permanent.

In a final reflection on the work altogether, several aspects stand out in terms of their significance for current and future socially aware persuasive game design. To start, the design-oriented labeling of persuasive games offered with this work helps in defining the landscape of persuasive games. In focusing on the designers' persuasive intent, one can differentiate between games designed to shape attitudes and those that shape attitudes as a byproduct, as well as include games that are designed with the shaping of attitudes as a secondary intent. For instance, commercial titles such as This War of Mine, Hellblade: Senua's Sacrifice, and Spec Ops: The Line are indeed games designed with the intent to entertain, but also with the intent to shape attitudes. In turn, their design can offer us insights into the production of games meant to be both entertaining and persuasive at the same time.

Following this perspective on persuasive games, this design research identified opportunities and challenges that pertain to both production as well as specific design aspects. For instance, in terms of the former, this work identified that persuasive game production is - in itself - a persuasive journey, and that persuasive game designers deal with both oversensitization and desensitization throughout production. This is not only an important observation in terms of insight into the emotional toll of socially aware persuasive game design, but on a higher level it also

highlights that there is often more behind design decisions than analysis of the artifact alone may reveal. Designers make decisions based on their own background and culture, are inspired by personal or others' experiences, and develop a better understanding of the issue at hand through working on their project. In short, persuasive game design does not happen in a vacuum and designers are continuously influenced by situational and contextual cues (in and out of the workplace). Therefore, it is good to remind oneself that implementing any specific design recommendation - including those mentioned in this dissertation - always remains a discretionary undertaking. Furthermore, because research addressing the bidirectional influence of designers and their persuasive game is still scarce, it accentuates a largely unexplored design research space that warrants further design research. Among the various insights discussed in terms of production, particularly fascinating is the tension that emerges when designers try to respectfully deal with those who are represented and how actual events unfolded (I.e., staying true to reality), while at the same time seeking a form of dramatization to keep players entertained. Beyond experiencing this dilemma first hand throughout the production of A Breathtaking Journey and Permanent, the designers and developers of This War of Mine articulated this tension in their work, and it is likely that other persuasive game designers may face similar tension throughout their production. A possible, but preliminary, approach to reducing this tension is not to replicate reality, but to design fictional events that fit within a framework of reality, and primarily focus on generating emotional realism and coherency with reality.

Beyond insights into production, this dissertation offers a series of artifacts, and in turn insights into the experiences of players interacting with these artifacts. A major allocation of time and effort has gone into the realization of the two artifacts, A Breathtaking Journey and Permanent, as a means to materialize theories and explore novel design opportunities. The A Breathtaking Journey project is a mixed reality socially aware persuasive game about a refugee's journey, employing a victim perspective in its design, whereas the Permanent project is a virtual reality socially aware persuasive game designed to raise empathy towards the evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan, employing a partaker perspective in its design. They are the direct convergence and materialization of aspects identified as supporting in generating both immersive and empathic player experiences, balanced against available time, budget, and manpower.

At the same time these artifacts embody the values, interests, and designerly input of their designers, and while many of the core decisions are detailed in this work, many more are the result of an iterative design and development process influenced by numerous situational and contextual cues. Beyond research purposes, these artifacts are ultimately socially aware persuasive games addressing real world issues, meant to raise awareness, shape attitudes, and inspire both the public and fellow socially aware persuasive game designers through national and international events. This form of public display is perhaps as important for design research as is the presentation of work through journals and conferences, as it provides a gateway to disseminate and discuss practical design insights and illustrative examples beyond the boundaries of academia.

Furthermore, the public events offered the unique opportunity to gain insight into the experiences of players within actual real-life settings following their own intrinsic motivations to engage with the artifacts. For instance, one of the key insights revolves around players indicating feeling fully absorbed by the gameplay or the story and describing their experience as if the events happened to themselves, which may be considered a prime example of the catchphrase “standing in another’s shoe,” as well as an optimal player experience indicating that the game is engaging. However, for empathizing towards others beyond the fictional universe this actually happens to be somewhat counterproductive. In fact, players who felt completely absorbed may have only experienced the empathic state of emotion matching, and potentially never got to the point where they considered the thoughts and feelings of the other in distress, thus inhibiting other-oriented empathic states. In contrast, in another case, players almost effortlessly seemed to blend fictional and real stories together to make sense of the particular conditions or situations of those who were affected. While personality plays a role, design aspects that stimulate reflection seem to have a positive effect on players experiencing other-oriented empathic states - such as imagine-other perspective and empathic concern - which are characterized by a prominent position of the other, rather than self-oriented empathic states wherein the self is more important. This work illustrates that reflection may be stimulated by design aspects such as the inclusion of dull moments in which players have nothing other to do than to drift off in thoughts, a player role that has a reflective or investigative component, the inclusion of game objects that refer to objects in the extrafictional universe, or through the inclusion of transreal gameplay.

Beyond the offering of insights into player experiences and recommendations for future design, this work clearly demonstrates the ability of socially aware persuasive games - using immersive technologies - to foster empathy, and moreover how designers can gear their design towards arousing self-oriented and other-oriented empathic states as an approach to designing socially aware persuasive games. For instance, this design research offers practical examples as to how different perspectives to empathic engagement influences the arousal of particular empathic states, as well as how the ambivalence of fictional characters may influence the arousal of certain empathic states.

Altogether this work offers both a theoretical and practical perspective as to how socially aware persuasive game designers may foster empathy through their designs using immersive technologies, therein providing an answer to research question 3 (RQ3) of how to foster empathy through socially aware persuasive games, using immersive technologies, as a steppingstone to shaping the thoughts and feelings of players? However, as the current wave of immersive technologies is still young and empathy has not been scrutinized as a persuasive appeal within persuasive games to the same extent as it has been within fields related to narrative persuasion, there is likely a lot left to discover. Future research should provide insight into how players transfer empathic states and attitudes between the real and fictional universe, how designers can create experiences that are both absorbing and reflective (in relation to represented characters, conditions, and situations) at the same time, as well as how the inclusion of other senses in gameplay may offer new opportunities for influencing empathic states and attitudes.

Limitations and Ethical Considerations

No work comes without limitations and ethical considerations, and the studies presented in this dissertation are no exception. In terms of limitations, due to the explorative nature of this work it is important to note that no precise causal relationship between players' experience and design aspects can be deduced. For this, a more clinical study may be preferred in which a specific design aspect can be evaluated and compared over a large sample size. However, an advantage of a more explorative approach to research is that it excels at capturing rich insights and supports in generating yet unconsidered opportunities and challenges from data. Given the primary objectives of this work - to explore novel approaches, opportunities, and challenges for persuasive

game design - a more explorative approach was deemed more suitable. Still, despite the belief that predefined design solutions rarely produce novel and innovative persuasive games, it is true that the insights generated would benefit from a more clinical research approach in order to produce more generalizable and causal conclusions. Another limitation lies in the use of field studies as a primary method for gathering data. While field studies afford a more natural interaction with the game (both in approaching the game and playing it), it has to be acknowledged that a field study also presents the risk of participants being influenced by situational and contextual cues. Furthermore, while all studies have been carried out with representative self-motivated participants across multiple countries, it is understood that the work is ultimately limited to a distinct part of the world population. Finally, the interviews presented in this work were conducted with participants of which the vast majority are not native to the English language. Despite the goal to stay as close as possible to the original text and involve professional translators in the process, nuances may have been lost through the translation.

In terms of the ethical considerations, the chapter 1 (specifically section 1.3 Design Research Space) of this dissertation provides a perspective on conducting ethical research and ethical persuasion. In short, the author promises to contribute to society and human well-being, avoid harm, be fair, be honest and trustworthy, and respect both privacy and the work of others. Furthermore, the author carried out this work with the promise to be an ethical persuader, and wishes all those who use the insights offered with this work to make this promise too, and as such "affirm the dignity of each person, treat audience members as free and autonomous agents, present facts and opinions fairly, and provide different perspectives on an issue to enable people to make the most thoughtful decision possible" (Perloff, 2008, p. 50).

Final note

As a final note, I also hope that this work contributes to the growth and acceptance of games as a worthwhile medium to raise awareness and shape attitudes on humanitarian and social issues - to or beyond the same level as film documentaries - as well as encourage the design of games that stimulate people to become more empathic beings. This encouragement somewhat extends beyond the immediate scope of this research, namely the employment of empathy as a persuasive appeal, but has surfaced as a byproduct that cannot be ignored. The importance

of empathy cannot be understated as it is the social glue that keeps human societies together and is considered a primary building block for social interaction. However, increased media consumption - including the use of games - has been blamed for playing a part in the declining empathic abilities among parts of the population. Fortunately, this work vividly illustrates the opposite is true as well by demonstrating that games may actually stimulate a variety of empathic states, and thus helping us to actually better understand and feel for or with one another.

References

11 bit studios. (2014a). This War of Mine [Video Game]. 11 bit Studios. http://www.thiswarofmine.com

11 bit studios. (2014b). This War of Mine Launch Trailer - The Survivor : Youtube. Retrieved 2019-10-02

11 bit studios. (2018). What would you do with 500k dollars? This War of Mine and War Child changing the world: Youtube. Retrieved 2019-10-01 from https://youtu.be/17ojWP--0fs

Adamo, G., Mushiva, M., & Willis, M. (2017). Persuasion and Empathy in Computer Games, An Ontological Perspective. The Philosophy of Computer Games Conference, Kraków 2017.

Adams, A., Lunt, P., & Cairns, P. (2008). A qualititative approach to HCI research. In P. Cairns & A. Cox (pp. 138-157). Cambridge University Press. https://doi.org/10.1017/CBO9780511814570.008

Ahn, S. J., Bailenson, J., Nass, C. I., Reeves, B., & Wheeler, S. C. (2011). Embodied experiences in immersive virtual environments effects on pro-environmental attitude and behavior (Unpublished doctoral dissertation). Stanford University.

Ahn, S. J. G., Le, A. M. T., & Bailenson, J. (2013). The Effect of Embodied Experiences on Self-Other Merging, Attitude, and Helping Behavior. Media Psychology, 16(1), 7–38. https://doi.org/10.1080/15213269.2012.755877

Ahn, S. J. G., Bailenson, J. N., & Park, D. (2014). Short- and long-term effects of embodied experiences in immersive virtual environments on environmental locus of control and behavior. Computers in Human Behavior, 39, 235–245. https://doi.org/10.1016/j.chb.2014.07.025

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179–211. De Young, 509-526. https://doi.org/10.1016/0749-5978(91)90020-T

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Rothstein, H. R., & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review. Psychol. Bull., 136(2), 151-173. https://doi.org/10.1037/a0018251

Antle, A. N., Tanenbaum, T. J., Macaranas, A., & Robinson, J. (2014). Games for Change: Looking at Models of Persuasion Through the Lens of Design. In A. Nijholt(pp. 163-184). Springer Singapore. https://doi.org/10.1007/978-981-4560-96-2_8

Antoniades, T. (2017). Hellblade: Senua's Sacrifice. Hellblade Feature Documentary.

Antonisse, J., & Johnson, D. (2013). Hush [Video Game]. http://www.jamieantonisse.com/hush/

Arduino. (2015). Arduino Microprocessor. https://www.arduino.cc

Aristotle. (2004). Rhetoric (W. R. Roberts, Trans.). Dover Publications, Mineola, NY. (Original work published 350 BCE / Original translation published 1924).

Arjoranta, J. (2014). Game definitions: A Wittgensteinian approach. Game Studies: the international journal of computer game research, 14.

Aronson, E. (1999). The power of self-persuasion. American Psychologist, 54(11), 875–884. https://doi.org/10.1037/h0088188

Arora, G., Pousman, B., & Milk, C. (2015). Clouds over Sidra [360° Video]. https://www.with.in/watch/clouds-over-sidra/

Ash, J. (2012). Attention, Videogames and the Retentional Economies of Affective Amplification. Theory, Culture & Society. https://doi.org/10.1177/0263276412438595

Association for Computing Machinery. (2018, June 22). ACM Code of Ethics and Professional Conduct. Retrieved March 2, 2022, from https://www.acm.org/code-of-ethics

Audio-Technica. (2014). ATH-M40x. http://www.audio-technica.com/cms/headphones/75b2f282c93a7651

Bachen, C. M., Hernández-Ramos, P. F., & Raphael, C. (2012). Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games. Simulation & Gaming, 43(4), 437-460. https://doi.org/10.1177/1046878111432108

BAFTA Guru. (2018). 'I Was In Tears Most Days' Tameem Antoniades on Making Hellblade: Senua's Sacrifice [Video]. YouTube. https://www.youtube.com/watch?v=fftTG-o5A10

Bang, M., Torstensson, C., & Katzeff, C. (2006). The PowerHhouse: A Persuasive Computer Game Designed to Raise Awareness of Domestic Energy Consumption. In (pp. 123-132). Springer Berlin Heidelberg. https://doi.org/10.1007/11755494_18

Bardzell, J., & Bardzell, S. (2015). Humanistic HCI. Synthesis Lectures on Human-Centered Informatics, 8(4), 1-185. https://doi.org/10.2200/S00664ED1V01Y201508HCI031

Barthes, R. (1977). Rhetoric of the Image.

Basballe, D. A., & Halskov, K. (2012). Dynamics of Research through Design. DIS ‘12, 58-67. ACM. https://doi.org/10.1145/2317956.2317967

Basil, D. Z., Ridgway, N. M., & Basil, M. D. (2008). Guilt and giving: A process model of empathy and efficacy. Psychology and Marketing, 25(1), 1–23. https://doi.org/10.1002/mar.20200

Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective Taking: Imagining How Another Feels Versus Imaging How You Would Feel. Personality and Social Psychology Bulletin, 23(7), 751–758. https://doi.org/10.1177/0146167297237008

Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, Attitudes, and Action: Can Feeling for a Member of a Stigmatized Group Motivate One to Help the Group. Pers. Soc. Psychol. Bull., 28(12), 1656-1666. https://doi.org/10.1177/014616702237647

Batson, C. D. (2009). Two forms of perspective taking: Imagining how another feels and imagining how you would feel. In K. D. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), Handbook of imagination and mental simulation (pp. 267–279). Psychology Press.

Batson, C. D., & Ahmad, N. Y. (2009). Using empathy to improve intergroup attitudes and relations. Social Issues and Policy Review, 3(1), 141–177. https://doi.org/10.1111/j.1751-2409.2009.01013.x

Batson, C. D. (2010). Empathy-induced altruistic motivation. Prosocial Motives, Emotions, and Behavior: The Better Angels of Our Nature., 15–34. https://doi.org/10.1037/12061-001

Batson, C. D. (2011). Altruism in humans. Oxford University Press, USA. DOI:10.1093/acprof:oso/9780195341065.001.0001

Belman, J., & Flanagan, M. (2010). Designing games to foster empathy. International Journal of Cognitive Technology, 15(1), 11.

Benford, S., & Giannachi, G. (2011). Performing Mixed Reality. The MIT Press.

Benford, S., Greenhalgh, C., Giannachi, G., Walker, B., Marshall, J., & Rodden, T. (2012). Uncomfortable Interactions. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems CHI ‘12, 2005-2014. https://doi.org/10.1145/2207676.2208347

Biocca, F. (2003). Can we resolve the book, the physical reality, and the dream state problems? From the two-pole to a three-pole model of shifts in presence. In EU Future and Emerging Technologies, Presence Initiative Meeting.

Birdwell, K. (1999, December 10). The Cabal: Valve’s Design Process For Creating

Half-Life. Game Developer. Retrieved March 30, 2017, from https://www.gamedeveloper.com/design/the-cabal-valve-s-design-process-for-creating-i-half-life-i-

Blythe, M. A., Overbeeke, K., Monk, A. F., & Wright, P. C. (2004). Funology: From Usability to Enjoyment (Human–Computer Interaction Series, 3) (2003rd ed., Vol. 1). Springer. https://doi.org/10.1007/1-4020-2967-5

Bogost, I. (2007). Persuasive games: The expressive power of videogames. MIT Press. https://doi.org/10.1093/llc/fqn029

Bogost, I. (2011). How to do things with videogames. U of Minnesota Press.

Boltz, L. O., Henriksen, D., & Mishra, P. (2015). Rethinking Technology & Creativity in the 21st Century: Empathy through Gaming - Perspective Taking in a Complex World. TechTrends, 59(6), 3–8. https://doi.org/10.1007/s11528-015-0895-1

Bopp, J. A., Mekler, E. D., & Opwis, K. (2016). Negative emotion, positive experience? Emotionally moving moments in digital games. In (pp. 2996-3006). New York, NY, USA: Association for Computing Machinery. https://doi.org/10.1145/2858036.2858227

Bopp, J. A., Opwis, K., & Mekler, E. D. (2018). "An Odd Kind of Pleasure" Differentiating Emotional Challenge in Digital Games. In. New York, NY, USA: Association for Computing Machinery. https://doi.org/10.1145/3173574.3173615

Bopp, J. A., Müller, L. J., Aeschbach, L. F., Opwis, K., & Mekler, E. D. (2019). Exploring emotional attachment to game characters. In (pp. 313-324). New York, NY, USA: Association for Computing Machinery. https://doi.org/10.1145/3311350.3347169

Bourdieu, P., & Johnson, R. (1993). The field of cultural production: Essays on art and literature. Columbia University Press.

Boyle, E. A., Connolly, T. M., Hainey, T., & Boyle, J. M. (2012). Engagement in digital entertainment games: A systematic review. Computers in human behavior, 28(3), 771-780. https://doi.org/10.1016/j.chb.2011.11.020

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

Braun, V., & Clarke, V. (2012). Thematic analysis. APA Handbook of Research Methods in Psychology, Vol 2: Research Designs: Quantitative, Qualitative, Neuropsychological, and Biological., 57–71. https://doi.org/10.1037/13620-004

Bromet, E. J. (2014). Emotional consequences of nuclear power plant disasters. Health Phys., 106(2), 206-210. https://doi.org/10.1097/HP.0000000000000012

Brown, E., & Cairns, P. (2004). A Grounded Investigation of Game Immersion. CHI '04 Extended Abstracts on Human Factors in Computing Systems CHI EA '04, 1297-1300. https://doi.org/10.1145/985921.986048

Brown, F. (2019). This War of Mine has sold 4.5 million copies and raised $500K for charity. PCgamer. Retrieved June 5, 2019, from https://www.pcgamer.com/this-war-of-mine-has-sold-45-million-copies-and-raised-dollar500k-for-charity/

Brown, J., Gerling, K., Dickinson, P., & Kirman, B. (2015). Dead Fun: Uncomfortable Interactions in a Virtual Reality Game for Coffins. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play CHI PLAY '15, 475-480. https://doi.org/10.1145/2793107.2810307

Brunero, S., Lamont, S., & Coates, M. (2010). A review of empathy education in nursing. Nursing inquiry, 17(1), 65-74. https://doi.org/10.1111/j.1440-1800.2009.00482.x

Burdette, M. (2015, November 18). The Swayze Effect. Oculus. Retrieved June 20, 2018, from https://www.oculus.com/story-studio/blog/the-swayze-effect/

Byrne, R., Marshall, J., & Mueller, F. F. (2016). Designing the Vertigo Experience: Vertigo As a Design Resource for Digital Bodily Play. Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction TEI '16, 296-303. https://doi.org/10.1145/2839462.2839465

Bystrom, K.-E., Barfield, W., & Hendrix, C. (1999). A Conceptual Model of the Sense of Presence in Virtual Environments. Presence: Teleoperators and Virtual Environments, 8(2), 241-244. https://doi.org/10.1162/105474699566107

Campo Santo. (2016). Firewatch [Video Game]. Campo Santo / Panic. https://www.firewatchgame.com

Carpenter, J. M., & Green, M. C. (2012). Flying with Icarus: narrative transportation and the persuasiveness of entertainment. Psychology of entertainment media, 2, 169-194. Routledge.

Chandler, D. (2007). Semiotics: The Basics. Routledge.

Chittaro, L., & Zangrando, N. (2010). The Persuasive Power of Virtual Reality: Effects of Simulated Human Distress on Attitudes towards Fire Safety. Persuasive Technology Lecture Notes in Computer Science, 58-69. https://doi.org/10.1007/978-3-642-13226-1_8

Cho, J., Won, Y., Kothari, A., Fawaz, S., Ding, Z., & Cheng, X. (2016). INJUSTICE:

Interactive Live Action Virtual Reality Experience. Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts CHI PLAY Companion '16, 33-37. https://doi.org/10.1145/2968120.2968121

Cialdini, R. B. (2009). Influence. Harper Collins.

Cohen, J. (2001). Defining Identification: A Theoretical Look at the Identification of Audiences With Media Characters. Mass Communication and Society, 4(3), 245-264. https://doi.org/10.1207/S15327825MCS0403_01

Cooper, S., Khatib, F., Treuille, A., Barbero, J., Lee, J., Beenen, M., Leaver-Fay, A., Baker, D., Popović, Z., & Players, F. (2010). Predicting protein structures with a multiplayer online game. Nature, 466(7307), 756–760. https://doi.org/10.1038/nature09304

Creswell, J. (2014). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.

Crogan, P. (2011). Gameplay mode: War, simulation, and technoculture (36). U of Minnesota Press. DOI:10.5749/minnesota/9780816653348.001.0001

Cross, N. (1999). Design Research: A Disciplined Conversation. Design Issues, 15(2), 5-10. https://doi.org/10.2307/1511837

Cross, N. (2011). Design Thinking: Understanding How Designers Think and Work. Berg Publishers.

Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (1992). Optimal experience: Psychological studies of flow in consciousness. Cambridge university press. https://doi.org/10.1017/CBO9780511621956

Cuff, B. M., Brown, S. J., Taylor, L., & Howat, D. J. (2014). Empathy: A Review of the Concept. Emotion Review, 8(2), 144–153. https://doi.org/10.1177/1754073914558466

Cummins, R. G., & Chambers, T. (2011). How production value impacts perceived technical quality, credibility, and economic value of video news. Journalism & Mass Communication Quarterly, 88(4), 737-752. https://doi.org/10.1177/107769901108800404

de Graaf, A., Hoeken, H., Sanders, J., & Beentjes, J. W. J. (2011). Identification as a Mechanism of Narrative Persuasion. Communication Research, 39(6), 802–823. https://doi.org/10.1177/0093650211408594

De la Hera, T., Jansz, J., Raessens, J., & Schouten, B. (2021). Persuasive Gaming in Context. Amsterdam University Press. https://doi.org/10.5117/9789463728805

De la Hera Conde-Pumpido, T. (2013). A Conceptual Model for the Study of Persuasive Games. Proceedings of the 2013 DiGRA International Conference: DeFragging Game Studies.

De la Hera Conde-Pumpido, T. (2014). Persuasive structures in advergames. Conveying Advertising Messages through Digital Games. Utrecht University.

De la Peña, N., Weil, P., Llobera, J., Giannopoulos, E., Pomés, A., Spanlang, B., Friedman, D., Sanchez-Vives, M. V., & Slater, M. (2010). Immersive Journalism: Immersive Virtual Reality for the First-Person Experience of News. Presence: Teleoperators and Virtual Environments, 19(4), 291-301. https://doi.org/10.1162/PRES_a_00005

De Smale, S. (2016). Game Essays as Critical Media and Research Praxis. DiGRA/FDG '16 - Proceedings of the First International Joint Conference of DiGRA and FDG.

De Smale, S., Kors, M., & Sandovar, A. (2017). The Case of This War of Mine: A Production Studies Perspective on Moral Game Design. Games and Culture. https://doi.org/10.1177/1555412017725996

De Smale, S. (2019). Ludic Memory Network. Following translations and circulations of war memory in digital popular culture. Utrecht University.

Decety, J., & Cowell, J. M. (2014). Friends or Foes: Is Empathy Necessary for Moral Behavior. Perspect. Psychol. Sci., 9(5), 525-537. https://doi.org/10.1177/1745691614545130

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining" gamification". In Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments (pp. 9-15). https://doi.org/10.1145/2181037.2181040

Deuze, M., Martin, C. B., & Allen, C. (2007). The Professional Identity of Gameworkers. Convergence: The International Journal of Research into New Media Technologies, 13(4), 335–353. https://doi.org/10.1177/1354856507081947

DICE. (2016). Battlefield 1 [Video Game]. Electronic Arts. https://www.ea.com/games/battlefield/battlefield-1

Dinh, H., Walker, N., Hodges, L., Chang Song, & Kobayashi, A. (1999). Evaluating the importance of multisensory input on memory and the sense of presence in virtual environments. Proceedings IEEE Virtual Reality (Cat. No. 99CB36316). Published. https://doi.org/10.1109/vr.1999.756955

Dourish, P. (2001). Where the Action is: The Foundations of Embodied Interaction. MIT Press, Cambridge, Massachusetts. https://doi.org/10.7551/mitpress/7221.001.0001

Dyer-Witheford, N., & De Peuter, G. (2009). Games of Empire: Global Capitalism and Video Games. University of Minnesota Press.

Eagly, A. H., & Chaiken, S. (1998). Attitude structure and function. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), The handbook of social psychology (pp. 269–322). McGraw-Hill.

Eklund, L. (2015). Focus group interviews as a way to evaluate and understand game play experiences. Game Research Methods, 133-148. ETC Press.

Eindhoven University of Technology. (2019). Scientific Integrity. Retrieved November 13, 2021, from https://www.tue.nl/en/our-university/about-the-university/integrity/scientific-integrity/

Emblematic. (2013). Project Syria [Video Game]. http://emblematicgroup.com/experiences/project-syria

Epic Games. (2015). Unreal Engine 4 [Game Engine]. https://www.unrealengine.com

Epic Games. (2017a). Unreal Engine [Game Engine]. https://www.unrealengine.com

Epic Games. (2017b). Unreal Marketplace. https://www.unrealengine.com/marketplace

Ermi, L., & Mäyrä, F. (2005). Fundamental components of the gameplay experience: Analysing immersion. Worlds in play: International perspectives on digital games research, 37(2), 37-53.

Escalas, J. E., & Stern, B. B. (2003). Sympathy and Empathy: Emotional Responses to Advertising Dramas (Vol. 29, Issue 4). Oxford University Press (OUP). https://doi.org/10.1086/346251

Fazio, R. H., & Zanna, M. P. (1981). Direct Experience And Attitude-Behavior Consistency. Advances in Experimental Social Psychology, 161–202. https://doi.org/10.1016/s0065-2601(08)60372-x

Ferrara, J. (2013). Games for Persuasion: Argumentation, Procedurality, and the Lie of Gamification. Games and Culture, 8(4), 289-304. https://doi.org/10.1177/1555412013496891

Festinger, L. (1957). A theory of cognitive dissonance. Stanford University Press.

Fiore, S., Wright, P., & Edwards, A. (2005). A Pragmatist Aesthetics Approach to the Design of a Technological Artefact. Proceedings of the 4th Decennial Conference on Critical Computing: Between Sense and Sensibility CC '05, 129-132. https://doi.org/10.1145/1094562.1094581

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior: An

Introduction to Theory and Research. Reading, MA: Addison-Wesley.

Fisher, J. A. (2017). Empathic Actualities: Toward a Taxonomy of Empathy in Virtual Reality. Interactive Storytelling, 233-244. https://doi.org/10.1007/978-3-319-71027-3_19

Flanagan, M. (2009). Critical Play: Radical Game Design. MIT Press. https://doi.org/10.7551/mitpress/7678.001.0001

Flanagan, M., & Nissenbaum, H. (2014). Values at Play in Digital Games. MIT Press. https://doi.org/10.7551/mitpress/9016.003.0018

Fogg, B. J. (2003). Persuasive Technology. Morgan Kaufmann.

Frankel, L., & Racine, M. (2010). The Complex Field of Research: for Design, through Design, and about Design, in Durling, D., Bousbaci, R., Chen, L, Gauthier, P., Poldma, T., Roworth-Stokes, S. and Stolterman, E (eds.), Design and Complexity - DRS International Conference 2010, 7-9 July, Montreal, Canada.

Frasca, G. (2003). September 12th: A Toy World [Video Game]. Newsgaming. http://www.newsgaming.com/games/index12.htm

Frasca, G. (2004). Madrid [Video Game]. Newsgaming. http://www.newsgaming.com/games/madrid

Frasca, G. (2007). Play the Message: Play, Game and Videogame Rhetoric. IT University of Copenhagen

Frayling, C. (1993). Research in art and design. Royal College of art Research Papers, 1.1), 1-5.

Fullerton, T. (2008). Game Design Workshop: A Playcentric Approach to Creating Innovative Games. CRC Press. https://doi.org/10.1201/b13172

Galloway, A. R. (2006). Gaming: Essays on algorithmic culture (18). University of Minnesota Press.

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, Motivation, and Learning: A Research and Practice Model. Simulation & Gaming, 33(4), 441–467. https://doi.org/10.1177/1046878102238607

Gaver, W. (2012). What Should We Expect from Research through Design. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. ACM. CHI '12, 937-946. https://doi.org/10.1145/2207676.2208538

Genette, G. (1983). Narrative Discourse: An Essay in Method. Cornell University Press.

Gerling, K. M., Mandryk, R. L., Birk, M. V., Miller, M., & Orji, R. (2014). The Effects

of Embodied Persuasive Games on Player Attitudes Toward People Using Wheelchairs. Proceedings of the 32Nd Annual ACM Conference on Human Factors in Computing Systems CHI '14, 3413-3422. https://doi.org/10.1145/2556288.2556962

Gerrig, R. J. (1993). Experiencing Narrative Worlds: On the Psychological Activities of Reading. Yale University Press. https://doi.org/10.4324/9780429500633

Gotsis, M., Piggot, J., Hughes, D., & Stone, W. (2010). SMART-games: A Video Game Intervention for Children with autism Spectrum Disorders. Proceedings of the 9th International Conference on Interaction Design and Children IDC '10, 194-197. https://doi.org/10.1145/1810543.1810569

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. Journal of Personality and Social Psychology, 79(5), 701–721. https://doi.org/10.1037/0022-3514.79.5.70

Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), Narrative impact: Social and cognitive foundations (pp. 315–341). Lawrence Erlbaum Associates Publishers.

Green, M. C., Brock, T. C., & Kaufman, G. F. (2004). Understanding Media Enjoyment: The Role of Transportation Into Narrative Worlds. Communication Theory, 14(4), 311–327. https://doi.org/10.1111/j.1468-2885.2004.tb00317.x

Green, M. C. (2006). Narratives and Cancer Communication. Journal of Communication, 56(suppl_1), S163–S183. https://doi.org/10.1111/j.1460-2466.2006.00288.x

Green, M. C. (2008). Transportation Theory. The International Encyclopedia of Communication. Published. https://doi.org/10.1002/9781405186407.wbiect058

Green, M. C., & Jenkins, K. M. (2014). Interactive Narratives: Processes and Outcomes in User-Directed Stories. Journal of Communication, 64(3), 479–500. https://doi.org/10.1111/jcom.12093

Greitemeyer, T., Osswald, S., & Brauer, M. (2010). Playing prosocial video games increases empathy and decreases schadenfreude. Emotion, 10(6), 796–802. https://doi.org/10.1037/a0020194

Grigorovici, D. (2003). Persuasive Effects of Presence in Immersive Virtual Environments. In G. Riva, F. Davide, & W. IJsselsteijn (Eds.), Being there: Concepts, effects and measurement of presence in synthetic environments.

Guevara-Villalobos, O. (2011). Cultures of independent game production: Examining the relationship between community and labour. Proceedings of DiGRA 2011 Conference: Think Design Play.

Hall, L., Woods, S., Aylett, R., Newall, L., & Paiva, A. (2005). Achieving Empathic Engagement Through Affective Interaction with Synthetic Characters. Affective Computing and Intelligent Interaction, 731-738. https://doi.org/10.1007/11573548_94

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does Gamification Work? -- A Literature Review of Empirical Studies on Gamification. 2014 47th Hawaii International Conference on System Sciences (pp. 3025-3034). Published. https://doi.org/10.1109/hicss.2014.377

Hamby, A., Brinberg, D., & Jaccard, J. (2016). A Conceptual Framework of Narrative Persuasion. Journal of Media Psychology, 1-12. https://doi.org/10.1027/1864-1105/a000187

Hamby, A., Brinberg, D., & Daniloski, K. (2017). Reflecting on the journey: Mechanisms in narrative persuasion. J. Consum. Psychol., 27(1), 11-22. https://doi.org/10.1016/j.jcps.2016.06.005

Hand, S., & Varan, D. (2009). Interactive Stories and the Audience: Why Empathy is Important. Comput. Entertain., 7(3), 39:1-39:14. https://doi.org/10.1145/1594943.1594951

Harper, D. (2002). Talking about pictures: A case for photo elicitation. Visual Studies, 17(1), 13-26. https://doi.org/10.1080/14725860220137345

Herrera, F., Bailenson, J., Weisz, E., Ogle, E., & Zaki, J. (2018). Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking. PLOS ONE, 13(10). https://doi.org/10.1371/journal.pone.0204494

Higgins, C., & Walker, R. (2012). Ethos, logos, pathos: Strategies of persuasion in social/environmental reports. Accounting Forum, 36(3), 194–208. https://doi.org/10.1016/j.accfor.2012.02.003

Hoeken, H., & Sinkeldam, J. (2013). De rol van emoties in narratieve overtuiging. Tijdschrift Voor Taalbeheersing, 35(3), 226–236. https://doi.org/10.5117/tvt2013.3.hoek

Hoeken, H., & Fikkers, K. M. (2014). Issue-relevant thinking and identification as mechanisms of narrative persuasion. Poetics, 44, 84–99. https://doi.org/10.1016/j.poetic.2014.05.001

Hoeken, H., Kolthoff, M., & Sanders, J. (2016). Story Perspective and Character Similarity as Drivers of Identification and Narrative Persuasion. Human Communication Research, 42(2), 292–311. https://doi.org/10.1111/hcre.12076

Hojat, M., Gonnella, J. S., Nasca, T. J., Mangione, S., Vergare, M., & Magee, M. (2002). Physician Empathy: Definition, Components, Measurement, and

Relationship to Gender and Specialty. American Journal of Psychiatry, 159(9), 1563–1569. https://doi.org/10.1176/appi.ajp.159.9.1563

Höök, K., & Löwgren, J. (2012). Strong concepts. ACM Transactions on Computer-Human Interaction, 1–18. https://doi.org/10.1145/2362364.2362371

Hoover, C. W., Wood, E. E., & Knowles, E. S. (1983). Forms of social awareness and helping. Journal of Experimental Social Psychology, 19(6), 577–590. https://doi.org/10.1016/0022-1031(83)90017-3

HTC Corporation. (2016). HTC Vive.

Huck, J., Coulton, P., Gullick, D., Powell, P., Roberts, J., Hudson-Smith, A., De-Jode, M., & Mavros, P. (2015). Supporting Empathy Through Embodiment in the Design of Interactive Systems. Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction, 523–528. https://doi.org/10.1145/2677199.2687892

Huizinga, J. (1974). Homo ludens: proeve eener bepaling van het spel-element der cultuur (7 ed.). H.D. Tjeenk Willink bv.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. Proceedings of the AAAI Workshop on Challenges in Game AI, 4, 1.

Iacovides, I., & Cox, A. L. (2015). Moving Beyond Fun: Evaluating Serious Experience in Digital Games. Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems CHI '15, 2245-2254. ACM. https://doi.org/10.1145/2702123.2702204

ImpactGames. (2007). PeaceMaker [Video Game]. ImpactGames. http://www.peacemakergame.com/

Independent Game Festival. (2015). Game Festival.. Independent Games Festival (IGF). Retrieved April 23, 2017, from https://igf.com/2015

Infinity Ward. (2003). Call of Duty [Video Game]. Activision. https://www.callofduty.com

The Interaction Design Foundation. (2019). What is Human-Computer Interaction (HCI)? Retrieved March 2, 2019, from https://www.interaction-design.org/literature/topics/human-computer-interaction

Jacobs, R. R. S. (2017). Playing to win over: validating persuasive games. Erasmus University Rotterdam.

Jenkins, H. (2004). Game design as narrative architecture. In Salen, K & Zimmerman (Eds.), The Game Design Reader: A Rules of Play Anthology (pp. 670-689). The MIT Press.

Johnson, D. R. (2012). Transportation into a story increases empathy, prosocial behavior, and perceptual bias toward fearful expressions. Personality and Individual Differences, 52(2), 150–155. https://doi.org/10.1016/j.paid.2011.10.005

Jones, D. M. (1997). Advertising Animal Protection. Anthrozoös, 10(4), 151–159. https://doi.org/10.2752/089279397787000969

Jørgensen, K. (2010). Time for New Terminology? Diegetic and Non-Diegetic Sounds in Computer Games Revisited. In M. Grimshaw (Ed.), Game sound technology and player interaction: Concepts and developments. IGI Global. https://doi.org/10.4018/978-1-61692-828-5.ch005

Julier, G. (2006). From Visual Culture to Design Culture. Design Issues, 22(1), 64-76. https://doi.org/10.1162/074793606775247817

Juul, J. (2011). Half-Real: Video Games between Real Rules and Fictional Worlds. MIT Press.

Kadayifcioglu, T., Marshall, M., & Howarth, K. (2013). Auti-Sim [Video Game]. https://gamejolt.com/games/auti-sim/12761

Kamen, M. (2016). My Mother's Wing: Vrse.works and UN VR film shows life in Gaza. Wired UK. Retrieved March 21, 2016, from https://www.wired.co.uk/article/vrse-vr-gaza-movie-my-mothers-wing

Kapralos, B., Moussa, F., & Dubrowski, A. (2014). An Overview of Virtual Simulation and Serious Gaming for Surgical Education and Training. In A. L. Brooks, S. Brahnam, & L. C. Jain(pp. 289-306). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-45432-5_14

Kerr, A. (2011). The Culture of Gamework. In D. Mark (Ed). Managing Media Work. London. Sage.

Kerr, A. (2013). Space Wars: The Politics of Games Production in Europe. In N. B. Huntemann & B. Aslinger (pp. 215-231). Palgrave Macmillan US. https://doi.org/10.1057/9781137006332_16

Khaled, R., Barr, P., Fischer, R., Noble, J., & Biddle, R. (2006). Factoring culture into the design of a persuasive game. Proceedings of the 20th Conference of the Computer-Human Interaction Special Interest Group (CHISIG) of Australia on Computer-Human Interaction: Design: Activities, Artefacts and Environments - OZCHI '06. ACM. https://doi.org/10.1145/1228175.1228213

Khaled, R., Barr, P., Biddle, R., Fischer, R., & Noble, J. (2009). Game Design Strategies for Collectivist Persuasion. Proceedings of the 2009 ACM SIGGRAPH Symposium on Video Games Sandbox '09, 31-38. https://doi.org/10.1145/1581073.1581078

Kitzinger, J. (1995). Qualitative Research: Introducing focus groups. BMJ, 311(7000), 299–302. https://doi.org/10.1136/bmj.311.7000.299

Koenitz, H., Ferri, G., Haahr, M., Sezen, D., & Sezen, T. İ. (2015). Interactive Digital Narrative: History, Theory and Practice. Routledge.

Konrath, S. H., O'Brien, E. H., & Hsing, C. (2010). Changes in Dispositional Empathy in American College Students Over Time: A Meta-Analysis. Personality and Social Psychology Review, 15(2), 180–198. https://doi.org/10.1177/1088868310377395

Kors, M. (2015). Towards Design Strategies for the Persuasive Gameplay Experience. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play CHI PLAY '15, 407-410. https://doi.org/10.1145/2793107.2810281

Kors, M., van der Spek, E., & Schouten, B. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the 10th International Conference on the Foundations of Digital Games.

Kors, M. J. L., Ferri, G., van der Spek, E. D., Ketel, C., & Schouten, B. A. M. (2016a). A Breathtaking Journey. On the Design of an Empathy-Arousing Mixed-Reality Game. Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play, 91-104. https://doi.org/10.1145/2967934.2968110

Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A. M. (2016b). Occasionally a Dull Moment. Designing for Introspection and Retrospection in Persuasive Games. DiGRA 2016 Workshop: Morality Play: The Design of Games for Moral Engagement.

Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A.M. (2018). You; the Observer, Partaker or Victim. Delineating Three Perspectives to Empathic Engagement in Persuasive Games using Immersive Technologies. Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts. https://doi.org/10.1145/3270316.3271547

Kowalczyk, T. (2015, July 15). "Robimy gry dla graczy" - wywiad z Pawłem Miechowskim z 11bit Studios ['We Make Games for Gamers': the Interview with Paweł Miechowski of 11bit Studios]. komputer Swiat. Retrieved October 9, 2016, from https://www.komputerswiat.pl/gamezilla/artykuly/robimy-gry-dla-graczy-wywiad-z-pawlem-miechowskim-z-11bit-studios/b37w4kl

Lachner F., von Saucken C., Mueller F., Lindemann U. (2015) Cross-Cultural User Experience Design Helping Product Designers to Consider Cultural Differences. In: Rau P. (eds) Cross-Cultural Design Methods, Practice and Impact. CCD 2015. Lecture Notes in Computer Science, vol 9180. Springer,

Cham. https://doi.org/10.1007/978-3-319-20907-4_6

Landis, J. R., & Koch, G. G. (1977). The Measurement of Observer Agreement for Categorical Data. Biometrics, 33(1), 159–174. https://doi.org/10.2307/2529310

Lankoski, P. (2007). Goals, affects, and empathy in games. Philosophy of computer games.

Laurel, B. (1991). Computers as Theatre. Addison-Wesley.

Lawson, B. (2005). How Designers Think, Fourth Edition: The Design Process Demystified (4th ed.). Architectural Press.

Levisohn, A., Cochrane, J., Gromala, D., & Seo, J. (2007). The Meatbook: Tangible and Visceral Interaction. Proceedings of the 1st International Conference on Tangible and Embedded Interaction TEI '07, 91-92. https://doi.org/10.1145/1226969.1226987

Lindley, C. A. (2005). Game space design foundations for trans-reality games. In Proceedings of the 2005 ACM SIGCHI International Conference on Advances in computer entertainment technology (pp. 397-404). ACM. https://doi.org/10.1145/1178477.1178569

Lu, A. S., Baranowski, T., Thompson, D., & Buday, R. (2012). Story Immersion of Videogames for Youth Health Promotion: A Review of Literature. Games Health J, 1(3), 199-204. https://doi.org/10.1089/g4h.2011.0012

Pope, L. (2012). The Republia Times [Video Game]. https://dukope.com/trt/play.html

Lucero, A., Karapanos, E., Arrasvuori, J., & Korhonen, H. (2014). Playful or Gameful?: creating delightful user experiences. Interactions, 21(3), 34-39. https://doi.org/10.1145/2590973

Maio, G., & Haddock, G. (2009). The psychology of attitudes and attitude change. Sage.

Manders, F. (2015). INTERU_PSY [Video Game]. http://www.interupsy.com

Marsh, T. (2016). Slow serious games, interactions and play: Designing for positive and serious experience and reflection. Entertainment Computing, 14, 45–53. https://doi.org/10.1016/j.entcom.2015.10.001

Marshall, J., Walker, B., Benford, S., Tomlinson, G., Rennick Egglestone, S., Reeves, S., Brundell, P., Tennent, P., Cranwell, J., Harter, P., & Longhurst, J. (2011). The Gas Mask: A Probe for Exploring Fearsome Interactions. CHI '11 Extended Abstracts on Human Factors in Computing Systems CHI EA '11, 127-136. https://doi.org/10.1145/1979742.1979609

Masto, M. (2015). Empathy and Its Role in Morality. The Southern Journal of Philosophy, 53(1), 74–96. https://doi.org/10.1111/sjp.12097

Maxis Emeryville. (2013). SimCity [Video Game]. Electronic Arts. https://www.ea.com/games/simcity/simcity

Mayring, P. (2004). A Companion to Qualitative Research. In U. Flick, V. E. Kardoff, & I. Steinke (Eds.), Qualitative Content Analysis (First ed., pp. 266–269). SAGE Publications Ltd.

McCarthy, J., & Wright, P. (2004). Technology as experience. Interactions, 11(5), 42–43. https://doi.org/10.1145/1015530.1015549

McCroskey, J.C. (2001). An Introduction to Rhetorical Communication. Allyn & Bacon. http://books.google.nl/books?id=iNwbAQAAIAAJ&hl=&source=gbs_api

McHale, B. (1987). Postmodernist fiction. Routledge.

McWhertor, M. (2015). Games for Change 2015 award finalists include Never Alone, This War of Mine, Bounden. Polygon. Retrieved July 23, 2015, from https://www.polygon.com/2015/2/26/8117113/games-for-change-2015-nominees

MediaMonks (2016). A Journey to the Arctic [360° Video]. https://www.mediamonks.com/vr-ar/work/greenpeace-a-journey-to-the-arctic

Might, M. (n.d.). The illustrated guide to a Ph.D. Matt Might. Retrieved April 6, 2022, from https://matt.might.net/articles/phd-school-in-pictures/

Mildner, P., & Mueller, F. '. F. (2016). Design of serious games. In R. Dörner, S. Göbel, W. Effelsberg, & J. Wiemeyer (Eds.), Serious games (pp. 57-82). Springer, Cham. https://doi.org/https://doi.org/10.1007/978-3-319-40612-1_3

Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. IEICE Trans. Inf. Syst., 77(12), 1321-1329.

Milk, C. (2015). How virtual reality can create the ultimate empathy machine [Video]. TED Talks. https://www.ted.com/talks/chris_milk_how_virtual_reality_can_create_the_ultimate_empathy_machine?

Miyamoto, Y., Ma, X., & Wilken, B. (2017). Cultural variation in pro-positive versus balanced systems of emotions. Current Opinion in Behavioral Sciences, 15, 27–32. https://doi.org/10.1016/j.cobeha.2017.05.014

Molleindustria. (2006). McDonald's Video Game [Video Game]. Molleindustria. http://www.mcvideogame.com/game-eng.html

Moyer-Gusé, E. (2008). Toward a Theory of Entertainment Persuasion: Explaining the Persuasive Effects of Entertainment-Education Messages. Communication Theory, 18(3), 407–425. https://doi.org/10.1111/j.1468-

2885.2008.00328.x

Muller, D. A., van Kessel, C. R., & Janssen, S. (2017). Through Pink and Blue Glasses: Designing a Dispositional Empathy Game Using Gender Stereotypes and Virtual Reality. Extended Abstracts Publication of the Annual Symposium on Computer-Human Interaction in Play CHI PLAY '17 Extended Abstracts, 599-605. https://doi.org/10.1145/3130859.3130862

Murray, J. H. (1997). Hamlet on the holodeck: The future of narrative in cyberspace. Simon and Schuster.

Nakamura J., Csikszentmihalyi M. (2014) The Concept of Flow. In: Flow and the Foundations of Positive Psychology. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9088-8_16

Nelson, D. W., & Baumgarte, R. (2004). Cross-Cultural Misunderstandings Reduce Empathic Responding1. Journal of Applied Social Psychology, 34(2), 391–401. https://doi.org/10.1111/j.1559-1816.2004.tb02553.x

Nerurkar, M. (2017). Wheelhouse [Video Game]. https://animationsinstitut.de/wheelhouse

Nieborg, D. B. (2011). Triple-A: The political economy of the blockbuster video game. University of Amsterdam.

Nilsson, N. C., Nordahl, R., & Serafin, S. (2016). Immersion Revisited: A review of existing definitions of immersion and their relation to different theories of presence. Human Technology, 12(2), 108–134. https://doi.org/10.17011/ht/urn.201611174652

Ninja Theory. (2017a). Hellblade: Senua's Sacrifice [Video Game]. Ninja Theory. https://www.hellblade.com

Ninja Theory. (2017b). Mental Health Support. Hellblade: Senua's Sacrifice. Retrieved June 12, 2020, from https://www.hellblade.com/mental-health-support

Norman, D. A. (2005). Emotional design: Why we love (or hate) everyday things. Basic books.

O'Donnell, C. (2014). Developer's Dilemma: The Secret World of Videogame Creators. MIT Press.

O'Keefe, D. J. (2002). Persuasion: Theory and research. Sage Publications.

Oculus. (2014). Oculus Development Kit 2. https://www.oculus.com/en-us/dk2

Ölander, F., & Thøgersen, J. (1995). Understanding of consumer behaviour as a prerequisite for environmental protection. Journal of Consumer Policy, 18(4), 345–385. https://doi.org/10.1007/bf01024160

Olson, J. S., & Kellogg, W. A. (2014). Ways of Knowing in HCI. Springer Science & Business. https://doi.org/10.1007/978-1-4939-0378-8

Parrott, W. G. (2001). Emotions in social psychology: Essential readings. Psychology Press.

Peckham, M. (2014, December 23). The 15 Best Video Games of 2014. Time. Retrieved October 23, 2015, from https://time.com/3643724/best-video-games-2014/

Peirce, C. S. (1958). Selected Writings. Dover.

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

Perloff, R. M. (2008). The dynamics of persuasion: communication and attitudes in the twenty-first century (3). Lawrence Erlbaum Associates.

Peters, R. G., Covello, V. T., & McCallum, D. B. (1997). The Determinants of Trust and Credibility in Environmental Risk Communication: An Empirical Study. Risk Analysis, 17(1), 43–54. https://doi.org/10.1111/j.1539-6924.1997.tb00842.x

Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of Persuasion. Communication and Persuasion, 1–24. https://doi.org/10.1007/978-1-4612-4964-1_1

Plewe, C., & Fürsich, E. (2017). Are Newsgames Better Journalism? Journalism Studies, 19(16), 2470–2487. https://doi.org/10.1080/1461670x.2017.1351884

Polanski, R. (2002). The Pianist [Film]. Canal+

Pope, L. (2013). Paper, Please [Video Game]. Lucas Pope.

Pötzsch, H. (2015). Selective Realism: Filtering Experiences of War and Violence in First- and Third-Person Shooters. Games and Culture, 12(2), 156–178. https://doi.org/10.1177/1555412015587802

Power, M., & Dalgleish, T. (2008). Cognition and emotion: From order to disorder (2nd ed.). Psychology Press.

Presser, S., Rothgeb, J. M., Couper, M. P., Lessler, J. T., Martin, E., Martin, J., & Singer, E. (2004). Methods for Testing and Evaluating Survey Questionnaires (546). John Wiley & Sons.

Przybylski, A. K., Deci, E. L., Rigby, C. S., & Ryan, R. M. (2014). Competence-impeding electronic games and players' aggressive feelings, thoughts, and behaviors. Journal of Personality and Social Psychology, 106(3), 441–457.

https://doi.org/10.1037/a0034820

Raessens, J. (2006). Reality Play: Documentary Computer Games Beyond Fact and Fiction. Popular Communication, 4(3), 213–224. https://doi.org/10.1207/s15405710pc0403_5

Rameson, L. T., & Lieberman, M. D. (2008). Empathy: A Social Cognitive Neuroscience Approach. Social and Personality Psychology Compass, 3(1), 94–110. https://doi.org/10.1111/j.1751-9004.2008.00154.x

Ramirez, E. (2018, October 26). It's dangerous to think virtual reality is an empathy machine. Aeon. Retrieved December 1, 2018, from https://aeon.co/ideas/its-dangerous-to-think-virtual-reality-is-an-empathy-machine

Rankin, Y. A., McNeal, M., Shute, M. W., & Gooch, B. (2008). User centered game design: evaluating massive multiplayer online role playing games for second language acquisition. Proceedings of the 2008 ACM SIGGRAPH Symposium on Video Games - Sandbox '08. https://doi.org/10.1145/1401843.1401851

Razorworks. (2006). Ford Racing: Full Blown [Video Game]. Sega

Ruggiero, D. (2013). The Four Keys of Social Impact Games. In Foundations of Digital Games Conference, FDG2013. Chania, Greece.

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

Ruiz, S., York, A., Stein, M., Keating, N., & Santiago, K. (2006). Darfur is dying [Video Game]. https://susanaruiz.org/takeactiongames-darfurisdying

Ryan, M.-L. (2001). Narrative As Virtual Reality: Immersion and Interactivity in Literature and Electronic Media. Johns Hopkins University Press.

Ryan, M.-L. (2015). Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media. JHU Press.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Salen, K., & Zimmerman, E. (2004). Rules of Play: Game Design Fundamentals. MIT press.

Sandovar, A., Braad, E., Streicher, A., & Söbke, H. (2016). Ethical Stewardship: Designing Serious Games Seriously. In R. Dörner, S. Göbel, M. Kickmeier-Rust, M. Masuch, & K. Zweig(pp. 42-62). Springer International Publishing. https://doi.org/10.1007/978-3-319-46152-6_3

Sandovar, A. (2017). It's an Indie Thing: Independent Narratives of Game Design. In P. Lankoski & J. Holopainen. ETC Press.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic Books New York.

Schouten, B. A. M., Deen, M., & Bekker, M. M. (2010). Playful Identity in game design and open ended play. Proceedings of the Homo Ludens conference.

Schouten, B., Ferri, G., de Lange, M., & Millenaar, K. (2017). Games as Strong Concepts for City-Making. In A. Nijholt(pp. 23-45). Springer, Singapore. https://doi.org/10.1007/978-981-10-1962-3_2

Schulzke, M. (2013). Being a terrorist: Video game simulations of the other side of the War on Terror. Media, War & Conflict, 6(3), 207–220. https://doi.org/10.1177/1750635213494129

Segal, E. A., Wagaman, M. A., & Gerdes, K. E. (2012). Developing the Social Empathy Index: An Exploratory Factor Analysis. Advances in Social Work, 13(3), 541–560. https://doi.org/10.18060/2042

Shaver, P., Schwartz, J., Kirson, D., & O'Connor, C. (1987). Emotion knowledge: Further exploration of a prototype approach. Journal of Personality and Social Psychology, 52(6), 1061–1086. https://doi.org/10.1037/0022-3514.52.6.1061

Shelton, M. L., & Rogers, R. W. (1981). Fear-arousing and empathy-arousing appeals to help: The pathos of persuasion. Journal of Applied Social Psychology, 11(4), 366–378. https://doi.org/10.1111/j.1559-1816.1981.tb00829.x

Shen, L. (2011). The Effectiveness of Empathy- Versus Fear-Arousing Antismoking PSAs. Health Communication, 26(5), 404–415. https://doi.org/10.1080/10410236.2011.552480

Shrum, L. J. (2012). The Psychology of Entertainment Media: Blurring the Lines Between Entertainment and Persuasion. Taylor & Francis.

Shusterman, R. (2014). Somaesthetics. In The Interaction Design Foundation, The Encyclopedia of Human-Computer Interaction (2). https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed

Sicart, M. (2009). The Ethics of Computer Games. Cambridge, MA: MIT Press.

Slater, M. D. (2002). Entertainment education and the persuasive impact of narratives. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), Narrative impact: Social and cognitive foundations (pp. 157–181). Lawrence Erlbaum Associates Publishers.

Slater, M. D., & Rouner, D. (2002). Entertainment-Education and Elaboration Likelihood: Understanding the Processing of Narrative Persuasion. Communication Theory, 12(2), 173–191. https://doi.org/10.1111/j.1468-2885.2002.tb00265.x

Smethurst, T., & Craps, S. (2014). Playing with Trauma: Interreactivity, Empathy, and Complicity in The Walking Dead Video Game. Games and Culture, 10(3), 269–290. https://doi.org/10.1177/1555412014559306

Sosa-Tzec, O., Stolterman, E., & Siegel, M. A. (2015). Gaza Everywhere: Exploring the Applicability of a Rhetorical Lens in HCI. Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives AA '15, 69-72. https://doi.org/10.7146/aahcc.v1i1.21314

Spielberg, S. (1993). Schindler's List [Film]. Steven Spielberg

Squire, K. D. (2005). Educating the fighter: buttonmashing, seeing, being. On The Horizon - The Strategic Planning Resource for Education Professionals, 13(2), 75-88. https://doi.org/10.1108/10748120510608106

Stark, L. (2015). Making Values Visceral: "Charting the Next Decade for Value Sensitive Design. Aarhus Conference 2015 Workshop.

Steinemann, S. T., Mekler, E. D., & Opwis, K. (2015). Increasing Donating Behavior Through a Game for Change: The Role of Interactivity and Appreciation. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play CHI PLAY '15, 319-329. https://doi.org/10.1145/2793107.2793125

Stemler, S. (2001). An overview of content analysis. Practical assessment, research & evaluation, 7(17), 137-146. https://doi.org/10.7275/z6fm-2e34

Sterczewski, P. (2016). This Uprising of Mine: Game Conventions, Cultural Memory and Civilian Experience of War in Polish Games. Game Studies. Retrieved January 14, 2017, from http://gamestudies.org/1602/articles/sterczewski

Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence. J. Commun., 42(4), 73-93. https://doi.org/10.1111/j.1460-2466.1992.tb00812.x

Stolterman, E. (2008). The nature of design practice and implications for interaction design research. International Journal of Design, 2(1), 55-65.

Stuart, K. (2016, October 12). Video games where people matter? The strange future of emotional AI. The Guardian. Retrieved July 11, 2018, from https://www.theguardian.com/technology/2016/oct/12/video-game-characters-emotional-ai-developers

Sturm, C., Oh, A., Linxen, S., Abdelnour Nocera, J., Dray, S., & Reinecke, K. (2015).

How WEIRD is HCI?: extending HCI principles to other countries and cultures. In Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems (pp. 2425-2428). ACM. https://doi.org/10.1145/2702613.2702656

Suits, B. (2005). The Grasshopper. Broadview Press.

Sutherland, A. (2017, October 12). No, VR Doesn't Create Empathy. Here's Why. BuzzFeed News. Retrieved June 7, 2018, from https://www.buzzfeednews.com/article/ainsleysutherland/how-big-tech-helped-create-the-myth-of-the-virtual-reality

Tale of Tales (2008). The Graveyard [Video Game]. Valve. http://tale-of-tales.com/TheGraveyard

Tanenbaum, T. J., Antle, A. N., & Robinson, J. (2013). Three Perspectives on Behavior Change for Serious Games. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems CHI '13, 3389-3392. https://doi.org/10.1145/2470654.2466464

Tanenbaum, T. J., & Tanenbaum, K. (2015). Empathy and Identity in Digital Games: Towards a New Theory of Transformative Play. Proceedings of the 10th International Conference on the Foundations of Digital Games.

TechCrunch. (2016, May 10). The Era of VR Storytelling [Video]. YouTube. https://www.youtube.com/watch?v=5CqPyT3G_SE

The Chinese Room. (2012). Dear Esther [Video Game]. The Chinese Room. https://www.thechineseroom.co.uk/games/dear-esther

The Fullbright Company. (2013). Gone Home [Video Game]. The Fullbright Company. https://gonehome.com

The Quinnspiracy (2013). Depression Quest [Video Game]. The Quinnspiracy. http://www.depressionquest.com

Thompson, J. B. (1995). The Media and Modernity: A Social Theory of the Media. Stanford University Press.

United States Army. (2002). America's Army [Video Game]. United States Army. https://www.americasarmy.com

Van der Spek, E. D., Wouters, P., & van Oostendorp, H. (2011). Code Red: Triage Or COgnition-based DEsign Rules Enhancing Decisionmaking TRaining In A Game Environment. British Journal of Educational Technology, 42(3), 441–455. https://doi.org/10.1111/j.1467-8535.2009.01021.x

Van Laer, T., de Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents

and consequences of consumers' narrative transportation. Journal of Consumer Research, 40(5), 797–817. https://doi.org/10.1086/673383

Visch, V. T., Vegt, N., Anderiesen, H., & Van der Kooij, K. (2013). Persuasive Game Design: A model and its definitions. CHI 2013: Workshop Designing Gamification: Creating Gameful and Playful Experiences. Paris, France.

Volpe, J. (2015, January 24). The Godmother of Virtual Reality: Nonny de la Peña. Retrieved May 11, 2018, from https://www.engadget.com/2015/01/24/the-godmother-of-virtual-reality-nonny-de-la-pena

Vosmeer, M., Roth, C., & Koenitz, H. (2017). Who Are You? Voice-Over Perspective in Surround Video. Interactive Storytelling, 221–232. https://doi.org/10.1007/978-3-319-71027-3_18

Waal, F. B. M. (2009). The Age of Empathy. Three Rivers Press.

War Child Gaming. (2019). Gaming Campaigns. War Child Gaming. Retrieved February 1, 2020, from https://www.warchild.org.uk/get-involved/gaming/game-on/gaming-campaigns

Wells, J. (2016, January 20). From Project Syria to That Dragon, Cancer: the rise of empathy video games. The Telegraph. Retrieved May 11, 2018, from https://www.telegraph.co.uk/men/the-filter/the-surprising-rise-of-empathy-video-games/

Williams, R. (1977). Marxism and Literature. OUP Oxford.

Wilson, M. (2012, August 6). How Do Real Cars End Up In Video Games? And Does It Help The Brands? Fast Company. Retrieved June 23, 2017, from https://www.fastcompany.com/1669990/how-do-real-cars-end-up-in-video-games-and-does-it-help-the-brands

Wiseman, T. (1996). A concept analysis of empathy. Journal of Advanced Nursing, 23(6), 1162–1167. https://doi.org/10.1046/j.1365-2648.1996.12213.x

Wittgenstein, L. (1968). Philosophical investigations (3 ed.). Blackwell Publishers.

Wobbrock, J. O. (2012). Seven Research Contributions in HCI. Available at http://faculty.washington.edu/wobbrock/pubs/Wobbrock-2012.pdf

Wouters, P., van der Spek, E. D., & van Oostendorp, H. (2009). Current Practices in Serious Game Research. Games-Based Learning Advancements for Multisensory Human Computer Interfaces, 232–250. https://doi.org/10.4018/978-1-60566-360-9.ch014

Wright, P., & McCarthy, J. (2008b). Empathy and experience in HCI. Proceeding of the Twenty-Sixth Annual CHI Conference on Human Factors in Computing Systems - CHI '08, 637–646. https://doi.org/10.1145/1357054.1357156

Yager Development. (2012). Spec Ops: The Line [Video Game]. 2K Games. https://2k.com/en-US/game/spec-ops-the-line/

Yee, N., & Bailenson, J.N. (2006). Walk a mile in digital shoes: The impact of embodied perspective-taking on the reduction of negative stereotyping in immersive virtual environments. Proceedings of PRESENCE 2006: The 9th Annual International Workshop on Presence.

Yin-Poole, W. (2014, November 27). It took just two days for This War of Mine to make its money back. Eurogamer. Retrieved January 23, 2015, from https://www.eurogamer.net/articles/2014-11-27-this-war-of-mine-made-its-money-back-in-just-two-days

Zagal, J. P. (2009). Ethically Notable Videogames: Moral Dilemmas and Gameplay. Proceedings of the 2009 DiGRA International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory.

Zhang, H., Yan, W., Oba, A., & Zhang, W. (2014). Radiation-Driven Migration: The Case of Minamisoma City, Fukushima, Japan, after the Fukushima Nuclear Accident. International Journal of Environmental Research and Public Health, 11(9), 9286–9305. https://doi.org/10.3390/ijerph110909286

Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through Design As a Method for Interaction Design Research in HCI. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems CHI '07, 493-502. https://doi.org/10.1145/1240624.1240704

Zimmerman, J., & Forlizzi, J. (2008). The Role of Design Artifacts in Design Theory Construction. Artifact, 2(1), 41–45. https://doi.org/10.1080/17493460802276893

Zimmerman, J., & Forlizzi, J. (2014). Research through Design in HCI. In J. S. Olson & W. A. Kellogg (pp. 167-189). Springer New York. https://doi.org/10.1007/978-1-4939-0378-8_8

List of Figures

Figure 1: A Breathtaking Journey demonstration at the Dutch VR Days in Amsterdam, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 2: The living room area of a virtual temporary housing in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 3: The bombing of a city in the game September 12th: A Toy World. Frasca, G. (2003). September 12th: A Toy World.

Figure 4: A player is presented with a moral dilemma in the game This War of Mine. 11 bit studios. (2014). This War of Mine.

Figure 5: A player is holding his breath to avoid detection in the game A Breathtaking Journey at De Culturele Zondag in Utrecht, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 6: A player is exploring Watanabe's temporary housing in the game Permanent at the Fukushima Film Festival in 2017. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 7: A Ford Fiesta effortlessly overtakes a Ford EX concept buggy in the game Ford Racing: Full Blown. Razorworks. (2006). Ford Racing: Full Blown.

Figure 8: Screenshot of September 12th: A Toy World showing a player bombing a city. Frasca, G. (2003). September 12th: A Toy World.

Figure 9: The player hiding from the Janjaweed militia while collecting water for his community in the gameDarfur is Dying. Ruiz, S., York, A., Stein, M., Keating, N., & Santiago, K. (2006). Darfur is dying.

Figure 10: A player engages in unethical activities in the McDonald's Video Game. Molleindustria. (2006). McDonald's Video Game.

Figure 11: A player typing along with the words as they appear on the screen to soothe a baby in the game Hush. Antonisse, J., & Johnson, D. (2013). Hush.

Figure 12: The player experiences heavy audiovisual distortion when approaching other children in Auti-Sim. Kadayifcioglu, T., Marshall, M., & Howarth, K. (2013). Auti-Sim.

Figure 13: Concept art of traumatized soldiers for the game Spec Ops: The Line. Yager Development. (2012). Spec Ops: The Line.

Figure 14: Senua dealing with psychosis in the game Hellblade: Senua's Sacrifice's. Ninja Theory. (2017). Hellblade: Senua's Sacrifice.

Figure 15: The player guides a group of civilians in a city under siege in the

game This War of Mine. 11 bit studios. (2014). This War of Mine.

Figure 16: Drawing connections between the extrafictional and fictional universes on the official This War of Mine website. 11 bit studios. (2014). This War of Mine.

Figure 17: Intro screen of the game Mr. Powerful. Boerman, R., Gramberg, F., Gulekov, R., & Maier, L. (2015). Mr. Powerful.

Figure 18: A minigame as part of the game Mr.Powerful in which players try to stop a protest. Boerman, R., Gramberg, F., Gulekov, R., & Maier, L. (2015). Mr. Powerful.

Figure 19: The pressure gauge shown after each completed mini game in the game Mr. Powerful. Boerman, R., Gramberg, F., Gulekov, R., & Maier, L. (2015). Mr. Powerful.

Figure 20: Mr. Powerful's outro in which players are offered several options to help make a change in the real universe. Boerman, R., Gramberg, F., Gulekov, R., & Maier, L. (2015). Mr. Powerful.

Figure 21: Model illustrating attitudinal gameplay. Kors, M., van der Spek, E., & Schouten, B. (2015). The Attitudinal Gameplay Model.

Figure 22: The player is prompted with various budgeting choices in the game Footprint. Tomassen, R.M.J., Voeten, K.K., van der Velden, R.C.F.M., & Verhoeven, G.A.G. (2015). Footprint.

Figure 23: The player switches to the perspective of a polar bear in the game Footprint. Tomassen, R.M.J., Voeten, K.K., van der Velden, R.C.F.M., & Verhoeven, G.A.G. (2015). Footprint.

Figure 24: An overview of the map in Kolas. Lu, H., Schippers, S.R., & Sonnemans, L.L.A.(2015). Kolas

Figure 25: The player selects what news to publish in Kolas. Lu, H., Schippers, S.R., & Sonnemans, L.L.A.(2015). Kolas

Figure 26: A group of draws go camping in the game One of the Eight. Bogaerts, E., Herk, W., Disbergen, E., & Khalil, S. (2015). One of the Eight.

Figure 27: A player is confronted with negative thoughts in the game Face the Sun. Song, Y. (2015). Face the Sun.

Figure 28: A top down view of the map players can explore in Face the Sun. Song, Y. (2015). Face the Sun.

Figure 29: Overview of the game board and components of game The Moral Racket. Mighell, D. (2015). The Moral Racket.

Figure 30: Overview of the board game The Moral Racket. Mighell, D. (2015). The Moral Racket.

Figure 31: Introduction display for the game whereIF. Ruiter, A. (2015). whereIF.

Figure 32: Children working together to build a stable tower of blocks in the game AllRight. de Rond, M. & Wabeke, E. (2015). AllRight.

Figure 33: Player controlling a sphere trying to reach the end point in the

game GRASP. van Kessel, C. (2015). GRASP.

Figure 34: The player (a sphere) meets other characters (cylinders) in the game Cornered. Candido, A., Damen, K., Faro, A., van Gaalen, K. (2015). Cornered.

Figure 35: Model illustrating the persuasive game design process model. Kors, M. (2015). Persuasive Game Design Process model.

Figure 36: A screenshot from the trailer of This War of Mine, highlighting the difference between a civilian and military perspective. 11 bit studios. (2014). This War of Mine.

Figure 37: A character in the game This War of Mine expresses regret over what he did. 11 bit studios. (2014). This War of Mine.

Figure 38: Screenshot from a This War of Mine game trailer in which Emir Gerimovic talks about his experiences as a child during the siege of Sarajevo. 11 bit studios. (2014). This War of Mine.

Figure 39: Quiet House location in the game This War of Mine where the player is confronted with a moral dilemma. 11 bit studios. (2014). This War of Mine.

Figure 40: A photo of a deceased character in the game This War of Mine. 11 bit studios. (2014). This War of Mine.

Figure 41: A child character asking why people kill each other in the game This War of Mine: The Little Ones. 11 bit studios. (2015). This War of Mine: The Little Ones.

Figure 42: Drawing of quality assurance-lead on his role in the development process of the game This War of Mine. De Smale, S., Kors, M., & Sandovar, A. (2017). Drawing of quality assurance-lead

Figure 43: Sketch of a writer on his role in the development process of the game This War of Mine. De Smale, S., Kors, M., & Sandovar, A. (2017). Sketch of writer.

Figure 44: Model illustrating the diegetic location of the extrafictional player and extrafictional victim(s). Kors, M. J., Van der Spek, E. D., Ferri, G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 45: Model illustrating the diegetic location of the intradiegetic representation of the extrafictional victim(s). Kors, M. J., Van der Spek, E. D., Ferri, G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 46: Player observes children who are playing soccer in the Za'atari refugee camp in In Clouds over Sidra. Arora, G., Pousman, B., & Milk, C. (2015). Clouds over Sidra.

Figure 47: The player observes the plight of Syrian children in refugee camps, displaced in the Syrian civil war, in Project Syria. Emblematic. (2013). Project Syria.

Figure 48: Model illustrating the observer perspective. The diegetic location of the extradiegetic observer. Kors, M. J., Van der Spek, E. D., Ferri,

G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 49: The player witnesses an act of racial discrimination in the game Injustice. Cho, J., Won, Y., Kothari, A., Fawaz, S., Ding, Z., & Cheng, X. (2016). Injustice.

Figure 50: Model illustrating the partaker perspective. The diegetic location of the intradiegetic partaker. Kors, M. J., Van der Spek, E. D., Ferri, G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 51: Model illustrating the victim perspective. The diegetic location of the intradiegetic victim. Kors, M. J., Van der Spek, E. D., Ferri, G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 52: The player navigates through a house with obstacles, while seated in a wheelchair, in the game Wheelhouse. Nerurkar, M. (2017). Wheelhouse.

Figure 53: Model illustrating how adopted thoughts and feelings are used towards the intended extrafictional victim(s). Kors, M. J., Van der Spek, E. D., Ferri, G., & Schouten, B. A. (2018). Diagram of narrative universes.

Figure 54: The A Breathtaking Journey project demonstrated at the DutchVR Days. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 55: A player is holding his breath to avoid detection in the game A Breathtaking Journey at De Culturele Zondag in Utrecht, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 56: The player is wearing an Oculus head-mounted display, a pair of stereo headphones, and a custom gas mask attachment as part of the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 57: The physical contraption of the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 58: The virtual environment (truck scene) at the moment the border patrol opens the lorry in the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 59: The virtual environment (truck scene) in which the player is seated in the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 60: A modified heavy-duty table saw motor driving an enclosed eccentric to add movement to the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 61: A gas mask, with a custom 3D printed attachment, for the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 62: The CAD model for the 3D printed attachment, for the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A

Breathtaking Journey.

Figure 63: Inside the custom gas mask attachment, for the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 64: The PCB fitted into the 3D printed attachment, for the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 65: The player's breathing is represented in the game using a white smoke-like effect in the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 66: The player is shown a stylized video in the dream scene of the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 67: The player is surrounded by flames in the dream scene of the A Breathtaking Journey project. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 68: The player wakes up in the back of a lorry to the subtle scent of mandarins in the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 69: A small opening provides players with a peek to the outside world in the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 70: A bright light fills the lorry as the door of the truck swings open in the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 71: A player managed to remain undetected in the game A Breathtaking Journey. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 72: A Breathtaking Journey demonstrated at Night of the Nerds in Eindhoven, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 73: The A Breathtaking Journey project demonstrated at De Culturele Zondag in Utrecht, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 74: The A Breathtaking Journey demonstrated at festival deBeschaving in Utrecht, the Netherlands. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 75: Sheets with six portraits were provided to participants as part of a photo elicitation protocol. Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Figure 76: A player selects one of the available toys on display in the game Through Pink and Blue Glasses. Janssen, S., van Kessel, C.R., & Muller, A. (2016). Through Pink and Blue Glasses.

Figure 77: The player starts in an abstract room as one of the parents in the game Exchanging Perspectives. Loeffen, T. (2016). Exchanging

Perspectives.

Figure 78: A player in the role of a reporter, exploring Watanabe temporary housing in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 79: An early prototype of the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 80: The office space in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 81: Watanabe's temporary house in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 82: The temporary housing camp in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 83: The players freely navigate through Watanabe's temporary housing and interact with objects in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 84: When a player picks up an item a vignette is triggered in which Watanabe discusses a related event, in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 85: A wristwatch displays how much time is left for exploring Watanabe's temporary housing, in the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 86: A work-in-progress overview of a few of the topic-related vignette chains, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 87: An in-editor (Unreal 4) screenshot of how objects and vignettes are placed throughout Watanabe's temporary housing, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 88: An in-editor (Unreal 4) screenshot of how objects appear throughout Watanabe's temporary housing, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 89: A mock-up of the item / vignette chain distribution in Watanabe's temporary housing, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 90: A person is measuring radiation levels while driving through Fukushima prefecture, Japan, and a close up shot of a homemade geiger counter measuring radiation levels at ground level in Fukushima prefecture, Japan. Kors, M. J. L. (2016). Fukushima prefecture, Japan.

Figure 91: Workers removing the topsoil to remove hot particles in Fukushima prefecture, Japan. Kors, M. J. L. (2016). Fukushima prefecture, Japan.

Figure 92: One of the temporary housing camps in Fukushima prefecture, Japan, where interviews with evacuees from the 2011 Fukushima Daiichi nuclear disaster in Japan were carried out. Kors, M. J. L. (2016). Fukushima prefecture, Japan.

Figure 93: An evacuee from 2011 Fukushima Daiichi nuclear disaster who was interviewed for the development of the game Permanent. Kors, M. J. L. (2016). Fukushima prefecture, Japan.

Figure 94: Visual collection of stories from the ethnographic study, interviews, articles, news, publications, documentaries, combined with illustrative photos as grounding for the development of the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2016). Collage of photos.

Figure 95: Development of Watanabe's persona as the basis to personify the collated stories, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2016). Moodboard.

Figure 96: One of the temporary housing camps in Fukushima prefecture, Japan, that was visited during the development of Permanent. Kors, M. J. L. (2016). Fukushima prefecture, Japan.

Figure 97: Virtual recreation of a temporary housing unit using Autodesk 3DsMax, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 98: Creating collision boxes for the temporary housing unit using Autodesk 3DsMax, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 99: Virtual recreation of a temporary housing camp in progress, here shown imported into the Unreal Engine 4. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 100: Recording ambient audio in Fukushima city to capture realistic environmental ambient audio, as part of Permanent's development. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 101: A prototype for drafting reports in-game as part of a stand-alone version of Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 102: Project Permanent presented to the public at the Virtual Reality Exposition organized as part of the Fukushima Film Festival 2017 in Tokyo, Japan. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 103: Project Permanent presented to the public at the Virtual Reality Exposition organized as part of the Fukushima Film Festival 2017 in Tokyo, Japan. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 104: A participant is handed over a stack of polaroid-like photos containing all the items he collected during his play session, as part of the study carried out with the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 105: A participant writes down how she thought and felt about each of the selected items and corresponding vignettes, as part of the study carried out with the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 106: A participant explains in detail why she picked each item/vignette that she attached to the whiteboard, and how they made her think and feel, as part of the study carried out with the game Permanent. Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Figure 107: A player joins a poacher to hunt down rhinos, in the game The Hunt. Bos, C., Hamoen, J., van der Heide, J., Smets, J. (2016). The Hunt.

Formal Dissemination

The following overview lists the formal publications, presentations, workshops, and demonstrations offered as part of the research presented in this dissertation.

Articles and Presentations

Peer-reviewed and Published

van der Spek, E. D., Kors, M., & Schouten, B. (2014). Serious games - A quest to defeat the oxymoron. IFIP 13th International Conference on Entertainment Computing Workshop: Workshop on Entertainment in Serious Games Games and Entertaining Serious Purposes, Sydney, Australia.

Kors, M., van der Spek, E., & Schouten, B. (2015). A Foundation for the Persuasive Gameplay Experience. Proceedings of the 10th Foundations of Digital Games Conference. Pacific Grove, CA, USA.

Kors, M. (2015). Towards Design Strategies for the Persuasive Gameplay Experience. Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play, 407-410. London, United Kingdom. https://doi.org/10.1145/2793107.2810281

Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A. M. (2016). Occasionally a Dull Moment. Designing for Introspection and Retrospection in Persuasive Games. 1st Joint Interest Conference of DiGRA and FDG 2016 Workshop: Morality Play: The Design of Games for Moral Engagement. Dundee, United Kingdom

Kors, M. J. L., Ferri, G., van der Spek, E. D., Ketel, C., & Schouten, B. A. M. (2016). A Breathtaking Journey. On the Design of an Empathy-Arousing Mixed-Reality Game. Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play, 91-104. Austin, TX, USA. https://doi.org/10.1145/2967934.2968110

De Smale, S., Kors, M., & Sandovar, A. (2017). The Case of This War of Mine: A Production Studies Perspective on Moral Game Design. Games and Culture. https://doi.org/10.1177/1555412017725996

Kors, M. J. L., van der Spek, E. D., Ferri, G., & Schouten, B. A. M. (2018). You; the Observer, Partaker or Victim. Delineating Three Perspective to Empathic Engagement through Immersive Technologies. Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play. Melbourne, Australia. https://doi.org/10.1145/3270316.3271547

Kors, M. J. L., van der Spek, E. D., Bopp, J. A., Millenaar, K., van Teutem, R. L., Ferri, G., & Schouten, B. A. M. (2020). The Curious Case of the Transdiegetic Cow, or a Mission to Foster Other-Oriented Empathy Through Virtual Reality. Proceedings from CHI Conference on Human Factors in Computing Systems (CHI '20), Honolulu, HI, USA. https://doi.org/10.1145/3313831.3376748

Kors, M.J.L., Ferri, G., van der Spek, E.D., Ketel, C., & Schouten, B.A.M. (2021). A Breathtaking Journey. Appealing to Empathy in a Persuasive Mixed-Reality. In T. de la Hera, J. Jansz, J. Raessens, & B. Schouten (Eds.), Persuasive Gaming in Context (pp. 95-118). Amsterdam, the Netherlands: Amsterdam University Press.

Presentation without Publication

Kors, M. J. L. (2015). Persuasive Gaming in Context: Design. Etmaal van de communicatiewetenschap. Panel Games for Change interdisciplinary. Antwerp, Belgium.

Kors, M. (2016). Expanding the Empathy Machine to shape how we think and feel about Reality. The Dutch Digital Games Research Association Chapter (DiGRA.nl) 2016. Utrecht, the Netherlands

Raessens, J., Jansz, J., Schouten, B., Jacobs, R., & Kors, M. (2015). Persuasive Gaming. From Theory-Based Design to Validation and Back. Digital Games Research Association (DiGRA) 2015, Lüneburg, Germany.

B. A. M. Schouten & M. J. L. Kors (2017). On the Design of Persuasive Games. Persuasive Games in Context Conference. Amsterdam, the Netherlands.

Workshops

Peer-reviewed and Published

Kors, M. J. L., Millenaar, K., Van der Spek, E. D., Ferri, G., Schouten, B. A., & Marsh, T. (2017). Shaping attitudes across realities. Exploring strategies for the design of persuasive virtual, augmented and mixed reality games. In International Conference on Entertainment Computing, 497-501. Springer, Cham. Tsukuba, Japan. https://doi.org/10.1007/978-3-319-66715-7_71

Kors, M. J. L., Millenaar, K., van der Spek, E. D., Ferri, G., Schouten, B., Sandovar, A., Ketel, C., & Dormans, J. (2017). Arguing on the holodeck. Designing immersive interactive entertainment with persuasive intent. In Extended Abstracts Publication of the Annual Symposium on Computer-Human Interaction in Play, 667-671. Amsterdam, the Netherlands. https://doi.org/10.1145/3130859.3131444

Workhops without Publication

Kors, M. J. L., Millenaar, K., & Sandovar, A. (2017). Persuasive Games for Social Impact. Reframing Studio. Amsterdam, the Netherlands

Research through Design Projects

Ketel, C., & Kors, M. J. L. (2015). A Breathtaking Journey.

Kors, M. J. L., Millenaar, K., Teutem, R. L. V., Goossens, R., Ito, H., Bloemsma, B., Hermsen, K., & Sandovar, A. (2017). Permanent.

Public Demonstrations

The A Breathtaking Journey project. (2015). Dutch VR Days. Amsterdam, the Netherlands.

The A Breathtaking Journey project. (2015). Bright Day. Amsterdam, the Netherlands.

The A Breathtaking Journey project. (2015). Playground Virtual Reality. Groningen, the Netherlands.

The A Breathtaking Journey project (2016). De Culturele Zondag. Utrecht, the Netherlands.

The A Breathtaking Journey project (2016). Festival deBeschaving. Utrecht, the Netherlands.

The A Breathtaking Journey project (2016). Night of the Nerds. Eindhoven, the Netherlands.

The A Breathtaking Journey project (2016). Dutch Design Week 2016: Hyperspace Beyond. Eindhoven, the Netherlands.

Virtual Reality technology demonstration. (2016) Playground Virtual Reality. Groningen, the Netherlands.

The Permanent project. (2017). Fukushima Film Festival. Tokyo, Japan.

The Permanent project. (2017) Secretary of State visiting IJsfontein. Amsterdam, the Netherlands.

The Permanent project. (2017). Annual Symposium on Computer-Human Interaction in Play. Amsterdam, the Netherlands

The Permanent project demonstration (2017). Dutch Design Week 2017: Manifestations (Hyperspace Collective). Eindhoven, the Netherlands.

Public Presentations and Media Coverage

Dutch VR Days moeten virtual reality op de kaart zetten. (2015). NOS Journaal. NPO

De virtuele realiteit komt steeds dichterbij. (2015). Z Today. RTL

De Wereld van Virtual Reality. (2015). Radio EenVandaag. NPO

Brightday Report. (2015). Bright TV. RTL

De reis van een vluchteling in virtual reality. (2016). NOS Airtime. NPO

Onderzoekers ontwikkelen VR-ervaring op basis van verhalen van vluchtelingen. (2016). De Kennis van NU. NTR.

Kors, M. J. L. (2016). Fostering Empathy through Virtual Reality. Sign of Time: Virtual Empathy. Willem de Zwijger, Amsterdam, The Netherlands

Kors, M. J. L., & Millenaar, K. (2017). The Art of Persuasive Games. Dutch Embassy. Tokyo, Japan.

Acknowledgments

Unbeknownst to me when I applied for a position of researcher, pursuing a PhD is perhaps so much more about perseverance than it is about intellect. Tapping into the unknown requires patience, grit, an immense trust in the process, and ultimately the belief that everything will turn out fine. I still remember a blog post by Matt Might (n.d.) that illustrated how working towards a PhD is like endlessly pushing at the boundaries of knowledge, grinding towards the moment that these boundaries will give way for you to form a microscopic pimple on the face of knowledge. Undeniably, the past few years all too often felt like that. However, in between euphoria and some unpleasant words to describe this journey, loneliness is not one of them. On the contrary, I'm blessed to have crossed paths with absolute gems of people who were pivotal to both my work and mental wellbeing. Some guided me through the academic wastelands, others were a source of inspiration and motivation, some patiently listened to my rants, and yet others voluntarily (I hope) accompanied me to late-night karaoke or early-morning rodeo. Therefore, I would like to take the opportunity to express my gratitude towards the souls who endured me while I endured life as a rookie researcher.

First, I would like to thank my promoter Ben Schouten and co-promoters Erik van der Spek and Gabriele Ferri.

Ben, I know I should probably say something lengthy about your understanding of games and play, your love for exploratory design research, you extraordinary dancing skills at DiGRA 2015, or perhaps your endless supply of thought-provoking quotes. However, if I'm forced to name just one single thing that you've taught me over the years then it would be to 'game the system', not just to seize the opportunity but to create it. You showed me to shake the rigid nature of research and allowed me to play around with it to my heart's content. You may have said "Martijn, hold your horses!" all too often in an attempt to minimize collateral damage, but I wholeheartedly appreciate that you have always granted and defended my decisions and undertakings without too much hesitation or doubt.

Erik, I know you are probably expecting me to say something spectacular, like how well you can shake a tambourine with perfect rhythm to pretty much any AKB48 song, but perhaps I better focus on your academic

qualities instead. Oftentimes when I couldn't find a way out, got stuck in thoughts, or was crunching to meet a paper deadline, you were there to help out or to find an ingenious way to fix things (or at least make things look a whole lot better). You have a unique skill in forming well-rounded sentences and making papers juicy! Obviously, this helped a lot with getting papers accepted, but it also taught me a great deal about constructing my arguments, being consistent, and providing a good rationale for the whats and whys.

Gabriele, thank you for guiding me through the wild west of qualitative methodologies, helping me to embrace Research through Resign and all its quirks, and showing me how to find value in seemingly messy datasets. You even got me speaking in fancy narratological slang to boot. I'm pretty certain you are most proud of the latter achievement! Over the past few years your agenda got increasingly 'swampy' as you took on more and more duties at the Amsterdam University of Applied Sciences, which forced you to often take the backseat when I proposed writing a new article. While your directions from the backseat were obviously invaluable to my work, I really hope to see you shotgun an article with me once again in the future.

Next, I would like to thank Julia Bopp, Cas Ketel, Karel Millenaar, Alyea Sandovar, Stephanie de Smale, and Rutger van Teutem, for our fruitful and enjoyable collaborations. We spend days on end and plenty of late nights trying to craft convincing sentences, beat complicated templates for conference proceedings, complain about version control software, secure heavy machinery with tape, or turn a Japanese supermarket into a makeshift game studio.

Julia, you said yes to my request to briefly look at some Japanese interviews, but ended up spending many late nights writing about ambivalent characters, other-oriented empathy, and transdiegetic tomato plants. It was an unplanned collaboration over the summer months of 2019, but one which I enjoyed for both our casual chats and the ease at which we were able to rapidly bounce back and forth ideas. Thank you for making my first ever fully long-distance collaboration everything I could have wished for.

Cas, perhaps a shrill YEE-HAWww is all that is really needed to describe how much I enjoyed our collaboration. From becoming highly sensitive to smoke fragrance, dining at 'De Brink', shouting "hilfe, hilfe…" on a beach in Texas, almost burning down an elderly resort, locking

ourselves in a sea container with outside temperatures rising well above 40° Celsius, to being electrocuted by cheap Chinese relays. I can imagine that, for many, this doesn't sound like the most ideal or most fruitful collaboration, perhaps better described as a total mess. However, truth be told, I won't hesitate a second if I had the opportunity to do it all over again. Working with you was a pleasure, and I cannot remember a single moment that we couldn't find a way out or solve something by simply sticking our heads together and generate a wacky hack. I'm absolutely certain that we would quickly be nicknamed 'Pat & Mat' if we'd ever end up as neighbors, so 'a je to'!

Karel, I first met you as a lecturer at the University of the Arts Utrecht in 2006, when I was a fresh and fragile game design student. Among the first-year students your name quickly became synonymous with a madman that crushes dreams and slays prototypes, and I crossed my fingers every semester to not have you assigned as my examiner. You might be able to imagine how shocked I was in 2013, to learn that we would be colleagues! However, I deeply regret that I believed any of this nonsense back then. If anything, you have a heart of gold, are quick-witted, able to withstand my tantrums (even if this involves blaming you), know how to work and play hard (preferably at the same time), and on top of it all, you love watching footage of bullet trains without commentary as much as I do. Perhaps I should also say a thing or two about our mutual passion for karaoke, but now that you took singing lessons I'd rather not say anything more as it will make me look like a complete amateur.

Alyea, thanks to Ben's smuggled bottle of whiskey at FDG2015 I, unfortunately, have a hard time remembering the first time we had a chat. It was not until a year later, during FDG/DiGRA 2016 in Dundee, that we properly met. You said you planned to go on a whiskey tour with Maxwell Foxman and Juho Hamari, and I said something along the lines of wishing I had planned a whiskey tour myself. You immediately invited me to tag along, and the rest is history. You carried on this hospitality and openness in our contact over the years to follow, from continuing our shared interest in whiskey, our lengthy conversations about games, life, and everything pleasant and unpleasant about academia. And let's not forget your tremendous support during the production of Permanent, it's amazing to know someone who has the capacity to instantly brighten up any room!

Stephanie, we immediately decided to collaborate on an article as soon as we discovered our overlapping interests in the development of the game This War of Mine. Together with Alyea Sandovar, it quickly became our mission to dive deeper into the hows and whys behind the game. Mere months later we were drinking vodka with the development team in Warsaw, and all I can remember is flashes of us worrying about whether the shady Uber driver was actually going to drive us back to our rental apartment. Fortunately, we survived with all the interview data intact! If anything, our collaboration proved that, with the right company, writing a journal paper can be a remarkably quick, easy, and painless process.

Rutger, I'm not sure what would have become of the Permanent project without you. Originally you planned to stay for a single semester, but I guess you enjoyed our collaboration as much as I did, and decided to stay for a second semester to not only finish the project but also bring it all the way to Japan. Of course, we had our fair share of setbacks, and pushing a full 150% is apparently not always the best solution, but I enjoyed working with you a lot and I'm grateful for your tremendous contribution. I admire your technical know-how, curiosity, and willpower, which you expertly combine to create both useful, and sometimes less useful, prototypes.

Next, I would like to thank the members of the Persuasive Gaming in Context project group, Jeroen Jansz, Joost Raessens, Teresa de la Hera Conde-Pumpido, and Ruud Jacobs, for our insightful get-togethers and inspiring discussions. Jeroen, from our very first meeting I knew you meant business. You are sharp, action-oriented, and a rockstar at providing constructive criticism with a comforting ooze to it. Joost, your enthusiasm for novel virtual reality installations and anything that fits within the games for change category is very contagious. You fueled my eagerness to dive deeper into the world of immersive technologies and helped turn it into a key aspect of my work. Teresa, thank you for your fresh perspective on the multitude of ways in which games can persuade. This provided me with a sandbox of opportunities to play in right from the very beginning. Ruud, thank you for your stubbornness in arguing that persuasive games primarily focus on changing attitudes. I cannot agree more, and I leveraged your words to muster the confidence to swim upstream against the, in Human-Computer Interaction research fields far more common, behavior change focused interpretations of persuasion.

I would also like to thank the opposition of my doctoral committee, Wijnand IJsselsteijn, Hans Hoeken, and Floyd Mueller, as well as chairwoman Lin-Lin Chen, for being part of my doctoral committee, the insightful discussions we had over the years - on topics ranging from persuasive narratives to research through design - as well as for the suggestions offered to further polish my dissertation.

Next, I would like to thank the lovely bunch of people over at the Civic Interaction Design research group at the Amsterdam University of Applied Sciences. Thank you Anders Bouwer, Marije ten Brink, Martijn de Waal, Tamara Dobler, Joris Dormans, Luis Rodil Fernandez, Paul Geurts, Nicolai Hansen, Genevieve Korte, Stefan Leijnen, Svetlana Mironcika, Dop Terlingen, Adam van Heerden, Menno van Pelt-Deen, Valerio Perna, Monique van Rijen, Riemer van Rozen, and Mirjam Vosmeer. Regardless of how many times this group has changed its name, location, or bunch of bright minds, you always made me feel right at home.

I would also like to thank many of the colleagues I've met at the Eindhoven University of Technology over the years, especially those with whom I had the pleasure to interact with on a more frequent basis. Thank you Tilde Bekker, Cindy van den Bremen, Max Birk, Mendel Broekhuijsen, Mark de Graaf, Berry Eggen, Pelin Gültekin, Anne Jeuken, Rosalinde Kennis, Pierre Levy, Jingya Li, Fan Li, Rong-Hao Liang, Panos Markopoulos, Jesus Muñoz-Alcántara, Xipei Ren, Pepijn Rijnbout, Rob Tieben, and Xinwei Wang. You collectively taught me the ropes of conducting design research and contributed tremendously to an exciting workplace.

For helping out with the development of Permanent, I would like to thank Maxime Bloemsma, Rian Goossens, and Kim Hermsen. I know we could have perhaps organized things a bit better to increase efficiency, but it was a lot of fun working with you and the end results is certainly impressive.

Next, I would like to thank the many industry professionals, conference attendees, reviewers, and other bright people, who have inspired me, taught me, entertained me, supported me, critiqued me, or just enjoyed having a drink with me on more than one occasion. Thank you! Among those are Ellis Bartholomeus, Pieter van den Heede, Maaike de Jong, Luite Douma, Maxwell Foxman, Walter Giannuzzi, René Glas, Adrian Gradinar, Mary Beth Haines, Marja Halters, Jussi Holopainen, Jo Iacovides, Hartmut Koenitz, Frederike Manders, Elisa Mekler, Kenji

Ono, Jephta Peijs, Enrique Perez, Niki Smit, Sharon Steinemann, Sachie Takagi, Theresa Tanenbaum, Max Theaged, Roland van Veen, Takemi Wada, Harald Warmelink, Toshimasa Yamanaka, and Rembrandt Zegers. I would also like to thank Amnesty International the Netherlands, OurPlanet-TV, and the Embassy of the Netherlands in Tokyo, Japan, and 11 bit Studios, for their support.

And last, but not least, I would like to thank my family and friends for their unconditional love and care, while maintaining a healthy distance from the academic world. Haruno, for brightening each moment of my day, comforting me when I'm at my wits' end, and for insisting on maintaining a proper work-life balance. Margot, for grounding me when I'm at my best and my worst. Your endless reminders to approach each day with a fresh and positive perspective, and continued motivation to persevere when times get tough, were paramount for getting this far. Theo, for giving me strength, wherever I go. Marjolein, Ken, and Yuzu, for your endless motivation and frequent opportunities to get away from all the mess. Yasuo, Noriko, and Tsutomu, thank you for your patience and the yearly moments of relaxation that allowed me to recharge and tame this beast. To my friends outside of academia, thank you for being there whenever I needed distraction or a listening ear. And finally, I'd like to thank Nene, for her meow, chirrup, meow, meow!

Academic Curriculum Vitae

Martijn Kors was born on 24-10-1988 in Naarden, the Netherlands. After finishing HAVO in 2006 at the St Vitus College in Bussum, the Netherlands, he studied Game Design and Development at the Utrecht School of the Arts in Hilversum, the Netherlands. In 2010 he was awarded a Bachelor of Arts & Technology degree and a joint Master of Arts degree from the Open University in Milton Keynes, United Kingdom, for his work on playful interface design. After graduation, he enrolled in the master's program in Industrial Design at the Eindhoven University of Technology in Eindhoven, the Netherlands, and was subsequently awarded a Master of Science degree in Industrial Design in 2013. For his final graduation project he was awarded with the best graduation project of the Industrial Design department in 2013. In 2013 he started a PhD project on the topic of persuasive game design at the Eindhoven University of Technology in Eindhoven, the Netherlands, and the Amsterdam University of Applied Sciences in Amsterdam, the Netherlands, of which the results are presented in this dissertation.

This page intentionally left blank

Games are no longer designed exclusively for entertainment purposes, but increasingly often to shape how players think and feel about issues in reality. *Shaping Attitudes Across Realities* offers a design-oriented perspective into the fascinating universe of persuasive games, from describing their unique characteristics, surveying example cases, exploring design and development, assessing resulting player experiences, to distilling practical design insights.

In particular, this work focuses on the strategic combining of an appeal to empathy and the employment of immersive technologies in the design of socially aware persuasive games, with two research through design projects demonstrating a variety of ways designers may leverage these two powerful factors to achieve intended empathic and attitudinal effects.

ISBN: 978-90-386-5507-9