PLAYING TO WIN OVER
VALIDATING PERSUASIVE GAMES

Ruud S. Jacobs

Playing to Win Over:
Validating persuasive games

Games die spelers voor zich winnen:
Het valideren van persuasive games

This dissertation is part of the research program 'Persuasive Gaming. From theory-based design to validation and back' with project number 314-99-106 which is (partly) financed by the Netherlands Organization for Scientific Research (NWO).

ISBN: 978-90-76665-31-3

Publisher: ERMeCC - Erasmus Research Center for Media, Communication and Culture

Printing: Ipskamp Printing, Enschede

Cover design: Jorrit Kiel

This dissertation has been printed on FSC-certified paper (paper from responsible sources)

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Thesis

to obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the
rector magnificus

Prof.dr. H.A.P. Pols

and in accordance with the decision of the Doctorate Board
the public defense shall be held on
Friday 10 November 2017 at 13:30 hours
by

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Acknowledgements

Writing a dissertation is an exercise in placing oneself first. Although conducting scientific research is hardly a solitary affair, dissertations all too easily make the PhD candidate out to be the sole creator of the work. However, just as game players can avail themselves of walkthroughs and wikis for guidance and can these days even engage in jolly cooperation to tackle seemingly impossible problems, so too was the success of this dissertation dependent on the advice, input, and collaboration offered to me from all sides. I want to thank a few of these kind souls here before I do what I always do (i.e. talk about games endlessly).

My supervisors, Jeroen Jansz and Julia Kneer, deserve the first mention. Jeroen, you always know what to say and how to say it, and your (emotional) reactions to positive and negative moments during the past four years have been of greater comfort to me than I can admit to. Julia, your reviewer's eye and methodological insight are only matched by your heartfelt personal advice on work-life balance. I could not imagine a more fitting pair of supervisors to have molded me up from a providential bumbler to an independent, tactical bumbler who pre-registers his work.

I am also incredibly grateful to have had the chance to work together with the experts in the interdisciplinary Persuasive Gaming project team. Teresa de la Hera's confident, determined models and viewpoints, Martijn Kors' enthusiastic design ideas (and carpentry!), and Ben Schouten's artist's interpretations have all helped me sharpen up my thinking while adding to the basis of my work. Joost Raessens, seeing and hearing you process and react to my work over the years of PGiC meetings and sudden phone calls has been a constant source of inspiration to write for someone other than myself.

In my time at ERMeCC, I have met some of the smartest people I have ever known. The PhD Club's many meetings over the years have set a bar for my work by letting me read other candidates' writings. I am grateful to Simone, Lei, Qiong, Emy (talk about setting bars), Johannes, Joyce, Lela, and Roel as my roommates for their advice and for acting as word sponges for when I needed to vent or share. A few of the countless influences: Thanks to the many anonymous reviewers and kind editors for the hours they put in reading and critiquing my work; Sanne and Iris for showing how 'professional' and 'super nice' are not mutually exclusive states; Pieter and the many wonderful people of the ICA Game Studies division for sharing insights on game research; Stefan for helping me destroy a game about cotton picking; Anouk for our shared internal rage; Tom, Jip, Paul, Linda, Lisa, and Tom for not expecting anything in the way of decorum from me whenever they see me; and my parents, for showing the values of hard work and caring for others (Erna) and going against the grain with a smile on your face (Jens).

Lieke, you are at the end of my acknowledgments just as you are the final thought in my head and the person I return to whenever I am done with work, games, or traveling. Even if I had not told you every thought that came into my mind in the past four years, you would have still known every word in this book before you read it. I worked to make it the best I could for you. I love you.

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1. General Introduction

Long before I tried my hand at being a scientist, I researched the world through games. These fantastical virtual spaces offer tremendous insight into the way our physical world functions. Games let us test our own ideas of what is wrong and right (Jansz, 2015). We explore our minds while we struggle through the Black Mesa complex in *Half-Life* (Valve, 1998). Books and movies have similar designs on our reflective capabilities, but only games allow us to *experience choice* – or what happens when there is no choice, such as in *Bioshock* (2K Boston, 2007)*, Spec Ops: The Line* (Yager Development, 2012)*,* and *Depression Quest* (Quinn, 2013).

Similarly, long before starting a PhD project on the persuasive power of games, I was being persuaded by games. *Animal Crossing* (Nintendo, 2001) and many other games helped me construct a value that helping others in need without looking for personal gain is good behavior. *Rollercoaster Tycoon* (MicroProse & Sawyer, 1999) showed me why food in theme parks is often so expensive. *Shadow of the Colossus* (SCE Japan Studio, 2005) changed my conception of heroism. *Wario Land: Super Mario Land 3* (Nintendo, 1994) – along with my father's cooking – made me realize how powerful garlic can be. Whether it is viewing the world through the designers' eyes or forming one's own interpretation of trivial occurrences, game worlds and stories are brimming with thoughts and evaluations of the real world.

This dissertation covers (entertainment and serious) games that are *intended* to persuade players, often by making those players researchers within their worlds. Take, for example, *Nova Alea* (Molleindustria, 2016). This game places players in the shoes of a real estate investor, investigative behavior is encouraged. By playing to win the game by getting the most money, players find themselves roleplaying actual real estate investors. By forfeiting their hold on properties at inappropriate times (in essence playing to lose), players sink beneath the waves of liquidity and the game tells players others are keen to take

their place, meaning nothing positive was achieved. Persistent players can also reach a third ending between these extremes. *By virtue of playing the game,* players are engaging with arguments that are meant to change their attitudes towards real-world practices.

This idealistic perspective on persuasive games is not new. From far back in recorded history, games have been developed embedded with meanings they were meant to instill in their players (Flanagan, 2009). Although these were at first similar in function to folk tales (in that they would support community values), modern persuasive games are applied to most conceivable topics, from domestic energy conservation (Gustafsson, Bång, & Svahn, 2009) to the experience of undergoing hormone replacement therapy (Auntie Pixelante, 2012). Their creators are equally diverse, ranging from a father looking to share his son's experiences with autism (Kadayifcioglu, 2013), to game companies such as IJsfontein, that are designing more interesting ways to train doctors' skills in the emergency room (Dankbaar et al., 2016). People from all different backgrounds are starting to recognize that games can be more than a form of artistic expression, channeling that expression to effect *positive* change in their players. This makes the decision to investigate whether such changes occur a timely one. In 2013, the Netherlands Organization for Scientific Research (NWO) awarded funding for a multi-disciplinary project with the title 'Persuasive Gaming. From Theory-based Design to Validation and Back'. This dissertation is the result of one of three research lines within this project. It is focused on the validation of persuasive games, though it is also informed by game studies and design perspectives.

1.1. Research Questions and Aims of the Dissertation

Academic interest in persuasive games has only started to rise in the last dozen years, ramping up after the release of the seminal book *Persuasive Games* by Ian Bogost (2007). Because of this, there is still much we do not know about persuasive games. With this dissertation, I aim to contribute to one very specific

part of the growing knowledge base by researching effects of these games. This dissertation finds preliminary answers for the following research questions:

1. *Do persuasive games 'work'?*
2. *How do persuasive games compare to other media and each other?*
3. *What are the mechanisms for the effects of persuasive games?*

Persuasive games are a specialized form of persuasive communication. Their influence is therefore studied from the perspective of communication science throughout this dissertation. Figure 1.1 shows the main factors that are taken into account. For the *media-psychological* effects this dissertations aims to find, the characteristics of the player and his or her experience during the play session are of critical importance. Elements of game design are included in the framework primarily in terms of how they affect persuasiveness, either directly through how they compose the message the game offers during the play

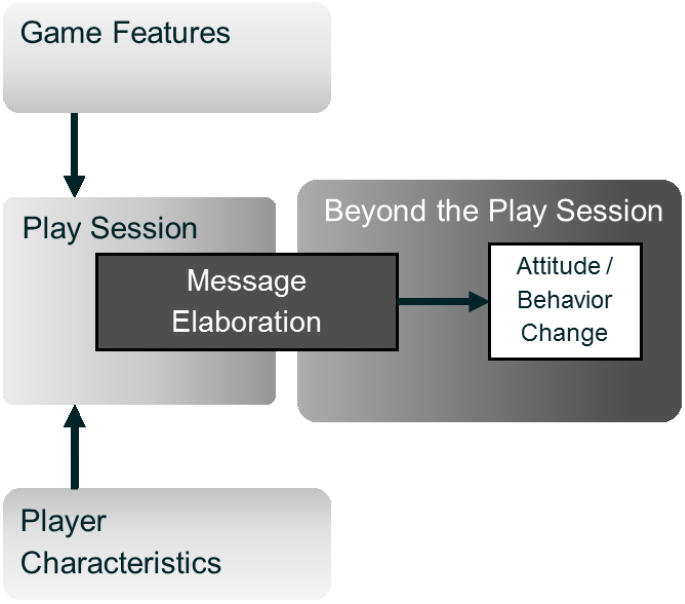


Figure 1.1: Simplified version of the Player-Oriented Persuasive Game Elaboration model (POPGEm) that is explained and expanded on in chapter 2.

session, or indirectly in how they promote the processing of that message. Message processing itself is seen here as a process of elaboration, taking the game's arguments into conscious reflection to a lesser or greater degree. Elaboration continues after the play session concludes, resulting in attitude and (possibly) behavior change.

Proving the validity of an entire medium of persuasive communication is no small task, of course. The focus for this dissertation is therefore on the second and third question; by looking for cases of incremental improvement and predetermined paths of influence this dissertation is intended to determine whether or not persuasive games work in specific cases. Once some games have been established to have robust effects and insights are generated into how they generate these effects, we can start calling the medium as a whole persuasive – similar to how not every individual television commercial needs to be investigated to determine if such commercials increase sales overall. This dissertation contributes on a theoretical level by showing the steps that are needed to provide conclusive answers beyond what is empirically proven in this volume. In chapter 2, different views on persuasive games are combined in the *Player-Oriented Persuasive Game Elaboration model*, or *POPGEm*, presented in figure 2.1 on page 33. This model has been developed as part of the research presented throughout the dissertation. The empirical chapters in this dissertation offer insights supporting the POPGEm, but they are also meant to spark further research. In this way, this dissertation goes beyond the data-driven conclusions on the validation of persuasive games the following chapters provide by signposting investigations that are still to be performed to generalize these conclusions across the medium.

1.2. Identifying Persuasive Games

To explicate the use of the term *persuasive game*, I propose the following definition:

> *A digital game in which the primary intention of its development is to shape, change, or reinforce attitudes towards a concept or object that is separate from the game to match a predefined attitude goal state.*

This definition is based on current knowledge in persuasion research in that it places the focus on attitudinal change over behavioral outcomes, as the latter can only be found as a result of the former (e.g. Ajzen, 1991; Bandura, 2001; O'Keefe, 2002; Petty & Wegener, 1999). Excluding instances of coercion – which simply do not exist for games – one can only change another's behavior by changing their attitudes. Which attitudes are involved is dependent on the game's topic and the arguments it offers, but this dissertation investigates games that aim to change attitudes towards topics outside of the game itself (also termed exocentric persuasion by de la Hera Conde-Pumpido, 2017). The entirety of attitudes that a certain game is intended and designed to influence in its players can be called the game's *attitude goal state*. The attitude goal state (AGS) – which is different for each game – could consist of just one attitude (e.g. 'smoking is not healthy'). It can also be more abstract, with facets of a multi-layered topic (such as global warming) being highlighted throughout a game. Attitude goal states also differ between games that share their broader topic. For example, while *September 12th* (Frasca, 2003b) – which is about bombing terrorists – and *The Best Amendment* (Molleindustria, 2013) – which deals with gun control – are both persuasive games on the futility of violence, they aim for their players to hold very different attitudes (Jacobs, Jansz, & de la Hera Conde-Pumpido, 2017). In the former game, the AGS can be described as that current Western military strategy does not solve the problem of terrorism and indeed exacerbates it. In the latter, it could be summarized as 'gun violence begets

violence', with specific mentions of firearm lobbyists providing an American context. In the POPGEm, the AGS is the message that informs the player's thinking, as will be explained in chapter 2.

Similar to Marsh's (2011) definition of serious games and Spagnolli, Chittaro, and Gamberini's (Spagnolli, Chittaro, & Gamberini, 2016) definition of persuasive systems, any game that primarily *intends* to persuade is called a persuasive game, while its worth is judged by the degree to which it succeeds at persuading players. This categorization has two consequences. Firstly, it groups together games on their shared intention (i.e. to persuade), which facilitates generalizations of findings across otherwise unconnected topics such as health and politics. Secondly, it places the emphasis of the study of persuasive games on their effects, foregrounding persuasive influence in the discussion around the medium. Throughout this dissertation, I follow the colloquial use of 'persuasive' among all media as having the *potential* to persuade, instead of reserving it for the scant few titles which have been empirically demonstrated to persuade.

1.2.1. Situating persuasive games

To demarcate persuasive games from other types of game, the reasons for a game's use should be taken into account separately from the intention behind its design (de la Hera Conde-Pumpido, 2017). The Euler diagram in figure 1.2 shows how persuasive games are a part of the serious gaming landscape. The numbered areas in the diagram correspond to seven types of games, outlined in table 1.1. As the central focus of this dissertation, persuasive games (5 and 6) fall under games designed for serious purposes – i.e. other than entertaining players and being sold to consumers (Ritterfeld, Cody, & Vorderer, 2009). This means all persuasive games are serious games, though not all serious games are persuasive games. Still, although commercial off-the-shelf (COTS) games and certain other serious games were not primarily designed to

persuade, some of them (2 and 3) are nevertheless *used* for this purpose in game-mediated persuasion (de la Hera Conde-Pumpido, 2017).

Of course, persuasive games are not the only games that can persuade. Indeed, serious and commercial games regularly carry (seemingly) strong messages that were deliberately included by their designers (e.g. Spec Ops: The Line, Yager Development, 2012). Among other issues, however, it is more difficult to discern the attitude goal states of these games and to disentangle them from intentions to entertain or educate, which in turn reduces the predictability of their effects. It is therefore necessary to focus on deliberate

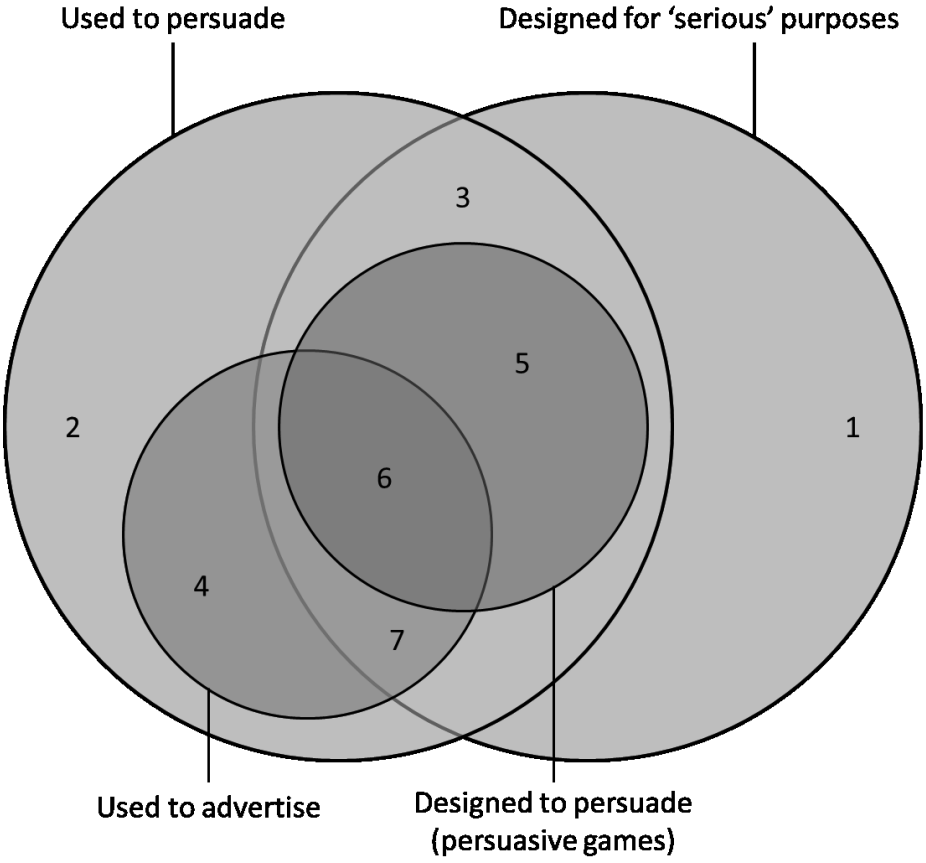


Figure 1.2: Euler diagram situating persuasive games (5 and 6) as games that were designed for the 'serious' purpose of persuasion that are also used to persuade players. See table 1.1 for the legend.

implementations of games that were designed to persuade to study their *intended* effects and ultimately inform parties interested in creating a persuasive game. For that reason, the primary focus of the POPGEm is on the games under point 5 and 6.

Table 1.1: Listing of the categorizations of serious games and games used to persuade from figure 1.2.

# in fig. 1.2	Types of game	Applications (examples)	Notable games
1	Designed for serious purposes that do not attempt to persuade players.	Education and training (e.g. vocational).	Underground (Goris, Jalink, & ten Cate Hoedemaker, 2014)
2	Not designed for serious purposes that used in game-mediated persuasion (de la Hera Conde-Pumpido, 2017).	Persuasion through existing (COTS) games.	Sim City (Bogost, 2006)
3	Designed for serious purposes (but not persuasion) that are used for persuasive purposes.	Education with reflection.	Poverty Is Not a Game (iMinds, 2010; Neys, van Looy, De Grove, & Jansz, 2012)
4	Not designed for serious purposes that are used to advertise.	In game advertising in existing (COTS) games.	FIFA series, Candy Crush Saga
5	Persuasive games without intent to advertise products, services, or brands.	Pro-social, health, political persuasion.	September 12th (Frasca, 2003b; Jacobs et al., 2017)
6	Persuasive games that include advertising messages.	Advertising with proprietary experiences.	Tem de Tank (de la Hera Conde-Pumpido, 2014b)
7	Designed for serious purposes (but not persuasion) that are used to advertise (Waiguny, 2013).	Branding in educational content	Teeth Games ("Teeth Games, Dentist Games for Kids Online. Colgate Kids," n.d.)

1.2.2. Advergames and persuasive games

This dissertation discusses persuasive games. Advergames are games that specifically aim to change attitudes towards brands, products, or services, and so fall completely under the definition of persuasive game used here. However, there are several key differences that distinguish the two, relating to the way they are defined, designed, and studied. This section explains the differences between these types of game and justifies the choice to investigate the broader group of persuasive games. In the diagram in figure 1.2, three different ways in which games are used to advertise are differentiated. Advertising can be seen as an attempt to affect attitudes of players towards brands, products, or services, making it a form of persuasion. Certain COTS and serious games are fitted with branding elements, in the form of in-game advertising (4 and 7 in figure 2.2). Since these games more often than not include multiple brands (for example as in-game items, or posted on virtual billboards) that are interchangeable, their designs are disconnected from specific persuasive intentions. Of these three applications, only advergames (6) were primarily designed to persuade. In most cases, their effects should be studied in the same way as non-commercial persuasive games (5). However, the way advergames' effects have been investigated up until now oversimplifies the persuasive mechanisms of the medium (de la Hera Conde-Pumpido, 2014a, sec. 1.3). There are three key differences in the way the POPGEm theorizes effects of persuasive games and how the majority of researchers have previously investigated advergame effects. These differences are on the level of the studies' dependent variables, the theories the studies used, and the type of games chosen (or developed) as stimulus materials. These discrepancies will be discussed to show how the POPGEm is more broadly applicable to game-borne persuasion than current theoretical frameworks in advergaming research.

Firstly, many advergame studies include brand recall as the primary dependent variable (e.g. Gross, 2010) while other persuasive game studies focus on player attitudes to the game's subject first and foremost (Peng, Lee, & Heeter,

2010; Ruggiero, 2015). Since memory of a brand is not necessarily tied to attitudes towards it, this means these studies were not researching games' persuasiveness.

Second, there are differences in the types of games used or developed in persuasive game effect studies. Non-commercial persuasive games that have been studied up until now have primarily been designed from the ground up to exert a specific message (e.g. Gerling, Mandryk, Birk, Miller, & Orji, 2014; Ruggiero, 2015). Conversely, advergame effect studies have employed proprietary games designed to resemble existing entertainment games (e.g. Bellman, Kemp, Haddad, & Varan, 2014; Cauberghe & De Pelsmacker, 2010; Goh & Ping, 2014; Redondo, 2012; Yoo & Eastin, 2016). Other studies tested freely available games that mimic entertainment game designs and merely introduced brand images (e.g. Cicchirillo & Mabry, 2016; Martí-Parreño, Aldás-Manzano, Currás-Pérez, & Sánchez-García, 2013; Peters & Leshner, 2013), without any kind of argument for the quality or efficacy of this brand. This strategy negates the importance of brand embedding in design, meaning the games studied are indistinguishable from COTS games with in-game advertising in area 4 of figure 2.2 (Lee & Faber, 2008).

The focus on brand recall and games without clear persuasive arguments reflects the theories applied to underpin the games' effects. Primarily, these consist of affect transfer theories (Baker, 1999; Cauberghe & De Pelsmacker, 2010) – whereby players like the brand if they enjoyed the game – rather than by argument-based cognitive persuasive mechanisms (Wise, Bolls, Kim, Venkataraman, & Meyer, 2008). This seems understandable given the idea of some advergame developers that the objective is for players 'to spend time in a branded environment in which all the content directly and exclusively relates to' (Mallinckrodt & Mizerski, 2007, p. 88) the brand the games promote. Indeed, a content analysis performed in 2008 concluded most advergames (84% of the included sample) were designed to have players have fun with the game first and foremost, with brands included on a product or brand logo level

(Lee & Youn, 2008). This unifies and simplifies the AGS (e.g. 'Brand X is fun'). Therefore, focusing effect studies on affect transfer over other mechanisms both downplays the legitimacy of games as persuasive communication and excludes games that do indeed employ richer persuasive mechanisms. The POPGEm re-establishes the focus on persuasion, looking at how games convince players through elaboration on messages.

1.3. Methods and Scope

In keeping with the majority of effects research, most of the studies in this dissertation applied quantitative methods. Quantitative methods enable generalizations from the individuals participating in each study to determine whether it is likely that the effects found are there for players outside of these research settings. It places this dissertation closer to general persuasion research in communication science (Perloff, 2014), and lets it serve as a benchmark for future efforts to validate persuasive games on different topics (Van Oostendorp, Warmelink, & Jacobs, 2016). However, the breadth of effects that can be detected with quantitative methods is necessarily limited by what measurements are used. As persuasive games can (and do) persuade in a large variety of ways (de la Hera Conde-Pumpido, 2015), a wide scope on how games (attempt to) affect players was needed. A qualitative content analysis (discussed in chapter 3) determined this scope for several of the games tested, which helped to compose appropriate measurement scales for the quantitative studies. Wherever possible, participants in this dissertation's studies were also given a chance to discuss the games they played (a process called *debriefing*), further widening the scope of the games' influences that could be detected in these studies.

In the context of the possible influences of persuasive games, the terms 'work' and 'effect' are used in the main research questions to signify the outcomes of playing persuasive games. The scope for these outcomes is kept constant throughout this dissertation, focusing on effects rather than

effectiveness or efficacy. Although these terms are sometimes used interchangeably, effects are operationalized here as short-term influences of persuasive games that are (in most cases) measured by the attitude scales developed or selected for each game. Effectiveness and efficacy are seen as broader concepts, signifying the intended consequences of a game that is unleashed on the public. Although conclusive investigations into effectiveness were outside of the scope of this PhD project, chapter 4 lifts the veil slightly on this kind of outcome by investigating the experiences of a 'natural' audience that sought out a freely available persuasive game. Similarly, the POPGEm posited in chapter 2 is oriented towards actual players instead of potential ones. In other words, the focus for this dissertation was not on motivations to play persuasive games, but on how games affect the players it already has. In chapter 4, this consisted of natural players who had already been playing the game in question when they were approached to participate in the study. In chapter 5 through 8, players were participants first, contributing to the study either at home or in laboratory or classroom settings after being invited to do so as part of a study.

All these considerations are a consequence of the width of this investigation. Persuasive games can have any sort of message embedded in them. Rather than try to generalize motivations of players and effectiveness in broader contexts across games communicating healthy behaviors, citizen participation, personal life experiences and the myriad other topics these games tackle, this research focused on the goal that unifies persuasive games; the attitude change they aim to evoke in their players. In this sense, this dissertation aims to be more broadly useful than studies into the full process of one persuasive game implementation (i.e. public validation and investigation into side-effects and player motivations). This generalization extends to games that do not yet exist; knowing that games can persuade (and how they function) could help motivate interested parties looking to spread a message to choose a persuasive medium that fits their topic. For this, solid proof is needed *whether*

persuasive games work, and in what ways they function better (or worse) than types of media that have already been established as persuasive.

1.4. Chapter Overview

In chapters 2 through 8, this dissertation aims to build evidence for the generalized effects of persuasive games. Each chapter's intent is briefly discussed here.

In chapter 2, the Player-Oriented Persuasive Game Elaboration model is introduced (see figure 1.1 for a simplified version of this model). The POPGEm charts not only what elements of game, player, and play session should be taken into account when studying the effects of games, but also how these factors interrelate. Drawing on established knowledge in persuasion, game studies, and media-psychology, the chapter shows how games distill their message through three broad mechanisms into an attitude goal state. Players bring their own factors to the play session, and start experiencing the game. Elaboration is theorized as the primary mechanism for the games under study here to persuade players, as these games construct their messages from (more or less) consciously processed arguments. The chapter describes how attitude change is the primary consequence of persuasion, and how behavioral change can only result from attitude change. Based on the POPGEm, five avenues of research are outlined that, when followed, validate persuasive games as a form of persuasive communication.

The study discussed in chapter 3 was designed to find the common mechanisms persuasive games use to change players' attitudes. After selecting a sample of 11 games to represent a broad group of games from different sources and focusing on different topics, a content analysis is applied that is grounded in De la Hera Conde-Pumpido's research on persuasive structures in advergames (de la Hera Conde-Pumpido, 2014a). Each of the games analyzed is discussed with respect to the persuasive mechanisms they emphasize, and how these design choices relate to the games' messages in total. By comparing

the games on three themes, the games' commonalities are contrasted with their differences, leading to the conclusion that the intent for persuasive games to persuade affects how they are designed (compared to entertainment games).

Chapter 4 focuses on the players of persuasive games. Because research on effects of games is typically performed on captive audiences, it is important to investigate *natural players* (those players who sought the game out of their own accord before being asked to participate in the study) of freely available persuasive games. The study sought out the audience of the persuasive game *Tweet, Chat, Like & Drive* (*TCLD*), which was advertised in Dutch broadcast media as part of a campaign to curb smartphone use in traffic. The game let players drive a virtual car while simultaneously sending and receiving messages on their own physical smartphone. To investigate who would choose to seek out a game like *TCLD*, a link to a survey was placed on the game's last screen. The survey was centered on how players' perceptions on smartphone use in traffic related to their evaluation of the game. 258 players completed the full survey. The survey's results differentiated between *TCLD*'s intended audience and its actual audience. Conclusions are drawn on how player experience with smartphone use related to their evaluation of the game, and what this allows us to say about the importance of natural players in a wider context.

Chapter 5 describes the first of three studies in this dissertation that offer direct proof of their effects. The aim of this study was to establish how effects of persuasive games compare to other persuasive media. First, a number of previous effects studies into persuasive games are discussed, noting that – apart from some exceptions – their influence is reasonably robust. Previous researchers also concluded that rigorous methods with proper control conditions would be needed to offer objective insights into effects. Through an online experiment (N=237), it was tested whether *My Cotton Picking Life*, a short game about cotton-picking practices in Uzbekistan, had stronger attitude-changing effects than an activist YouTube clip on the same topic. The clip's

length closely matched the average play time of the game. The attitudes intended to be affected by these two works were workload (how hard it is to pick 50 kilograms of cotton), slavery and empowerment (whether slavery is a contemporary issue that individual consumers have any control over), and denial (denying that these issues exist). Results are interpreted in terms of which of these attitudes is affected differently by the game and clip as well as how the enjoyment players got from the game was related to its effects. This chapter closes with specific recommendations for future studies on the effects of individual games.

Chapter 6 expands on the previous chapter's effect study by comparing two different persuasive games on the same topic. With the knowledge from chapter 3 that persuasive games emphasize different dimensions to exert similar messages, a study was set out to compare how these dimensions contributed to effects. Two games were selected from a growing catalogue of works discussing the issue of dating violence among teenagers. Despite sharing the same message and having been vetted on the same criteria, the two games shared their message in their own, unique ways. One game discussed this topic through player agency, letting in-game behavior reflect the dynamics of dealing with an abusive partner. The other game embedded its message in a linear narrative, letting players experience the emotional journey of a girl coming to terms with the fact that she is being abused. An experiment was performed with 262 respondents, consisting of secondary school and university students ranging from 15 to 32 years of age. Respondents played either one of these persuasive game or one entertainment game (that served as a control condition). To be able to tie together the effects of these games and their specific persuasive mechanisms, two antecedent scales were included on how players identify with the game protagonists (character identification) and how they see the gameplay as reflective of the real-world issue (here termed cognitive identification). Comparisons are drawn between the persuasive games and the control group and between the games themselves. Finally, conclusions

are offered on the viability of varying design choices and how antecedent scales can be used in this more intricate type of effects study.

In chapter 7, the focus was on how games can offer persuasive messages through its gameplay systems and rulesets. This non-verbal argument type is called procedural rhetoric. Players experience how their actions and behaviors in-game have certain consequences and can, from this, come to conclusions about how the real world operates. Since procedural rhetoric had not been discussed until quite recently, it is still unclear how an individual player processes this kind of message on a psychological level. This chapter offers first insight into how players *elaborate* on procedural rhetoric. Taking *My Cotton Picking Life* (discussed in chapters 3 and 5) as a base game, four versions of the game were developed that differed on two key aspects. Firstly, procedural rhetoric strength was manipulated, making versions of *MCPL* that either did or did not reflect cotton picking practices realistically in their gameplay. Second, distraction elements were included that meant to prevent players from elaborating. While testing these four different games in a laboratory experiment (N=241), cognitive identification and perceived task load served as manipulation checks of procedural rhetoric strength and distraction, respectively. Although the distraction manipulation was not successful, the study still yielded useful insights into the functioning of procedural rhetoric. Based on these insights, advice is offered for future research on how to approach testing elaboration on procedural rhetoric.

The eighth chapter investigates how players evaluate their experiences with persuasive games. Although the broader consensus in media research is that simple terms of enjoyment (such as 'fun') do not adequately address the spectrum of emotions media consumers experience, many parties designing or researching serious games still abide by fun as a primary goal. By relating persuasive games to other media content not typically enjoyed for immediate hedonic enjoyment, this chapter highlights how more nuanced views on game experiences can help explain seemingly paradoxical findings. The Persuasive

Game Experience scale is presented; a ten-item list of survey items that consists of four subscales (numeric evaluation, hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge). By including this scale in the studies previously discussed in chapter 6 and 7, the role of enjoyment and appreciation is investigated in the effects of the teen dating violence games and the four modified versions of *My Cotton Picking Life*. The chapter also details the validity and robustness of the scale and shows how its subscales relate to wider evaluations of persuasive games. From these findings, the primacy of enjoyment is critiqued, and recommendations are offered to designers and to researchers in this field on how to view players' experiences.

In chapter 9, the findings throughout this dissertation are collated from the perspective of the player-oriented persuasive game elaboration model (POPGEm) offered in chapter 2. The POPGEm is redrawn to indicate which factors and pathways have been addressed within this dissertation, as well as to show the work that is still to be done. The chapter describes future research recommendations based on the findings of all of the previous studies, categorized in the five critical avenues of research described in chapter 2. The implications of this dissertation for game developers are discussed, urging them to feel free to experiment with their designs as long as it helps the game's message. Finally, the POPGEm and the findings of this dissertation are placed in the wider discussion on the effects of games in general.

2. A Validation-Oriented Approach to Persuasive Games

2.1. Abstract[1]

Persuasive games have emerged as a category of serious games that focus primarily on changing or reinforcing attitudes. Despite the growing interest, academic research has not yielded insights into the effects of argument-based persuasive games. The current chapter proposes the Player-Oriented Persuasive Game Elaboration Model (POPGEm) to guide further investigations and explain results found on effects of persuasive games. We combine theories from game studies and psychology to construct a conceptual model for the mechanisms through which persuasive games influence players' attitudes. The POPGEm integrates with the Elaboration Likelihood Model, focusing on the experience of players before and during the play session, as well as persuasive elements embedded in games. Game factors include the procedural rhetoric of its systems and rules, its presentation, and narrative. Player factors are prior knowledge, personal relevance, and need for cognition. During play, the psychological play context is formed, which is joined by the physical and social context. We explore how these factors influence the elaboration on the game's message, which causes player-held attitudes to move towards a game-defined attitude goal state, possibly leading to behavioral change. The current chapter explicates multiple avenues of research this conceptual model opens up to pave the way towards conclusively validating the effects of persuasive games.

[1] This chapter is under review as Jacobs, R.S., Jansz, J. & Kneer, J.: A Validation-Oriented Approach to Persuasive Games.

2.2. Introduction

There is a gap in persuasive games research. Despite gaining widespread popularity, with players of games like *Dumb Ways to Die* numbering in the hundreds of millions (Metro Trains Melbourne, 2016), research into this form of communication is lagging. From a game studies perspective persuasive games are seen as disruptive works (Bogost, 2007; Flanagan, 2009), though conclusions drawn in this field are criticized for ignoring players' agency and individuality (Khaled, Barr, Fischer, Noble, & Biddle, 2006; Sicart, 2011). Moreover, the game studies perspective is often non-empirical, meaning insight into effects of persuasive games is lacking in this area. Social science investigations into persuasive games do focus on effects, and results so far indicate small but noticeable influences (Gustafsson et al., 2009; Jacobs, 2016; Peng et al., 2010; Redondo, 2012; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015). However, with a few exceptions (Gerling et al., 2014), these investigations posit games as indivisible products with holistic effects, and simplify the mechanisms games employ to change players' attitudes. They also predominantly make use of convenience samples, downplaying the importance of investigating target audiences. Overall, this stifles persuasive games research by compartmentalizing the field and preventing results from feeding into the larger knowledge base. At this point, we cannot generalize persuasive games' effects beyond individual games and studies. Simply put, we do not know whether persuasive games are persuasive.

To further the study of persuasive games, there is a need to tie together the involved view of games and dynamism of play espoused by game studies with the idea of a game as an interactive form of persuasive communication that has measurable effects on its players. In this chapter we present the Player-Oriented Persuasive Game Elaboration model (POPGEm) that theorizes the mechanism through which a persuasive game can influence an individual player

by making them elaborate on the message embedded in the game. Currently, the POPGEm is conceptual; it describes how persuasive games could persuade. Hypothetically, if all the factors described in the model are known for a specific game, the context in which it is played, and the individual playing it, predictions can be made with regards to its direct, short-term effects on attitudes and (to a lesser extent) behaviors of the individual after play. The next step is for future studies to validate the POPGEm on an empirical level by testing these predictions.

POPGEm is not design-oriented, as it does not offer advice on how to construct a game that has the largest effect on all players (such as Orji, Vassileva, & Mandryk, 2014). Rather, its scope is descriptive; we purport to show how the construction and presentation of a message could lead to attitude-changing effects among players, and that this is a dynamic process starting during play and extending beyond it. We list the most important prerequisites for this process to take place, and illustrate the psychological mechanisms at work during and after a play session. The framework for persuasive effects is the Elaboration Likelihood Model (Petty & Cacioppo, 1986b), which we apply to game-borne persuasive attempts. In this chapter, we attempt to answer the following research question: Which elements of games, players, and play contexts can cause or affect players' elaboration on persuasive games' messages, and how does this translate to persuasive effects?

In the following section, we will introduce the model and describe how distinct game, player, and play session factors interrelate and exert effects that persist after play. We will conclude by comparing the POPGEm to adjacent models and outlining several directions for further research highlighted by the model.

2.3. The player-oriented persuasive game elaboration model (POPGEm)

Based on the concept of persuasive games as experiences that are designed and used to persuade players by offering some kind of argument, we can identify elements prerequisite to their effects. The POPGEm in figure 2.1 includes all of these elements and models their relationships. We will discuss the ways in which the game, player, and play session characteristics act upon the persuasive process.

Primarily, a game needs to be constructed in a certain way to persuade. Although there are multiple paths to that point and no sure-fire design or presentation style exists to guarantee success, there can be no doubt that a vital part of the persuasive strength of a game lies in its composition. Game characteristics are therefore the first group of elements included in our model. However, persuasion must also include a target, in this case a game's player. The characteristics and propensities of these players can improve, dampen, or even outright negate any persuasive effect, thereby forming the second group of elements in our model. Where the player and game meet, a play session emerges. The way a game is played and what happens during play can affect persuasiveness largely independently of game and player characteristics. Play session characteristics compose the final group of elements in our model.

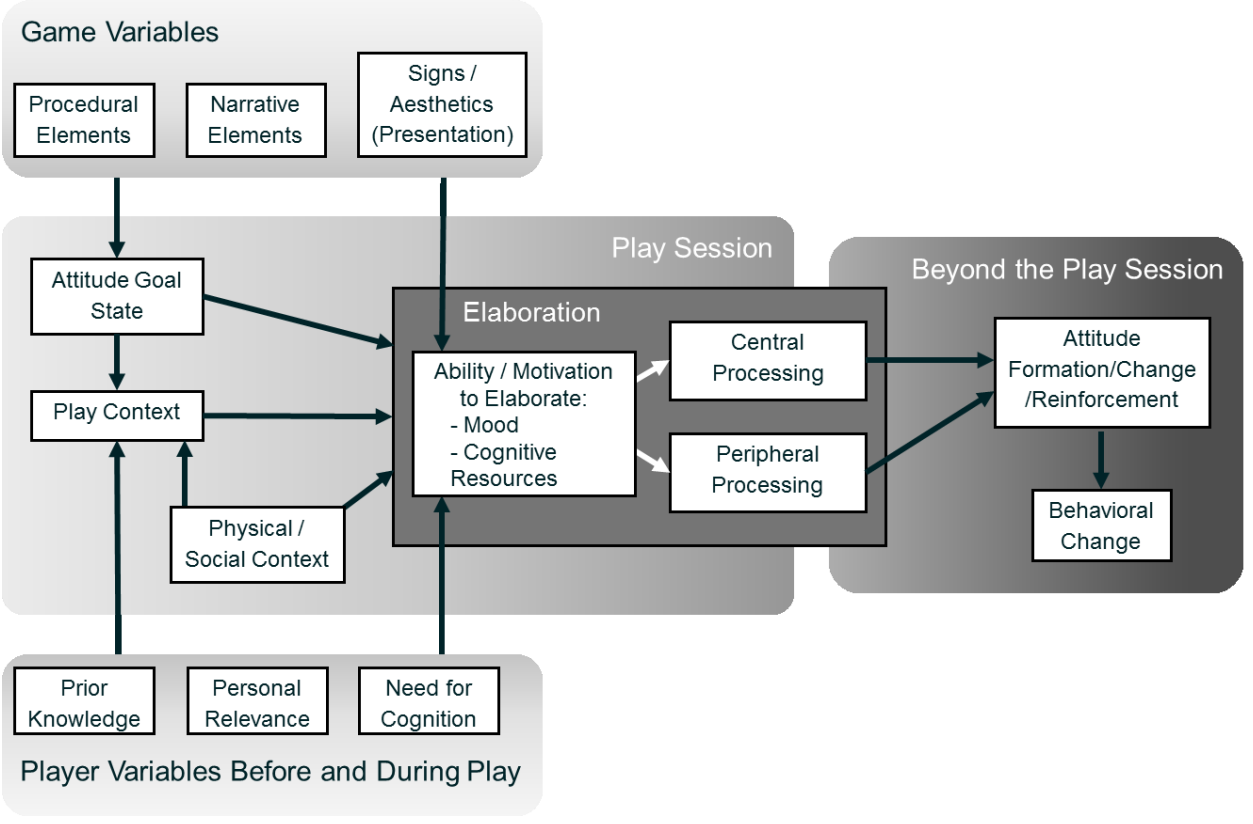


Figure 2.1: The Player-Oriented Persuasive Game Elaboration model (POPGEm). Chronologically, an instance of persuasion first includes game and player elements (lighter shading), then play session elements in the middle of the figure, and ends with the game's effects after the play session (darker shading).

The elaboration likelihood model (Petty & Cacioppo, 1986a, 1986b) is adapted to link game, player, and play elements to persuasive effects. This model separates the way a message is absorbed by persuadees into a processing continuum involving greater or lesser elaboration on a message. To elaborate on a message means to think about it consciously and actively (Petty & Cacioppo, 1986b). This includes referring back to own experience, logically testing arguments, and ultimately coming to self-generated conclusions. The propensity and ability to elaborate is linked to moods and cognitive abilities (Mackie & Worth, 1989; Sinclair, Moore, Mark, Soldat, & Lavis, 2010; van Reijmersdal, Lammers, Rozendaal, & Buijzen, 2015), though higher elaboration is not necessarily better for every kind of message. If a persuadee is elaborating more on a message, that person is using a so-called *central* processing route. This route has been shown to put the arguments of a message under scrutiny; messages with strong arguments lead to persuasive effects, but those with weak arguments will not cause a change in the persuadee (O'Keefe, 2002). Conversely, if the *peripheral* processing route is used (under low elaboration), argument strength does not affect persuasion. Instead, persuadees respond to cues outside of the message content, such as the source of the message or even the number of arguments it contains (Booth-Butterfield & Welbourne, 2002). Our model's factors tie into the player's elaboration on the message; a cognitive process that should continue after play has ended (see figure 2.1). Eventually, this results in attitude change and, where appropriate, behavior change (Ajzen, 1991) beyond the play session. In the section on play session factors, we will theorize how game elements posit the attitude goal state and how they affect the motivation and ability to elaborate. First, we highlight each of the groups of elements that serve a role in the persuasive process.

2.3.1. Game factors

Inherent to our definition of persuasive games on page 15 of chapter 1.2 is that the game's message is the primary reason for its development. Messages are integrated into a game's design from a very early point (Flanagan, 2009; Kors, 2015). How messages are expressed and whether or not a game can ultimately persuade players depends on choices made during development. Game design factors are therefore hugely important for persuasive effects. There are many ways to look at parts of games' designs in terms of how they can affect players (de la Hera Conde-Pumpido, 2015; Elson, Breuer, Ivory, & Quandt, 2014; Flanagan & Nissenbaum, 2014; Orji et al., 2014). Unfortunately, previous models have not been empirically tested, meaning few attempts have been made to distinguish mechanisms from one another concerning their respective impacts on attitude change.

To arrive at a small, testable set of persuasive factors embedded in games, we consider the model of 11 persuasive dimensions by De la Hera Conde-Pumpido (2015), displayed in figure 2.2. Categorizing persuasive mechanisms on three levels, she differentiates between signs presented to the player (be they visual, aural, textual, or even tactile), the systems in which play operates (consisting of gameplay systems, narratives, and perspective and cinematic factors), and the context a game aims to generate both in players' experiences and their social interaction. For the game factors in POPGEm, we distil those dimensions that are embedded in the game before play starts and are most commonly used in persuasive games (Jacobs et al., 2017; Lee & Youn, 2008; Roettl, Waiguny, & Terlutter, 2016). We include three broader elements that we will link to elaboration and persuasive processes: systems and rules, presentation, and narrative. These elements are closely related to the concepts of narrative and mechanics as discussed by Elson, Breuer, Ivory & Quandt (2014) in terms of providing meaningful player experiences. Though not entirely exhaustive, they cover most of the ways in which a message can be embedded in a game that can be completely predetermined by designers. They can also

be manipulated independently of each other; designers can for instance change the ruleset of the gameplay without modifying the overall narrative or presentation.

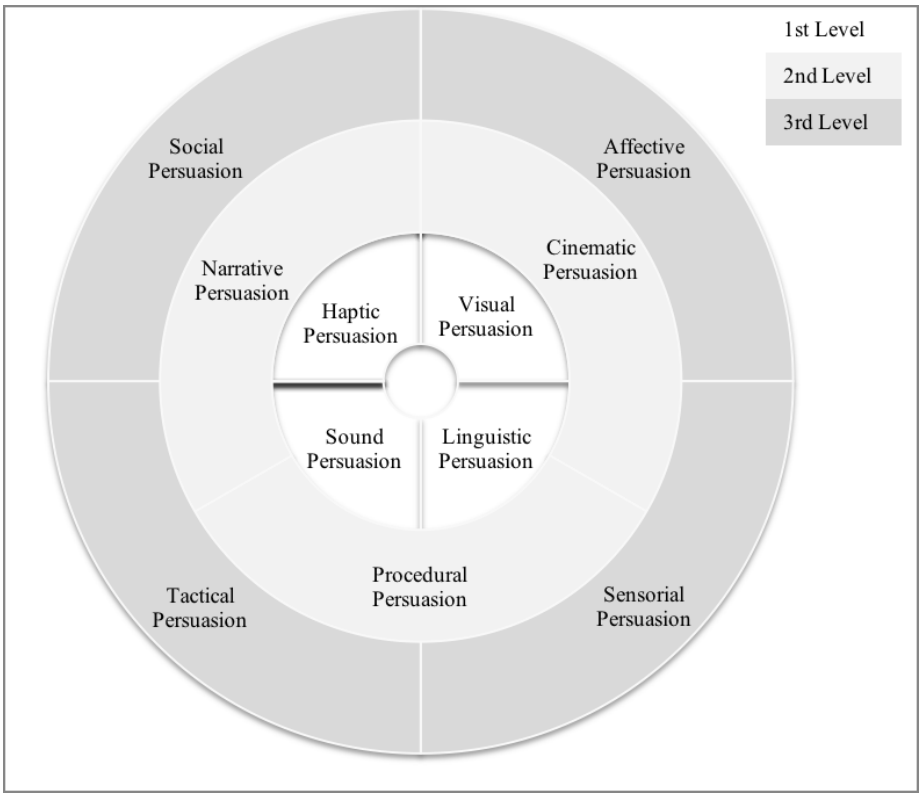


Figure 2.1: Model of persuasive dimensions that persuasive games can employ. Printed with permission from author (De la Hera Conde-Pumpido, 2015).

Systems and rules. As interactive experiences, games allow players to make choices within rulesets that effect changes in gameplay systems. This feature in itself can proffer a message. In *My Cotton Picking Life* (Rawlings, 2012b), player choice is limited to picking cotton or 'giving up'. Each picking action yields less than a hundredth of one percent of the goal of 50 kilograms (Jacobs et al., 2017). Astute players quickly notice that it would take over five hours to

complete the game, and typically give up soon after. The game's succinct representation of cotton picking enables it to change players' attitudes towards this complex issue in (on average) under two minutes (Jacobs, 2016).

Ian Bogost (2007) coined the term 'procedural rhetoric' to describe how a game's systems and rulesets form a persuasive message that can be unpacked by players through observing and responding to these rules – in essence playing with(in) the system. The extent to and manner in which the system models real-world processes (for instance by simplifying phenomena or enhancing certain aspects) is the primary persuasive actuator of any game applying procedural rhetoric. The interactivity affords testing, experiencing, or merely applying the system, which leads players to come to conclusions about the real world that should match the game's attitude goal state (AGS). Because of the complex interactions that are involved, procedural rhetoric is a persuasive mechanism unique to games and certain highly involved persuasive technologies.

Despite its apparent strength, procedural rhetoric is yet to be validated as a persuasive mechanism. On a more basic level, interactivity has been found to improve a game's persuasiveness when looked at in isolation (Peng et al., 2010), and has promoted learning effects for an educational game (Ritterfeld, Shen, Wang, Nocera, & Wong, 2009). Because interactivity merely allows for procedural rhetoric, precluding it almost completely when absent, these results do not prove the persuasiveness of rules and systems. Future studies need to compare versions of a game where the rules and systems either do or do not credibly reflect the phenomena they are centered on. This is easier said than done: Since persuasive games are holistic packages of multiple interdependent persuasive dimensions (de la Hera Conde-Pumpido, 2015; Jacobs et al., 2017), changing the rules and systems typically has ripple effects, altering the game experience in other ways. Psychological antecedents of persuasion through this mechanism can help pinpoint what is causing a game's attitudinal effects. In the case of messages embedded in systems and rulesets, the construct Williams and Williams (2007) termed 'cognitive identification' could serve as such an

antecedent. Cognitively identifying with a game means to 'identify the simulation with reality and see its principles as valid in real life' (Williams & Williams, 2007, p. 5), meaning players recognize the similarities between the game's systems and the real-world processes they represent. If greater attitude change coincides with high cognitive identification for some players, these players are arguably persuaded more by the systems and rules of the game than players showing low cognitive identification.

Presentation. Although the view of persuasive games as those works that employ procedural rhetoric helps to distinguish games from other persuasive media, we should not limit persuasive game research only to games that apply procedural rhetoric. The first level of the model of persuasive dimensions (the inner ring in figure 2.2) describes the different signs that games can present to players (de la Hera Conde-Pumpido, 2015). Persuasive game developers can, in most instances, reach players through three senses (sight, sound, and touch), and can include any type of stimulus also applied in other persuasive media as part of the persuasive gaming experience. More often than not, multiple signs are combined; *My Cotton Picking Life* describes the plight of its protagonist and the outcomes when the player gives up in text, while the visuals and audio highlight the bleakness of the character and surroundings. The game's picking mechanic even manifests a tactile dimension; the repetitive motion with the mouse or tapping on a touch screen stands in for the monotony – if not the intensity – of cotton picking.

Among serious games, effects from presentational factors have already been demonstrated. When Gerling et al. (2014) placed players in wheelchairs – a tactile and visual change separate from game systems or narrative – to play a game on disabilities, they had different experiences and subsequent levels of attitude change when compared to players with traditional game controllers. Ritterfeld et al. (2009) also found that adding more presentational layers to an educational message (ranging from a text to a playable game) made respondents more interested in the message topic. A rich presentation style

appealing to all senses does require higher production values, however, leading Procci et al. (2014) to conclude that serious games' opening cinematics are an inefficient way of generating a more powerful experience. Despite the plurality of persuasive dimensions employed in most persuasive games, it is clear that a game's presentation can act as an independent persuasive actuator.

Narrative. Similar to presentation factors, the persuasive efficacy of narrative has been modeled and demonstrated in different media (Green & Brock, 2000; Slater, 2002). We maintain a simple definition for the current chapter to separate narrative from the other game elements; narratives in persuasive games are an ordering of events that affect one or more characters. Although they are essentially a sequence of presentational elements, narratives function as a distinct persuasive mechanism by demonstrating temporality and causality in real-world processes. In games, narratives take two forms. Where players can only advance through these events or fail, narratives are as linear as they are in other media. Games can also have interactive narratives, offering players varying levels of control over what happens to the characters (Green & Jenkins, 2014).

Including narratives in games can positively influence specific behaviors in players (Baranowski, Buday, Thompson, & Baranowski, 2008). The mechanism through which narratives work is found in links between protagonists and players. While non-interactive narratives can be meaningful to those experiencing them by promoting transportation into the virtual world and identification with the protagonist (Green & Jenkins, 2014), interactive narratives can also confer a sense of responsibility for what happens to the protagonists (Steinemann et al., 2017). Effects are therefore often investigated in terms of social learning (Slater & Rouner, 2002), wherein protagonists act as models for certain attitudes or behaviors. Players would feel a connection to these protagonists, and would subsequently align their beliefs with theirs. Because of this, identification with protagonists can serve as an antecedent of attitude change through narrative persuasion. Contrasted with the concept of 'cognitive identification' discussed earlier, character identification involves the player

reducing their distance from the protagonist, by seeing their personalities and intentions (among others) as similar. This kind of identification has been found to mediate effects of persuasive games (Peng et al., 2010; Steinemann, Mekler, & Opwis, 2015), although the relationship between identification and attitudinal effects can sometimes be affected by a third variable (Steinemann et al., 2017).

All three game elements could theoretically affect both the message itself (informing the AGS) as well as the ability and motivation to elaborate. The mechanisms through which this occurs are dependent on the context of play. We will first discuss player variables that also influence the context of play before positing these mechanisms.

2.3.2. Player factors

One of the criticisms leveled at Bogost's (2007) idea of procedural rhetoric argues that it takes agency away from players (Sicart, 2011). Detractors of procedurality focus on the experience and underline that a play session is an interaction of player and game. Players create their own meaning of play and can choose to engage with the game's systems in any way they want. Their autonomy and reasons for playing influence the way messages are received. Autonomy complicates the processes by which an attempt at persuasion reaches players by making play a more active process. The proceduralist argument requires that players are interested and pro-active, observing the models that form the game's system and drawing conclusions based on these observations that outlast the game sessions and are in line with what the creators intended. In POPGEm, we highlight three elements that affect players' likelihood of elaborating on the game's message: prior knowledge, personal relevance, and need for cognition. These elements need to be present as play starts, and so are features of a game's target audience, rather than elements affected by playing a game.

Prior knowledge and personal relevance. The effects of any attempt to persuade depend on the persuadee's current involvement with a topic. Apart

from the attitudes in the AGS, two elements of this involvement are critical to elaboration: prior knowledge – what an individual already knows about a message topic – and personal relevance of the topic to the player. Both of these factors are linked to message elaboration in other media (Booth-Butterfield & Welbourne, 2002; O'Keefe, 2002). Prior knowledge primarily affects the *ability* to elaborate; persuadees who know more about a topic can more easily see the truth (or untruth) in a message's arguments, and so are likely to engage with these arguments on a cognitive level (O'Keefe, 2002, p. 144). Prior knowledge has up to this point mostly been treated as a factor to control; advergame studies list it as a reason to include fictional brands rather than existing ones with which players could have unknown familiarity (Lee & Faber, 2008). Personal relevance – also known as issue involvement (Johnson & Eagly, 1989) – is important for the *motivation* of the persuadee to elaborate on any message. If an issue is more relevant to the persuadees – for instance because it concerns them or their family and friends – it will cause the persuadee to more actively consider a message's arguments, leading to more central processing (O'Keefe, 2002, p. 141). Serious game developers have in some instances applied this factor in their designs, tailoring their games to the presumed player base, or letting players customize game modes or their avatars (Blumberg, Almonte, Anthony, & Hashimoto, 2013; Lee & Youn, 2008), though this has not yet yielded results specific to persuasive games.

Need for cognition. Apart from the mutable personal states of knowledge and relevance, more stable personality traits should also be taken into account. The most significant among these traits for researchers applying the elaboration likelihood model is need for cognition (Booth-Butterfield & Welbourne, 2002; Cacioppo & Petty, 1982). Need for cognition describes the intrinsic pleasure an individual could get out of considering and thinking about certain topics. Individuals with a high need for cognition elaborate more on a persuasive message, meaning they more often process messages through the central route (Petty & Cacioppo, 1986a, 1986b). Within the current field, players of

persuasive games with a high need for cognition could want to understand and explore the intricacies of a game's message. However, need for cognition's influence is more complex when looking at interactive content (Green & Jenkins, 2014). When testing the attitude-changing effects of websites, Sicilia, Ruiz, and Munuera (2005) found that greater levels of interactivity were more persuasive for individuals with low need for cognition. This has implications for choosing levels of interaction to match certain target audiences, which could mean that in some cases other media than persuasive games might be better suited (Bezjian-Avery, Calder, & Iacobucci, 1998).

2.3.3. The context of play

So far, we have discussed static elements, whether embedded in games or as properties of players. In figure 2.1, the POPGEm includes four elements that more dynamically influence the persuasive process during the play session. First, play takes place in a physical location, with or without others nearby (Elson, Breuer, Ivory, et al., 2014). Second, the game and player together generate a play context, or the experience of playing the game (de la Hera Conde-Pumpido, 2015). Third, the game offers up its AGS in persuasive rhetoric to the player. Most importantly, the player elaborates to a greater or lesser degree on the game's message. Successful persuasion depends on each of these elements to varying degrees.

Physical/social context and debriefing. The way games are played depends on how, where, and with whom they are played (Elson, Breuer, Ivory, et al., 2014). When the teenager-focused educational title *Poverty Is Not a Game* was tested in classroom and domestic settings, for example, multiple differences were found in player outcomes (De Grove, van Looy, Neys, & Jansz, 2012). When playing at home, players found the game more enjoyable, identified with the game protagonist to a greater degree, and reported better learning outcomes. De Grove et al. (2012) explained effects on enjoyment and identification as stemming from differences in playing time (longer at home) and

technical issues (more in the classroom). Individuals directing their own play experience at home were therefore inclined to focus more attention on the experience. Their increased attention would facilitate greater elaboration on the game's message (Petty & Wegener, 1999). Based on these results, persuasive games would most likely benefit from individual play, wherein players can direct their own experiences. Although co-located play can add meaning to the experience (Elson, Breuer, Ivory, et al., 2014), playing with others can just as easily distract players from the game's message.

Social interaction can still positively affect persuasion, especially if it is included *after* the play session. Debriefing is seen by many as a vital link in the chain of any serious game's effects (Crookall, 2014; Lederman, 1992). During debriefing, the experience of the game is discussed with other players and/or people overseeing the play session, and a conscious effort is made to reflect on the game's meaning, linking its topic to the real-world topic it deals with. This causes players who processed a message peripherally to elaborate on it afterwards, from memory. In cases where the arguments presented during play were weak, debriefing could cause players to change attitudes in unpredictable directions as they in discussion reject the game's message. While debriefing does not need to take place in a physical setting and could technically be done asynchronously (e.g. through an online chat box), it still requires an investment from the developer, either through hiring play session supervisors or providing an infrastructure that encourages players to share their experiences (Erb, 2015). In practice, few persuasive games are currently equipped to facilitate debriefing (Jacobs et al., 2017). Rather than deny the effects of all games that do not facilitate debriefing, we posit that a descriptive model of the effects of persuasive games should recognize the potential of debriefing for enriching the reflection on the topic, but that it at the same time should not require the presence of a debriefing effort to predict a game's effects. Debriefing, while likely a boon for persuasive games' efficacy, is not a requirement for effects to take place in our model.

Play context and the attitude goal state. On the left side of the POPGEm in figure 2.1, the play context is the middle point between the game and player, influenced by the physical and social context. This element describes the experiences of players during play; their affective reactions toward the game, and their persuasion knowledge (Friestad & Wright, 1994; Vanwesenbeeck, Michel, & Ponnet, 2016), among others. This experience is important for persuasive effects, as it is the anchoring point for multiple persuasive dimensions (de la Hera Conde-Pumpido, 2015). Game designers can implement strategies intended to elicit player responses during this experience – as shown in the outer ring of figure 2.2 – with the goal of putting players into an affective state in service of the AGS. However, the play context is a function of game, player, and physical/social factors, so players might experience the game very differently from what the designer intended. Designers can only attempt to unify player experiences, for instance by heavily scripting gameplay (Khaled, Barr, Noble, Fischer, & Biddle, 2007), though this reduces emergence (Juul, 2002) and narrows the bandwidth of persuasive dimensions on the level of systems and narrative.

In the context of play a key difference between persuasive and entertainment media becomes apparent; persuasive games in many cases do not need to be enjoyable to get a message across (Jacobs et al., 2017), and are free from other restraints such as having to be beatable (Ruggiero & Becker, 2015). Without the ubiquitous experiential criterion of enjoyment, the importance of the play context depends on the attitude goal state of a game. For example, *Darfur Is Dying* is – in line with its AGS – a cheerless struggle to play, which explains why enjoyment of that game was not important for its persuasive effects (Peng et al., 2010). During the play session, a game's embedded persuasive dimensions (discussed above in the game factor section) are geared to its AGS, which in turn informs the play context. Because the AGS should be reflected in player attitudes after the message is presented, the attitudes that it comprises need to be discoverable by its players. Only then

would players be able to elaborate on the message. This is the key difference of the POPGEm and persuasion based on affect transfer; the importance and predictability of the AGS and play context are inverted. In affect-transfer-based persuasion, the play context has a specific purpose generalizable across most games (i.e. to entertain; Lee & Youn, 2008) that is vital to persuasion, and the AGS is not readable through play, though it is mostly operationalized as a brand preference scale. Conversely, argument-based persuasive games have idiosyncratic attitude goal states. This means that in many cases where no validated attitude scale suits the game's message, the study of effects of persuasive games should entail the composition of a unique dependent variable that is informed by games' AGS (Jacobs, 2016; Ruggiero, 2015).

Elaboration. During a play session with a persuasive game, a process starts that eventually leads to attitude change. When a player is experiencing a game and its message, the player engages with the AGS, causing them to elaborate to a certain degree on the message. In this section, we describe how the game and play context factors discussed earlier can lead to different processing routes.

Elaboration is influenced by the game in two ways. Primarily, the game's message serves as input for elaboration, shown in the POPGEm figure 2.1 as the link from AGS to elaboration. This message is a composite of game presentation, narrative, and systems (given shape in the play session) that the player can elaborate on. Secondly, the game variables affect the player's ability and motivation to elaborate. The processing of commercial media content model by Buijzen, Van Reijmersdal, and Owen (2010) describes how elaboration is dependent on a balance between the resources required by media content and the resources allocated to it by the consumer. So, if a game is too complex or if it bombards players with information, elaboration on the game's message will be reduced because the resources required are too large (Buijzen et al., 2010; Waiguny, Nelson, & Terlutter, 2012). In other words, players might not be *able* to elaborate. Conversely, if the game is too slow and fails to keep players' attention, they will be less *motivated* to elaborate despite being able to do so

(the resources allocated are insufficient). Motivation can be affected by games through the context of play, primarily by inciting certain moods (Mackie & Worth, 1989; Yoo & Eastin, 2016). Enjoyment – in the sense of 'having fun' – is only one possible mood a persuasive game could aim to incite, depending on its message. This recontextualizes the experience of flow (achieved through a balance of game difficulty and player ability) as being in service of the game's message rather than a goal to strive for in itself (Steffen, Mau, & Schramm-Klein, 2013; Waiguny et al., 2012). Persuasive games require careful balancing to ensure players are able and motivated to elaborate. Message elaboration is not necessarily a process secondary to game-play despite often being considered that way in studies on serious games (Blumberg et al., 2013; DeSmet et al., 2014, p. 103; Vashisht & Royne, 2016). Theoretically, a game offering procedural rhetoric would allow players to elaborate on a message in-game, through the choices they make while playing (Bogost, 2007). From this perspective, message elaboration in persuasive games is inherent in gameplay, with players' actions essentially testing a system: players further their understanding of the system while advancing the game itself. For example, elaborating on the process of buying and selling properties in *Nova Alea* (Molleindustria, 2016) – a persuasive game about gentrification – would lead players to play the game by exploring strategies to see their consequences unfold on the in-game real-estate market. It is an open question whether such entanglement of play context and elaboration leads to integrated message processing, or whether messages are still primarily processed separately from gameplay. If the latter is true, persuasive games with strong rhetoric need to be designed to motivate players and allow them the cognitive freedom to elaborate on a message without being burdened by gameplay pressures. As weak arguments fare better when persuadees show low elaboration (Petty & Cacioppo, 1986b), this also means that games with weak rhetoric should keep players occupied while peripheral cues change their attitudes. Research needs to be undertaken to qualify which elements of persuasive games are taken as (central) arguments and which act as peripheral cues. It is likely in-game text and narratives can act as arguments in the same

way as they would in textual media (Green & Brock, 2000), so the focus of this kind of research should lie with systems and rules.

2.3.4. Beyond the play session

The POPGEm predicts that elaboration on the game's message persists beyond the play session (see fig. 2.1), meaning that players start thinking about the topic during play and keep reflecting on the message after they stop. Post-play elaboration is evident from the sleeper effect Ruggiero (2015) found among her participants: Despite not showing differences on relevant attitudes directly after play, players of *Spent* held more positive attitudes when tested three weeks later. Enduring retention of strengthened attitudes of this kind is one of the consequences of greater elaboration (Booth-Butterfield & Welbourne, 2002; Petty & Cacioppo, 1986b).

Of course, elaboration (by way of a central processing route) is not the only path to persuasion. Previous research notes several differences between central and peripheral processing routes (Booth-Butterfield & Welbourne, 2002; Petty & Cacioppo, 1986b; even in persuasive games: Vashisht & Royne, 2016). In many cases, attitudes altered after central processing are more resistant to change, and persist over longer periods of time, while changes that are the result of peripheral processing are less pronounced and more readily countered. This does not mean game developers should always strive for more elaboration. Rather, which processing route the developers should prefer depends on several things. If a message is supported by weak arguments, for example, peripheral processing is advantageous. It also depends on the preferred outcome. If the effect should be short-term behavior, for instance donating to a charity or buying a product, there are few drawbacks to peripheral processing of a message. It might even be preferred because it is comparatively easier to achieve. Naturally, if the topic is more complex, such as climate change (Fennewald & Kievit-Kylar, 2013), deliberate reflection on arguments is necessary, requiring players to process centrally. As persuasive game research

matures, more specific predictions could be made on which gameplay systems, types of narrative, and presentational stimuli elicit processing routes to suit goals beyond the play session.

Lastly, the model in figure 2.1 shows behavioral change as a possible consequence of attitude change. This is in keeping with current knowledge in cognitive psychology (e.g. Ajzen, 1991; O'Keefe, 2002) which holds that all changes in a person's goal-directed behavior require preceding (short- or long-term) changes in attitudes. This is certainly true for persuasive games, as they are inherently incapable of physically forcing players to perform behaviors, both during play sessions and afterwards. Although attitude change is therefore a necessary precondition to behavioral change, it is not always sufficient. The theory of planned behavior (Ajzen, 1991) holds that attitudes (towards a topic, but also on perceived control and subjective norms) can help predict someone's intention to behave in a certain way, which in turn is related to performing that behavior. Because this link is well-researched, researchers of persuasive games should place primacy on attitude measurement as the indicator of a game's persuasiveness.

2.4. Discussion and research directions

The POPGEm proposed in the current chapter categorizes specially designed persuasive games as persuasive communications that aim to change attitudes. The intent behind these games' designs is of importance to the POPGEm, as it allows us to evaluate designs, target audiences, and implementation strategies in terms of whether they facilitate attitude change on the correct topic. This (among other elements) sets the model apart from the Integrated Model of Player Experience (IMP), which deals with meaning-making practices based on COTS games on the open market (Elson, Breuer, Ivory, et al., 2014; Elson, Breuer, & Quandt, 2014), and the Ethics Practice and Implementation Categorization (EPIC) Framework (Schrier, 2015), which aims to guide educators in selecting COTS games for educational purposes. In both of these cases, the

games under study were not (necessarily) designed to persuade, meaning these two models describe game-mediated persuasion (de la Hera Conde-Pumpido, 2017). Essentially, the POPGEm is a combination of insights from models in different fields. POPGEm's game factors are found on the intersection between the model of 11 persuasive dimensions (de la Hera Conde-Pumpido, 2015) and elements described in the IMP model (Elson, Breuer, Ivory, et al., 2014), though we distinguish between pre-embedded elements and play context factors. Player factors and attitude change mechanisms were primarily based on the elaboration likelihood model (Petty & Cacioppo, 1986b) and later dual-process theories (Buijzen et al., 2010; Chen & Chaiken, 1999). Crucially, the POPGEm is limited to the player's experience, only describing what happens when a player sits down to play a persuasive game. This means it does not reflect how designers embed their message in games, as is the remit of the Persuasive Game Design Model (Visch, Vegt, Anderiesen, & van der Kooij, 2013) and the Values at Play Heuristics (Flanagan & Nissenbaum, 2014). Instead, it provides a scope of general argument-based persuasion to complement the peripheral processes tested with affect transfer models (Waiguny, Nelson, & Marko, 2013). In this, the POPGEm is the first model to include an attitude goal state.

Compared to affect-transfer-based advergames and educational games, the number of studies on effects of argument-based persuasive games is small. The POPGEm is intended to focus future research towards validating whether the intended impacts of persuasive games are actually realized. Several issues that previous research has not addressed are apparent from this model. Table 2.1 lists the most prominent among these issues, ordered into avenues of research. The first of these avenues consists of the replication and generalization of the results currently found on individual persuasive games by investigating different games with diverse audiences (Gerling et al., 2014; Gustafsson et al., 2009; Jacobs, 2016; Peng et al., 2010; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015). These studies need to carefully construct or align attitude measurements with the topics of these games for use in controlled

experiments, and select control group stimuli that match the message as closely as possible. This avenue of research would serve to generalize effects across the medium, eventually presenting it as a credible form of persuasion that offers promise to interested parties.

Table 2.1: Avenues for future research on persuasive games.

Issue	Locus of interest	Research areas	Hypotheses / Expectations
Attitude-changing power of persuasive games	After the play session	Attitudinal effects	Broadly supported results proving persuasive games change attitudes
Persuasive factors in games	Game & after the play session	Design/effects research	Strong impact of procedural and textual persuasive dimensions
Clarity of attitude goal states	Game & play session	Design/player experience	Consensus of players on games' attitude goal states
Individual characteristics	Player	Audience	Linking types of game (topics) to audiences to improve design
Procedural rhetoric and elaboration	Game & after the play session	Design/player experience	Procedural rhetoric is seen as a centrally processed argument, with weaker (vs. stronger) rhetoric leading to less attitude change under high elaboration

It is not enough simply to establish effects of individual games, however. With the exception of the differentiated control schemes employed by Gerling et al. (2014), effects studies of persuasive games are too focused on investigating the impact of each game as a holistic experience, ignoring the power of individual persuasive mechanisms. The second avenue of research is set to

prove what the presentation, narrative, and game systems individually add to the persuasiveness of a game. This can be performed either through modding existing titles into concurrent versions or by selecting games for study that focus on the same topic while differing in (one of) these key areas. Results from this avenue can help designers choose stronger persuasive mechanisms when developing new persuasive games.

The attitude goal state has not yet been investigated. The most important issue raised in table 2.1's third avenue is whether games' intended players are aware of their AGSs. First, do players consistently recognize what the game wants them to think? *The Best Amendment*'s anti-violence message, for example, can be hard to parse without reflecting on the game's system and the game allows the message to be overlooked quite easily. Secondly, is this conscious recognition necessary for effects to take place? Studying these issues requires a more open-ended post-testing phase, letting respondents fill in what they thought a game was about before applying attitude scales.

Player factors need to be given more prominence in further research, as seen in the fourth point in table 2.1. Primarily, this entails gauging the POPGEm's player factors before play, and linking these to the degree of attitude change found after play. Such a method can be implemented concurrently with the experiments mentioned previously. Alternatively, the factors of prior knowledge and personal relevance can be controlled variables in experiments, for instance by educating players before play or developing versions of games that are set in target audience's school (van Hoecke et al., 2016). Another interesting way to study personal variables is by observing the differences between an intended and the actual audience of persuasive game that is freely available online. The outcome of this kind of research can help designers to link their designs to the players they attract. It also offers a closer look into how these players experience these games.

Lastly, the importance of elaboration as a function of game design should be investigated. Apart from effects of mood (e.g. through positive or negative game contexts, Yoo & Eastin, 2016) and ability (Buijzen et al., 2010), which need to be investigated more thoroughly specifically with persuasive games, there currently is no certainty on which game factors act as arguments and which affect players as peripheral cues. Procedural rhetoric is vital in this regard. This persuasive strategy is unique to games, though its individual impact has not been determined. Investigating whether procedural rhetoric acts as a non-verbal argument or simply as a cue to consider the message delivered in other ways is key to our understanding of persuasive games as a medium. Doing so requires the substitution of procedural rhetoric for arguments as they were employed in classic elaboration research (Petty & Cacioppo, 1986a, 1986b). If procedural rhetoric functions the same way, strong procedural rhetoric should lead to attitude change when players are able and motivated to elaborate on a message while showing no improvement over weak procedural rhetoric when a message is processed peripherally.

2.4.1. Conclusion

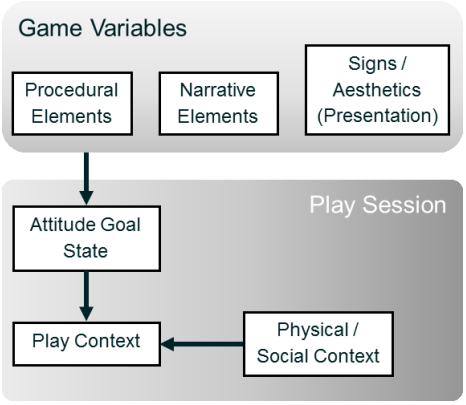
Persuasive game research is not yet on a level where the importance of players, games, and play sessions is acknowledged simultaneously. Advergame effect studies often trivialize the use of arguments in game-based persuasion and only study effects in terms of affect transfer, which occur mostly through peripheral message processing. Within game studies, player agency is either not acknowledged at all or regarded so highly as to deny any effects of games. Persuasive game effect studies, lastly, see the composition of games as a given, and have yet to empirically disentangle which elements are important to a game's attitudinal effects.

The Player-Oriented Persuasive Game Elaboration model explains the effects of persuasive games by taking game, player, and play session factors into account. Game factors include a game's signs (what it presents to the players in

text, audio, visuals, and tactility), its narrative, and the alignment of the message it aims to bring across with its gameplay systems and rules. Player factors include the topic-specific states of prior knowledge and personal relevance and the stable character trait of need for cognition. When players start a game, they do so in a physical and possibly social context, which can greatly influence their experience of the game (here termed play context). The combined effort of all of the game's persuasive mechanisms should result in an attitude goal state; the group of attitudes the game wishes to change in players. Based on the AGS, players elaborate to a greater or lesser degree based on their motivation and ability to do so. Message processing occurs throughout play and continues beyond it, leading primarily to attitude change. The strength, duration, and type of attitude change is dependent on the degree of elaboration. In particular circumstances, this attitude change leads to changes in the player's behavior.

By taking all of these elements together in the POPGEm, we have attempted to demonstrate which avenues of research need further investigating. The final goal of the investigations we propose is to prove the added value of games in an increasingly crowded persuasive media landscape. Games play an important role in worldwide entertainment consumption, but their application to persuasion has so far been cautious and restrained compared to other media (e.g. documentaries, social media). Providing robust proof of effects of persuasive games would embolden policy makers, corporations, and grass roots activists looking for a way to persuade that (rather than simply acknowledge it) thrives on persuadee agency to get to the heart of an issue.

3. Key Features of Persuasive Games



3.1. Abstract[2]

Persuasive games are used to win over players on diverse topics. They aim to persuade their players to, for example, drive safely, eat healthy, or to engage with the politics of forced migration. Having been primarily developed to change or reinforce one or more attitudes, they are equipped to reach this goal in an impressive variety of ways. The current chapter investigates the growing body of digital persuasive games by analyzing 11 exemplar games that are available online. We apply a model that typifies the different persuasive dimensions such games can employ. The model enables us to compare the 11 titles we selected on their use of different sensory modalities, the systems through which they operate, and the context of play the games partly generate

[2] This chapter has been published as Jacobs, R. S., Jansz, J., & De la Hera Conde-Pumpido, T. (2017). The Key Features of Persuasive Games: A Model and Case Analysis. In R. Kowert & T. Quandt (Eds.), *New Perspectives on the Social Aspects of Digital Gaming: Multiplayer 2* (pp. 153–171). Oxford: Routledge.

when they are played. Each game is described and critically analyzed on its application of persuasive dimensions, and games that share themes are compared. This generates an overview of the persuasive dimensions typically employed. Moreover, it shows how the games' developers are stretching the boundaries of online games to spread their message. This chapter aims to offer researchers focusing on persuasive games detailed analyses of both recent and established exemplar cases. It will help the research community to identify best practices in order to further the discussion on this dynamic communicative medium.

3.2. Introduction

Digital games are increasingly being recognized as more than entertainment media by policy makers, the industry, and idealistic developers. They are claimed to be able to alter players' worldviews and change the way they think (Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012). This view has been advocated strongly by the Games for Change platform that aims to 'catalyze social impact through digital games'("Games for Change," n.d.). Some researchers believe games influence players on an abstract level by, for example, making players feel empowered and teaching them the virtues of confidence and persistence (Granic, Lobel, & Engels, 2013; McGonigal, 2011; Neys, Jansz, & Tan, 2014). Others have theorized the ability for games to promote societal change by focusing on specific knowledge, skills, and attitudes in players, for instance by foregrounding the game's rhetorical potential (Bogost, 2007). Such games are tailor-made to serve a particular purpose, such as teaching math, promoting healthy diets, or considering humanitarian crises in the Global South. These games are generally labelled as 'serious games', with subdivisions as educational games, advertising games, and health games, among others.

This chapter will discuss *persuasive games* as a subset of serious games. We have embedded our definition of persuasive games in current theorizing about persuasion (O'Keefe, 2002), defining them as serious games made with

the primary intention of changing or reinforcing specific attitudes (O'Keefe, 2002), where an attitude is defined as "a learned, global evaluation of an object (person, place or issue)" (Perloff, 2014, p. 71). Although many games have this intention, we looked at games that place this intention front and center by being free to play. The present chapter aims to deepen our insight into the nature and possible impact of persuasive games by analyzing several existing games that are united in their intentions to change or reinforce attitudes. This investigation was aimed at answering the following research question: How are persuasive games equipped to persuade their players and maximize their impact?

Because the research field focusing particularly on persuasive games is nascent, most previous research cited a handful of examples of games that were made to persuade, like *Darfur is Dying* (Cohen, 2014; Peng et al., 2010), *Food Force* (Raessens, 2015), *PeaceMaker* (Alhabash & Wise, 2012; Neys & Jansz, 2010) and *September 12th* (Bogost, 2007). Given the dynamic socio-political context these games are published in, we find it necessary to provide the community of game researchers with a broader set of contemporary examples of how these games aim to persuade players. However, because of the variety in the themes, styles, and formats of persuasive games, it is impossible to represent all forms of this genre in one study. Therefore we discuss in detail a set of 11 games that are playable online at the time of writing to serve as exemplary cases. Each case shows in its own way how a game can convey certain messages and how the message is translated into the game's operations. The focus of the current study is on manifest game content. By playing these games, we analyzed them to determine how the persuasive elements emerged. This means that we did not study the games' actual impacts on their players. In sum, this chapter investigates a set of 11 exemplar cases of contemporary persuasive games to get a better understanding of the elements that game developers employ to persuade players.

3.2.1. A conceptual model to analyze persuasive properties

Previous studies on persuasive elements in games focused on games as a consumable product that delivers a rhetoric embedded in the game's systems and rules (Bogost, 2007). This proceduralist view posits that games offer a unique opportunity to engage with a message through their interactive nature, proposing that developers and researchers interested in game rhetoric focus on the systems underpinning this interactivity. As our analysis is concerned with the dynamics of game design we needed to go beyond procedural rhetoric to a more holistic view of persuasive elements. De la Hera's (2015) conceptual model (displayed in figure 3.1) describes many different ways to persuade players of persuasive games, combining methods of persuasion unique to games with those that could also be employed in different media. Moreover, games are experiences that not only allow for interaction but also interact with players to create a context of play. The conceptual model of persuasive dimensions distinguishes possible persuasive properties or features across three levels: signs, systems and contexts (figure 3.1). Signs (the inner ring of the figure) refers to the visual, auditory, linguistic and tactile stimuli, incorporating all the information that reaches the players across different sensory modalities. Next, in the figure's middle ring, the system-level persuasive strategies establish meaningful ties between the signs and are divided into narrative, procedural and cinematic persuasion. These dimensions cover the way a game's interplay of signs and structure can create a persuasive argument. For example, successions of linguistic and visual elements constitute a narrative of events that offers a different message than the signs could have offered independently. The third level describes how games could effect change through the social, tactical, sensorial and affective contexts of play (displayed on the figure's outer ring). These contexts focus on how the players experience the game. Though browser-based persuasive games are experienced through endless combinations of players and social environments that all influence the play session, this level of persuasive dimensions refers to what the game could

possibly stir up in players under ideal circumstances (for example, when users are emotionally and attentively engaged and make optimal use of all of the games' affordances). Taken together, these eleven dimensions describe the different ways a game can attempt to persuade players. In practice, games of course employ several methods simultaneously. The current study applies this model of persuasive dimensions (originally posited by de la Hera Conde-Pumpido, 2015) to the exemplar cases of browser-based persuasive games to determine which dimensions are used to effect the persuasive message and to what degree the games' arguments rely on each of these dimensions.

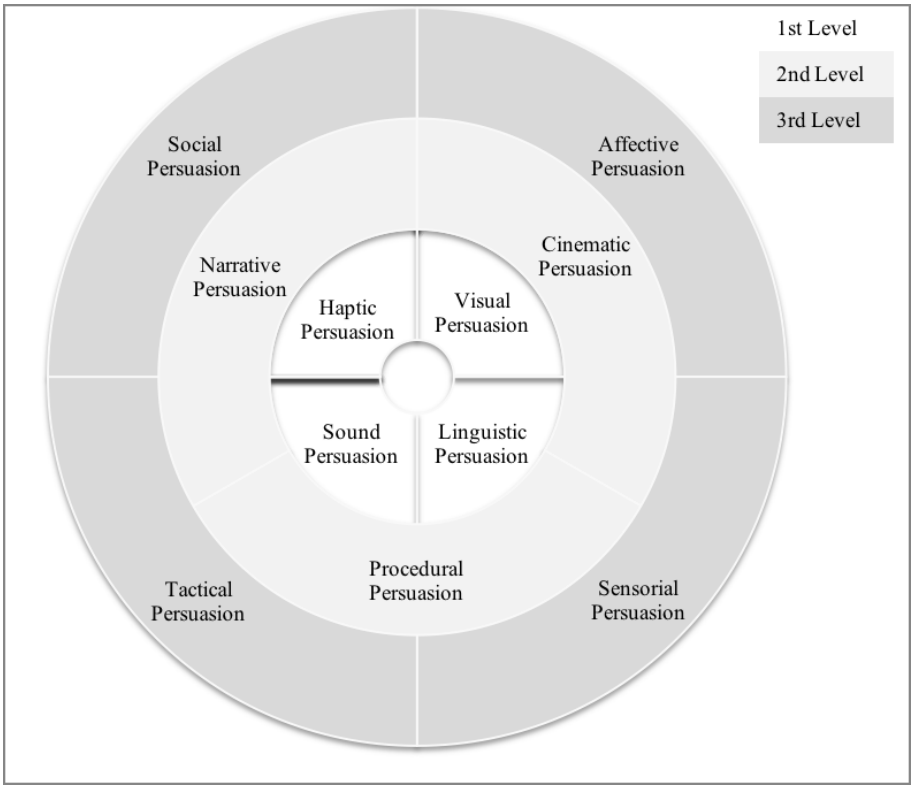


Figure 3.1: Model of persuasive dimensions employed in persuasive games (De la Hera Conde-Pumpido, 2015).

3.3. Method

3.3.1. Selection

A set of criteria determined our selection of persuasive games: First of all, the games had to appear to primarily argue for a certain topic or stance in an effort to persuade players to change or reinforce their attitudes towards a particular subject. For example, the game *Darfur is Dying* was designed to convince players that the situation in Sudan was untenable to motivate them to act. Secondly, the games needed to be freely available online and in English. Games related to marketing efforts for commercial products or brands were excluded. Different methods were used in our online search. To identify the games, we used a wide range of search terms on Google, including persuasive games, political games, health games, news games, impact games, or games for change[3]. Forty-three persuasive games were found this way. This list was then compared to three online databases of serious games. These were the Health Games Research website (http://www.healthgamesresearch.org/db), the MIT Game Lab overview of purposeful games for social change (http://purposefulgames.info/), the Games for Change website (http://www.gamesforchange.org/), and the listing by the Center for Games and Impact (http://gamesandimpact.org/). After removing overlap, 66 unique games remained. Next, these games were played (to completion, where applicable) by the primary author. During these explorative play sessions, the styles of gameplay, themes and topics were noted, and an inference was made as to the persuasive message the game intended to convey. From the 66 games that fit the definition, 11 were selected as exemplar cases for in-depth analysis. Our

[3] *The preliminary overview of persuasive games generated by our intern Clarissa Spiekerman in the first half of 2014 enabled us to fine-tune the selection for the analysis in this chapter.*

selection was based on two criteria. The first was concerned with the developers. Care was taken to select games from different game-designers or institutions commissioning the game (organizations, single authors, activist groups) to represent the different ways in which such games are made. The second criterion was diversity. We chose games that were as different as possible while still sharing key elements. By focusing on shared elements, we tried to gain insight into how similar topics can be approached in different ways as well as how similar design choices can support games that proffer different messages. The application of these criteria resulted in a meaningful set of 11 games which are listed in Table 3.1.

The games spanned three broad themes. The first was poverty and hardship. These games addressed poverty in different situations in an effort to promote empathy for people who are worse off, stir players towards action, or inform them about how to handle this kind of life. Games in this category included *Survive125*, *Poverty Is Not a Game*, *Ayiti: The Cost of Life*, and *My Cotton Picking Life*. The second theme was about lived experiences and suffering from disorders. Though these are two different things, these games were grouped because they were all deeply personal experiences. These games wanted to let players experience life in a certain situation, either for its own sake or to promote action and included *Depression Quest*, *Power and Control*, *Dys4ia*, and *Auti-Sim*. The third theme included games that dealt with the topic of violence and politics. While these games usually included violent content, they strayed from entertainment games in that all of them carried messages about the consequences and futility of violent acts. This category included *September 12th*, *The Best Amendment*, and *Endgame: Syria*.

It should be noted that these three themes do not represent the breadth of topics that are currently being explored by developers of persuasive/serious/games for change. For example, there are games about animal abuse (e.g. PETA, n.d.), energy conservation (e.g. Bang, Torstensson, & Katzeff, 2006), and smoking cessation (e.g. Deleon, 2011), among many others.

It is outside the scope of this chapter to provide a full overview of the entire catalogue of persuasive games. However, by including games that fit within these three themes, we aim to draw meaningful comparisons between the persuasive mechanisms in these games.

3.3.2. Analysis

After describing the games, they were analyzed for their persuasive elements using the model by De la Hera Conde-Pumpido (2015) and subsequently compared with the other game(s) in each of the three themes. The emphases games place on each of the 11 persuasive dimensions (de la Hera Conde-Pumpido, 2015) were coded by one researcher, distinguishing different levels and kinds of emphasis for each dimension.

3.4. Results

The analyses are divided in three different themes. Table 3.1 contains an overview of how the games in this study attempted to persuade their players by noting to what degree each of the 11 persuasive dimensions of the model by De la Hera Conde-Pumpido (2015) are employed in each game.

The games' persuasive emphases were divided into strong, nominal or no emphasis. In some instances, the message of the game as a whole seemed to be contradicted by an individual dimension, in which case the emphasis was marked as conflicted. Finally, some games employed signs, systems or contextual dimensions to support the other elements, rather than to bring across the game's message. In these cases, the emphasis was marked as supportive even if a dimension would not be persuasive by itself.

The following sections present the three themes we used to label the different games. Each game is first briefly described and next compared to the other games within the theme with respect to their persuasive intent. Overarching analyses are shared in the conclusion and discussion section.

Table 3.1: Emphasis on persuasive elements of the games studied.

Theme:		Poverty & Hardship				Personal Experience & Illness				Violence & Politics		
Level	Persuasive Dimension	*Survive 125*	*PING*	*Ayiti*	*My Cotton Picking Life*	*Depression Quest*	*Power and Control*	*Dys4ia*	*AutiSim*	*September 12th*	*The Best Amendment*	*Endgame: Syria*
Signs	Linguistic	++	++	++	+	++	++	++	0	+	+	++
	Visual	0	+/-	+/-	+	+	&	+	++	+	+/-	&
	Aural	0	&	+/-	&	&	++	+	++	+	&	&
	Haptic	0	0	&	++	0	++	+	0	0	&	0
Systems	Procedural	+	+	++	++	+	+	+/-	+	++	++	+
	Narrative	++	++	+	0	++	+	++	0	0	0	++
	Cinematic	0	+	0	0	0	0	0	0	0	0	0
Contexts	Affective	+/-	&	+	0	++	+	+	+	+	0	0
	Sensorial	0	0	0	0	+	+	0	++	+	&	0
	Tactical	+	+/-	++	0	+/-	0	0	0	++	+/-	++
	Social	&	0	0	&	+	0	0	0	0	0	0

Legend: ++: Strong emphasis, +: Emphasis, +/-: Conflicting emphasis, 0: No direct emphasis, &: Supportive emphasis

3.4.1. Poverty and Hardship

Four persuasive games were found that dealt with the subject of poverty and hardship. These games are *Survive125* (Live58, 2014), *Poverty Is Not a Game* (iMinds, 2010), *Ayiti: The Cost of Life* (Global Kids, 2006), and *My Cotton Picking Life* (Rawlings, 2012b).

Survive125 is a short text-based narrative game where players have to survive as a working single mother in India for 30 days by making decisions about family and health matters. The presentation is minimalist, as it only shows players how their actions affect their health and available money, though the actions do result in small snippets of text about their consequences.

Ayiti: The Cost of Life (*Ayiti*) describes a similar situation as it is about a family living in poverty in Haiti. In this strategy game, players control the actions of a family of five, determining the family members' access to education, work, health care, and rest. Few players will make it to the end of a 20-minute session (spanning 4 in-game years), as family members often fall ill and die in their efforts to keep their heads above water.

Poverty Is Not a Game (*PING*) is a 3D roleplaying game about individual poverty wherein players guide a recently poverty-stricken teen boy or girl through the process of finding a job, getting education, and maintaining a roof over his or her head in a big Belgian city. As one storyline takes around 45 minutes to complete, it is one of the longer games in our selection.

Lastly, *My Cotton Picking Life* (*MCPL*) explores the despairing monotony of being forced to pick cotton in a field in Uzbekistan. Picking one day's quota of cotton (50 kg) in the game would by our estimation take up to 6 hours of uninterrupted gameplay. Because the game is very repetitive and offers no incentives to keep going for that long, it is unlikely that many players play the game for more than a few minutes.

With the exception of *MCPL*, all the games covering this theme in this sample rely heavily on linguistic persuasion. All are trying to convey the situation their characters have found themselves in, and for the first three games this takes not only a backstory but also explanations of how their actions change their situation, taking the players through a narrative that the players have authorial control over. *MCPL*, on the other hand, does not focus on any story of the character, their situation is left vague while the displayed text addresses the general issue of forced labor in Uzbekistan. This game focuses a lot of its persuasive signs on visual representation. The character looks unhealthy and unhappy, his (literal) outlook bleak. In the other games about poverty, the visuals are often underplayed. *Survive125* offers only schematic icons and a single background image. *Ayiti* and *PING* however, both styled their protagonists to best fit their target demographics. *Ayiti*, seemingly made for children, is visually and aurally gaudy despite the grave circumstances. Characters trot to and fro with cheerful tunes, and only when they get severely ill does their demeanor change to an unhappy one. *PING* shows 3D models in baggy pants and loose clothes, while portraits shown during dialogues show edgy haircuts and the odd piercing. Again, however, their state is not reflected in the way they look. The characters do not look tired, grimy, or even unhappy. This was likely done not to shock or scare away players. Because the developers of *PING*, *Survive125*, and *Ayiti* used such a "tell, don't show" approach, players can slowly get to grips with the situations detailed in the games. Lastly, haptic signs are not used to any serious degree for the first 3 games. However, *MCPL*'s message that the work involved in picking cotton is an arduous and monotonous task is carried out through its reliance on players to constantly click buttons. The movement itself is dull, perfectly reflecting its task in its sheer futility while avoiding the intensity of the work and the fatigue it creates.

When looking on the level of systems, the haptic signs of *MCPL* also form the backbone of its procedural rhetoric. The game mimics the real-world work and instills the sense of hopelessness and lack of freedom through its

monotonous gameplay. *Ayiti* also employs strong procedural rhetoric; the choices players make for their characters could keep the family afloat but restrict individual development, and driving characters to work hard to eke out enough money can push them to the brink of death. The balance that players must seek mirrors the struggles of families in Haiti and other poverty-stricken countries. *Survive125* also covers that balance, but abstracts control of actions to one decision per day. Whether players send their child to school or to fetch water has an impact on both their current and future lives. In this regard, the games are similar, but because of the level of abstraction in *Survive125*, the choices are more easily made than if players would have to force these actions as it is in *Ayiti*. *PING* is about poverty in a Western city. The systems to be reflected in the game are necessarily different. *PING* therefore focuses its gameplay on the bureaucratic rat-race that destitute Western citizens fall into. Running to catch appointments at employment offices as well as asking friends for a place to stay are part of this routine.

Although *PING* reflects these real-world trials and tribulations in their procedures, it is impossible to fail. Spending what little money the characters have on hamburgers does not incur a fail state. Leaving his or her boss waiting for an hour does not mean they are terminated. In other words, this game employs conflicting tactical persuasion, as its difficulty does not match the problems faced in the real world. *Ayiti* fares better at this as it is quite difficult to make it through one session. Although this outcome is not inevitable, the family bond easily disintegrates into a game screen lined with tombstones. In fact, the tactical scope of this game is such that walkthroughs have been made available online by other players, and optimal strategies have been the topic of discussion on several online spaces. *Survive125* finds the middle ground between these games as it is possible to fail, but players who choose carefully can easily 'survive' its 30 day run.

Evidently, the difficulty levels of these games are the result of their specific messages and target audiences. *Survive125*'s minimalist aesthetic is

aimed at more adult players when compared to *Ayiti*'s cheery animations and melodies, which might mean *Survive125*'s players crave less game-like elements (such as challenge). This is why these games can have the same message of finding balance while being poor but have very different degrees of difficulty. *PING*'s purpose was split between informing and persuading (De Grove et al., 2012), which in this case meant that (young) players who were not proficient would still be able to learn the appropriate actions in preparation of their own lives. Lastly, *MCPL* approaches difficulty differently. Despite threats of harm from an off-screen aggressor, there is no fail state. Still, the size of its quota means it is also nearly impossible to win, and a button marked 'Alright, I've had enough' is visible all while playing. In this way, the game pushes players to give up, to stop playing to prove the point that forcing children to pick this much cotton is reprehensible.

The theme of poverty and hardship is prevalent in persuasive games because people want to spread awareness of humanitarian crises in novel ways (see also *Darfur is Dying*, for instance). However, adding a social component to help spread awareness seemed to have only been an ancillary concern for these games. Overall, these games employ few direct calls to action, apart from *MCPL*'s share buttons and *Survive125*'s options to post messages to Facebook. It needs to be noted that some games outside of the current selection, such as *Darfur is Dying* (Ruiz, York, Stein, Keating, & Santiago, 2006), do link to mobilization pages.

3.4.2. Lived Experience and Disorders

Games in the theme of lived experience and disorders are about personal stories. These games were made to reflect on what life is like for certain individuals, whether those individuals are insecure, repressed, or suffer from a neurological disorder. The games subsumed under this theme were *Depression Quest* (Quinn, 2013), *Power and Control* (Sain, 2011), *Dys4ia* (Auntie Pixelante, 2012), and *Auti-Sim* (Kadayifcioglu, 2013). Two of these games, *Depression*

Quest and *Dys4ia* are partly autobiographical, as their developers relay their experiences with depression and hormone replacement therapy, respectively. *Auti-Sim* is biographical, developed by a parent of an autistic child. They all engage the player in first-person accounts of salient events or experiences.

Depression Quest is a branching text narrative that integrates the level of depression as a modifier that limits players' options as it deepens. Because the unavailable responses are still visible, the few months of the protagonist's life (shown through mood pictures, soft music, and text) the game follows are noticeably affected by this affliction.

The second game, *Power and Control*, is a uniquely designed game about a young female who is in a relationship with an abusive male. Displayed on a stark pink background and aurally accompanied by a male voice and varying background score, words are used to represent objects, actions, or thoughts that the players can approach and touch or even avoid. All interactions in this game occur through the mouse cursor.

Dys4ia is the developer's account of the situations she dealt with while undergoing hormone replacement therapy (HRT). The game is played as a series of around 40 micro-game vignettes (reminiscent of Wario Ware games (Nintendo, 2014)), that all use one gameplay mechanic to display a situation, thought, or feeling.

Lastly, *Auti-Sim*'s title is a portmanteau of autism and simulation. The game itself is a 3D simulation of an autistic child walking through a playground filled with children. Approaching these children leads to social anxiety in the child, which is relayed through off-putting shrieking sounds while white noise blurs the screen. Players are driven to avoid the other children and seek out quieter areas, reflecting how difficult it typically is for individuals with this disorder to establish human contact.

Similar to the previous theme, three of the four games about personal experience rely heavily on linguistic persuasion, although they differ in their presentation style. *Depression Quest* offers a full narrative with fleshed out characters who react to each choice made, with every situation described in detailed text. *Power and Control*, on the other hand, presents single words that take the place of visual stimuli and behavior. The interactivity these words allow often give them meaning as they stand in for the protagonist's thoughts as well. *Dys4ia* presents the middle ground, with short sentences describing a situation or feeling. This shows how even in the relatively narrow genre of first-person experiential games, text can be used to either create a total picture, or adversely to shield players from what would surely be off-putting (not to mention costly to produce) images. In all three cases, it allows for easier identification with the protagonist as players' minds fill in the blanks left by the text.

Auti-Sim, as can be seen in table 3.1, is the only game in this sample that does not in any way rely on in-game text for persuasive effect. Instead, its emphasis is on visual and aural presentation. The masking of the screen and piercing noises form a deterrent to players from seeking out contact with others. The sensorial bombardment stands in for inner turmoil in anticipation or as a result of interaction. The game thus attempts to spread beyond the confines of the audio-visual browser game to simulate an internal state of being. Similarly, *Depression Quest* projects white noise on the game's background to signify deepening depression. However, in this case, the noise is not used to deter players but to frame the current situation. *Dys4ia* employs visuals in a very different way, though towards the same purpose. Its visuals are metaphorical, often either supreme close-ups of body parts or abstracted top-down views of social events. As the treatment progresses and insecurities come and go, the protagonist's body is in turn shown as silhouettes of oddly-shaped lumps or stereotypical male and female icons. The transition is also marked aurally through the developer's deep voice as it was used to create high-pitched sound effects.

Lastly, while *Power and Control* uses its words to great effect, the power of the game's signs comes from the physical mouse interactions. The cursor is at once a finger, a body, and a decision. Told to approach, stay on, or avoid some of the words, the game is lent a physical dimension as the player is forced to 'touch' disconcerting concepts. Since there are no visuals beyond the words, the game's constantly oppressive male voice-over enforces the brunt of the emotional engagement.

Of the three themes, lived experience and disorder persuasive games seem to rely the least on procedural rhetoric. *Depression Quest* crosses off unavailable (often assertive or positive) ways to deal with situations, explicitly showing players that what they would normally do is simply not an option for the protagonist. Moreover, this funnels the player, making it harder to 'choose' their way back from the depression. Despite the limitations, it remains possible for players to simply always choose the most positive option available to work their way up – which is in our model labelled as conflicting tactical persuasion. This means the unavailability system does not necessarily cause *Depression Quest* to have players think or act as if they were depressed. The game therefore relies primarily on affective persuasion (by drawing the player into its narrative and making it their own) to envelop the player in its message.

Looking at *Dys4ia*, procedural rhetoric is not only limited (in that its systems do not meaningfully reflect real-world processes), players can get a sense that since the game is a straightforward set of micro games, undergoing HRT is also not really a struggle. Its many tiny mechanics can be interpreted to show that each situation the protagonist finds themselves in is unfamiliar and requires novel ways of dealing with a situation. However, as with *Depression Quest*, *Dys4ia*'s power lies in narrative and affective persuasion, showing the players what such an idiosyncratic process feels like in a personal way.

What is then different from the other themes is that the games about these personal experiences are not hard. The developers have prioritized the

game's experience and story over providing a challenge. The lack of difficulty does not always help the game's messages (*Depression Quest*, *Dys4ia*), but in most cases these games do not need to hinder the player more than needed to tell their stories. Lastly, just like in the poverty and hardship theme, social persuasion is mostly absent. *Depression Quest* does underline the importance of social contact for this affliction, though, by linking players to sites where they can look for help.

Persuasive games are a fitting home for personal experiences. Players can try to match their thinking to that of the protagonist, trying to get a feel for what cannot easily be transferred through an audio-visual medium. Similarly, many commercial games are picking up on this trend (coinciding with a shift towards greater diversity) and portray lived experiences in critically acclaimed games (e.g. *Gone Home*, *Life is Strange*, *That Dragon, Cancer*) as gaming culture is slowly becoming more inclusive (see section 3 of this volume). Interestingly, these high-profile games tend to show the same pattern of branching or uncoverable narratives as the smaller non-profit counterparts described in this chapter.

3.4.3. Violence and Politics

This theme includes three games that seek to address the use of violence in wars and civilian contexts. The violence these games contain is therefore meant to address violence in society on a broader level. The games are *September 12th*, (Frasca, 2003b), *The Best Amendment* (Molleindustria, 2013), and *Endgame: Syria* (Rawlings, 2012a). Two of these games (*September 12th* and *The Best Amendment*) condemn it outright, while the third (*Endgame: Syria*) explores its apparent necessity and uses in combating dictatorships.

September 12th is a self-titled 'toy world' exploring aggressive tactics used against terrorists. On a single screen, the player can fire missiles at terrorists walking among civilians in a Middle-Eastern country. The delay between a missile's launch and impact as well as its large blast radius means it is impossible

to keep from killing civilians. Those that are caught in the blast are mourned by other civilians who subsequently turn into terrorists, presenting a perennial cycle of violence where more terrorists are 'created' than are killed.

The second game, *The Best Amendment*, is concerned with gun violence in the United States. In this top-down twin-stick shooter, players are competing with their former selves. By shooting these prior versions, subsequent levels then have this same aggressive act in them, increasing the violence and danger until it becomes impossible to survive. The message this extolls is that the use of violence only fights fire with fire, adding more violence until the situation becomes untenable and the player character is killed.

The third game is *Endgame: Syria*. Coming from the same developer as *My Cotton Picking Life*, this game similarly tackles a contentious topic: the early years of the Syrian civil war. Players play tactical and aggressive cards in an abstracted card game environment (in the vein of *Magic: The Gathering*) to maintain support for the rebels, weaken the regime's forces as well as negotiate cease-fires and peace talks.

The way the games are presented is surprisingly varied. September 12th displays text only before the game starts, though that text sums up most of the game's message: "It has no ending. It has already begun. The rules are deadly simple. You can shoot. Or not. This is a simple model you can use to explore some aspects of the war on terror" (Frasca, 2003b). *The Best Amendment* intersperses its combat scenes by quoting and referencing famous pro-gun activists from the National Rifle Association (NRA). The text explicitly references a dichotomy of good and bad and immediately problematizes this: "Be the good guy with a gun! Stop the bad guys with guns! But will that make you a bad guy in the eyes of somebody else?" (Molleindustria, 2013). Both games offer thinly veiled critique through the use of certain phrases. *Endgame: Syria*, conversely, does not include many subversive or explicitly persuasive messages. Instead, players are given a lot of information on each possible action, detailing effects

such actions have on the rebels, support for the regime as well as civilian life. Through the act of playing this game, players can therefore get a sense of how both parties have behaved in this conflict.

Visually and aurally, both *September 12th* and *Endgame: Syria* make use of stimuli without relying on them for their argument. Though *September 12th*'s cell-shaded visuals seem out of place, they are never cheery, and the sounds of explosions and mourning establish a bleak atmosphere that reflects the continuing tragedies in this region of the world. *Endgame: Syria*'s visual and aural cues are all icon-based and mostly designed to quickly relay necessary information. As with the games on poverty and hardship, these games eschew horrific images, masking them with menus filled with numerical information in the case of *Endgame: Syria* or abstracting them to small and simple sprites (*September 12th*). Conversely, *The Best Amendment* seems designed for shock value. Characters bleed after being shot, for instance. The player character is a conical white figure, invoking images of Ku Klux Klan (KKK) robes. This racist connotation is made explicit as the enemies the player shoots are black cones and the game's score consists of frantic banjo riffs. The game's author, Paolo Pedercini, indeed drew a comparison between the NRA and the KKK when asked about this interpretation (Webster, 2013).

All three games approach violence differently. *The Best Amendment* is fast-paced and becomes progressively more difficult. *September 12th* is sedate, as the terrorists do not pose a threat to players and the time delay between firing a rocket and hitting the target precludes a fast rate of fire. *Endgame: Syria* allows players to set the pace, valuing strategy over reaction times. For the first and third game, this difference is caused by the distinct messages of these games. *The Best Amendment* aims to satirize and subvert pro-gun ideology, with zesty, violent gameplay conveying its message. *Endgame: Syria* instead treats its subject matter more solemnly. It aims to provide a realistic view of the different actions one can take to fight a civil war – though it leaves out civilian-targeting atrocities such as chemical warfare. Its message is therefore more one of

understanding and, perhaps, sympathizing. *September 12th*'s succinct point is delivered mainly through the single gameplay loop of firing missiles and hitting innocents to 'create' new terrorists. The similarities of these games therefore come down to a shared focus on the game's systems to relay the message. *Endgame: Syria*, in contrast to the others, further adds a narrative element to these systems. Through constant battles and contact with outside organizations and nations, players not only manage their resources but can also actively choose to minimize civilian casualties, for example. The story of the civil war this creates will be counterfactual, but it is meant to let players experience how decisions they would make would work out.

In opposition to the previous theme's focus on narrative over gameplay, all three violence-focused games offer some degree of tactical freedom. While this is comparatively limited in *September 12th*, players are likely to try to wrestle with different times of firing and different locations before they give up. This entails getting to grips with the inevitability of collateral damage, but the game leaves enough leeway for first-time players to get the sense that it is possible to only hit terrorists. In *Endgame: Syria*, the luck-based drawing of cards as well as the multiple advantages and disadvantages each card offers lend the game surprising depth. Players can choose to play in different ways, and the game's relative difficulty means there is an incentive to play tactically. The design of both of these games is aimed at tactical persuasion, as the leeway and freedoms granted to players all further promote the messages they send. *The Best Amendment* is fun to play and surprisingly addictive, incentivizing repeated attempts in pursuit of a high score. Indeed, the game is such an enjoyably frantic game that its message could easily be lost on players amid the carnage. In that way, the game's score counter is to the message's detriment as it might cause players to want to add violence in pursuit of the leader boards, meaning it can be played and enjoyed by exactly those individuals it should be persuading. These players might get the feeling that though violence only builds up, it does

make for an interesting experience. This is likely not the message its creators have wanted to spread.

3.5. Conclusion and Discussion

Overall, with the exception of *Auti-Sim*, all of the games discussed in this chapter rely on linguistic persuasion. The appeal of communicating with players through text is obvious; it is an efficient (and comparatively cheap) way of reaching the audience to make a message explicit. Moreover, while all games also emphasize other persuasive dimensions, the addition of text in most cases does not disturb the flow of the game or its core message. From the current selection, it seems that most games therefore include text to bolster an otherwise less clear message.

All games in this selection also employ procedural rhetoric, though not every game is successful in this regard. Table 3.1 supports the contention that when developers set out to make a persuasive game they develop it around either a core narrative (*PING*, *Depression Quest*, *Dys4ia*, *Endgame: Syria*) or around their principal gameplay elements (*Ayiti*, *MCPL*, *September 12th*, *The Best Amendment*). Developers want to (allow the player to) tell a powerful story or they rely on the gameplay elements to tell the story for them. While this harkens back to the ludology/narratology debate (Frasca, 2003a), there is no indication that narrative-focused persuasive games have uninteresting gameplay or vice-versa. Moreover, both routes seem to lead to concrete and interesting experiences that offer strong messages.

Apart from procedural, linguistic, and in half of the cases narrative persuasion, other persuasive strategies are used only in a few of the games. Visual persuasion especially is used sparingly. This is likely the result of the reduced budgets available to persuasive game developers. However, *PING*'s 3D graphics – signifying a more generous production – are not used to convey elements like negative emotions or griminess often associated with living in destitution. The other reason for this paucity is the desire for developers to shield

their audience from shocking visuals. The likely argument behind this is that shocking players would scare them away or at the very least remove attention from the game's message. This also holds in the case of *PING* and *Ayiti* because of their younger target audiences. For games like *Survive125* and *Depression Quest*, the clean and unthreatening presentation seems to cater to a target audience that takes the subject matter seriously and is playing to be informed, rather than entertained. On the other hand, the bold visual styles of *Dys4ia* and *The Best Amendment* make these games stand out. Overall, the way persuasive games are presented depends on their target audiences and specific persuasive goals.

Several persuasive games studied here are trying to break free from their constrictive medium (i.e. the browser window). *Power and Control* draws players into an oppressive situation. Using only written and spoken words, it aims to unsettle players and cause them to feel threatened and belittled. *Depression Quest* and *Autı-Sim* both apply visual signals to indicate negative states of feeling. Compared to non-interactive media, these games more easily elicit empathic responses from players, as they are given a role to play, uniting their goals with that of their protagonists at least for the duration of play (Juul, 2013). The games about lived experiences and disorders all try to invoke an affective dimension, in keeping with the emphasis on personal stories. Interestingly, this does not necessarily coincide with a focus on narrative persuasion. *Autı-Sim* does away with it entirely, and *Power and Control* relies more heavily on moment-to-moment interactions between the protagonist and her abuser, only developing into a coherent story as it reaches a crescendo where the protagonist is deciding whether or not to leave her tormentor. However, in keeping with their browser-based nature, only one game (*PING*) out of eleven can be said to apply cinematic persuasion. For the others, there are no cut scenes, and the framing of each scene is often abstract, minimalist, or purely functional. In other words, the viewpoint and mise-en-scene are not used to express the games' messages. The games are certainly attempting to expand

beyond their windows, but they do not adhere to the strategies of other media. Instead, they make use of the unique engagement afforded by the playful, interactive experience.

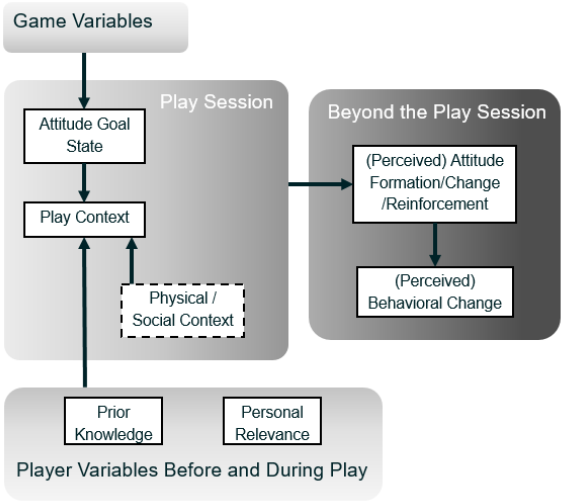
My Cotton Picking Life, *September 12th*, and *The Best Amendment* share another interesting structural element. These games were not designed to let players win and experience mastery, but rather the opposite; these games intend for their players to give up. *MCPL* features a button that reads 'Alright, I've had enough', before chastising players who click it by telling them not everyone is in a position to decline this work. *September 12th* initially seems like an easy game of target practice before it frustrates players with the inevitability of harming innocents. *The Best Amendment* shows that acting violently only adds violence, escalating a situation and leading to more harm. This supports the point made by Ruggiero and Becker (Ruggiero & Becker, 2015) that some games are not made to be winnable. In fact, these games want players to give up to get their message across. Players need to have a revelatory moment where it becomes clear that their actions are futile (*MCPL*) or only escalate the problem (*September 12th, The Best Amendment*) and that "the only winning move is not to play" (Badham, 1983).

De la Hera Conde-Pumpido's model (2015) enabled us to differentiate between the linguistic and procedural persuasive dimensions that are emphasized in almost every game, and dimensions that are used sparingly. Moreover, while dimensions are almost always used in tandem in any particular game, each dimension can be emphasized on its own as well. For example, narrative persuasion does not necessarily need to coincide with affective persuasion, and visual and aural persuasion can be distinguished from sensorial persuasion. We consider the model to be a valuable tool for descriptive purposes, discerning different kinds of persuasive games. Additionally, the model is a means to visualize gaps – unused persuasive dimensions– that could be filled by future persuasive games. The social dimension, for example, saw little emphasis in most of the games discussed here, despite the level of

reflection discussing these games could encourage (see also chapter 12 of this volume).

In this chapter, we investigated the persuasive dimensions games employ to spread their message. We based our conclusions on 11 persuasive games that are currently playable online. Though these games only represent a small portion of the rapidly expanding catalogue of this genre, they show at the same time a broad reliance on the written word and procedural rhetoric as well as an interesting variety of strategies. For example, differences can be found in the time needed to finish these games. Some authors feel their message needs or deserves a certain time investment from their players, while others are satisfied with 60 seconds of the players' attention (e.g. *September 12th*, *Auti-Sim*). Persuasive games can be seen as separate from entertainment games or other serious games because they were not made to appeal to as large a crowd as possible. Persuasive games can be short, hard – even unwinnable – and developed with any budget. They do not need to entertain their players for the duration of lengthy, cinematic campaigns to give players their "money's worth". Persuasive games justify their length and production values only insofar as they help to propagate their messages. This economical consideration informs their designs and presents the freedom to make games that, for example, almost force players to stop playing to prove their point. Similarly, other authors make it impossible to lose the game in favor of letting players stick to the narrative (*Dys4ia*), which might cause players who do not feel challenged to lose interest. The results of our case based analysis lead us to the conclusion that persuasive games offer organizations and idealistic authors alike an outlet for novel persuasive communication which can employ different dimensions. In this sense, persuasive games are indeed the digital pamphlets of the current media landscape.

4. Who's Playing Whom? Audiences of Persuasive Games



4.1. Abstract[4]

The current study investigates the players of a persuasive game – a game that has the primary intention of changing or reinforcing players' attitudes on a certain topic. As these games are typically researched in experimental settings where their players are all study respondents, little is known about the natural audience that online persuasive games attract. Drawing survey respondents (N=364) from the last screen of a racing game called *Tweet, Chat, Like & Drive*, we investigated the relationship of the attitudes players held towards the game's topic (the dangers of texting and driving) with those they held towards the game

[4] This chapter is under review as Jacobs, R.S., Jansz, J.: Who's Playing Whom: Audiences of Persuasive Games

itself. The Social Cognitive Theory was applied to generate factors salient to texting and driving on personal, social, and cognitive levels. Linking these attitudes to evaluations of the game and its message, our results illustrate that the experience of the game depends on who is playing. Differences were found between players with and without a driver's license on how often they played the game, how highly they evaluated it, and how they saw the game as a product of persuasive communication. We present the factors with the highest influence on perceived message reception – deficient self-regulation, third person perceptions, and whether or not the players are licensed to drive – to offer conclusions on the importance of tailoring (design and research of) persuasive games to the intended and actual audience.

4.2. Introduction

An increasing number of digital games are designed with a persuasive message, for example with respect to safety behavior or famine relief. On the surface, it seems counterintuitive to willingly become a player of such persuasive games. As they are intended and designed to change certain attitudes in their players about issues external to the games themselves (Fogg, 2003), starting a persuasive gaming session of one's own volition amounts to submitting to an attempt at persuasion. However, while knowledge of being persuaded often leads to processes like reactance (Friestad & Wright, 1994), countless individuals choose to start playing games like Dumb Ways to Die (Metro Trains Melbourne, 2016) and Darfur is Dying (Ruiz et al., 2006), despite the fact that these games wear their intended impact on their sleeve. What kind of people then seek out and play persuasive games of their own accord? Unfortunately, as investigations into persuasive games typically make use of a captive audience selected by researchers to test for effects using surveys or experiments (e.g. Ruggiero, 2015; Waiguny et al., 2013), there is currently very little insight into players playing these games spontaneously, that is, without being asked. The consequence is that the nascent medium of persuasion through digital games is only

investigated through participants who might not have played such games by themselves, hampering our ability to generalize effects found to society at large. To arrive at a total perspective of persuasive games, it is important to not just look at how any player is affected by them, but also study the characteristics of the spontaneous players.

The current chapter explores the self-motivated audience of one popular persuasive game - called *Tweet, Chat, Like & Drive* - that intends to persuade players not to use their smartphone while driving. By taking a real-world game as an example and quantitatively surveying its 'natural' audience immediately after play, we offer insight into the characteristics of these players and the perceptions they hold. We used Bandura's (1986) Social Cognitive Theory to conceptualize the players' perceptions of their own behavior with an emphasis on those related to self-regulation.

We will start by discussing what is currently known about persuasive games and their audiences. Because it is important to keep the topic and gameplay style of any game in mind when discussing its audience, we will introduce *Tweet, Chat, Like & Drive* in more detail before outlining the current study's goals and methods.

4.2.1. Persuasive Games

Although the term 'persuasive game' was coined by Ian Bogost (2007) to denote a gaming experience wherein a persuasive message is embedded in the way the gameplay and game systems reflect some real-world process (a persuasive technique termed 'procedural rhetoric'), we advocate a broader meaning and conceptualize persuasive games as digital games that were specifically designed to persuade regardless of their persuasive mechanism (in line with Orji et al., 2014, p. 457). Persuasive games cover different topics for both commercial and non-commercial purposes. They are made for many different kinds of brands (Lee & Youn, 2008; Roettl et al., 2016) and non-commercial topics range from energy conservation (Gustafsson et al., 2009) and humanitarian crises (Peng et

al., 2010) to safe driving behaviors (the current chapter). The persuasive mechanisms used in these games are sometimes specific to the game's topic, but often similar across games (Jacobs et al., 2017). Bogost's original notion of procedural rhetoric has been expanded upon by identifying other persuasive mechanisms that can be applied independently or in combinations (de la Hera Conde-Pumpido, 2015). For instance, persuasive games can persuade through visual stimuli alone, for example by overlaying brands to be advertised on traditional arcade games (Redondo, 2012). Alternatively, they can employ textual and visual stimuli, narratives, and gameplay together to offer a message more broadly.

Categorizing games on their shared intention to persuade is fruitful because it allows researchers to see the commonalities in how games on different topics enact this intention and how successful they are at it. Unfortunately, the rise of persuasive games has not yet been properly matched by empirical evidence supporting their effects on attitudes of individual players or their impact on broader society. The scattered effects on attitudes that were found point to small improvements after playing most (if not all) of the games studied (Gerling et al., 2014; Gustafsson et al., 2009; Peng et al., 2010; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015). To validate the effects of persuasive games as a medium, more research is needed. Empirically supported models are required to explain and predict effects, and to help game designers move towards validated design strategies (DeSmet et al., 2016; Kors, 2015). One important facet of the development of a theoretical backing for effects of persuasive games is to closely investigate the audiences that these games can reach.

4.2.2. Persuasive Gamers: Players and Audiences

Persuasive games span across categories that would otherwise not be researched as one group, such as educational, health, and sociopolitical games. This means there is not one unified player base, just like there is no single

audience for other types of persuasive communication. The intended groups of players range from young children (Folkvord, Anastasiadou, & Anschütz, 2017) and adolescents (Crecente, 2014; Ruggiero, 2015) up to the elderly (de Oliveira, Cherubini, & Oliver, 2010). Persuasive games are therefore not necessarily made for a young audience of avid videogame players. In fact, many persuasive games are simply aimed at general, interested adults (Jacobs et al., 2017). *September 12th* (Frasca, 2003b) about Bush's war on terror is an example of a persuasive game that aims to reach that kind of audience.

One differentiation can be easily made among audiences of persuasive games: whether individuals are asked to play as part of a curriculum or program, or whether they self-select. For the purposes of this chapter, we refer to any person who opts to play a persuasive game without systematic forms of material incentives, external expectations, or coercion as the game's 'natural players'. Note that this does not necessarily make the players intrinsically motivated (Ryan & Deci, 2000). It merely describes the absence of systematic extrinsic motivations (i.e. research participation incentives and school or institutional requirements). The audience we describe as 'natural players' is the audience a freely available game receives. Although studies into captive audiences are well-served by laboratory or field experiments where participants do not get to choose to play, experimental studies into games made for open audiences – defined here as consisting of natural players from any background – necessarily suffer from reduced external validity. Any effects found therein could be overstated: artificially motivated players could be more eager to play along for the sake of an experiment where they would have quit earlier if they felt they had been wasting their own time. In other cases, effects might be larger for natural players: as was stated in the introduction, persuasive games have the ability to attract large audiences of people who are willingly giving up their time. Then again, these players might simply be seeking out messages that are in line with their current attitudes, limiting the possible impact from changing attitudes to strengthening them (Smith, Fabrigar, & Norris, 2008).

To our knowledge, no empirical results have been published on how natural players respond to persuasive games or even whether the players these games attract match the target audience on a demographical level. On the level of design, however, advancements have been made to focus games on certain groups or types of players. Previous research has established that design choices can impact the way a game is perceived by audiences from different cultural backgrounds (Khaled et al., 2006), highlighting the importance of involving members of the intended audience in the design process. Trait-based player characteristics were also researched in this way. Orji and colleagues first linked player types (i.e. individual gaming style preferences) to perceived impacts of health behavior modifications, before suggesting ways to design games to either fit specific types or appeal to the largest cluster of player types (Orji, Mandryk, Vassileva, & Gerling, 2013). In subsequent research, they also queried participants on which game-like mechanic they perceived to be able to change their attitudes and behavior (Orji et al., 2014). The results discussed in these studies show that some, but not all, of the persuasive strategies that are prevalent in health games and the wider field of persuasive technology fit well with players' expectations about themselves. However, there is no evidence that player types cluster around certain topics (for example for players fond of exploration gameplay to more often be interested in insulin regimen adherence), so the best course of action would indeed be a 'one-size fits all' approach to persuasive game design (Orji et al., 2014, sec. 5.1). Still, as these studies did not make use of existing games' players, they do not provide information about how natural players engage with persuasive games and how these games actually affect natural players. The current chapter aims to fill this gap.

4.2.3. Tweet, Chat, Like & Drive

The current chapter describes an exploratory study into the natural players of a persuasive game. It is important to root the investigation of any persuasive game's natural audience in the topic and game itself. A game on the processes

of gentrification in urban housing like *Nova Alea* will likely draw a different audience than a game about smoking cessation. For this reason, we will describe the game we used for this study before detailing the ways in which we investigated its natural players.

The persuasive game used in this study, titled *Tweet, Chat, Like, & Drive* (*TCLD*), was focused on the topic of smartphone use in traffic (Webby Awards, 2014). Launched as part of a public multimedia campaign to reduce the use of smartphones while driving, *TCLD* set players up to race a car across a busy in-game highway, with the winner being the first to finish. Both the car and highway were rendered in chunky, pastel-colored 3D. While racing, players could compose and send fake social media messages through a browser interface on their own (physical) smartphones – although a virtual phone was available in the game for players who did not own one. Social media messages of competing players would appear as obstacles in players' paths (a giant thumbs-up block represents a Facebook like, for example). The density of the game's traffic and the erratic appearances of social media obstacles, combined with the difficulty players experience in dividing attention across both screens, led players to frequently crash into other traffic and swerve off the road. The game also offered alternatives for the reckless behavior; players could send a progress-halting social media barrage to their competitors by stopping their car in a lay-by or rest area (see figure 4.1) to use their phone. After each race, players were shown statistics on their driving and smartphone use. Their behavior on the phone was logged and given as feedback, and players were warned of the consequences of this behavior in the real world. In short, the game encouraged players to use their smartphone while driving to confront them with the dangers of this behavior in real life situations.

Figure 4.1: Game screen from Tweet, Chat, Like & Drive. The separate game screen on the phone is not shown.

TCLD was an appropriate case for observing natural players for reasons of popularity, representativeness, and broad applicability. Primarily, it was a high-profile game commissioned by the Dutch government as part of a multi-media campaign on the use of social media in traffic. This meant it would regularly be brought to potential players' attention through diverse channels, among which were radio and television commercials, as well as roadside billboards. *TCLD*'s high visibility among the Dutch population presented a large group of people with the opportunity to play it. The game was made to be accessible, offering a simple control scheme and few mechanics. Combined with the 3-minute quick-fire nature of its challenge, these properties made the game comparable to most persuasive games (Jacobs et al., 2017; Lee & Youn, 2008; Roettl et al., 2016), even though it stood out for its use of 3D visuals. Its topic was of broad interest, as more than 10 million people in the Netherlands have a driver's license (Centraal Bureau voor de Statistiek, 2017). All in all, *TCLD* was a popular game with the media coverage necessary to reach its intended audience, making it an ideal candidate for surveying natural players.

Because each persuasive game is unique (in terms of message, design, and dissemination strategy), the research questions we sought answers for were necessarily limited to *TCLD*'s situation: Who plays *TCLD*? How do these natural players experience *TCLD*, and how do they perceive the game's message on smartphone use in traffic?

The exploratory nature of this study meant a framework was needed to funnel the selection of attitudes the players held towards both the game and its topic and the perceptions they held with respect to their own behavior. We employed Bandura's social cognitive theory (1986, 2001) in which the choice to perform a certain behavior is rooted in an individual's perceptions of that behavior on a personal, social, and cognitive level. We focused on two key concepts: self-efficacy, in particular to what extent players think they can combine using their phone and driving, and deficient self-regulation, that is, whether they had ever found themselves using their phone without realizing it. By querying players' stances towards both the game and the issue of smartphone use in traffic, we aimed to get an understanding of how the demographic make-up of natural players of *TCLD* can be related to the message it aims to bring across. Our last research question was therefore: Which socio-cognitive factors explain how players perceive *TCLD*'s message?

4.3. Methods

4.3.1. Game and Procedure

Tweet, Chat, Like & Drive was available to play online for free in Dutch and English between November 2013 and February 2015 on its own website. Because it was part of a transmedia campaign to limit smartphone use in traffic (van den Berg, Borkus, Loef, Perik, & Warmoeskerken, 2015), potential players were linked to the game from different websites, and the game was advertised on road-side billboards as well as television commercials. In communications with the governmental department responsible for the game, *TCLD*'s proprietor

was convinced to append a link to a survey on the game's last screen (which showed play statistics related to real-life risks). Participants were invited to fill in a questionnaire 'about their experience' with the game. To increase participation, players were informed they would have a chance to win one of four gift certificates worth € 25 upon completion of the survey. Apart from the raffle, no efforts were made to recruit participants for the study. The survey was therefore only available to those who, for whichever reason, decided to play at least one session of *TCLD*. The link to the questionnaire was available from December 2013 (shortly after its launch and before any advertising for it was aired on television) to February 2015, when the game was taken offline.

The study consisted of a short questionnaire. After clicking on the link at the end of the game, participants were informed of the nature of the study and asked for their consent on the survey's landing page. Next, participants completed the study's measures, answering questions on demographics, their evaluation of the game, perceptions of their own smartphone use in traffic, social norms, message reception, and how dangerous it is when others use their smartphone in traffic. Afterwards, participants were thanked and given a chance to compete in the gift certificate raffle. Most participants took less than 10 minutes to complete the study (5% trimmed mean: 4 minutes and 12 seconds). Because of the open nature of the questionnaire, respondent's IP addresses and raffle sign-up information were checked for duplicate entries. This led to the removal of 4 responses with duplicate IP addresses.

4.3.2. Measures

Working within the framework of social cognitive theory, we operationalized several aspects of players' attitudes towards the behavior *TCLD* aims to curtail as well as towards the game itself on a personal, social, and cognitive level (Bandura, 1986). All of the attitude items used in this study (shown in table 4.1) were answered on a seven-point Likert scale, unless otherwise noted. Scales were tested for reliability using Cronbach's alpha. All scales reported alphas of

.75 or higher after recoding and removal of certain items (listed in table 4.1 for each scale). Scales were also factor-analyzed with oblimin rotation, which in all cases supported the use of each of the scales as one indicator.

Three scales and two separate statements were designed to gauge attitudes towards the behavior of smartphone use in traffic. On a personal level, participants reported their own behavior on a scale consisting of four items (Cronbach's **α**: .91), for instance asking how often a respondent texts while driving. Two deeper personal attitudes were also measured. Respondents' perceptions of their abilities to use their smartphone in traffic were measured with a single self-efficacy item (Bandura, 1977). Second, the degree of automaticity of the behavior was gauged using a statement denoting deficient self-regulation (Bayer & Campbell, 2012). Perceived descriptive (social) norms on smartphone use in traffic were measured with a four-item scale (**α**: .80), with items focused on the acceptability of this behavior among friends and family. Lastly, a measure was designed to gauge attitudes towards the risks posed by smartphone use in traffic. To ensure the respondents' assessments were as objective as possible (i.e. free from optimistic bias: Weinstein, 1989), the items in this scale were uncoupled from views of their own abilities and instead referenced a generalized other. The scores of the resulting four-item third person risk perception scale showed acceptable interreliability (**α**: .76).

Attitudes towards *TCLD* were measured in two different ways that related to its intentions as a persuasive game. The first of these was a general evaluation of the game including, among others, an item on design (i.e. 'this game is well-designed'), as well as asking for a grade from 1 to 10. After multiplying the numerical grade by .7 to scale with the other items, the final five-item game evaluation scale's scores showed optimal interreliability (**α**: .89). The second game attitude scale gauged the *perceived* effectiveness of the game on its players, with five items linking the game to its effects (e.g. 'this game represents the dangers of using a phone while driving'). This scale's scores also yielded good interreliability (**α**: .83).

Lastly, demographic items were phrased that related to the topic of smartphone use in traffic. Respondents were asked for information with regards to age, gender, possession of a driver's license, and use of hands-free car kits. As investigating the demographic profile of *TCLD*'s players was a priority, the demographic items were placed at the start of the survey to minimize data loss as a result of attrition.

4.3.3. Analysis

Before running analyses, incomplete responses were identified but not removed outright. Differences in the drop-out rate for the sample were tested with Chi-Square tests for independence to look for asymmetrical attrition. Incomplete cases were excluded on a test-by-test basis to retain the most complete sample for each individual analysis. One-sample *t*-tests were performed to check for deviation from a neutral stance (i.e. a score of 4 on the 7-point Likert scale). In some instances, independent samples t-tests were performed to check for between-group differences. Two-tailed tests of significance were used in all of these cases. Linear and logistic regressions were used to find relationships between the demographic variables and scales. Effect sizes were reported along the guidelines proposed by Lakens (2013), among others using unbiased effect size estimate Hedges' g_s for independent samples t-tests, and Cohen's *d* for one-sample t-tests.

Table 4.1: Item list for the measures used in this study, translated from Dutch.

Item	M (SD)	N
How often have you played *TCLD*?	2.3 (5.3)	357
Attitudes towards smartphone use in traffic:		
Behavior Self-Reports *(α = 0.91)*	2.3 (1.5)	319
I occasionally use my phone while I'm driving a car	2.6 (1.8)	324
I occasionally read a message on my phone while I'm driving a car	2.5 (1.8)	325
I occasionally send a message from my phone while I'm driving	2.2 (1.6)	323
I sometimes place calls on my phone using my hands while I'm driving a car	2.0 (1.5)	323
Self-Efficacy *(single item)*		
I can safely divide my attention between my phone and traffic	4.2 (2.0)	323
Deficient Self-Regulation *(single item)*		
Sometimes I use my phone while I'm driving a car without realizing	2.8 (1.9)	324
Descriptive Norms *(α = 0.80)*	2.8 (1.4)	293
My friends and family expect me to always be available, even in traffic	2.8 (1.8)	297
Among my friends it's normal to use a phone while driving a car	2.6 (1.7)	296
My friends wouldn't mind if I used my phone while I'm driving a car	3.2 (1.7)	296
My family wouldn't mind if I used my phone while I'm driving a car	2.5 (1.7)	295
3rd Person Risk Perception *(α = 0.76)*	5.6 (1.1)	281
People cannot safely drive a car while doing things on their phone at the same time	5.9 (1.4)	283
I'm scared other drivers are not paying enough attention to the road because they are doing things on their phone	5.5 (1.4)	285
People who use their phone while driving cause accidents	6.0 (1.1)	284
People should decide for themselves whether or not they use their phone while driving *(Recoded)*	3.0 (1.9)	284
Attitudes towards *Tweet, Chat, Like & Drive*:		
Game Evaluation *(α = 0.89)*	5.4 (1.4)	336
I liked playing this game	5.5 (1.5)	344
I think this game is well-designed	5.3 (1.6)	342
This game looks beautiful	5.1 (1.5)	341
I like playing this game against my friends	4.1 (1.8)	341
If I had to give this game a grade from 1 to 10, it would get an:	7.1 (1.8)	345
Message Reception *(α = 0.83)*	4.2 (1.4)	282
This game represents the dangers of using a phone while driving	4.7 (1.8)	292
This game made me think more about my phone use while driving	4.2 (1.8)	293
Before I played this game I did not consider how many times I used my phone while driving	2.8 (1.8)	292
This game helped me to see how (in)capable I am at dividing attention between my phone and traffic	4.0 (1.8)	288
This game sends an important signal	5.4 (1.6)	289

Note. Means, standard deviations, and sample size are shown for each item and scale, and Cronbach's α are shown for relevant scales. All items apart from play frequency and game evaluation grade are on 7-point Likert scales.

4.3.4. Sample

The first research question that drove the current study was who made up the natural player base of *TCLD*. For this reason, the composition of the sample and the attrition suffered over the course of the survey were chief interests. Out of 423 unique visitors to the questionnaire, 364 respondents entered demographical information. 169 were female (46.4%), while 195 were male (53.6%). The mean age of the sample was 22.9 years (*SD*: 11.0), with a mode of 13 years indicating that a large group of respondents were too young to drive. This is reflected in the distribution of driver's licenses in table 4.2. The mean age of licensed drivers was 28.8 years (*SD*: 10.7), while unlicensed players were on average 15.1 years old (*SD*: 4.6). Of the individuals that were licensed to drive, 49.8% reported never using a hands-free car kit. 92.6% of all respondents owned a smartphone with touch-screen capabilities. When asked about their current behavior, 43.2% denied ever using their phone while driving, while 22.2% chose 'hardly ever' or 'rarely', and 34.6% chose 'sometimes' to 'all the time'. Fewer respondents admit to posting on social media while behind the wheel (56.3% 'never', 17.9% 'hardly ever' and 'rarely', 25.8% 'sometimes' to 'all the time'). Opinions are more diverse on the self-efficacy of smartphone use in traffic. A third of the sample reports little confidence in their ability to use a smartphone in traffic (totally disagree to somewhat disagree: 33.4%), while 49.6% is somewhat to totally confident (17.0% answered neutrally).

Table 4.2 shows the attrition rates for licensed drivers and respondents without a driver's license for the 364 respondents who answered this question. A chi-square test for independence showed that respondents who did not have a license more often did not fill in the questionnaire completely when compared to respondents that did have a license ($X^2(1)=55.148$, $p<.001$). The effect size of this difference in distribution was moderate ($\varphi = .39$). Respondents who did not have a driver's license were 5.2 times as likely (relative risk) as licensed players to not complete the full survey after providing demographic details. This indicates that the distribution of licensed and unlicensed respondents in the

sample might not be representative of the true natural player base, as it is likely that unlicensed players were then also less likely to start the survey to begin with. However, this does not change the fact that two groups of *TCLD* players can be distinguished based on whether or not they are in possession of a driver's license. These two audiences of players were compared in subsequent analyses.

Table 4.2: Distribution of incomplete responses and driver's licenses.

Attrition	Licensed to drive	Not licensed to drive	Totals
Complete response	191 (92.3%)	94 (59.9%)	285 (78.3%)
Incomplete response	16 (7.7%)	63 (40.1%)	79 (21.7%)
Totals	207 (100%)	157 (100%)	364 (100%)

4.4. Results

4.4.1. Game Evaluation and Message Reception

With the question of the demographic profile of the natural players answered in the methods section, three research questions remain. The first of these questions was: How do *TCLD*'s natural players experience the game? The game was generally well-liked: 346 respondents rated the game an average of 7.1 out of 10 (*SD*: 1.8). The evaluation scale average was significantly higher than the neutral score of 4 (*M*: 5.4, *SD*: 1.4, $t(336)=18.9$, $p<.001$, Cohen's $d=1.03$). Results did indicate that the game did not invite repeat plays. By the time they started the survey, most respondents (67.8%) had only played the game once, with 30.5% between 2 and 10 times and only 6 respondents reporting values higher than 10 (*M*: 2.3, *SD*: 5.3). That most natural players only play the game once is possibly related to the relatively low average of the multiplayer component of the evaluation: When asked if players liked to play *TCLD* against their friends, the scale average could not be differentiated from a neutral response (*M*: 4.1,

SD: 1.8, *t*(340)=1.2). Because playing data was not included in the current study, it is not possible to see if players were competing with their friends.

The second research question asked how players perceived the game's message. A significantly higher than neutral stance (i.e. a score of 4) was found in a one sample t-test on the scale average for message reception (*M*: 4.2, *SD*: 1.4, *t*(281)=2.2, *p*=.026, Cohen's *d*=.13), though the effect size of this difference was very small. Looking at the different elements of the message, players saw the game as effective in representing the dangers of smartphone use in traffic (*M*: 4.7, *SD*: 1.8, *t*(292)=6.8, *p*<.001, Cohen's *d*=.40) and sending 'an important signal' (*M*: 5.4, *SD*: 1.6, *t*(289)=14.6, *p*<.001, Cohen's *d*=.86). However, they also felt that they had been aware of this behavior before playing the game and that it did not increase their awareness (*M*: 2.8, *SD*: 1.8, *t*(292)=-11.0, *p*<.001, Cohen's *d*=-.64). Judging from the smaller effect size, players were less confident in saying that the game is just a way of focusing attention on the accompanying campaign (*M*: 4.3, *SD*: 1.7, *t*(293)=2.7, *p*=.008, Cohen's *d*=.16). No significant differences from neutral stance were found on whether the game pushed them to reflect on the behavior (*t*(293)=1.5) or on whether the game showed them they were not capable of this behavior themselves (*t*(288)=-.4). This is reflective of a sample that was internally motivated to play the game. They appreciated the game and the message it carried, but did not fully admit and/or recognize being affected by the game.

4.4.2. Socio-cognitive Factors and Message Reception

Lastly, we investigated which socio-cognitive factors could explain how players perceived TCLD's message. A hierarchical regression was performed in which the message reception scale average was predicted with three models, shown in table 4.3. In the first model, we included personal attitudes and behaviors: players' perceptions of their own behavior with smartphones in traffic, their self-efficacy with regards to this behavior, and the degree to which they felt able to control it (deficient self-regulation). Because of the likelihood that these

attitudes are influenced by whether a player has a driver's license or not, this dichotomous variable was also included as a predictor. In this first model, only the behavioral self-reports were not predictive of how respondents saw the game's message. Greater self-efficacy concerning smartphone use in traffic weakly predicted reduced attitudes towards the game's message, while deficient self-regulation had a weakly positive predictive effect. The strongest predictor in this model was the dichotomous driver's license variable, though its effect was still small. The relationship here was negative, indicating players who had no license held more positive views of the game's message.

In the second model of the hierarchical regression, social views on smartphone use in traffic were included alongside the previous personal predictors. Although descriptive norms did not influence views on the game's message, participants who were less accepting of others behaving this way scored higher on message reception. The driver's license variable was still significant, and the strength of both predictors was moderate. While deficient self-regulation still predicted message reception with these social factors taken into account, self-efficacy was no longer significant. In the third model, players' evaluations of the game were taken into account. Adding this predictor doubled the explained variance of the models (*Adjusted* R^2=.43). This did not meaningfully influence the predictive power of third person perceptions or deficient self-regulation, but it did cause the driver's license variable to become weaker as a predictor (while remaining significant).

Table 4.3: Hierarchical multiple regression on the message reception of the game, standardized regression weights (β) are shown for each factor.

Factor	Model 1: Cognitive & behavioral factors	Model 2: Adding social factors	Model 3: Adding game evaluation
Driver's License	-.29***	-.39***	-.19***
Behavioral Self-Reports	n.s.	n.s.	n.s.
Self-Efficacy	-.14*	n.s.	n.s.
Deficient Self-Regulation	.16*	.18**	.16**
Social Norms		n.s.	n.s.
3rd Person Perceptions		.34***	.28***
Game Evaluation			.52***
Model statistics:	$F(4, 275)$ = 10.5*** *Adj.* R^2 = .12	$F(6, 273)$ = 12.5*** $\Delta F(2, 273)$ = 14.5*** *Adj.* R^2 = .20	$F(7, 272)$ = 30.8*** $\Delta F(1, 272)$ = 110.6*** *Adj.* R^2 = .43

Note: *: p<.05, **: p<.01, ***: p<.001

4.4.3. Driver's License

Since possession of a driver's license divided the sample and predicted message reception, further analyses were performed that compared the licensed and unlicensed players, resulting in several contrasts. Unlicensed players had played the game more frequently (*M*: 3.5, *SD*: 7.8) than licensed players (*M*: 1.5, *SD*: 1.4) ($t(157.2)$=-3.1, p=.002, Hedges' g_s= .39), and had higher evaluations of the game (unlicensed: *M*: 5.6, *SD*: 1.1, licensed: *M*: 4.6, *SD*: 1.3) ($t(294)$= -6.6, p<.001,

Hedges' g_s= .81). As could be seen from the hierarchical analysis, message reception was higher for non-licensed (*M*: 4.8, *SD*: 1.2) than licensed players (*M*: 3.9, *SD*: 1.4) (*t*(289)= -5.7, *p*<.001, Hedges' g_s= .70).

The findings from this study indicate that respondents' possession of a driver's license meaningfully affected their experience with the game. To test if this was not simply caused by the fact that unlicensed players are on average younger than licensed ones, we tested for mediation of the influence of age on message reception. Age weakly predicted message reception in a linear regression by itself (*F*(1, 289)=5.7, *p*=.018, R^2=.02, **β**=-.14), and it significantly predicted whether or not people had a driver's license in a simple logistic regression (χ^2 (1, N=295)=184.5, *p*<.001, *Exp(b)*=.69, Cox & Snell R^2=.47, Nagelkerke R^2=.64). However, age did not significantly predict message reception when it was included in a multiple linear regression together with the license variable, though having or not having a license did (*F*(2, 287)=16.4, *p*<.001, R^2=.10, License **β**=.36, *p*<.001, Age **β**=.07, *p*=.331). Effects of age on message reception were therefore fully mediated by having a license.

4.4.4. Impact Cues

The current study does not provide direct evidence whether *TCLD* affected the attitudes of its players towards safe driving behaviors. It was possible, however, to search for indications for training effects. Because *TCLD* motivates players to practice exactly the behavior it is trying to reduce, the argument could be leveled against it that it trained its players in using a smartphone while driving, rather than warning them against it (Fischer et al., 2009; Hull, Draghici, & Sargent, 2012). It is likely that any training effect would be more pronounced for players with more experience with *TCLD*. When play frequency was taken as a predictor of self-efficacy in a linear regression, no significant relationship was found (*F*(1, 288)=1.1, *p*=.299), nor did this effect reach significance when the sample was split into licensed (*F*(1, 188)=.2, *p*=.630) and unlicensed players (*F*(1, 97)=2.0, *p*=.158). From these data there is no reason to assume repeated play

sessions with *TCLD* would have an effect on the self-efficacy of players. However, since the sample applied here consists for the most part of new players, the data are not ideally suited for this kind of analysis.

Lastly, the hierarchical regression showed a weak and inconsistent relationship between self-efficacy and message reception. Because this analysis cannot determine causality, it could also be seen as an influence of message reception – appreciating the game's message more – on self-efficacy. When separating the sample into licensed and unlicensed players, however, the licensed players did show some small but significant negative predictive value of message reception ($F(1, 189)=8.8$, $p=.003$, $R^2=.04$, $\beta=-.21$). This was not the case for the unlicensed players ($F(1, 95)=.1$, $p=.787$). Phrased differently, licensed (but not unlicensed) players showed a relationship between their recognition of the game's persuasive effect and the estimation of their skills with a smartphone while driving, whereby those who held the game's persuasive power in greater esteem in turn estimated their own skills to be worse. This effect was found in the same way for the game's evaluation, though the effect was very weak (licensed: $F(1, 190)=4.2$, $p=.042$, $R^2=.02$, $\beta=-.15$, unlicensed: $F(1, 99)=.8$, $p=.378$). Although (again) this is not evidence of causation, if anything it looks like greater appreciation of the game and its message were related to less inclination to use one's smart-phone in traffic.

4.5. Conclusion and Discussion

This study aimed to advance insight in how a natural audience would appreciate a persuasive game and its message. The results showed that the online game *TCLD* indeed reached a diverse, gender-balanced audience, who were self-motivated to play. The results also showed that the most meaningful differentiation between players was having a driver's license or not, rather than a differentiation according to gender or age. While the licensed drivers were arguably the game's target demographic, the younger group of non-drivers was most impressed by the game. They evaluated it more positively and placed

greater faith in its effectiveness. Since having a license or not mediated all predictive value of age, it is unlikely that age could have caused the positive message reception among non-driving players (for instance because of the game's friendly art-style's greater appeal to younger audiences). So, while the game cannot be said to cause immediate or lasting changes in its licensed players, its message was received positively among the future generation of drivers. The results also showed an interesting third-person effect, as the game's impact was higher among players who perceived other drivers' behavior as dangerous. Apparently, the players in our sample found texting and driving riskier when it was done by others, compared to when they did it themselves.

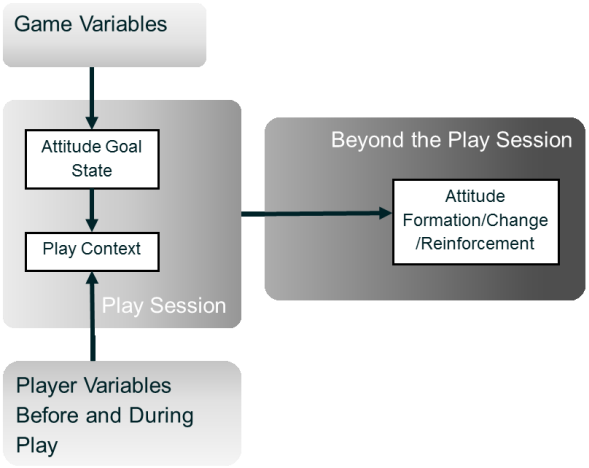
Overall, the players liked the game, rating it 7.1 out of 10, and message reception was highest among players who liked the game more. We interpret this as a strong indication that a greater appreciation of a persuasive game, which is not necessarily confined to experiencing fun, goes hand in hand with an appreciation of its message. Future research is necessary to determine how robust this relation is across titles. When our result on TCLD would be confirmed, it implies a serious impetus for developers of persuasive games.

Theoretically, this study was embedded in Bandura's (2001) Social Cognitive Theory, with a focus on self-efficacy and deficient self-regulation, that enabled us to conceptualize the experience playing TCLD in relation to the real-life behavior modelled in the game. We found a weak and inconsistent relationship between self-efficacy and message reception, which could be interpreted carefully as some licensed drivers feeling confident about their smartphone use in traffic, and thus being less receptive towards the game's message. The relation between deficient self-regulation and message reception was stronger and consistent in the regression analysis: players who had less confidence in their ability to combine texting and driving were most convinced of the impact of TCLD's message. These results are promising and warrant the inclusion of SCT concepts in future research about the impact of persuasive games on 'natural' audiences. In order to deepen our knowledge about the self-

motivation of natural audiences of persuasive games, we advise in future research to combine SCT with measures of intrinsic motivation to play games, as conceptualized in Self-Determination Theory (Ryan, Rigby, & Przybylski, 2006).

The current study's results prove that an attractive persuasive game is experienced differently by different groups of players. This is a critical consideration for future studies. Whereas in a lot of cases researchers make use of accessible samples, properly validating the effects of persuasive games requires studies to match their sample to the audience the game developers or sponsors intended to reach. In some instances this requires reaching out to obtain an appropriate sample (see for example, Gustafsson et al., 2009; Ruggiero, 2014), while in others the target demographic is broad enough to warrant the use of typical student samples (see for example, Peng et al., 2010). The current study then serves as a warning to both designers and researchers; the 'natural' audience that plays the game has a tremendous impact on how the game is experienced. When a persuasive game is published online, as most are (Jacobs et al., 2017), the self-motivated, 'natural' audience may be quite different from the audience targeted by the developers or sponsors of the game. The risk of reaching an inappropriate group should be dealt with during development, because it can undermine any of the good intentions behind the design. Researchers should, in turn, be aware that selecting a mismatched sample very likely diminishes the effect sizes of the study's results.

5. Play to Win Over: Effects of Persuasive Games



5.1. Abstract[5]

Persuasive games are a subset of serious games that are getting increased attention from the gaming industry as well as researchers. Although their title implies they can be intuitively defined as having the primary intention of changing or reinforcing players' attitudes on certain topics, only a handful of studies have provided evidence that these games actually influence attitudes. After presenting a summary of previous studies' results, the current chapter expands on this evidence by reporting on a controlled online experiment that compared a currently playable persuasive game (*My Cotton Picking Life*) to a mobilizing YouTube clip covering the same topic. The study included a pre- and

[5] This chapter has been published as Jacobs, R. S. (2016). Play to Win Over: Effects of Persuasive Games. Psychology of Popular Media Culture. http://doi.org/10.1037/ppm0000124

post-test and two media conditions. 237 individuals (mean age of 23) from an international population participated in this study. Since the persuasive game and comparable movie clip were concerned with forced labor in Uzbekistani cotton fields, attitude scales on empowerment, the workload of cotton picking, and denial of the issue, were composed for this study and subsequently validated. Results showed a greater increase on workload attitudes for individuals who played the game than for those who watched the clip. Enjoyment of the game as well as awareness of the game's intent also increased the attitude change from pre- to post-test. The chapter offers insight into how persuasive games can be further validated with different methods, and concludes that there is mounting evidence for the viability of games as a medium for persuasive communication.

5.2. Introduction

Games are not always meant to simply be enjoyed. So-called serious games are intended to educate, train, or persuade their players. This does not mean they are inherently not enjoyable. Rather, serious games recognize that enjoyment fits with certain uses of games, and guiding the players' experiences towards games' subjects is prioritized over offering a purely entertaining diversion. Persuasive games are a subset of serious games that are created with the primary intention of changing or reinforcing certain attitudes. Though the term 'persuasive game' was coined by Ian Bogost (2007) to denote games that mount procedural rhetoric – embedding a message into the systems and rules of games – games can employ many persuasive strategies to get their message across (de la Hera Conde-Pumpido, 2015). Despite the proliferation of the genre and the notability of games like *September 12th* and *Darfur is Dying*, only a handful of researchers have paid attention to attitude-changing effects of persuasive games (e.g. Gerling et al., 2014; Peng et al., 2010; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015). This is because most research on this topic did not categorize persuasive games as a distinct genre. By specifically focusing

on persuasive games, games can be grouped by their common goal of changing attitudes, facilitating rigorous studies into their effects. When seen in this way, a gap in the research is unmistakable: persuasive games need to be validated, their efficacy and effects determined through diverse studies.

The current chapter builds towards validation by investigating the effects of a persuasive game that is currently playable. An online experiment was conducted where a persuasive game was compared to a YouTube clip with a similar message. Two research questions guided this study: Firstly, can a persuasive game change attitudes of players more effectively than other persuasive media? Also, how does the player's experience of the game impact its effects? To ensure the results of this study add to the current knowledge base, published studies into attitude-changing effects of persuasive games are discussed in the next section.

5.2.1. Previous research into the effects of persuasive games

As one of the most well-known exemplars of persuasive games, *Darfur is Dying* has garnered some attention from mainstream press as well as academia through its portrayal of Sudanese refugees collecting water and farming crops while they are being attacked by militias. Peng, Lee & Heeter (2010) showed that the game *Darfur is Dying* had a more pronounced effect on players' willingness to help with the situation in Darfur than reading a text or watching a clip of the game did for participants in two control groups. By separating gameplay from watching footage of a game, these researchers demonstrate that the interactive nature of the game caused the increased role-taking, rather than its other persuasive elements (like sound and visuals). Although the authors did not draw this conclusion, it can be said that procedural rhetoric was responsible for the effect, as this element relies on the persuadee having agency in the experience. The importance of interactivity for this particular game's impact was later corroborated by Steinemann, Mekler, and Opwis (2015); they found a positive

relation between playing Darfur is Dying and the appreciation of the experience, encouraging charity donating behavior.

Another element of Peng, Lee & Heeter's (2010) study deserves mention: enjoyment of the content was inversely related to its persuasive impact. Playing the game was considered to be less enjoyable than watching it, and both were less enjoyable than reading a text. Since the significance of these differences was not discussed, conclusions cannot yet be drawn. On the face of it, the finding goes against the notion that enjoyment is essential for a game to be effective, especially when its subject matter is as grim as it is in *Darfur is Dying*.

Most studies published on the topic support the notion that persuasive games change attitudes of players. When the game *Power Explorer* challenged teenagers to turn off electrical equipment in their homes in order to win multiplayer battles, attitudes towards domestic energy saving became more positive for players while the opposite was found for non-players for the same time period (Gustafsson et al., 2009). More recently, Gerling et al. (2014) researched how playing a game about disabilities (*Birthday Party*) influenced relevant attitudes, finding a more powerful influence when the game was played with a specialized wheelchair-based input device. Lastly, Ruggiero (2014, 2015) investigated attitudes towards homelessness in over 5,000 teenaged players of the game *Spent* in what is very likely the largest study on the effects of a persuasive game. Immediately after the exposure no significant difference was found between a group that played the game compared to a group that did not on their attitudes towards homelessness. However, when the participants were tested again three weeks later, those who played the game held more favorable attitudes towards homelessness than those who had not. The game therefore had a sleeper effect, wherein reflections on the game over time had likely caused the change.

However, not all published studies found significant differences. In the most recent study of the effectiveness of the notable *Enercities*, Soekarjo and Van Oostendorp (2015) concluded that this game did not increase micro-level or macro-level attitudes about energy conservation in their players. This is reflected both in non-significant differences between a pre-test (administered a week before the experiment) and an immediate post-test as well as in a lack of differences between the game and the control group. However, there are indications that this study did not have enough participants (N=46) to consistently find significant differences. The small effect size (Cohen's d = .29) for the change in macro-level attitudes means this study had insufficient statistical power (1 - β = .25). In the same article's literature review, one out of six studies reporting on attitude change did not find significant effects (i.e. Lavender, 2008). The study in question also had few respondents (N=70 across 3 conditions) and reported small effects. These null results from small studies underline the notion (also voiced by Ruggiero, 2015) that the field of persuasive games research would benefit from adhering to rigorous and well-established methodologies that offer suitable power for picking up on small to moderate effects that such games have on attitudes.

These few recent examples indicate that persuasive games can have different and sometimes more lasting impacts than other media. Though effects are not guaranteed in every case, a clear trend towards efficacy is apparent. The first hypothesis (H1) for the current study is thus: Playing a persuasive game affects attitudes more than watching a mobilizing movie clip about the same topic.

Apart from studying attitude-changing effects, the current study also incorporates player experience elements to assess whether such elements can moderate effects found. Because the delivery of persuasive messages through games has not been studied extensively, there are no clear indications for the effects of experiential factors on attitude change. Looking specifically at enjoyment, previous results suggest that this link might be negative; the

presentation type that was found by Peng, Lee, & Heeter (2010) to be the least enjoyable had the strongest effect on attitudes. The answer to this seemingly paradoxical finding likely lies with dual process theories of persuasion, such as the elaboration likelihood model (Petty & Cacioppo, 1986b). For example, a persuadee's positive mood can reduce attitude change as caused by a message with strong arguments when the persuadee has limited cognitive resources available, because such a positive mood causes persuadees to process a message peripherally, rather than giving message arguments their full attention (Mackie & Worth, 1991; Schwarz, Bless, & Bohner, 1991). Under the same circumstances, messages with weak arguments do lead to improved attitude change when persuadees are in a good mood, as they would then pay less attention to badly supported arguments. The likeability of message sources further complicates this chain of effects, as high source likeability is linked to central processing routes when mood is high and cognitive load is low (Sinclair et al., 2010). The degree to which the persuader is candid about persuasive intent can also affect the influence of experiential factors (Reinhard, Messner, & Sporer, 2006). Specifically, being explicit about persuasive intentions promotes attitude change when likeability (and attractiveness) of sources are high, while it dampens effects when likeability is low.

The studies discussed in the previous paragraph were all concerned with more traditional forms of persuasion, such as presentations, sales pitches, and written texts. Because persuasive games have their message embedded in multi-modal interactive experiences, it is currently unknown how each of these experiential factors need to be taken into account, nor is it known which of the two processing routes are triggered by these factors. It is beyond the scope of the current chapter to provide an account of the elaboration likelihood model in persuasive games. To still be of aid to future research that does investigate this issue, the following hypothesis (H2) is tested here: Players who enjoy the game more consequently show greater attitude increases. This hypothesis is supported by current knowledge either under the assumption that mood,

source likeability, and source attractiveness are related to enjoyment, or when only mood is linked and the game's message is processed peripherally (Mackie & Worth, 1991; Schwarz et al., 1991; Sinclair et al., 2010). The transparency of the game's persuasive intent could also help to impact attitude change when enjoyment is high (Reinhard et al., 2006). The third hypothesis (H3), therefore, relates to how the persuasive effect of the content was perceived by players: Players who are more aware of the persuasive intent of the game were expected to show greater attitude change.

5.3. Methods

5.3.1. Sample

Respondents were sought through convenience and snowball sampling by second-year undergraduate students in an international bachelor track in the fall of 2014. 237 participants were exposed to one of the conditions and completed the full survey. Their mean age was 23 years (*SD*: 9.3), and 58.2% (138) of the respondents identified as female. Because the sample was gathered by students of an international bachelor program, multiple nationalities were present in the sample. Most respondents' native language was Dutch (56.8%), though sizeable portions spoke German (8.7%), English (8.3%), Russian (6.6%) and Vietnamese (6.1%), with the remaining 13.5% spread across 19 other languages. All stimuli and measures were presented in English.

5.3.2. Design

A 2 x 2 mixed experimental design was employed, whereby participants were randomly assigned to either play a game or watch a YouTube clip that dealt with the same issue. A within-subjects factor was also included as a pre- and post-test survey. The study took the form of an online experiment, giving respondents the freedom to experience the content they were assigned from their own computer for as long as they wanted to. The time participants spent away from the survey was logged.

5.3.3. Content

The persuasive game used in this study was *My Cotton Picking Life* (*MCPL*) (Rawlings, 2012b). This game is hosted on GameTheNews.net, a site containing games reflecting on current events. The game is played on a single screen displaying an Uzbekistani child who is forced to pick 50 kilograms of cotton. Players click alternating buttons to pick handfuls of cotton and throw them into a bag hanging from the character's shoulders. Although a progress bar shows how close players are to reaching the quota, reaching this goal would take around 5 hours of continuous play. It is made to be a dull, repetitive game with a bleak atmosphere. However, it gives players a way out of the situation; a large button labeled 'Alright, I've had enough' is visible throughout the play session. The game is intended to encourage players to give in, proving that no one would volunteer their time performing this kind of work, even if the harsh conditions of an Uzbekistani cotton field or enforced threats of physical abuse are not included in their experience. One play-through of the game therefore takes as long as the player can persevere. The game stops when the player tires of the game or when they accept that trying to reach the quota is futile.

This game was chosen as a stimulus for this study for several reasons: First, it was available to play online for free in a browser window and in English. Second, its gameplay was accessible and did not require experience with digital games. Third, its persuasive intent was made explicit while playing. Text both embedded in and surrounding the game directly linked the players own feelings with the issue (e.g. "It's OK for you, quitting isn't a luxury these kids have!" (Rawlings, 2012b, after clicking "Alright, I've had enough"), and links to take action and share on social media are present throughout the game. Fourth, the game did not need to be played for an extended period before the message became apparent. All in all, the game was exemplary as a digital pamphlet, combining high accessibility with concise and transparent persuasive intentions.

A YouTube clip was selected that dealt with the same issue of forced labor in the Uzbekistani cotton industry (Walk Free, 2014). The movie applies similar verbal rhetoric as that found in the game, as well as showing footage of children picking cotton. Despite the depressing subject matter, the clip includes an uplifting background score and is meant to empower rather than shock viewers. The message of the clip is that forming a united front against this practice can stop companies from purchasing cotton from improper sources.

The amount of time respondents spent on their respective content was monitored. On average, respondents in the game condition spent 101 seconds on the game's page. The YouTube clip was 142 seconds long, and respondents on average spent a little less than that on the clip's page (122 seconds). To control for possible confounds, responses were categorized as low-exposure and high-exposure, using a threshold of 45 seconds. This separated the sample in 153 high-exposure responses (game: 69, clip: 84) and 84 low-exposure responses (game: 43, clip: 41). Both low- and high-exposure groups were used in subsequent analyses, introducing a quasi-experimental factor to the design.

5.3.4. Measures

Because every persuasive game has its own subject, and even games on the same topic differ on what they want their players to think, studying the effects of persuasive games calls for the use of measures tailored to each case. For the current study, a three-part attitude scale was developed for the pre- and post-tests, consisting of 15 items. The first part consisted of items on slavery in contemporary society (e.g. 'Slavery still exists today'). The second part gauged the respondent's perception of the workload involved in picking cotton. The final part measured the perceived link between respondents and the topic, querying whether respondents could effect change in this situation and how their own behavior is affecting it (i.e. perceptions of empowerment). In the post-play observation, two further scales were developed intended to gauge the experiences respondents had with the content. The first concerned the

enjoyment and educational value of the content experienced and was based on a combination of hedonistic and eudaimonic outcomes (Ryan & Deci, 2001) partly adapted from Peng, Lee, & Heeter (2010), while a second scale, measuring the respondents' awareness of the content's persuasive intent, was based on manipulation checks from a previous study (Jacobs, Heuvelman, Ben Allouch, & Peters, 2015). All items used in this study are listed in table 5.1.

5.3.5. Analysis

Incomplete responses were removed from the dataset before analyses were performed. Group distributions were compared using Chi Square tests for independence. Repeated measures analyses of variance (RMAnova) and linear regressions were used to observe group and time differences together and find the influences of enjoyment and obtrusiveness of persuasive intent. Choices for effect size estimators were based on the guide and calculation aid of Lakens (Lakens, 2013).

The commonalities of the sample's scores of all 15 items of the attitude scale were analyzed with a confirmatory factor analysis with Varimax rotation (interfactor correlations were below .3). Of the three conceptual categories of slavery, empowerment and workload, only the workload category was reflected in a factor that had high loadings on 4 of the 5 items' scores in this category. The biggest factor grouped 8 items from the slavery and empowerment categories. A third factor grouped together reverse-coded items which were phrased in a way that denies or underplays problems in this topic. The items that loaded highly on each of these three factors were combined into a three separate scales: the first was called Awareness and Empowerment, the second Workload, and the third was termed Denial. When the resulting three scales' scores were tested for interreliability using Cronbach's alpha, the awareness and empowerment scale scores showed decent cohesion (**α**: pre-test .74, post-test: .79) and so did those of the workload scale (**α**: pre-test .76, post-test: .85). How-

Table 5.1: Item list for the measures used in this study.

Item	Pretest M (SD)	Posttest M (SD)
Awareness and Empowerment *(α pre: .74, post: .79)*	4.8 (.8)	5.2 (.9)
It is important to me that people who made the products I use are treated fairly.	5.1 (1.5)	5.7 (1.2)
Slavery still exists today.	5.6 (1.2)	5.9 (1.1)
Forced labor is a big problem in the world right now.	5.2 (1.3)	5.7 (1.2)
I can make a difference to stop forced labor.	4.1 (1.4)	4.6 (1.3)
Signing petitions and joining in protests helps to stop forced labor.	3.9 (1.4)	4.5 (1.4)
Buying clothes from trusted brands helps to stop forced labor.	4.4 (1.6)	4.6 (1.6)
I want to make a change to stop forced labor	5.2 (1.3)	5.5 (1.2)
Workload *(α pre: .76, post: .85)*	5.7 (.8)	6.0 (.9)
Harvesting cotton by hand is hard work.	5.7 (1.1)	6.1 (.9)
Harvesting cotton by hand takes a long time.	5.8 (1.0)	6.1 (1.0)
Cotton harvesters in some countries have to meet large quotas daily.	5.5 (1.1)	5.9 (1.1)
Cotton harvesters in some countries are not paid according to their efforts.	5.6 (1.1)	6.0 (1.1)
Denial *(α pre: .52, post: .59)*	2.8 (.7)	2.7 (.9)
In this day and age, clothes are made from materials harvested through honest labor.	3.0 (1.3)	2.7 (1.4)
As long as you're paid for work, it is not slavery.	2.9 (1.4)	2.5 (1.4)
I could pick 50 kilograms of cotton with little trouble.	2.3 (1.2)	2.2 (1.3)
I am well-informed about how my clothes are made.	2.9 (1.4)	3.4 (1.6)
Enjoyment and Educational Value *(α: .80)*		4.7 (1.0)
I have learned something new.		5.1 (1.5)
I liked learning about this topic.		4.9 (1.3)
I liked experiencing this topic.		4.6 (1.3)
I liked how the topic was presented.		5.1 (1.3)
I had fun experiencing this topic.		3.9 (1.5)
Obtrusiveness of Persuasive Intent *(α: n.a.)*		4.6 (.9)
The content I just experienced had a strong message.		5.5 (1.2)
The content I have just experienced was trying to persuade me.		5.1 (1.2)
I was being persuaded by the content I just experienced.		4.4 (1.3)
I felt I had to answer the second part of this questionnaire in a different way from how I feel about this topic.		3.8 (1.7)
The questionnaire itself tried to persuade me.		4.4 (1.7)

Note: Means and standard deviations are shown for each item and scale, and Cronbach's α is shown for relevant scales. All items are on 7-point Likert scales.

ever, the denial scale's scores did not show the same level of cohesion (**α**: pre-test .52, post-test: .59). The scale was maintained in this study to be able to explore this specific topic. Overall, all of the attitude items added to their respective scales' reliabilities, and none were left out of the final analysis (see table 5.1). Looking at the two experiential scales, it became clear the scores on items measuring enjoyment and educational value of the content had good interreliability (**α**: .80), so these items were also averaged to obtain an enjoyment scale. The first and third items from the persuasion obtrusiveness category (see table 5.1) were averaged (**α**: .68) to arrive at an indicator of respondents' awareness of the content's persuasive elements. The second item's scores ('the content I have just experienced was trying to persuade me') did not add to the reliability of the obtrusiveness scale. Because of the more negative connotation, it was used separately in the subsequent analyses.

5.4. Results

The first hypothesis for this study was concerned with the difference in the effectiveness of a persuasive game and a short video clip. This was tested using an RMAnova. An interaction effect of condition and observation time was found for players who spent more than 45 seconds with the game only on the workload scale ($F(1,151) = 5.9$, $p = .017$, *partial*-$\eta^2 = .04$, $\eta_G^2 = .01$)[6], though the effect size was small. A main effect for observation time was significant ($F(1, 151) = 69.452$, $p < .001$, *partial*-$\eta^2 = .32$, $\eta_G^2 = .07$), though there was no main effect for condition ($F(1, 151) = .665$). The workload scale increased more from pre- to

[6] When both high and low exposure groups were combined and exposure time was included as a covariate in an RMAnova on the workload scale, only a main effect of observation time was significant ($F(1,231) = 28.0$, $p < .001$, *partial*-$\eta^2 = .11$). The interaction effects and main effects of condition and exposure were both not significant.

post-test for the greater exposure group that played the game (*M diff.*=.53, *SD* = .65, Hedges' g_{av}= .70) than for those that viewed the clip (*M diff.*=.29, *SD*=.56, Hedges' g_{av}= .36) (see figure 5.1). After performing a 2-sample t-test on the differences in attitudes between the two conditions, this was confirmed ($t(151)=2.4$, *one-tailed* $p=.009$, Hedges' g_s= .39). The main pre- and posttest effect was seen for the other scales as well with both exposure groups together (Awareness and empowerment: $F(1,235)= 125.3$, $p<.001$, *partial*-$\eta^2=.35$, $\eta_G^2=.05$, denial: $F(1,235)= 4.1$, $p=.044$, *partial*-$\eta^2=.02$, $\eta_G^2<.01$), though these effects differ considerably in size. The interaction effect on workload attitudes was not found for respondents who chose to return to the questionnaire in under 45 seconds

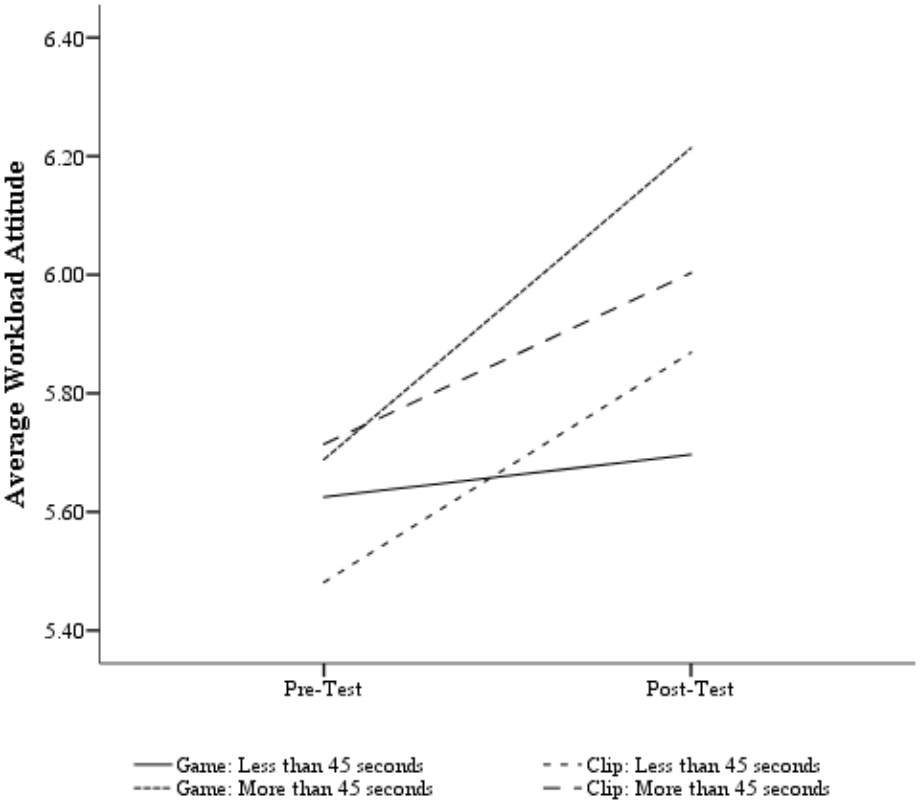


Figure 5.1: Graph of the average of the workload scale from pre- to post-test for both conditions and exposure times. The top two lines denote the high-exposure groups, while the lower two lines indicate low-exposure groups.

($F(1, 82)=1.6$), nor was it present for players who did engage with the content for more than 45 seconds with the awareness and empowerment scale ($F(1, 151)<.1$) or the denial scale ($F(1, 151)=.4$). Hypothesis 1 is therefore supported for only the workload attitudes and rejected for the awareness and empowerment and denial attitudes. Figure 5.1 shows the increases in workload attitudes for participants of both conditions and low and high exposure times. Though the pre-test workload attitudes are not significantly different for high- and low-exposure groups, the sample differences are the result of letting respondents choose how long to spend with the content. It is reasonable that those respondents who had very low attitudes towards the topic on average spent less time with the content related to those attitudes.

The second hypothesis held that enjoyment and informational value of the content would predict greater attitude change. This hypothesis is broadly supported for the game across all three attitude scales: without differentiating between exposure times, enjoyment as a sole predictor explains 21.2% of the variance in the difference in workload attitudes between pre- and post-test for the game players ($F(1, 110)= 29.6$, $p<.001$, $\beta=.46$, $R^2= .21$), 12.2% of this variance in the awareness and empowerment scale differences ($F(1, 110)= 15.2$, $p<.001$, $\beta=.35$, $R^2= .12$), and 8.5% of the variance in the denial scale differences ($F(1, 110)= 10.3$, $p=.002$, $\beta= -.29$, $R^2= .09$). Note that the negative β for the denial scale indicates reduced denial of the issue. When testing for differences in enjoyment between the two conditions, a two-sample t-test returned insignificant results ($t(209.2)=.2$). Although the attitude change of the participants who watched the clip instead was also influenced by their enjoyment of the content for two of the scales, betas were lower (Workload: $p=.013$, $\beta=.22$, Awareness and Empowerment: $p=.027$, $\beta=.20$, Denial: $p=.411$). Summarizing, though differences in the average level of enjoyment were not found between conditions, the game carried with it stronger effects of enjoyment on attitude change than the clip did.

Finally, the same regression analyses were done for the obtrusiveness of the persuasive intent. For the players of the game, this factor reliably predicted attitude change in the expected direction for all three scales (Awareness and empowerment: $F(1, 110) = 15.5$, $p<.001$, $\beta=.35$, $R^2= .12$, Workload: $F(1, 110) = 14.9$, $p<.001$, $\beta=.35$, $R^2= .12$, Denial: $F(1, 110) = 7.2$, $p=.008$, $\beta=-.25$, $R^2= .06$). The third hypothesis is supported: Players who were more aware of the game's intended effects were persuaded more. A medium-strength positive correlation between the enjoyment scale and the average of the obtrusiveness items was significant at .05 level across all participants ($r(237)=.56$, $p<.001$). Next, regression analyses were performed with both scales as independent variables. For the workload scale, this analysis showed that the effect of obtrusiveness was non-significant ($t(110)=1.0$) while enjoyment retained a significant predictive effect ($t(110)=3.7$, $p<.001$, $\beta=.40$). Similar results were found for the denial scale with enjoyment being marginally significant (Obtrusiveness: $t(110)=-1.0$, Enjoyment: $t(110)=-2.0$, $p=.052$, $\beta=-.22$), while for awareness and empowerment, it caused both predictors to be marginally significant (Obtrusiveness: $t(110)=2.0$, $p=.046$, $\beta=.22$, Enjoyment: $t(110)=1.9$, $p=.054$, $\beta=.22$). Like enjoyment, persuasion obtrusiveness was not significantly different between conditions ($t(235)=1.7$, *two-tailed* $p=.079$). Looking at the clip-watching condition, the degree to which participants recognized the clip's effect did have a weak influence on the differences on the denial attitude scale($F(1, 123) = 5.5$, $p=.021$, $\beta=-.21$, $R^2= .04$), though no influence was found on the other attitude scales (Awareness and Empowerment: $F(1, 123) = 3.1$, Workload: $F(1, 123) = 2.8$).

5.5. Discussion

The results presented in this chapter add to the small but growing evidence on the effectiveness of persuasive games. In most cases this evidence comes from exploratory studies and show either small or non-significant effects. The current study follows this trend, displaying a significant difference on the workload scale, whereby players of *MCPL* showed greater increases than viewers of the

YouTube clip on the same topic. However, the effect size for this difference was small. The fact that the difference was only found in the long-exposure players can be interpreted as that only those players who have played the game for more than 45 seconds came close to the sensation of the workload involved in harvesting 50 kilograms of cotton. These players had played the game long enough to see that in spite of their efforts, they were not coming any closer to filling the quota. Though the harsh nature of the work was also shown in the clip, it seems this particular sensation had a small but noticeable effect on their views on the topic. Whether this effect comes from the interactive experience of the game or from subtle content differences between clip and game is not unequivocally determined.

Both enjoyment and educational interest as well as obtrusiveness had interesting predictive effects on attitude change. Despite the game's apparent intention to not have the players enjoy themselves with the game, those who did enjoy themselves more were also influenced to a greater degree. If enjoyment is seen as related to player mood and source likeability, this result fits with previous findings where participants had limited resources to elaborate on the message, where the message had weak arguments, and/or came from a source that was considered an expert (Mackie & Worth, 1991; Schwarz et al., 1991). Because no differences in enjoyment were found between the two conditions in the current study, further conclusions on the level of processing routes cannot be drawn on the basis of these findings.

The results are reflective of the enjoyment scale used in this study, which included items on eudaimonic rewards (such as the joy of learning something new) alongside items related to fun (Ryan & Deci, 2001). This conclusion is supported by the finding that players who found that the game tried to affect them also had greater attitude change. The two obtrusiveness items used in these analyses (items 1 and 3 in table 5.1) could be interpreted in a positive way, that by noticing that the game tried to affect them, players understood the idea behind the game more than players who did not feel

affected. Judging by the overlap of effects from enjoyment and obtrusiveness, it is likely that these players appreciated the game more because they saw its intention, and were more open to attitude change because of it. This mechanism is supported by studies in traditional persuasive settings (Reinhard et al., 2006). As this essentially means that conscious awareness of a game's effects on players coincided with being affected more, causation cannot be concluded from these results. The most likely path is a reciprocal one, where attitude change and enjoyment both influence each other positively.

Apart from the differential processing routes discussed earlier, another possible explanation can be found for the differences of the effect of enjoyment in this study when compared to that of Peng, Lee, & Heeter (2010). An answer may lie in the complexity of the enjoyment scale used in both studies. The three items used in the latter were "I enjoyed playing this game/watching this video/reading this story, I think this game/video/this story is fun, and Playing this game/Watching this video/Reading this story gave me an entertaining experience." (Peng et al., 2010, p. 733), while the current study's items also included eudaimonic rewards under enjoyment. Although three of the items (the third, fourth, and fifth items under Enjoyment in table 5.1) are virtually identical to those found in the other study, the presence of items 'I learned something new' and 'I liked learning about this topic' might have influenced respondents to think of the good the game does, rather than how much they enjoyed the experience on a hedonistic level. The current study's game is certainly more enjoyable for its message than it is as an entertainment experience. Care must be taken that in future studies both types of enjoyment are disentangled. More complete and multi-faceted enjoyment measures would alleviate these concerns greatly. Such a dualistic view on enjoyment is also warranted as the intentions of persuasive games are in a lot of cases obvious to players; prospective players' motivations and expected outcomes will undoubtedly lie further away from pure entertainment than they do with other kinds of games.

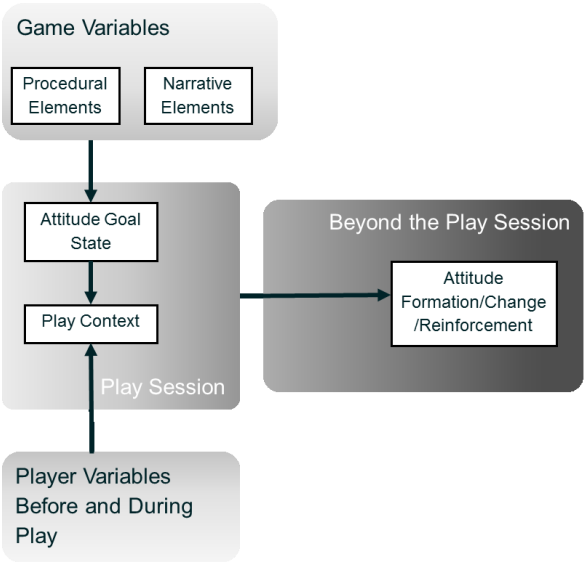
For the results of this study, the focus was on finding an interaction effect of observation time and condition. Considering that main effects for observation time were found for all scales on both exposure times and conditions, there is no reliable way to separate any true effect of the game from a retesting effect whereby attitudes improved simply because the respondent had spent time contemplating the topic because of the pretest. That the effect size for the denial scale for this analysis was very small (*partial*-η^2=.02) while it was large for the others (.18 for workload and .35 for awareness and empowerment) does not offer solid evidence to deny a possible retesting effect for any of these scales. However, if we can assume that a portion of this effect is caused by the content experienced by players and viewers, these results do show that this persuasive game's effect is at least on par with watching a short video clip and - for the workload scale - even has a stronger effect despite the exposure time being shorter for the game.

As evidenced in this study as well as in others (e.g. Gerling et al., 2014; Ruggiero, 2015), persuasive effects of this type of game can be found in multiple ways. Because of the variety of messages that persuasive games aim to spread, it is important to work towards a methodology that allows for robustly detecting small effects on attitude sets unique to each game (All, Núñez Castellar, & Van Looy, 2016). Regardless of whether an absolute effect still needs to be established in the first place (through a no-treatment control) or if an effect is incremental and found through comparisons with competing persuasive media (Soekarjo & van Oostendorp, 2015), future research should combine diverse methods such as implicit attitude tests with qualitative interviews (Gerling et al., 2014) as well as solidify scale-based testing. The latter is done through the application of pre-validated scales wherever possible (Ruggiero, 2015), though such measures would have to be selected to match the game's message closely. If no matching scales exist, it is better to develop tailor-made scales that exactly fit the game and to subsequently perform factor and reliability analyses validating their sensitivity and specificity, as was done for the current study. This

diverse toolset should ultimately be used to elevate the study of persuasive games to generalizable levels, linking game elements to effects to be able to predict future games' impact, and linking all of the factors in game, player, and play session to differential processing routes to construct a psychological model for the effects of persuasive games.

The small number of published works on this point to a future for persuasive games to be employed alongside other communicative media. As *MCPL* showed, persuasive games can be small, short term pamphlets to spread a message not in a ubiquitous, but in a uniquely personal way that calls for an active and engaging player to experience fully.

6. Playing Against Abuse: Effects of Procedural and Narrative Persuasive Games



6.1. Abstract[7]

Despite the fact that persuasive games – games that intend to change attitudes in players – employ numerous types of persuasive tactics, these tactics have not been tested for their individual contributions to the effects of persuasive games as full experiences. The current study employs two existing persuasive games on the topic of teen dating violence, selected on the basis of their relative focus on narrative or procedural arguments (i.e. mirroring real-world processes

[7] This chapter is under review as Jacobs, R.S., Jansz, J. & Kneer, J.: Playing Against Abuse: Effects of Procedural and Narrative Persuasive Games.

through in-game systems), and performed a controlled experiment on effects on attitudes towards abusive relationships. 262 participants were drawn from a mixed sample of university and senior secondary school students who, with a mean age of 19 years, were slightly older than the game's target audiences. Results indicated that the games affect some of the attitudes they intend to, but that the effects of the narrative and procedural games were not differentiated. Character and cognitive identification (with the games' protagonists and with their procedural rhetoric) differed suitably between games, but predicted attitude change negatively. Conclusions are drawn on how games can comfortably explore multiple designs without fear of hampering games' effects.

6.2. Introduction

Games are a new frontier in persuasive media. Barring a handful of recent efforts (e.g. Gerling et al., 2014; Peng et al., 2010; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015), the idea that games can persuade players using rhetoric embedded in their design remains largely unproven. Although a great deal of research has been performed into unintended effects of games (for example relating to violence: Elson & Ferguson, 2014) and into (adver)games that seek to improve brand or product opinions through mechanisms of affect transfer (Waiguny et al., 2013), research into effects of games that include rhetorical arguments is lacking. There are signs, however, that these 'persuasive games' – games that have been designed primarily to affect players' attitudes or behaviors on real-world topics – do not operate the same way as other persuasive communications. Chiefly, their interactivity allows for procedural rhetoric: the embedding of arguments into the systems and rules governing play (Bogost, 2007). By letting players *play* with a game's (partial) simulation of real-world phenomena and test its boundaries, games theoretically enable players to come to a deeper understanding of why certain issues exist and how to deal with them.

In games, procedural rhetoric joins the abundance of persuasive dimensions also found in non-interactive media (de la Hera Conde-Pumpido, 2015); games can persuade by sensations on the level of text, visuals, sounds, and even tactile sensations. They can also string events together into narratives that form distinct persuasive actuators (Slater, 2002). The current chapter describes a study that aims to disentangle the persuasive impacts of procedural rhetoric and narratives. We intend to provide insight into the unique affordances of this medium to ultimately determine its place in persuasive communication. The research question guiding this study was: Do persuasive games with a focus on either narrative or procedural rhetoric lead to different persuasive outcomes?

To answer this question, a controlled experiment was performed, employing two published persuasive games as the stimulus material. The games were developed to meet the same criteria with regards to their message; they were both entries in the annual Life.Love. Game Design Challenge issued by the Jennifer Ann's Group, a 501(c)(3) nonprofit charity group dedicated to preventing teen dating violence (Crecente, 2014; Jennifer Ann's Group, 2015). The current chapter will first outline the differences between the two persuasive actuators. Next, the games' shared prosocial topic will be discussed, before outlining the study's methods and results.

6.2.1. Narratives and Procedural Rhetoric

Aside from text-based arguments and other direct presentational elements, the primary ways in which games can deliver messages are found in either their procedural rhetoric or in their narratives. Games' procedural arguments are focused on simulating specific real-world processes relevant to the game's topic. By letting players engage with such systems, they can ideally draw their own conclusions about real-world issues. Alternatively, games can take players through narratives that can be either completely linear and pre-authored or that are directed by the players as they progress through the game. Although both types of narrative are potentially valid routes to persuasion, the current study

tests a game with a pre-authored linear narrative. This narrative-focused game is compared to a game mounting procedural rhetoric related to dating violence. Although the 'procedural game' also includes a fixed series of events in a brief narrative, this game's persuasive heft is predicated on how it leverages such systems to have the player experience certain facets of an abusive relationship.

Naturally, narrative and procedural persuasive elements are not mutually exclusive. Persuasive games such as *Nova Alea* (Molleindustria, 2016), marry procedural rhetoric to narratives, where player choices cause them to directly engage with the systems at play while also feeding into longer-term goals and events for the game's protagonists. However, the two are not inextricably linked. *My Cotton Picking Life* (Rawlings, 2012b) does not offer any progressing narrative and gives players no leeway as they embody a child laborer picking cotton in Uzbekistan, forcing them to operate within the endless futility of manual slave labor. Conversely, the narrative-driven game about teen dating violence included in this study employs systems that only tangentially relate to the issue of teen dating violence. Rather, the game relies primarily on its narrative to fuel its persuasive effect. Because these elements can be dissociated, differences in their effects should be researched in order to come to a complete understanding of how persuasive games persuade their players.

Persuasive Narrative Mechanisms. No research has empirically proven that using narratives in games adds to (or detracts from) their persuasive power, though narratives are known to exert persuasive effects in other media (Slater, 2002). A theory that lends itself well to narrative persuasion is social learning (Bandura, 1986), since most game narratives follow a human or anthropomorphized protagonist. In games where narratives follow linear paths and players' actions can only progress (rather than direct) the storyline, this protagonist could act as a model for the player by way of a parasocial relationship (Papa et al., 2000). The narrative creates an arc for this main character (Slater, 2002), ideally showing them as starting off from the same attitudes as those presumably held by players. Their arc takes them through

several stages of change (Prochaska, DiClemente, & Norcross, 1992), after which they end up in the attitudes the game intends to instill in the players. In this way, attitudes can change through game-play by way of a mechanism that is related not to a game's systems but to its characters. For this reason, attitude change as a result of narrative persuasion would be predicted by the degree to which players identify with the game's protagonist, as evidenced in film and television (Slater, 2002).

Procedural Rhetoric in Persuasive Games. While game narratives have their counterparts in other media from which to theorize their effectiveness in persuasion, no such anchoring point exists for procedural rhetoric. Procedural rhetoric relies on the interaction of player and game systems, making it a form of rhetoric unique to games (Bogost, 2007). Indeed, persuasive games have not been psychologically differentiated by any kind of content with regards to their influence on attitude change (Waiguny et al., 2013). The empirical study that comes closest to extracting procedural rhetoric from a game to compare it to normal play was a study by Peng, Lee, and Heeter (2010) where interactivity was removed entirely from the experience in one of the conditions. In their study, participants either read a text, played a persuasive game, or watched recorded gameplay footage of this game. Their results indicated that not allowing viewers to interact with the game and work out its rules through play had a negative effect on their resulting attitude change. Game watchers did not differ significantly from text readers, though game players were affected significantly more than both other groups (Peng et al., 2010).

Since there is more to the interactivity of a persuasive game than what is defined as procedural rhetoric (Bogost, 2007, p. 3) – such as the player's ability to explore and take as much time as needed to read, see, or hear the different parts of the game – this effect of interactivity does not offer conclusive insights into the impact of the procedural part of the game. Moreover, procedural rhetoric can likely be somewhat effective even when merely watching recorded gameplay if the person playing the game is seen to engage with the game's

systems in a profound way. Because of this, insight is needed into the different effects games can have when procedural rhetoric is either present or absent. Although there are currently no known psychological antecedents of persuasion through procedural rhetoric, the current study gauges players' recognition of the similarities between game systems and the real-world processes they mimic. Such a measurement hews closest to the cognitive identification found in multiple identification theory (Williams & Williams, 2007), where players "identify the simulation with reality and see its principles as valid in real life"(p. 5).

6.2.2. Combating Teen Dating Violence with Games

Dating violence among adolescents is a pervasive issue in most societies (World Health Organization, 2005). Although it is often simplified as physical violence, it is in reality a complex pattern of behaviors that affects victims physically, sexually, and psychologically. Different kinds of interventions have been implemented to curb this issue (De La Rue, Polanin, Espelage, & Pigott, 2016). It should be seen as an educational issue, which requires recurring emphasis either within school curricula or outside of it.

The remit of Jennifer Ann's group (JAG) is to spread awareness of teen dating violence and share knowledge (both for victims and for bystanders) on how to prevent it from happening. For this reason, JAG issues the annual Life.Love. Game Design Challenge (Jennifer Ann's Group, 2015). This challenge calls for games that meet the following criteria: they should discuss the topic of teen dating violence, show the warning signs of an abusive relationship, and present options for bystanders and victims to take action against it, all while not allowing for violent gameplay (Crecente, 2014). The games are shared digitally and widely accessible. Developers are given the freedom to create any kind of game within those restraints, which has led to an impressively varied group of games. Hosted on the JAG game repository are games in diverse genres, such as point-and-click and adventure games, as well as games that defy

categorizations usually applied to entertainment games (Jennifer Ann's Group, n.d.). Entries to this challenge are judged by a panel composed of game developers and researchers that are actively working with the topic of teen dating violence or that have previously worked on the design of serious games. Games published on the JAG website have therefore been scrutinized for their focus on this issue before release, which has in many instances led to improvements to the game (D. Crecente, personal communication, August 12, 2015). This process can therefore be said to lead to a selected and refined set of games. This set presents a unique opportunity for investigating otherwise disparate games that are highly similar with regards to the message they intend to convey. For the current study, two games were selected from this set based on their emphasis on either procedural or narrative elements.

Narrative-led persuasive game. *Another Chance* (Another Kind, 2015) is the 2015 winner of the Life.Love. Game Design Challenge. It is an action role-playing game (RPG) that is viewed from a top-down perspective. The presentation style consists of open game assets (opengameart.org) that are reminiscent of 16-bit Japanese RPGs such as *Secret of Mana*. The game's narrative involves a woman dreaming that she is in a videogame. Though she is confused at first, she soon learns from conversations with family and friends that she was being abused by her partner. Ultimately, the protagonist realizes that she had been unconscious throughout the game, hospitalized after being assaulted when she tried to break up with him. The gameplay consists of walking around the game world and speaking to other characters.

The protagonist's initial confusion reflects a precontemplation stage of attitude change (Prochaska et al., 1992). For the majority of the game, the character's objective is to obtain several keys to free her ex-partner from prison. By hearing others' views, she becomes convinced that her partner is not behaving correctly, resulting in her rejecting him, and no longer blaming herself for his wrongdoings. The narrative is therefore congruent with a modeling approach to learning by showing the protagonist's mental journey to

acknowledging and ending her abusive relationship. Action elements do imbue the game with a light procedural argument; players gather courage (in the form of in-game collectibles) which they use to fend off ghost-like hostile characters who try to drag the protagonist away, by shouting 'no!' when they are close. Apart from this gameplay dynamic, the gameplay and systems do not reflect the processes in abusive relationship, meaning the persuasive influence of the game depends on its narrative elements.

Procedural persuasive game. *Power and Control* (Sain, 2011) is a game that deals with the topic of teen dating violence in a novel way. The game has no graphics beyond a pink background, superimposed with text. The game's two layers of audio are a soft background score and a fully voiced young male boyfriend character. The player uses the mouse cursor to 'touch' the words on screen, which can represent physical objects or action as well as the otherwise silent protagonist's thoughts and feelings. The game consists of a sequence of interactions with the protagonist's boyfriend that indicate he is acting abusively towards her. This is made clear, for example, by his efforts to control how the protagonist dresses and even by forcing her into sexual actions. The game is made to feel oppressive: the boyfriend is constantly speaking, becoming more and more hostile as the game progresses.

Power and Control offers up procedural rhetoric focused on putting players in the shoes of the victim of abuse. In the game's main dynamic, the player is repeatedly asked to approach or avoid certain words, and has to maneuver (physically by way of the mouse cursor) around the boyfriend. The only course available to players is to weather the storm of abuse. They are forced to comply with the abuser's demands to progress through the game. The protagonist's thoughts are visualized on screen independently of the voiced boyfriend character, indicating she is trying to ignore his behavior. Although this means that there is a small narrative arc in the game where the protagonist is coming to terms with her situation, the player is always in control of this process.

Players can ultimately choose to stay in the relationship or to leave the abuser. The narrative is not emphasized to the degree it is in *Another Chance*.

6.2.3. Hypotheses

By looking at the two games mentioned previously, the current study offers first evidence on the differential effects of narrative and procedural persuasive elements in games. Moreover, it also attempts to demonstrate antecedents of attitude change originating from both kinds of argument. The following hypotheses can be generated from previous results and theory:

Hypothesis 1: Both the narrative-led game (*Another Chance*) and the procedural game (*Power and Control*) change attitudes to the issue of teen dating violence compared to a control game.

Hypothesis 2: There is a difference in attitude change as resulting from the narrative-led and procedural game.

Hypothesis 3: Attitude change as a result of the narrative-led game can be predicted from identification with the game's protagonist.

Hypothesis 4: Attitude change as a result of the procedural game can be predicted from cognitive identification with the game's systems (i.e. an acknowledgment that they reflect real-world processes).

Hypothesis 2 does not specify which of the two games will show greater effects. The reason for this is that no previous studies have provided sufficiently unilateral indications, let alone evidence, to warrant a directional hypothesis. As stated previously, procedural rhetoric has not been empirically validated, while narrative persuasion has only been investigated in other media (Slater, 2002).

6.3. Methods

6.3.1. Sample

Two samples were drawn for this study, reaching a total of 262 respondents. Because the target audience of both of the games consists of teenagers, the first sample was drawn from the final three grades of Dutch secondary schools. Three schools participated in the study, yielding 147 respondents aged 15 to 19 (M: 16.3, SD: .74). Comparatively more males participated in the study: 68.7% of the secondary school participants were male. A possible reason for this could be the way the study was introduced: the schools communicated to their students that the topic of the study was 'serious gaming'. The second sample was drawn from an international student body from a Dutch university. These respondents reacted to a call for participants for a study on 'interactive experiences of pro-social topics'. The university students were comparatively older than those in the other sample (M: 22.5, SD: 22.87), ranging between 18 and 32 years of age, and included more female participants (60.9%). The average age across the full sample was 19.0 years (SD: 3.67), with a slight majority identifying as male (55.7%). 99 participants played *Power and Control*, 102 played *Another Chance*, and 62 played a control game that was unrelated to dating violence. This distribution was skewed towards the two persuasive games to allow for greater resolution when comparing the effects of these two games than is needed to compare either persuasive game and the control game. The distribution of participants of both genders was equal across conditions ($\chi^2(2)=.50$, $p=.778$).

Although the games were only playable in English, the instructions for participants and measurements were all available in Dutch as well. All secondary school students except for one completed the study in Dutch, while 32.2% of university students preferred Dutch over English. This is reflective of the international make-up of this university. All participants from the university sample were financially compensated for their participation. One of three

groups (40.1%) of secondary school students received a similar reward upon completion of the study, while the others participated during school hours and were not compensated.

6.3.2. Stimuli

The two games discussed in the introduction to this chapter were employed as stimuli for the two treatment conditions in this study. *Another Chance* (Another Kind, 2015) served as a narrative-oriented game, and *Power and Control* (Sain, 2011) as a procedural game. A third game was used for the study's control condition. *Samorost 2* is an online Flash-based point and click game developed by Amanita Design (2005), of which the first chapter is freely accessible online. In *Samorost 2*, players guide a small anthropomorphic creature living on an asteroid in its effort to rescue its pet from a pair of alien abductors. Players manipulate objects from a fixed viewpoint to solve a series of puzzles.

This game was chosen for the control condition for several reasons. Primarily, its presentation, gameplay, and storyline were completely unrelated to the topic of teen dating violence. Second, its gameplay was accessible, allowing all participants to proceed through the game. The arcane nature of its puzzle design, however, did serve to engage all players, keeping them focused on play for the game's duration while they figured out how to proceed. In debriefing sessions, many participants described actively considering the game's link to the survey, for instance by considering the validity of the protagonist's mission to save its pet as a metaphor for abusive relationships. Few respondents rejected this idea outright before debriefing, which serves as an indicator that participants were looking for meaning in the game. The game therefore could be said to have acted as a placebo for many respondents, who had the idea that the game did attempt to discuss this topic in some obscure way.

The games differed in the time it cost participants to complete them: *Power and Control* had, on average, the shortest playing time (M: 13.1 minutes, SD: 4.01). *Another Chance* took the most time to finish (M: 39.5 min., SD: 7.60),

with *Samorost 2* in between (M: 33.8 minutes, SD: 7.13). All playing time differences between groups were significant and large ($F(2, 255)=450.5$, $p<.001$, $\eta^2 = .78$).

6.3.3. Procedure

Although the procedure differed slightly for the two samples drawn for this study, all participants followed one of three paths through the same digital questionnaire in an online survey platform. Participants were seated in front of a computer with headphones. A short introduction on the procedure of the study was given by the experimenter before the survey was started. After providing informed consent, the survey instructed participants to put on the headphones, click on a link to go to a game page, and to keep playing until they completed it or until they were asked to stop. The games were hosted on their respective publishers' websites. Upon starting the game, participants were given a paper sheet with instructions how to play the games. The contents of these sheets were based on issues encountered in informal pre-testing of the game during public events. For *Another Chance*, this included the game's controls, the gameplay, and how to check the current in-game objective on the map screen. For *Power and Control*, the sheet explained how the mouse cursor interacted with words and discussed how to complete one specific scene in the game that many players struggle with. The sheet for *Samorost 2* simply explained the way a cursor changes appearance if an object can be interacted with. To avoid issues with difficulty, participants were told during the introduction that they could also ask the experimenter for assistance during play. All sessions were monitored by the same experimenter.

To manage the experiment's time while allowing the greatest number of participants to finish the games, participants were asked to stop playing after 45 minutes if they were not yet close to completing, or allowed to continue for slightly longer if they were close. This strategy allowed 98.0% of players to finish

Power and Control, 86.3% to finish *Another Chance*, and 68.9% to finish *Samorost 2* during the study.

After play, respondents continued in the online survey platform, and filled in the items comprising the study's measurements. These included questions on game completion and comprehension, two attitude scales on dating violence, character and cognitive identification scales, game enjoyment questions, a short scale on obtrusiveness of persuasive intent, and demographic items (in this order). The survey closed with an open-ended question allowing for candid comments on the study or the games. After completing this item, respondents entered a debriefing stage.

The procedure differed somewhat between the samples. University students were tested in a laboratory setting in pairs, separated by a cubicle wall. Debriefing took place individually or in pairs, starting as soon as participants completed the study. Secondary school students were tested in different settings. The majority (61.9%) were tested in a classroom with between 12 and 25 participants per session. Within the classrooms, participants were divided across conditions, though care was taken to position them so they could not see other games being played. The remaining 38.1% of secondary school students were tested in groups of four students that were assigned to the same condition.

Debriefing sessions followed a loose structure, though each session started with the experimenter explaining he was not involved with the design of the games in the study and asking for an honest opinion. From there, participants' interests were followed in the discussion. Afterwards, the study's design and goals were briefly explained, and the participants were thanked for their participation.

6.3.4. Analysis

All measurement scales used in this study were subjected to principal component analysis with oblique (oblimin) rotation and tested for reliability using Cronbach's alpha before being averaged into scale variables. Hypotheses were tested with multivariate analyses of variance using planned comparisons and Dunnett or Tukey post-hoc tests (Seltman, 2015) and with linear regressions. Indicators of effect size were selected, computed, and interpreted in accordance with Lakens (2013). Power analyses were performed using G*Power version 3.1.9.2. All other analyses were performed using IBM SPSS Statistics version 23.

6.3.5. Measurements

All measurements in this study were taken after the play session. The main measurements consisted of two attitude scales on dating violence and two scales separately gauging character and cognitive identification. These items are listed in table 6.1.

Teen dating violence attitudes. To measure attitudes towards the issue of teen dating violence, the Justification of Verbal/Coercive Tactics (JVCT) scale was used (Slep, Cascardi, Avery-Leaf, & O'Leary, 2001). This scale consisted of 11 items describing behaviors in relationships. Participants rated behaviors as admissible or inadmissible separately for both male and female actors. Four items were added, relating to texting and social media, to keep the scale valid in the current landscape. In total, this created 30 items measuring acceptability of behaviors for men and women. Factor analysis called for the separation of the scale into three subscales. The first measured justification of controlling behaviors on a social level (social control, 12 items, Cronbach's α: .90). The second was concerned with justification of jealous behaviors (jealous behavior, 12 items, α: .89). The final grouping combined items on angry and violent behaviors (angry behavior, six items, α: .85). Higher values on these scales indicate less justification and less acceptance of abusive behaviors.

Table 6.1: Item list of the scales used in this study.

Justification of Verbal/Coercive Tactics scale	M (M)	SD (M)	M (F)	SD (F)
Social Control subscale (12 items, α: .90)				
Keeping him/her from seeing or talking to his/her family	4.69	.64	4.69	.61
Turning his/her family and friends against him/her	4.81	.59	4.82	.48
Keeping him/her from doing things to help himself/herself	4.64	.68	4.62	.75
Using a second phone that the partner does not know about *	4.61	.74	4.62	.71
Demanding to know his/her passwords to social media, e-mail, and other accounts *	4.60	.70	4.60	.72
Sharing or threatening to share sexually explicit pictures of him/her with others *	4.89	.54	4.90	.52
Jealous Behavior subscale (12 items, α: .89)				
Interfering in his/her relationship with family members	3.88	.98	3.88	.98
Being jealous and suspicious of his/her friends	3.76	.90	3.71	.92
Being jealous of other girls/boys	3.28	1.02	3.23	1.03
Checking up on him/her, making him/her say where he/she was	3.63	1.11	3.63	1.08
Accusing him/her of seeing another girl/boy	3.90	.79	3.90	.80
Texting constantly to check up on him/her *	4.21	.80	4.20	.83
Angry Behavior subscale (6 items, α: .85)				
Insulting or swearing at boyfriend/girlfriend	4.07	.88	4.03	.86
Stomping out of the room or house	3.42	.98	3.38	.98
Doing or saying something to spite him/her	3.80	1.13	3.76	1.15
Other attitude and identification scales				
Victim Blaming scale (3 items, α: .82)			M	SD
Most physical violence in dating occurs because a partner asked for it			1.50	.91
If you did something wrong, it is your fault if you get hit			1.39	.81
If you make up after being abused, it won't happen again			1.44	.86
Self-Efficacy in dealing with abusive relationships scale (3 items, α: .72)				
I know how to tell if someone I know is in an abusive relationship *			2.98	1.04
As an outsider I can help if someone I know is in an abusive relationship *			3.47	1.02
I know what to do if someone I know is in an abusive relationship *			3.08	1.08
Recognition of abusive situations/relationships (5 items, α: .68)				
A dating partner who wants to be in charge and make all decisions might become abusive			3.11	1.12
Slamming a door or driving recklessly in a car to scare someone is abusive			3.60	1.17
It can be abusive to yell at someone even if you don't hit them			3.87	1.19
It is possible to be angry or even argue with your dating partner without being abusive			4.35	1.03
People can strongly deny being in an abusive relationship even when they realize that something is not right *			4.18	1.04
Character Identification scale (6 items, α: .85)				
I agreed with the main character's thoughts and what she said *			2.91	1.17
The way the main character reasoned was similar to how I thought about this topic *			2.41	1.09
I recognize myself in the main character			1.87	1.04
The main character is an example to me			1.97	1.09
The main character has characteristics that I would like to have			2.20	1.10
The main character is like me in many ways			1.96	1.01
Cognitive Identification scale (6 items, α: .86)				
This game lets players experience abuse in a safe way *			3.50	1.19
The gameplay in this game shows what it is like to be abused *			2.89	1.26
The way this game works reflects what abuse is like in the real world *			2.77	1.20
This game is meant to be played for its message, not just for fun *			4.00	1.20
The way this game is played makes me think of what it is like to be abused *			2.92	1.39
The way this game is played shows how abusive relationships can work *			3.15	1.32

*Note: Means and standard deviations are shown for each item and scale, and Cronbach's α is shown for relevant scales. Items for the JVCT are posed twice (M/F). *: Item developed and included specifically for this study.*

Separately, wider attitudes towards dating violence were measured using a nine-item scale developed by Macgowan (1997). These questions were also complemented with seven new items. Factor analysis again supported a division into three subscales. The first related to victim agency and culpability in abusive relationships (victim blaming, three items, α: .82), while the second was about self-efficacy with regards to handling abusive situations for oneself and friends (self-efficacy, α: three items, .72), and the third gauged the self-reported ability of respondents to recognize abusive relationships (recognition, five items, α: .68). Higher values on these scales indicate more compassion with victims, higher self-efficacy, and greater sensitivity in abuse recognition, respectively.

Character and cognitive identification. To support the contention that the games' relative emphasis on either narrative or procedural persuasion is causing differences in attitude found, two indicator scales were used. Identification with the games' protagonists was used as an indicator for narrative persuasion; those who feel closer to their character will be engaged in a game's story more strongly. This nine-item scale is a combination of character identification measures in previous literature (Van Looy, Courtois, De Vocht, & De Marez, 2012; van Reijmersdal, Jansz, Peters, & van Noort, 2013). Items were adapted to fit with single-player games where the protagonist is not always visible or shaped by the player. Because no previous measure existed for the perceived similarity of game- and real-world processes, six items were developed to measure this construct. The items were informed by the concept of cognitive identification described by Williams and Williams (2007). Factor and reliability analyses supported the division of the two types of identification, leading to two scales: six items for character identification (α: .85) and six items for cognitive identification (.86).

6.4. Results

Hypothesis 1 predicted that both types of persuasive game affect attitudes to the issue of teen dating violence more than the control game. This hypothesis

was tested using a multivariate ANOVA with the six dating violence attitude scales with planned contrasts between both of the persuasive game conditions and the control condition, ending with post-hoc Dunnett's tests. The overall ANOVA result was significant with a medium effect size (Wilk's Λ: .88, $F(12,508)=2.78$, $p=.001$, *partial*-$\eta^2=.06$). Looking at the individual attitude scales, the conditions were found to differ significantly (though with small effects) on justification of angry and violent behaviors ($F(2,259)=5.40$, $p=.005$, *partial*-$\eta^2=.04$) and on self-efficacy with regards to dealing with abusive relationships ($F(2,259) = 4.17$, $p=.017$, *partial*-$\eta^2=.03$). The other four attitude scales did not show significant overall differences (justification of social control: $F(2,259)=.37$, justification of jealous behavior: $F(2,259)=2.31$, victim blaming: $F(2,259)=1.45$, recognition of abusive behaviors: $F(2,259)=1.10$). Planned comparisons were drawn for justification of angry behavior and self-efficacy in dealing with abusive relationships. *Another Chance*'s (*AC*) players held different attitudes from those who played *Samorost 2* (*S2*) for both justification of angry behavior (*AC*: $M=3.82$, $SD=.78$, *S2*: $M= 3.47$, $SD=.78$, $p=.004$, Hedges' $G_s=.45$) and self-efficacy (*AC*: $M=3.14$, $SD=.80$, *S2*: $M=3.43$, $SD=.80$, $p=.029$, Hedges' $G_s=.36$). *Power and Control* (*P&C*) fared similarly, yielding different attitudes from the control condition on justification of angry behavior (*P&C*: $M=3.84$, $SD=.68$, $p=.003$, Hedges' $G_s=.51$) as well as self-efficacy (*P&C*: $M=3.05$, $SD=.87$, $p=.005$, Hedges' $G_s=.45$). Apart from these effects, the post-hoc comparison between *Another Chance* and the control group also returned a significant difference on attitudes on the justification of jealous behaviors (*AC*: $M=3.87$, $SD=.66$, *S2*: $M=3.66$, $SD=.61$, $p=.039$, Hedges' $G_s=.33$). Closer inspections of the average attitude scores of the groups, however, show that players in the control group held the highest scores on self-efficacy in dealing with abusive relationships, compared to both treatment groups. The scaling of these items indicates that players of either persuasive game felt *less* sure of their ability to deal with abusive relationships. Because the attitudes for two scales were different from the control condition for both persuasive games and *Another Chance* also affected

attitudes on a third scale, the first hypothesis is tentatively accepted. Though effects are small and not ubiquitous, the games can be said to reduce acceptance of angry behaviors as well as the self-efficacy of dealing with abusive situations.

Hypothesis 2 predicted attitude change to be different for both persuasive games because of the differences in their design. A multivariate ANOVA was performed on the two persuasive game conditions (excluding the control group) with the six dating violence scales as dependent variables. The overall result was not significant (Wilk's Λ: .95, $F(6,194)=1.81$), with none of the individual variables showing significant differences (social control: $F(1,199)=.57$, jealous behavior: $F(1,199)=2.28$, angry behavior: $F(1,199)=.03$, victim blaming: $F(1,199)=.29$, self-efficacy: $F(1,199)=.54$, recognition: $F(1,199)=2.08$). Hypothesis 2 was therefore rejected: there were no differences in the effect *Another Chance* and *Power and Control* had on attitudes towards dating violence. The power this study achieved in discerning the current analysis' very small effect (f2(V)=.06) was .68.

The third hypothesis predicted that attitude change as a result of the narrative of *Another Chance* would be the result of identification with the game's protagonist (character identification). While *AC* did show higher character identification in a one-way ANOVA than *P&C* with a large effect size ($F(2,259)=40.52$, $p<.001$, *partial*-$\eta^2=.24$), the relationship of this identification with attitude change was the inverse of that expected: in separate linear regressions, three of the six outcome scales were negatively predicted by character identification for *AC* players. These were social control ($F(1,100)=11.07$, $p=.001$, $\beta=-.32$, $R^2=.10$), jealous behavior ($F(1,100)=6.44$, $p=.013$, $\beta=-.25$, $R^2=.06$), and victim blaming ($F(1,100)=4.78$, $p=.031$, $\beta=-.21$, $R^2=.05$). This effect was not found for angry behavior ($F(1,100)=1.32$), self-efficacy ($F(1,100)=.86$), or recognition ($F(1,100)=.35$). Although effects on justification of behaviors were limited to *AC*, character identification also negatively predicted victim blaming among *P&C* players ($F(1, 97)=9.76$, $p=.002$,

β=-.30, R^2=.09). This means that despite the positive influence of *AC* and *P&C* on justification of jealous behavior, players who identified more with the protagonists of either game subsequently reported greater justification of abusive behaviors (in *AC*) and increased victim blaming. Because this effect runs counter to expectations, H3 is rejected.

Finally, hypothesis 4 predicted a positive influence of likening *P&C*'s gameplay to real-world abuse processes (cognitive identification) on subsequent attitudes. A one-way ANOVA showed cognitive identification was higher for *P&C* than for *S2* ($F(2,259)=94.64$, $p<.001$, *partial*-$\eta^2=.42$, $M_{diff}=1.50$, $p<.001$), though *P&C* and *AC* did not differ ($M_{diff}=.01$, p=.995). Four of the six attitude scale scores were unrelated to cognitive identification among *P&C* players; social control ($F(1,97)=.13$), jealous behavior ($F(1,97)=.82$), angry behavior ($F(1,97)=.37$), and victim blaming ($F(1,97)=.32$). Self-efficacy, however, was *positively* predicted for these players ($F(1,97)=4.99$, $p=.028$, β=.22, $R^2=.05$). Recognition of abusive relationships was also positively predicted ($F(1,97)=26.33$, $p<.001$, β=.46, $R^2=.21$). Cognitive identification was not related to attitudes for the other two groups, although *AC*'s players show a borderline significant positive prediction ($p=.073$, β=.18) of self-efficacy similar to *P&C*'s. Across both persuasive games, character and cognitive identification were positively (though weakly) correlated ($r=.23$, $N=201$, $p=.001$) Again, these results run counter to the difference in attitudes between players of *P&C* and the control group, as that comparison showed lower self-efficacy among *P&C*'s players. This pattern does not allow us to conclude cognitive identification was responsible for the effects of *P&C*, and so we reject H4.

6.5. Discussion

Although not all attitudes were affected, both persuasive games showed a clear difference with the control game in the attitudes their respective players held afterwards. Primarily, players of both *Another* Chance and *Power and Control* reported being less accepting of angry behaviors in relationships, while *Another*

Chance also reduced justification of jealous behaviors. These results show a small but significant effect in strengthening attitudes of players against relationship abuse. Although the results found on the self-efficacy in dealing with relationship abuse seem counter-intuitive – as the persuasive games did not increase self-efficacy but actually lowered it relative to those in the control condition – they could indicate increased awareness of the issue of dating violence. Participants had an increased sense that they would not know what to do if they or someone they knew would find themselves in an abusive relationship. It could be beneficial for players if this realization would spur them on to educate and train themselves to prevent abusive situations from occurring. On the other hand, it could also indicate a sense of helplessness. In this case the games' effect would be negative; reducing players' confidence and increasing apprehension towards relationships in general. Because the current study did not include longer-term behavioral intentions, it is not possible to determine how the reduced self-efficacy affects players of these games. A possible reason for the erratic effects could be the loose design process behind both games. As they were designed on the intuition of the designers and not, for example, by making use of an evidence-based design strategy (e.g. like DeSmet et al., 2016), it is difficult to ground specific design choices in validated persuasive strategies. Although evidence-based persuasive games are rare, future research should strive to link game dynamics and texts to previously successful strategies (in other media).

The sizes of effects found while testing the first hypothesis offer a possible explanation why the second hypothesis, predicting a difference in attitude change as a result of persuasive games emphasizing either narratives or gameplay elements, was not retained. Because the impact on attitudes directly after play was small, it is likely that further differentiating two successful persuasive games would require excessive granularity in effect measures. The difference between the games' persuasive power in the short term could therefore be said to be trivial despite their divergent designs. The current findings

do show that persuasive games do not necessarily have to be long to be immediately effective; the two games did not differ in effects despite *Power and Control*'s mean playtime being a third of that of *Another Chance*. There can of course be more to the impact of a persuasive game than its immediate attitudinal influence. The current design was not equipped to discern changes in the longer term, such as the sleeper effect noted by Ruggiero (2015).

In testing the third hypothesis, we found negative predictive effects of character identification on justification of controlling and jealous behaviors as well as victim blaming. This effect was opposite to the effect of *Another Chance* as a condition, but it was tied to this game; even though the same effect was found on victim blaming attitudes for *Power and Control*, those who played through the narrative of *Another Chance* feeling a stronger connection to its protagonist subsequently reported more negative attitudes on exactly the issues facing that protagonist. Because this effect was found in a regression within one condition, causality has not been established; it is not clear whether the identification influenced attitudes or whether these were simply correlated. Counter to the effect we found, perceived similarity to a victim of sexual abuse (a measure showing considerable overlap with our identification scale) had previously coincided with less lenience towards abusive behavior and reduced victim blaming (Bell, Kuriloff, & Lottes, 1994). However, it is likely that, in the current study, a third factor influenced both. Previous research showed that lenient attitudes on violence towards women were often found among individuals who had experienced this kind of violence in their lives. In our sample, it is therefore possible that the negative relationship between character identification and attitudes towards abuse was caused by experience with abusive relationships. Those who had this experience would then have identified more with the two protagonists of *AC* and *P&C* who were actively going through it during the game. Since the current study did not include measures of experience with abuse because of the ethical issues involved in posing such

sensitive questions in a group-based experimental setting, this explanation is currently only speculative.

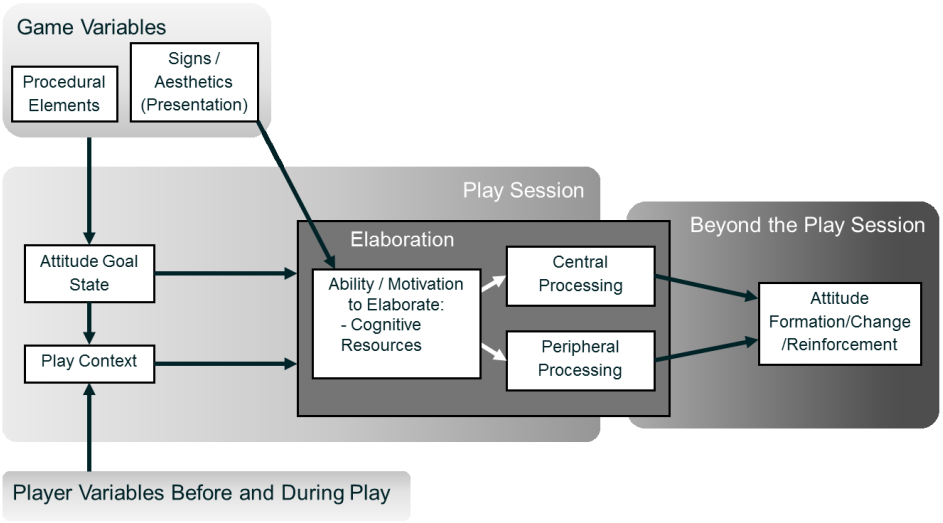
Finally, cognitive identification showed a weakly positive influence of cognitive identification (i.e. seeing the game as mirroring the real-world process of abuse) on subsequent attitudes held. The direction of this change was opposite to that of the game condition as a whole. It is therefore not proven that the procedural rhetoric embedded in *Power and Control* is responsible for the game's effects. Similar to the results of character identification, it is possible a third variable influenced certain respondents to both report the similarities of the gameplay with abusive relationships and to report increased self-efficacy in recognizing and dealing with abusive situations. Since the total effect of the game was to *lower* self-efficacy, it is worth investigating whether experience with this issue could be causing the relationship between identification and self-efficacy. The positive correlation between the two identification measures used in this study provide an indication into the direction of such an effect, though no hard conclusions can be drawn here.

6.5.1. Conclusion

The current study was to our knowledge the first effort to disentangle the attitudinal influences of emphasizing either a persuasive game's narrative or its procedural elements. Although the games did prove to have mild effects on players' attitudes towards dating violence, their relative influences could not be differentiated from each other, possibly because both games were vetted by a jury on their intent to persuade players on the same topic, making them of roughly equal quality. Antecedents of attitude change as a result of narrative and procedural elements could not be reliably established in this study, since both measurements used had effects that ran counter to those of the games that were supposed to invoke them. These results paint the picture of persuasive games as offering a similar persuasive influence as long as they were developed with the goal of attitude change in mind. Although further research is definitely

needed in this area, persuasive games for now seem to abide by the adage that 'all roads lead to Rome', and that emphasizing certain persuasive mechanisms over others might not necessarily lead to demonstrably different outcomes on player attitudes in the short term. This is not a negative result; it could be seen as evidence that persuasive games do not need to offer long experiences, or even that lengthier games are better. Apparently, game designers have at least some freedom in how they persuade players, opening the doors to games to discuss many different topics from equally varied perspectives.

7. Procedural Arguments of Persuasive Games: An Elaboration Likelihood Perspective



7.1. Abstract[8]

Studies into the effects of persuasive games – games designed to change players' attitudes – have not yet yielded insight into the psychological processes involved in persuasion through procedural rhetoric. As a type of non-verbal argument embedded in game systems, it is an open question whether procedural rhetoric leads players to elaborate on a message in the same way as traditionally delivered arguments do. The current study tested 241 participants in a 2 (rhetoric strength) by 2 (level of distraction) experimental setting, with

[8] This chapter is submitted as Jacobs, R.S., Werning, S., Jansz, J. & Kneer, J.: Procedural Arguments of Persuasive Games: An Elaboration Likelihood Perspective. We acknowledge the efforts of our intern Simiao Chen in collecting data for this study.

game stimuli generated through analytical game design. Results indicate that procedural rhetoric strength meaningfully adds to persuasive effects. Participants in high-distraction conditions were not driven to process the games' message differently. After this, we outline the empirical process required to further investigate effects of procedural rhetoric on elaboration, and conclude how the current study contributes to conceptions of arguments borne out through gameplay.

7.2. Introduction

As serious games specifically made to persuade their players, persuasive games share a common goal that is nevertheless difficult to realize. Based on current knowledge around persuasive messages in other media and interpersonal communication, changing individual players' attitudes after a single, brief exposure is an uphill struggle (Perloff, 2014). Yet this is the format most persuasive games are published in, whether they relay advertising messages (Lee & Youn, 2008; Roettl et al., 2016) or personal and prosocial messages (Jacobs et al., 2017). What's more, studies are showing that some – though not all – persuasive games are indeed changing attitudes in their players (Gerling et al., 2014; Jacobs, 2016; Peng et al., 2010; Ruggiero, 2015; Soekarjo & van Oostendorp, 2015). Now that we can cautiously say persuasive games work, two new questions emerge: Firstly, how do they work? Secondly, what (if anything) do persuasive games contribute to mediated persuasion in general?

In this chapter we apply what we know about the latter question to start building an answer to the former. Namely, we work from the assumption that persuasive games differ from other media on their ability to offer procedural rhetoric (Bogost, 2007). Procedural rhetoric describes how a game's systems and rulesets form a persuasive message that can be unpacked by players through observing and responding to these rules – in essence playing with(in) the system. As this kind of play requires systems to be interactive, it hinges on persuadee agency in a way no other medium does. Naturally, persuasive games

are not all reliant on procedural rhetoric. Game developers have access to multiple persuasive dimensions while embedding messages (de la Hera Conde-Pumpido, 2015). These dimensions (such as narrative (Slater & Rouner, 2002), or emotional appeals (Perloff, 2014)) have in many cases been explored in other media while procedural rhetoric has not. Proving the influence of procedural rhetoric on player attitudes therefore builds up the case for persuasive games as a different type of persuasion (rather than simply being an alternative) while also allowing insight into the psychological processes elicited by game-borne persuasion.

The question therefore becomes: Does procedural rhetoric persuade players of a persuasive game in the same way as verbal arguments have been proven to do? We present here a study that tested differences in procedural rhetoric not in terms of its presence or absence– as could arguably be done by manipulating the interactivity of an experience (Peng et al., 2010) – but in terms of argument strength. Our framework for this investigation was the elaboration likelihood model (Petty & Cacioppo, 1986b), which offers an in-depth psychological view of how persuasion takes place in other contexts, but that has not yet been applied to single instances of persuasive gameplay. In previous investigations into this model (Perloff, 2014), verbal arguments were composed to be strong – making a solid point in favor of an attitude – or weak – an argument that does not make sense or even leads to counter-attitudinal conclusions. Simply put, strong arguments only lead to greater persuasive effects when persuadees can *elaborate* on a message. A more specific research question for this study was: Do common results with verbal argument strength and elaboration replicate when arguments are procedurally embedded in a persuasive game? We will first discuss the elaboration likelihood model (ELM) before describing how procedural rhetoric could interact with elaboration.

7.2.1. Elaboration and Game Persuasion

The ELM (Petty & Cacioppo, 1986a, 1986b) charts the persuasive effects of messages by not just considering the message, but also the attention the central arguments of a message are given by the persuadee. Under conditions of full attention (i.e. when the persuadee is able and willing to attend to a message), persuadees *elaborate* on a message by carefully weighing the arguments and, for example, referencing their own experience. This way of receiving a message is termed central processing. Under central processing, strong arguments lead to greater attitude change than weaker arguments. Conversely, peripheral processing minimizes attention to the message argument. Persuadees processing a message peripherally can still be persuaded, but they are convinced by elements of the message apart from its core arguments, such as presentation style, the sheer number of arguments, or the source of the message (Perloff, 2014). This means that, under peripheral processing, stronger and weaker arguments cannot be differentiated in terms of attitude change. Persuadees process a message peripherally when they are not able or willing to process it centrally. The ability to do so is influenced, among others, by cognitive load (Vyvey & Núñez Castellar, 2016) – the amount of information that someone is asked to process simultaneously – while motivations can be affected by the persuadee's mood. This way of thinking about elaboration as a function of the abilities and motivations of persuadees is found in multiple other so-called dual-process theories (Petty & Wegener, 1999).

Dual-process theories have been of great use in explaining previously anomalous effects in other fields, and the studies on persuasive games could benefit from their explanatory power (Jacobs, 2016). Indeed, dual-process models have already contributed to knowledge on brand recall and attitude in advergames, leading to the conclusions that peripheral processing of a brand is preferred (Peters & Leshner, 2013), at least for certain groups of players (Cicchirillo & Mabry, 2016). Malliet and Martens (Malliet & Martens, 2010) considered elaboration likelihood while investigating the effects of shooter

games on attitudes towards the use of violence in general. Their study investigated attitudes cultivated through years of playing games without persuasive intent, rather than a single, argument-bearing play session. Empirical studies on argument-based persuasive games that include dual-process theories have not been performed.

On a theoretical level, Christiansen (Christiansen, 2014) proposed design strategies to promote either central or peripheral processing, highlighting 'heuristic cues' to steer elaboration in players. This underlines the point of the current chapter: to determine empirically how players process specific parts of games. Only by investigating this process can we move forward to determine whether persuasive game designers need to focus on central arguments – and how to embed them – or on peripheral cues. We start this investigation by focusing on the persuasive dimension unique to persuasive games; procedural rhetoric.

7.2.2. Operationalizing Procedural Rhetoric

Procedural rhetoric is a term coined by Ian Bogost (Bogost, 2007) to describe how a developer can model certain aspects of the real world in a game to proffer a persuasive message. This concept is primarily based on simulations; designers simulate elements of a real-world topic in gameplay systems and rules to persuade players on how the world works. Procedural rhetoric consists of non-verbal arguments. Instead, players 'play' the rhetoric by engaging with gameplay systems, testing what consequences certain actions have. During play, they develop a mental model (Wasserman & Banks, 2017) of the game system – a representation of the relationships and links between actors and objects in the game – in order to advance within the game. This mental model would then lead them to draw conclusions about the process in the real world.

Interactivity is a prerequisite for procedural rhetoric; persuadees cannot play within the system if they have no control over the experience. Removing interactivity can adversely affect the impact of a persuasive game (Peng et al.,

2010). However, interactivity is not by itself sufficient for procedural rhetoric, as the latter requires a discernible link of the game systems and rules and the topic they are concerned with. Despite being interactive, branded puzzle games (e.g. Redondo, 2012) clearly offer no message through their systems, and could not be said to include procedural rhetoric. Moreover, interactivity affects more of the experience than just the execution of procedural rhetoric. This is evident from the finding of Peng, Lee, and Heeter (Peng et al., 2010) that enjoyment was *lower* when participants played, rather than watched, a game.

Having simultaneously been hailed as the way forward in game-based persuasion by some (Ferrara, 2013) and lambasted by others for presupposing a limited view on (motivations to) play (Sicart, 2011), it is perhaps surprising that procedural rhetoric has not yet been isolated and manipulated in empirical studies on attitudinal effects of games. One possible cause of the paucity of empirical evidence on procedural rhetoric is that it is difficult to operationalize. Most games are based on systems that could say something about the real world, and these systems are intertwined with the other persuasive dimensions often emphasized in persuasive games (Jacobs et al., 2017) (e.g. textual rhetoric relating to gameplay systems). Therefore, changing one part of a game's design could affect other persuasive mechanisms, making it harder to differentiate them through experimental manipulations.

We propose that, rather than manipulating interactivity or altering the gameplay to remove procedural rhetoric, the best way to study the effects of procedural rhetoric is through weakening or strengthening the arguments it offers. This can be achieved by tweaking game system parameters to affect the link to the process the system aims to model. Weak procedural rhetoric would reflect the process poorly (e.g. exaggerating it beyond credibility or changing causal links), while strong rhetoric would provide a consistent, believable model. Naturally, tweaks to gameplay systems to alter the message of game should be minimal and carefully controlled to prevent other parts of the game experience

(that are not related to the message embedded in systems and rules) from changing along with it.

Hypotheses. If procedural rhetoric is processed by players the same way as verbal arguments, we expect to replicate traditional ELM studies as they are found in figure 7.1. This leads us to formulate the following hypotheses for the current study:

Hypothesis 1: Weak procedural rhetoric is less persuasive than strong procedural rhetoric when players are not distracted.

Hypothesis 2: An interaction effect of rhetoric strength and level of distraction shows that the difference between strong and weak rhetoric either becomes smaller when players are distracted, or that it disappears entirely.

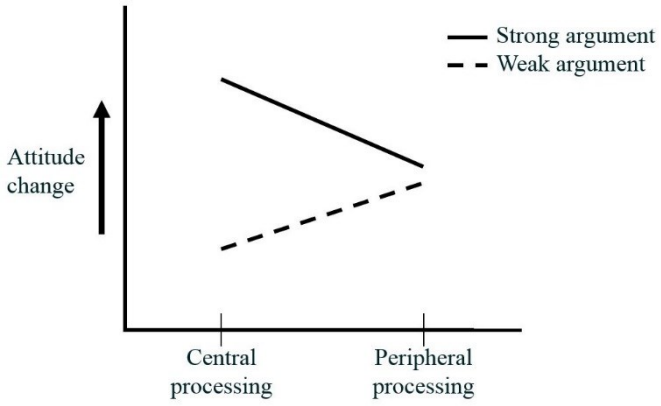


Figure 7.1: Traditional results found when comparing strong and weak persuasive arguments under central and peripheral processing (Perloff, 2014)

7.3. Method

7.3.1. Design

Traditional ELM studies were replicated with a 2 (procedural rhetoric strength) x 2 (ability to elaborate) factor between subjects experiment with pre- and post-test attitude scales. Four versions of a previously researched (Jacobs, 2016) persuasive game were used, alternating between two configurations of gameplay-based argument strength and two levels of facilitating elaboration. Conform Vyvey and Núñez-Castellar (2016), elaboration facilitation was operationalized as greater cognitive load as caused by distracting elements.

7.3.2. Sample

A total of (*N*=) 241 participants were drawn from an international student sample at a European university to participate in this study. Respondents could sign up for the study through an online administration system in exchange for a compensation of €10 cash. The majority of this sample was of an international origin (70.1%). Most respondents were female (again 70.1%), and the sample was on average 21.7 years of age (SD: 2.4), ranging from 18 to 33 years. The sample did not consist of self-styled gamers; although 83.8% of respondents had a little (33.2%), some (36.1%) or a lot (14.5%) of experience with games, 85.1% did not consider themselves 'gamers'. Country of origin, gender, and identification as a gamer did not significantly influence any of the main variables in this study, and randomization ensured a balance of gender and country of origin across this study's conditions.

7.3.3. Stimuli

The persuasive game *My Cotton Picking Life* (Rawlings, 2012b) (*MCPL*) served as the object of this study. *MCPL* is a simple and short game about cotton-picking practices in Uzbekistan that involve child slave labor (Jacobs et al., 2017). As part of a series of 'news games', *MCPL* aimed to raise awareness and

persuade its players on the severity of the problem. Principally, however, its gameplay consisted of repetitively pressing buttons to pick handfuls of cotton with the end goal being to gather 50 kilograms. As this task would take around 6 hours of continuous play to complete, players often gave up early on and clicked a third button that simply read 'Alright, I've had enough', whereupon they were confronted with how little they would have earned and how Uzbekistani children are unable to choose to stop working. Even though an average session with the game lasted for less than 2 minutes on average, the game was more effective at persuading players on the workload involved in cotton picking than a YouTube clip on the same topic (Jacobs, 2016).

Following a process of analytical game design (Werning, 2017), *MCPL* was re-developed in GameMaker Studio (YoYo Games, n.d.) and modified to arrive at four different versions. The procedural rhetoric (on the workload involved in cotton picking) was embedded in the gameplay system of clicking a button and receiving a realistically minute amount of cotton (around 1.5 grams) compared to the 50 kilogram goal. As the original game was already effective, this was taken to be the strong procedural rhetoric condition. To weaken the game's message, this gameplay element was changed; every button clicked in the weak procedural rhetoric condition yielded around 2 kilograms of cotton. Of course, this allowed players the opportunity to reach 50 kilograms easily. Therefore, players reaching the goal received a notification that they were done for the day, whereupon the game would immediately start a second day (and so on). Through this small numerical change, the game system became a worse reflection of the real-world practice of cotton picking while maintaining the same textual and visual message.

The second modification was intended to increase players' cognitive load. The modification was limited to audio-visual effects to distract players without affecting the gameplay or textual persuasive elements. The manipulation consisted of four elements. Primarily, Uzbekistani folk music was added, tweaked to sound like a radio for a diegetic effect. As music could

conceivably affect the experience in other ways, the same score was included in all four conditions, differing only in increased volume and the addition of white noise for the high distraction condition. Three visual effects were also added; a grainy distortion effect, small birds flying in flocks across the top half of the screen, and pulsating (rather than static) action buttons. Since it was unlikely that these three visual effects meaningfully changed how the game was played or how it persuaded players, they were only included in the high distraction condition. During debriefing the high distraction games were described by some participants as annoying, loud, and intense.

7.3.4. Measures

Table 7.1 contains a list of the items and scales used for the analyses in this study.

Attitudes. When *MCPL* was previously tested for effects compared to a YouTube clip (Jacobs, 2016), attitude scales were developed to gauge those attitudes the game and clip were aiming to change. *MCPL* was more effective in changing attitudes related to workload, presumably because of its procedural rhetoric. The four workload-related attitude items (e.g. 'harvesting cotton by hand is hard work') were re-used here, and further items were generated relating specifically to aspects of workload. Items were added on the physical pain ('harvesting cotton by hand is painful work'), task monotony ('harvesting cotton by hand is boring'), and futility ('harvesting cotton by hand feels like an endless task'). This generated an 11-item scale with adequate interreliability (Cronbach's α pre-test: .73, post-test: .81). To measure those attitudes the game also affected outside of its procedural rhetoric (primarily in atmosphere and text), items from the previous study on *MCPL* relating to slavery and empowerment (e.g. 'I want to make a change to stop forced labor') to change it were re-applied here, resulting in a three-item empowerment scale after factor and reliability analyses (Cronbach's α pre-test: .72, post-test: .74). The difference scores between the pre- and post-test scales were used in the analyses for this study.

Manipulation checks. Two measures were included to ascertain whether the study's manipulations on cognitive load and procedural rhetoric strength affected participants as predicted. The NASA Task Load Index (TLX) measures subjective workload perceptions (Hart & Staveland, 1988), and is frequently applied to measure cognitive load (including within games research, (Sharek & Wiebe, 2014)). As a likely result of *MCPL*'s unattainable goal, one item ('how successful were you in accomplishing what you were asked to do?') did not meaningfully add to the reliability. After dropping this item, the average scores of the five-item scale displayed adequate interreliability (Cronbach's **α**: .72). Procedural rhetoric has not been investigated through experimental effects studies. It was therefore necessary to find an antecedent of attitude change as a result of procedural argument strength. We developed a five-item scale based on Williams and Williams' concept of cognitive identification (Williams & Williams, 2007). The scale measured the degree to which the gameplay reflected real-world systems by including items such as 'this game shows what it feels like to pick cotton' and 'the way this game works reflects what it is like to pick cotton in the real world'. Overall, the scale's scores showed adequate interreliability (Cronbach's **α**: .75).

Table 7.1: Item list of the scales used in this study.

Item	M (pre)	SD (pre)	M	SD
Workload attitudes (α: pre: .73, post: .81)				
I would be able to pick 50 kilograms of cotton with little trouble. (R)	5.4	1.5	6.1	1.4
Harvesting cotton by hand is hard work.	6.2	.7	6.3	1.0
Harvesting 50 kilograms of cotton by hand takes a long time.	6.2	.8	6.5	1.0
Cotton harvesters in some countries have to meet large quotas daily.	6.0	1.0	6.3	.9
Cotton harvesters in some countries are not paid according to their efforts.	6.3	1.0	6.4	1.0
Harvesting cotton by hand is good for your physical fitness. (R)	4.6	1.4	5.5	1.5
Harvesting cotton by hand is painful work.	5.4	1.1	6.0	1.0
Harvesting cotton by hand is boring.	5.8	.9	6.6	.7
I would go crazy if I had to pick 50 kilograms of cotton every day.	6.2	1.1	6.6	1.0
Harvesting cotton by hand feels like an endless task.	5.8	1.1	6.6	.9
Harvesting cotton by hand is work that offers a bright future. (R)	6.0	1.2	6.4	1.1
Empowerment attitudes (α: pre: .72, post: .74)				
It is important to me that people who made the products I use are treated fairly.	6.0	1.0	6.2	1.0
Forced labor is a big problem in the world right now.	6.2	.8	6.3	.8
I want to make a change to stop forced labor.	5.5	1.0	5.9	1.0
NASA Task Load Index (α: .72)				
How mentally demanding was the experience?			4.3	5.2
How physically demanding was the experience?			5.3	6.6
How hurried or rushed was the pace of the experience?			9.9	6.0
How hard did you have to work to accomplish your level of performance?			7.8	7.3
How insecure, discouraged, irritated, stressed, and annoyed were you?			11.9	5.8
Cognitive Identification (α: .75)				
This game lets players experience cotton picking in a safe way.			3.8	1.2
This game shows what it feels like to pick cotton.			3.0	1.3
The way this game works reflects what it is like to pick cotton in the real world.			2.6	1.2
This game is meant to be played for its message, not just for fun.			4.6	.6
The way this game is played makes me think of what it is like to be forced to pick cotton.			4.1	1.0
On a scale from 0 to 10, 0 being the absolute worst possible game, and 10 being the absolute best, what grade would you give this game after playing it?			3.5	2.4

Note: Means and standard deviations are shown for each item and scale, and Cronbach's α is shown for relevant scales. (R): Item recoded before analysis.

7.3.5. Procedure

The study was performed in a laboratory-based setting to avoid potential uncontrolled distractors. Participants followed the study on computers through a web-based survey suite while wearing headphones, while an experimenter was present throughout. Participants were randomly assigned to the four conditions by the survey software. They were asked not to adjust the volume of their headphones themselves, and instructed to 'undergo the experience' (i.e. the game) for as long as they wished. This was done to allow all participants to engage with the games' procedural rhetoric at their own pace. The first part of the survey consisted of the attitude pre-test, followed by demographic items. Before starting the games themselves, participants were instructed through on-screen text to behave as if they had some time available and found a game while browsing online. Directly after quitting the game, participants filled in the TLX, followed by the post-test attitude scales and the cognitive identification scale. Upon completing the survey, participants were debriefed. Debriefings focused on letting participants talk about the game they played and their perception of it as a persuasive message.

The decision to let participants decide how long they wanted to play each of the games led to differences in stimulus exposure time. A two-way ANOVA for rhetoric strength and level of distraction on exposure time demonstrated a small effect of rhetoric strength ($F(1,237)=4.4$, $p=.038$, *partial-*$\eta 2=.02$), while a similar effect of level of distraction was not significant at .05 level ($F(1,237)=3.7$, $p=.056$, *partial-*$\eta^2=.02$). The strong-rhetoric/high-distraction condition had the longest average exposure time (*M*: 537.7 s, *SD*: 413.4), differing significantly from the condition with the lowest exposure time, weak-rhetoric/low-distraction (*M*: 355.7 s, *SD*: 255.4) (*Kruskall-Wallis* $\chi^2(3)= 9.9$, $p=.019$). The two other conditions did not differ significantly from any other (strong-rhetoric/low-distraction *M*: 457.3 s, *SD*: 326.3; weak-rhetoric/high-distraction *M*: 449.7 s, *SD*: 393.1). We suspect that higher distraction and stronger procedural rhetoric both caused respondents to play for slightly longer.

7.4. Results

7.4.1. Confirmatory analyses

The first hypothesis posited that weak procedural rhetoric would less persuasive than strong procedural rhetoric when players are not distracted, while the second hypothesis predicted an interaction effect of rhetoric strength and distraction, whereby differences between the procedural rhetoric groups would be less pronounced under high distraction. Both hypotheses were tested with a Multivariate ANOVA with the workload and empowerment scales as dependent variables and a planned contrast of the two procedural rhetoric groups under low distraction. Of the full model, a main effect of procedural rhetoric strength was significant (*Wilk's* $\boldsymbol{\lambda}$: $F(2,236)=10.4$, $p<.001$, *partial-*$\eta^2=.08$) with a medium effect size, while the main effect of distraction (*Wilk's* $\boldsymbol{\lambda}$*:* $F(2,236)=1.0$) and the interaction effect between the two factors (*Wilk's* $\boldsymbol{\lambda}$*:* $F(2,236)=.1$) did not reach significance. Specifically, procedural rhetoric strength affected the workload attitudes ($F(1,237)=20.9$, $p<.001$, *partial-*$\eta^2=.08$) and not the empowerment attitudes ($F(1,237)=.7$). The planned contrast for the low-distraction conditions showed this same difference for workload (contrast estimate= .34, p=.001, 95%CI: .14-.53) but not for empowerment (contrast estimate= .03, p=.695, 95%CI: -.18-.12). The effect size of the difference on the workload attitudes (strong-rhetoric/low-distraction *M*: .64, *SD*: .47; weak-rhetoric/low-distraction *M*: .30, *SD*: .47) was (*Hedges' g*$_s$) .71. Since procedural rhetoric strength affected workload attitudes in the hypothesized direction for the low-distraction conditions, H1 is retained. The absence of an interaction effect for either of the two dependent variables leads us to reject H2, as it means the high-distraction conditions did not have smaller differences in the effect of rhetoric strength. Figure 7.2 shows how this result contrasts with the expectation in figure 7.1.

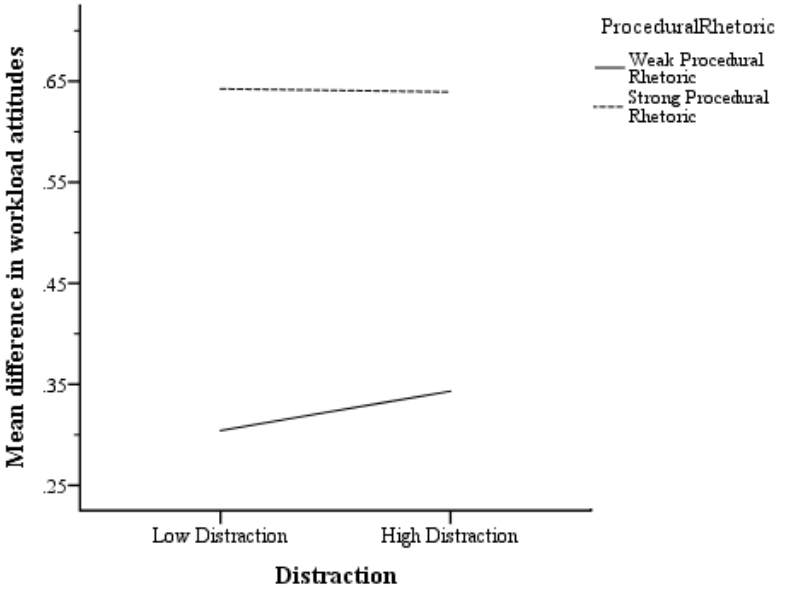


Figure 7.2: Graph showing the distribution of average attitude change under strong and weak procedural rhetoric and low and high levels of distraction.

7.4.2. Exploratory analyses

The confirmatory analyses showed that there were no effects on either attitude scale of the distraction manipulation. To follow up on this null result, the TLX scale scores – indicating cognitive load – were entered into subsequent analyses. As we expected TLX scores to be higher for high-distraction conditions without differing between procedural rhetoric strength, we performed a two-way Anova with both factors and the TLX as the dependent variable. In this model, procedural rhetoric strength had a significant main effect ($F(1,237)=13.3$, $p<.001$, *partial-*$\eta^2 = .05$), while distraction did not ($F(1,237)=0.9$). Respondents who played the games with strong procedural rhetoric (M: 9.3, SD: 4.2) reported higher subjective workload than those who played the games with weaker arguments (M: 7.3, SD: 4.1, $t(239)=-3.6$, $p<.001$, *Hedges' g*$_s$=.47). This means that the distraction manipulation very likely failed; participants did not perceive their

workload to be higher in the high-distraction conditions. Stronger procedural rhetoric did result in a higher perceived workload.

It is possible the TLX (i.e. subjective workload of the task the respondent was performing) became conflated with the attitude scale influenced by the games' procedural rhetoric (i.e. the workload of picking cotton in a field in Uzbekistan). To investigate this further, we performed stepwise linear regressions separately for low and high distraction conditions. In the first step, the TLX scores were set to predict workload attitudes, with the procedural rhetoric manipulation entered in the second step. Table 7.2 displays the results of this analysis. Perceived current-task workload predicted cotton-picking workload attitude change only in the low distraction conditions, though it did so independently of procedural rhetoric strength. Moreover, uncontrolled individual differences in perceived workload were about equally strong in their predictive power (β_{TLX}=.32 and $\beta_{rhetoric}$=.29) under conditions of low distraction, while rhetoric strength was the only predictor of attitude change under high distraction.

Table 7.2: Stepwise regression analysis for workload attitude change.

	Low distraction			High distraction		
Step and predictors	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.13***			.00		
NASA TLX			.36***			.01
Step 2	.21***	.09**		.06*	.06**	
NASA TLX			.32***			-.07
Procedural rhetoric strength			.29**			.27**

Note: * p<.05, ** p<.01, *** p<.001.

Finally, the cognitive identification scale was analyzed for its viability as an antecedent of attitude change resulting from manipulations in procedural rhetoric. A two-way Anova with both manipulated factors indicates that

procedural rhetoric had a strong effect on cognitive identification ($F(1,237)=37.6$, $p<.001$, *partial-*$\eta^2=.14$), while distraction exerted no such influence directly ($F(1,237)=.0$) or in interaction with procedural rhetoric strength ($F(1,237)=.4$). Strong rhetoric conditions showed a large difference in their cognitive identification (*M*: 3.9, *SD*: .7) from weak rhetoric conditions (*M*: 3.3, *SD*: .8, $t(239)=-6.2$, $p<.001$, *Hedges' g*$_s=.79$). To determine whether cognitive identification mediated the relationship between rhetoric strength and workload attitudes, a mediation analysis was performed using PROCESS (Hayes, 2013). Apart from a direct effect on workload attitudes ($F(1,239)=21.0$, $p<.001$, $R^2=.08$, $\beta=.28$), rhetoric strength also directly influenced cognitive identification ($F(1,239)=37.8$, $p<.001$, $R^2=.14$, $\beta=.37$). In the total model, rhetoric strength's effect became smaller ($F(2,238)=21.6$, $p<.001$, $R^2=.15$, $\beta_{cognitive}=.29$, $\beta_{rhetoric}=.18$), showing a small indirect effect through cognitive identification ($R^2_{med}=.05$, *95%CI*: .02-.10). Cognitive identification partially mediated the effect of rhetoric strength on attitude change, and so functioned as a psychological antecedent of attitude change as a result of procedural persuasion.

7.5. Discussion

The current study intended to investigate the way procedurally delivered arguments are processed by players. If strong arguments embedded in the gameplay of a persuasive game would have resulted in the strongest attitude change when players were not distracted and less (or no) change when they were, it would have been proof that players elaborate on procedural rhetoric in much the same way as they do verbally delivered rhetoric. This distinction was not found; although weaker and stronger procedural rhetoric led to robust, noticeable differences in attitude change, players who were in the 'high distraction' condition did not react differently than players in the low distraction condition. Although this could have been an indication that elaboration on procedurally delivered arguments occurs in a different way than with verbally delivered arguments, the manipulation check (in the form of the NASA task load

index) provided evidence for a simpler conclusion: the distraction manipulation was not successful in increasing cognitive load. Regardless of the added stimuli, players in either condition were able to elaborate on the message.

Two differences between the high- and low-distraction groups remained. Firstly, though only significant at .10 level – likely due to being non-normally distributed – players who were subject to more distracting elements played for a longer time. Secondly, the experience of subjective workload did not predict cotton-picking workload attitudes for 'distracted' players as it did for the low-distraction participants. Thus, though discrepancies were not found in cognitive load or attitude change, some part of the experience of the game was different between the low and high-distraction conditions. This difference caused players in the low-distraction condition to be more persuaded if their individual workload perceptions were higher. Whether high-distraction players were more able to unlink perceptions of their own workload from those of their in-game avatar because of (for example) greater perceived distance or reduced identification or whether another factor is in play cannot be determined with the current dataset.

Manipulating procedural rhetoric by tweaking a small aspect of the game's design (i.e. the amount of cotton picked per button press) affected the persuasiveness of the overall game. This part of the game's message was chiefly focused on how hard it is to pick the daily quota of cotton, which means the null results found with regards to the empowerment scale are easily interpreted. The manipulation was specific to that part of the message that hinges on the gameplay, so the interconditional differences on the workload scale can also be said to be borne out through the gameplay. This study therefore proved that procedural rhetoric meaningfully added to the persuasive heft of a persuasive game as a whole. Further support for this comes from the (partial) mediating effect of cognitive identification; more participants saw the way the game reflected cotton picking practices as realistic in the strong procedural rhetoric conditions, and so they were more convinced.

7.5.1. Limitations and future research

Although the current study provided evidence for the efficacy of procedural rhetoric, it was not able to force players into a peripheral processing route. This leads to three considerations for future studies into this topic. Firstly, the choice for *My Cotton Picking Life* as a stimulus was made on the basis of its accessibility and previously found indications of its effects (Jacobs, 2016). One drawback of *MCPL* was that its persuasive heft was predicated on the visualization of intense physical labor. The NASA task load index used in this study gauged the respondents' *own* sensation of workload, but its applicability as an indicator of greater cognitive load means it needed to be applied directly after playing the game. It is likely this influenced respondents to conflate their own sense of workload with that of their in-game character. Future studies should therefore include a game in which the procedural rhetoric is unrelated to task load. This also problematizes the use of, for example, September 12th (Frasca, 2003b) for studies in this area, since its message is predicated on the unwinnable nature of the conflict it portrays (Ruggiero & Becker, 2015).

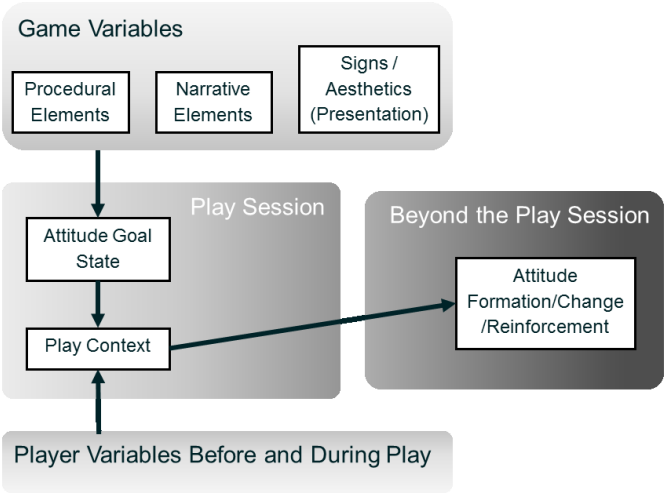
Second, cognitive load elicits peripheral processing only when respondents cannot recover from its effects. By giving players the time to play the game until they felt they were done, a compensation effect might have been created where players first had to adjust to the visual and aural intensity of the high-distraction games before being able to tune it out. Judging from the fact that differences in exposure time were almost significantly higher for distracted players, there is good reason to control this further. Putting more pressure on players can be done in two ways. *MCPL* is a rather sedate game without time pressure or action-oriented gameplay. Including stimuli with more frenetic gameplay (or, indeed, any kind of fail state) could help rush the player so that they are more likely to process any messages peripherally. Second, the intensity of the distracting elements could be increased. Adding a reaction time task to be performed simultaneously would at the same time present the chance to elicit peripheral processing (by decreasing the interval between prompts) as well

as measure cognitive load (by measuring response latencies). Alternatively, the games could be tweaked to be more personally relevant (acting as a trigger for elaboration (Malliet & Martens, 2010; Perloff, 2014)) for the sample by personalizing the experience for one condition and keeping it generalized for the other. With any of these solutions, however, care must be taken not to disturb the stimulus game's procedural rhetoric. The interconnected nature of game-borne persuasion means any change is likely to have ripple effects throughout the rest of the experience. The cognitive identification scale was operationalized from Williams and Williams' Multiple Identification Theory (2007) to support that any attitude change caused by the game was the result of procedural rhetoric. The finding of partial mediation of the procedural rhetoric manipulation on attitude change by cognitive identification supported the use of this scale, leading us to posit that future endeavors to uncover the additive effects of procedural rhetoric should include a variation on this measure (tuned towards the rhetorical goal, of course).

7.5.2. Conclusion

Based on the results of this study, we can conclude that procedural arguments can be an important part of the way in which games persuade their players. The current result corroborates the long-standing supposition in game studies that procedural rhetoric can act independently of verbal arguments (Bogost, 2007), by letting players act within a system to reach their own conclusions about its real-life counterpart. This type of rhetoric is warranted in cases where an agentic perspective is needed. Although the current study cannot bring conclusive results to the concept of elaboration on game-based messages, it is aimed to develop a method by which this goal can be reached in a realistic and reproducible way. Above all, the current study offers further insight into effects of procedural rhetoric, a persuasive dimension that is unique to games, with the end goal of determining what role games can take in the broader landscape of persuasive communication.

8. Hilarity Does Not Ensue: On the Role of Enjoyment in Persuasive Games



8.1. Abstract

Based on the findings of chapters 4 and 5, and in relation to previous work, the primacy of enjoyment in designing and researching persuasive games should be questioned. The current chapter describes how enjoyment is only one facet of players' experiences, and that their *eudaimonic appreciation* might be more important. Eudaimonic appreciation describes the evaluation of how an experience makes someone reflect or become a better person. As a measure of experience it gauges meta-emotions – positive feelings resulting from negative emotions such as sadness. By performing additional analyses on the data gathered for chapter 6 and 7 on the Persuasive Game Experience Scale, I show that players' experience with persuasive games can be differentiated as hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge. These factors are related to the effects found in previous chapters. Eudaimonic

appreciation is more clearly associated with persuasive games, while enjoyment plays an inconsistent role. Persuasion knowledge did not negatively affect persuasion knowledge in the present samples. Based on this, I draw conclusions on the importance of eudaimonic appreciation, and the value of including experiential measurements in further studies on persuasive games' effects.

8.2. Introduction

Despite the adjective in their title, serious games are typically evaluated in terms of their ability to entertain their players (Spagnolli et al., 2016). Bellotti et al. (2013) even place the mandate of serious games to entertain players before their educational purposes. As part of the wider view on serious games espoused in this dissertation (see figure 1.2 on page 33), I had already contended in chapter 5 that these games in fact need not always be fun to play (Jacobs, 2016). Fun is not always a prerequisite for their effects (Núñez Castellar, All, de Marez, & Van Looy, 2015). In fact, seeing persuasive games – serious games designed and used to persuade their players – as *fun* games first and meaningful experiences second disregards current knowledge about how and why we consume (persuasive) media. Entertainment media is known to elicit different kinds of gratifications beyond what is commonly regarded as 'fun' (Oliver & Bartsch, 2010), and this granularity has also been applied to entertainment games (Elson, Breuer, Ivory, et al., 2014), persuasive effects of interactive narratives (Steinemann et al., 2017), and even games for health (Crutzen, van 't Riet, & Short, 2015). In this chapter I will develop a more nuanced view of gratifications involved in playing persuasive games. I will build on the findings from chapter 5 by analyzing data from the studies performed for chapters 6 and 7 to offer a short multidimensional scale to robustly quantify experiential aspects of persuasive games. Before detailing these additional analyses, I will discuss the theoretical perspectives on gratifications of media and apply these perspectives to games that are built to persuade.

8.2.1. Hedonic Enjoyment and Eudaimonic Appreciation of Media

All mediated content holds meaning. When this meaning involves having fun, the result is often a breezy entertainment experience that consumers can use to regulate their emotional state (Zillmann, 1988). It can also be far removed from fun, however. Few viewers of *Schindler's List* (Spielberg, 1993) would describe their experience with this film as being fun (Oliver & Bartsch, 2010). Its setting and grim atmosphere might be depressing, but it also lends especial poignancy to its story expressing the importance of caring for one another in times of need. Rather than being fun first and foremost, entertainment media seek to provide gratifications based on the meaning they carry. This holds especially for games, since games can base their gameplay, narrative, and presentational style on the kind of meaningful experiences they aim their players to have (Elson, Breuer, Ivory, et al., 2014).

Apart from having fun, then, entertainment media also seek to let us experience other emotions. Oliver and Bartsch (2010) used the term *appreciation* to describe reactions to media that are not necessarily hedonistically enjoyable (i.e. inducing pleasure) but instead provide a *eudaimonic* reward - a sense of personal growth (Ryan & Deci, 2001). In this sense, experiencing *Schindler's List* positively does not involve seeking pleasurable sensations while avoiding painful ones, but reflecting on the bond between its protagonists and how we would act in similar situations. Eudaimonic appreciation is not dependent on the media content inciting a positive mood. It forms an evaluative dimension that is related to but distinct from enjoyment (Steinemann et al., 2017). Expanding on this, Bartsch (2012) divided the outcomes of media experiences into rewarding feelings and psychosocial functions. By mapping the concepts of hedonic and eudaimonic evaluations onto the experience of emotions from consuming media content, she noted that many aspects of what is called eudaimonic appreciation consist

of meta-emotions – affective evaluations of emotions experienced during the experience. Consumers can, in this sense, *appreciate* experiencing negative emotions. Moreover, both kinds of gratifications are intrinsically motivating, though they can lead to different outcomes; hedonistic enjoyment only leads to improved moods on the short term, while eudaimonic appreciation can also elicit a sense of meaning that persists for longer (Bartsch, 2012).

More recently, Bartsch and Schneider (2014) connected hedonic and eudaimonic experiences to persuasive messaging through Petty and Cacioppo's (1986b) elaboration likelihood model that was discussed in earlier chapters of this dissertation (chapters 2, 5, and 7). The short-term affective changes associated with hedonic enjoyment of content were linked to peripheral processing of persuasive messages, while longer term changes in cognition (such as meaning-making practices) associated with eudaimonic appreciation were linked to more central processing (Bartsch & Schneider, 2014). By itself, this does not translate to a recommendation that all persuasive games only elicit eudaimonic appreciation, since the two modes of experience are not mutually exclusive and can occur simultaneously. Overall, there is much that is still not known about how elaboration interacts with hedonic and eudaimonic experiences in persuasive media, especially when it comes to complex multimodal stimuli like games.

8.2.2. Enjoyment and Appreciation of Persuasive Games

Persuasive game research can greatly benefit from a more nuanced view on enjoyment and appreciation. Primarily, it would help to explain seemingly paradoxical effects. Although these issues are also found in more general games research (Crutzen et al., 2015), I will discuss three examples relating to persuasive games here. While studying *Darfur is Dying*, Peng, Lee, and Heeter (2010) found that the most persuasive condition (playing the game) was also the least enjoyable – less enjoyable, even, than watching pre-recorded play sessions. Conversely, in chapter 4 of this dissertation, our results indicated that

players who evaluated the game more positively also felt its message was more powerful. Later on in chapter 5, I found that players who had more positive experiences with the game and also had more persuasion knowledge ultimately showed greater attitude change.

The differences between these studies can be linked to the three different ways in which the positive experience was operationalized. In the first study, enjoyment was operationalized with a scale consisting of three items that read "I enjoyed playing this game/watching this video/reading this story, I think this game/video/this story is fun, and Playing this game/Watching this video/Reading this story gave me an entertaining experience" (Peng et al., 2010, p. 733). This type of questioning is closest to hedonic enjoyment. Because of hedonic enjoyment's primarily short-term affective impacts (Bartsch, 2012; Bartsch & Schneider, 2014), it is likely that this operationalization of enjoyment was simply uncorrelated to the meaning-making involved in persuasive effects. In chapter 4 of this dissertation, the game evaluation scale consisted of items on fun (e.g. 'I liked playing this game', table 4.1), but also of items evaluating the game's design ('This game looks beautiful', ibid.) and a basic 'grade' from 1 to 10. Whereas the scale used by Peng, Lee, and Heeter (2010) was related purely to the emotional experience, the scale we used also measured *attitudes* towards the game. As the message reception used in chapter 4 was not a full measure of a game's attitudinal effects but of *perceptions* of those effects, the link of evaluation and message reception found in that study could have been the result of a broader positive stance towards the game: knowing that the game was trying to persuade, a better evaluation of the game correlated positively with perceptions of its message (Reinhard et al., 2006). Lastly, the study described in chapter 5 (Jacobs, 2016) mixed hedonic ('I had fun experiencing this topic', table 5.1) with eudaimonic items (e.g. 'I have learned something new', ibid.) to be used as a measure that was then termed 'enjoyment and educational value'. Contrary to the Peng, Lee, and Heeter (2010) study, this measure had more overlap with eudaimonic appreciation, which could explain why the

findings were inverted from their study. Although the differences between these studies are partly due to their respective intentions, unifying the operationalizations of enjoyment would greatly improve the comparability of this work.

The second reason persuasive game research could benefit from a more nuanced view is the normative effect of discussing 'simple' enjoyment. By placing enjoyment front and center (e.g. Bellotti et al., 2013; Spagnolli et al., 2016), undue importance is placed on this aspect when it comes to both designing and researching these games. While the developers of some extreme kinds of games might understand that these games are not necessarily experiences wherein "we ask of ourselves, if we are having fun or not" (Neys & Jansz, 2010, p. 233), many more designers feel that persuasion (or more specifically, brand advertising) can only take place in positive environments (Mallinckrodt & Mizerski, 2007). While this strategy does pay dividends for advergame developers that aim for affect transfer (transferring a positive mood onto a brand attitude, Baker, 1999; Cauberghe & De Pelsmacker, 2010), it is simply not the only or even most traditional way persuasion works (de la Hera Conde-Pumpido, 2014a, sec. 1.3). As was stated in chapter 3 as well as by Ruggiero and Becker (2015), persuasive games do not need to offer the same experience as commercial-off-the-shelf (COTS) entertainment games. They can make players lose regardless of how they play; they can provide a bleak atmosphere without hope; they can even entice players to quit the game as long as it is in service of the message. Adherence to a mandate of fun or 'playability' can also cause messages to be oversimplified or lose part of their meaning (Fennewald & Kievit-Kylar, 2013).

Summarizing, to be able to properly categorize enjoyment-related findings and offer a counterpoint to normative design practices, we need data on the appreciation of real-world persuasive games. This includes investigating how players of argument-based persuasive games experience them as well as finding out what players base their post-play evaluations of these games on.

Research Questions. With this chapter, I aimed to offer support for a more nuanced and less normative view on experiential aspects of persuasive games. To this end, I will describe exploratory additional analyses on studies into the effects of three persuasive games and one COTS game. Based on the findings of chapters 4 and 5, I had included measures on hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge in two studies that I have previously discussed in chapters 6 and 7. In performing these analyses, I will attempt to find answers to the following research questions:

1. Does the appreciation of persuasive games consist of separate constructs (i.e. hedonic and eudaimonic)?
2. On what experiential elements do players base a numerical grade for persuasive games?
3. How do hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge relate to the effects of persuasive games?
4. How do hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge relate to other experiential aspects (i.e. cognitive and character identification) of persuasive games?

8.3. Methods

8.3.1. Overview of Studies

Four additional measures were included in the two studies discussed in previous chapters of this dissertation. The study performed in chapter 6 (*Playing Against Abuse*) is henceforth referred to as study 1, and the study in chapter 7 (*Procedural Arguments of Persuasive Games*) will be referred to as study 2. The additional measures included in the current chapter were in both cases administered after the main measures of each study and before debriefing took place. I will first summarize these studies before detailing the measures added for the current analyses.

Study 1. In this study we compared two persuasive games (*Power and Control* and *Another Chance*) on the same topic of relationship abuse among teenagers to a COTS control game (*Samorost 2*). Apart from (post-test only) attitude measurements on the acceptance of abusive behaviors, two scales were included to trace the influence of each game back to its persuasive emphasis. *Power and Control*'s (*P&C*) influence was intended mostly through its gameplay systems, leading to the use of a cognitive identification scale. *Another Chance*'s (*AC*) relied on narrative persuasion, so a protagonist identification scale was used (termed *character* identification for clarity). Study 1's main results were that both games affected some (but not all) of the attitude scales more than the control game did. No differences on attitudes were found between the two persuasive games themselves. P&C could not be distinguished from AC with regards to cognitive identification, though both were higher than Samorost 2 (S2). *AC* evoked more character identification than *P&C*, though players of *S2* had even higher scores.

Study 2. The study in chapter 7 investigated four different versions of the game *My Cotton Picking Life* (*MCPL*) in an effort to link procedural rhetoric (arguments embedded in gameplay systems) to current knowledge about how persuadees process persuasive messages from the elaboration likelihood model (Petty & Cacioppo, 1986b). A 2 (strong and weak procedural rhetoric) x 2 (few and many distracting elements) research design was employed with pre- and post-test attitude measurements. The four versions of *MCPL* were developed through analytical game design (Werning, 2017). This study included two attitude scales, one on the workload involved in Uzbekistani cotton picking practices and the other on perceptions of individuals' powers to stop this practice. The cognitive identification scale from study 1 was adapted to the current game's topic. Although procedural rhetoric was successfully manipulated, causing appreciable changes in attitudes, the distraction manipulation failed to increase the task load of respondents. Task load was, however, connected to procedural rhetoric strength. This was explained by a

connection between the specific gameplay rhetoric, which was intended to make a task seem harder, and the task load and workload attitude scales.

8.3.2. Sample

Study 1. As the topic of teen dating violence is most salient to younger audiences, a teenaged sample consisting of 147 secondary school students (aged 15 to 19) was drawn for this study. To attain the necessary statistical power, a second sample of 115 participants was drawn from an international university student population (aged 19 to 32). The total sample (N=262) consisted of slightly more male (55.7%) than female respondents. Over a third of the sample (35.1%) reported having a lot of experience with games, while only 13.0% had little to no experience[9]. Still, 62.2% did not consider themselves gamers, while 28.6% did consider themselves gamers. The sample was randomly but unevenly distributed across conditions to maximize the statistical power of comparisons between the two persuasive games: 99 played *P&C*, 102 played *AC*, and 62 played *S2*.

Study 2. 241 participants were drawn from a population of international university students, with a majority of women (70.1%). The sample's age ranged from 18 to 33 years. Compared to study 1, this study's sample had less experience with games (14.5% reported having a lot of experience, while 16.2% reported little to none), and 85.1% did not consider themselves gamers (only 8.7% did). Participants were randomly distributed across the four conditions in this study.

8.3.3. Measures

Before any other evaluative statements, respondents were asked to rate the game by giving it a grade from 0 (worst) to 10 (best). This type of grading is

[9] This information was not discussed in chapter 6.

colloquial among media critics, although it is typically constructed from multiple implicit elements (Jacobs et al., 2015). No other instruction was given for this question to avoid steering how participants composed this evaluation. Next, a ten-item five-point Likert scale was created to expand on the enjoyment and learning scale employed in chapter 5. Four items measuring hedonic enjoyment were adapted from Reinecke et al. (2012), and four more representing eudaimonic rewards were re-used from chapter 5 (see table 5.1). Lastly, two items relating to persuasion knowledge were taken from the broader obtrusiveness scale used in chapter 5 (ibid.). The attitude and antecedent measures used in the current analyses to answer RQ 3 and 4 were reported in chapter 6 (study 1) and chapter 7 (study 2).

8.3.4. Analysis

The differences in the samples and research designs of study 1 and 2 preclude direct comparisons between the two studies. I will therefore discuss the results of both studies side by side, demonstrating the robustness of the experiential measurements rather than comparing the four tested games on their experiences.

To answer the first research question, all experience evaluation items (i.e. the numerical grade and the ten items just discussed) were subjected to exploratory factor analysis with oblique rotation (direct oblimin) separately for both studies. Although 3 factors were expected based on the items themselves, factor analysis was exploratory because (1) these items had not been used together in prior work, (2) persuasive games had not been the stimulus material for these investigations, and (3) the sample differed between studies. Oblique rotation was used to account for correlations between factors. In study 1, the COTS game was excluded as part of this analysis, as the experience of persuasive games was the focus of this study and experiences of the two types of game likely hinge on different criteria. Parallel analysis was used to determine the number of factors to extract in each case. After reliability analyses, one item

('while I was playing this game, I was thinking about how much I enjoyed it') was removed in both studies. The subsequent scale scores all showed good interreliability (Cronbach's **α**: .78-.94). The persuasive game experience scale (with four subscales: numerical evaluation, hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge) used for the remaining research questions are listed along with their average subscale variables in table 8.1. I will discuss the results of the factor analyses in the next section. The remaining research questions were answered using linear regressions (RQ2-4) and Multivariate ANOVAs with Bonferroni-corrected post-hoc tests (RQ3).

Table 8.1: Persuasive Game Experience Scale included in the studies for chapter 6 and 7.

Item	Study 1		Study 2	
	M	SD	M	SD
Numerical evaluation (grade from 0 to 10)	6.4	1.7	3.5	2.4
Hedonic Enjoyment *(**α**: Study 1: .94, Study 2: .88)*	3.1	1.1	1.6	0.7
I enjoyed playing this game	3.3	1.2	1.7	0.9
This game was fun to play	3.0	1.3	1.6	0.8
I thought this game was an enjoyable activity	3.1	1.2	1.6	0.8
Eudaimonic Appreciation *(**α**: Study 1: .85, Study 2: .78)*	3.5	1.0	3.7	0.9
I have learned something new by playing this game	3.2	1.3	3.5	1.2
I liked learning about this topic by playing this game	3.3	1.2	3.3	1.1
I liked how the topic was presented in this game	3.6	1.2	3.7	1.1
This game had a strong message	3.7	1.3	4.1	1.0
Persuasion Knowledge *(**α**: Study 1: .87, Study 2: .85)*	3.1	1.2	3.6	1.0
This game was trying to persuade me	3.3	1.2	3.8	1.0
I was being persuaded by the game as I was playing it	3.0	1.3	3.5	1.1

*Note: Means and standard deviations are shown for each item and subscale average separately for the two studies, and Cronbach's **α** is shown for relevant scales. Study 1 was chapter 6 (Playing Against Abuse). Study 2 was chapter 7 (Procedural Arguments).*

8.4. Results

8.4.1. RQ 1 & 2: Differentiating appreciation

The first research question asked whether the appreciation of persuasive games could be differentiated into hedonic and eudaimonic elements. Factor analyses on the experiential items resulted in three separate factors for both datasets. A

clear division was found between items related to fun (e.g. 'this game was fun to play'), those relating to eudaimonic appreciation (e.g. 'I liked learning about this topic by playing this game'), and those gauging persuasion knowledge (e.g. 'this game was trying to persuade me'), as can be seen in table 8.2. Despite including different samples and persuasive games with completely different topics (dating violence and cotton picking practices), the item loadings are highly similar for both studies. The numerical evaluation showed a moderate loading on the eudaimonic factor (loading study 1: .64, study 2: .45). Its loading on hedonic enjoyment was smaller for study 2, and negligible for study 1 (study 1: .15, study 2: .33). Numerical evaluation was also unrelated to persuasion knowledge (study 1: .11, study 2: <.1). Summarizing, the experiential evaluations of the three persuasive games could be differentiated into hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge. Numerical evaluation was related to eudaimonic appreciation. Following factor and reliability analyses, the items were averaged into the persuasive game experience scale three separate subscales, leaving the numerical evaluation as a single item (see table 8.1).

The second research question was concerned with how players construct a numerical grade in light of hedonic and eudaimonic experiential elements. Linear regressions were performed separately for both datasets to predict numerical evaluation from hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge. The numerical evaluation was significantly predicted in both datasets. Looking at the persuasive game and the COTS game together in study 1, the three variables explained 39.8% of the variance on numerical evaluations ($F(3,257)=56.6$, $R2=.40$, $p<.001$). Both hedonic ($\beta=.39$, $p<.001$) and eudaimonic ($\beta=.43$, $p<.001$) subscales had medium-sized effects on numerical evaluations, while persuasion knowledge was unrelated ($p=.412$).

Table 8.2: Factor loadings for the Persuasive Game Experience Scale for each study.

Factor / Item	Hedonic *(1.7/2.5)*	Eudai-monic *(4.9/3.6)*	Pers. Know. *(1.3/1.2)*
Numerical evaluation (grade)		.64/.45	
I enjoyed playing this game	.88/.87		
This game was fun to play	.90/.88		
I thought this game was an enjoyable activity	.89/.84		
While I was playing this game, I was thinking about how much I enjoyed it*	.69/.53		<.40/.44
I have learned something new by playing this game		.83/.74	
I liked learning about this topic by playing this game		.67/.78	
I liked how the topic was presented in this game		.83/.77	
This game had a strong message		.77/.71	
This game was trying to persuade me			.93/.90
I was being persuaded by the game as I was playing it			.74/.76

*Note: Rotated factor loadings above .4 are shown for each study as 'loading study 1/loading study 2'. Factor eigenvalues are listed in brackets. PersKnow: Persuasion Knowledge. *: Item not included in the Persuasive Game Experience Scale.*

The results were different when only looking at the persuasive games in study 1: while the explained variance was roughly the same when the COTS game was excluded ($F(3,196)=46.8$, $R^2=.42$, $p<.001$), hedonic enjoyment lost some of its predictive effect ($\beta=.16$, $p=.009$), eudaimonic appreciation remained the same ($\beta=.47$, $p<.001$), and persuasion knowledge became significant at .05

level (β=.15, p=.015). All predictors were positive, indicating that greater hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge all contributed to a higher overall grade.

The same analysis on all four versions of *MCPL* in study 2 again showed predictive influences of hedonic enjoyment (β=.26, p<.001) and eudaimonic (β=.32, p<.001) appreciation but not persuasion knowledge (p=.151) (F(3,229)=23.2, R^2=.23, p<.001). The explained variance and regression coefficients were lower than in study 1, which indicates that the numerical evaluations for the four versions of *MCPL* were dependent on other criteria to a higher degree. Overall, both hedonic and eudaimonic experiences were consistently considered when evaluating persuasive games. The separate influence of persuasion knowledge found for the teen dating violence games was absent for *MCPL*. Apparently, there are differences among persuasive games (and possibly the samples of players) on whether persuasion knowledge adds to players' evaluation of the game as a whole.

8.4.2. RQ 3: Enjoyment, Appreciation, and Effects of Persuasive Games

Including the persuasive game experience scale in study 1 and study 2 allowed me to investigate whether enjoyment, appreciation, and persuasion knowledge contributed to the effects of persuasive games. As both studies investigated effects in different ways, I will discuss influences of experiential variables separately for each study.

Study 1 compared two natural persuasive games to each other and to a COTS game. A Multivariate ANOVA, performed to find differences in these variables across the three conditions, was significant with a strong effect (*Wilk's* λ: F(8,510)=61.4, p<.001, *partial-*η^2=.49). Differences were found on each of the experience subscales: numerical evaluation (F(2,258)=14.9, p<.001, *partial-*η^2=.08), hedonic enjoyment (F(2,258)=87.2, p<.001, *partial-*η^2=.08), eudaimonic

appreciation ($F(2,258)=93.6$, $p<.001$, *partial-*$\eta^2=.08$), and obtrusiveness ($F(2,258)=84.3$, $p<.001$, *partial-*$\eta^2=.08$). Numerical evaluation was highest for *AC* (*M*: 7.0, *SD*: 1.3), greater than *P&C* (*M*: 5.9, *SD*: 1.8, $p<.001$) and *S2* (*M*: 6.1, *SD*: 1.7, $p=.001$). *S2* and *P&C* could not be differentiated ($p=1.000$). A similar result was found for hedonic enjoyment ($M_{P\&C}$: 2.2, *SD*: .9, M_{AC}: 3.6, *SD*: .9, M_{S2}: 3.9, *SD*:1.0), though *S2* was not differentiated from *AC* on this variable ($p=.119$). Eudaimonic appreciation differed significantly between all conditions (all $p\leq.001$), with *AC* scoring the highest (*M*: 4.0, *SD*: .7), followed by *P&C* (*M*: 3.6, *SD*: .8), with both being higher than the control game (M_{S2}: 2.3, *SD*: .8). Lastly, persuasion knowledge followed the same pattern as eudaimonic appreciation ($M_{P\&C}$: 3.2, *SD*: 1.0, M_{AC}: 3.8, *SD*: .8, M_{S2}: 1.9, *SD*: .9, all $p<.001$). Summarizing these results, the two persuasive games differed on all four variables, with the narrative-oriented *AC* consistently scoring higher than the procedurally-oriented *P&C*. *AC* was graded higher, more enjoyable, more appreciated, and led to higher persuasion knowledge. On those variables influenced by enjoyment (the numerical evaluation and hedonic scale), the persuasive games were not consistently different from the control game. Eudaimonic appreciation and (unsurprisingly) persuasion knowledge was higher for the persuasive games than for the message-less *S2*.

When taking the results of study 1 (chapter 6) into account, it is clear the experiential differences between conditions were not uniformly reflected in these games' effects. Although *AC* was rated higher for all variables, it did not cause the game to be stronger than *P&C*. When comparing the two persuasive games to the control condition, one could argue that both games evoked higher eudaimonic appreciation and more persuasion knowledge, and were therefore more effective. Enjoyment was lowest for *P&C*, yet that game still had effects that *S2* did not. To see whether players who had better experiences with the two persuasive games in study 1 were also persuaded more, I performed linear regressions with the experience subscales predicting attitudes while *S2* was excluded. I focused here on the two attitude subscales where effects of the

games' were found: justification of angry and violent behaviors and self-efficacy with regards to dealing with abusive relationships. Neither justification of angry and violent behaviors ($F(4,195)=1.7$) nor self-efficacy ($F(4,195)=1.4$) were predicted from any of the variables. Players of either persuasive game did not have stronger attitudes if they graded the game higher, enjoyed their time with it more, appreciated its meaning more, or if they found the game's persuasive intent more obvious.

Study 2 compared different versions of one modified game (*MCPL*) to examine if persuasiveness can be influenced by stronger (or weaker) procedural rhetoric and more (or less) distractions. Another Multivariate ANOVA on the experience scale was performed with the two factors of rhetoric strength and distraction as independent variables. Similar to the attitudinal results discussed in chapter 7, experiential variables were only affected by procedural rhetoric strength (*Wilk's* $\boldsymbol{\lambda}$: $F(4,226)=7.3$, $p<.001$, *partial-*$\eta^2=.11$), and not by distraction (*Wilk's* $\boldsymbol{\lambda}$*:* $F(4,226)=.8$) or an interaction effect (*Wilk's* $\boldsymbol{\lambda}$*:* $F(4,226)=.4$). The differences caused by procedural rhetoric strength were limited to eudaimonic appreciation ($F(1,229)=20.3$, $p<.001$, *partial-*$\eta^2=.08$) and persuasion knowledge ($F(1,229)=10.2$, $p=.002$, *partial-*$\eta^2=.04$). Disregarding the level of distraction, appreciation was higher for strong rhetoric (M: 3.9, SD: .8) than for weak rhetoric (M: 3.4, SD: .9). Persuasion knowledge followed the same pattern (M_{strong}: 3.8, SD: 1.0, M_{weak}: 3.4, SD: 1.0). The game grade ($F(1,229)=3.1$, $p=.079$) and hedonic enjoyment ($F(1,229)=3.1$, $p=.078$) did not differ between strong and weak rhetoric conditions at .05 level. Just like in study 2, the level of distraction had no influence on any of the experiential variables, but rhetoric strength positively affected eudaimonic appreciation and persuasion knowledge. Playing the game with weakened procedural rhetoric lowered the participants' sense that the game caused personal growth while also lowering perceptions of the game's persuasive intent.

These results were followed up with two linear regressions on the attitude scales used in study 2, with the four experiential subscales used as

predictors. Procedural rhetoric strength was added as a predictor to control for the conditional differences that were just discussed. Workload attitude change (perceptions on how difficult it is to pick 50 kilograms of cotton) was significantly predicted using these five variables ($F(5,227)=9.3$, $p<.001$, $R^2=.17$). Numerical evaluation (**β**=.16, $p=.021$), eudaimonic appreciation (**β**=.23, $p=.003$), and rhetoric strength (**β**=.19, $p=.003$) predicted workload attitudes positively, while persuasion knowledge had no influence ($p=.643$). In this model, hedonic enjoyment negatively predicted workload attitude change (**β**=-.17, $p=.009$). The other attitude scale used in study 2 measured perceptions of empowerment to stop cotton-picking practices in Uzbekistan. This attitude was not affected by any of the manipulations in this study (chapter 7). Still, the model with four experiential variables and procedural rhetoric strength significantly predicted changes in this attitude ($F(5,227)=4.2$, $p=.001$, $R^2=.08$). Of all predictors, however, only eudaimonic appreciation had a significant positive effect on empowerment (**β**=.25, $p=.001$, all other predictors $p>.10$). Summarizing, workload attitudes (the primary attitude the game aimed to change) were higher for players who rated the game higher, appreciated it more, and who were in the strong rhetoric condition. Greater eudaimonic appreciation also coincided with feelings of empowerment (an attitude unaffected by the manipulated procedural rhetoric). Recognizing the persuasive game's intent had no influence on attitude change, while more hedonic enjoyment was related to reduced workload attitude change. Players who had more fun with the game could therefore be said to have been persuaded *less* on how hard it is to pick cotton.

8.4.3. RQ 4: Experiential Variables and Antecedents of Attitude Change

In both previous studies, measures were employed that intended to pin any resulting attitude change to specific persuasive dimensions. In study 1, character identification (otherwise referred to simply as identification) was used to indicate attitudinal effects of narrative persuasion, and cognitive identification (perceived

similarities between gameplay and real-world processes) in study 1 and 2 to highlight effects from procedural rhetoric. In the current study, I analyzed both scales on how well their scores are predicted by the persuasive game experience scale. As these antecedent variables reflect different aspects of the experience, I will discuss them in turn.

Character Identification. Linear regressions were performed on the two persuasive games of study 1 to predict character identification (i.e. feelings of similarity and closeness to the protagonist) from the four experiential variables. The condition variable was also included as a predictor, as the previous results showed that these experiential variables differed between conditions. The overall model was significant ($F(5,194)=6.3$, $p<.001$, $R^2=.14$), though individual predictors were not significant at .05 level ($p_{grade}=.264$, $p_{hedeonic}=.055$, $p_{eudaimonic}=.137$, $p_{persknowledge}=.173$, $p_{condition}=.106$). Hedonic enjoyment was close to significant (at .05 level) as a positive predictor ($\beta=.18$). When the two dating violence games were analyzed separately, a different pattern emerged: Though the smaller sample groups meant the models were statistically underpowered (*P&C*: $F(4,93)=2.1$, $p=.084$ *AC*: $F(4,97)=2.2$, $p=.080$), hedonic enjoyment predicted character identification only for *P&C* ($\beta=.25$, $p=.017$), while eudaimonic appreciation predicted this variable only for *AC* ($\beta=.31$, $p=.020$). Though a larger sample would have been necessary to determine this conclusively, the suspicion is raised that having more fun with *Power and Control* coincided with players identifying with its main character more, while (eudaimonically) appreciating *Another Chance* had the same effect.

Cognitive identification was used in study 1 and study 2 to detect how players see a game's systems as reflecting a real-world topic. In study 1, 49.7% of the variance in this scale's scores were predicted with the four experiential variables and the condition variable ($F(5,194)=38.3$, $p<.001$, $R^2=.50$). This strong effect was caused by the numerical evaluation ($\beta=.30$, $p<.001$), eudaimonic appreciation ($\beta=.53$, $p<.001$), and condition variable ($\beta=-.23$, $p=.001$), while hedonic enjoyment ($p=.446$) and persuasion knowledge ($p=.653$) had no effect.

This pattern was identical for each separate game. Having more fun with the games or recognizing their persuasive intentions did not coincide with players seeing similarities between the gameplay and real world, while eudaimonic appreciation did. Moreover, other (implicit) elements in the evaluations of these games that were expressed in the numerical evaluation were also related to cognitive identification.

Lastly, the same analysis was applied to the dataset from study 2, including procedural rhetoric strength as a fifth predictor. Again, the overall model explained a large proportion of the variance in cognitive identification ($F(5,227)=37.1$, $p<.001$, $R^2=.45$). Every predictor was significant apart from persuasion knowledge ($p=.121$). The strongest positive predictor was eudaimonic appreciation ($\beta=.50$, $p<.001$), followed by rhetoric strength ($\beta=.19$, $p<.001$) and numerical evaluation ($\beta=.12$, $p=.042$). The same negative effect of hedonic enjoyment on workload attitudes is seen on cognitive identification ($\beta=-.12$, $p=.024$). More variance in cognitive identification is explained through eudaimonic appreciation than through the experimental manipulations in this study. Participants who experienced the game as meaningful also saw its gameplay as reflecting reality, while players who enjoyed themselves more were slightly less likely to do so. Similar to study 1, the positive influence of numerical evaluation indicates other experiential elements apart from enjoyment and appreciation were still impactful on cognitive identification.

8.5. Discussion

In this chapter, I investigated the intricacies of enjoyment, appreciation, and persuasion knowledge in relation to persuasive games by applying the persuasive game experience scale. This 10-item scale consists of four subscales. Three subscales measure hedonic enjoyment (whether one is having fun with a game) taken from Reinhard et al. (2006), eudaimonic appreciation (whether one experiences personal growth from playing a game), and persuasion knowledge (how apparent a game's persuasive influence is). It also includes one item,

placed before the others, that simply asks participants to rate the game they played with a grade from 0 to 10. Corroborating previous results on the differentiation of positive experiences with media content (Oliver & Bartsch, 2010), I found that the hedonic, eudaimonic, and persuasion knowledge subscales clearly link to separate constructs. Players can experience fun, appreciation, and persuasion knowledge independently in persuasive games. Importantly, these factors can be reliably gauged with a small scale that is broadly applicable.

Using an undefined numerical evaluation allowed me to see what criteria are important for players in deciding how good a persuasive game is. In both of the datasets analyzed for this study, eudaimonic appreciation was the strongest individual predictor of this evaluation. Hedonic enjoyment was also related to this measure, while persuasion knowledge had a smaller influence for only two of the three persuasive games tested. These three subscales together explained much of the variance in numerical evaluations, but not all of it. Players very likely base their grading of a persuasive game on other aspects besides those measured by the other parts of the persuasive game experience scale. This highlights the importance of retaining such a broad measure alongside more specific scales. Numerical evaluations can help to see how well the other scales cover the players' experiences with a game. I therefore recommend the use of the persuasive game experience scale in full for any subsequent studies into effects of this kind.

The persuasive game experience scale has now been used in two separate studies with different samples, and its implementation shows how inconsistently specific experiential variables contribute to (or even detract from) persuasive effects of games. The hedonic enjoyment offered by all of the games in study 1 and 2 was unrelated to the games' persuasive effects. In study 1, one persuasive game was found consistently less enjoyable while its effects were identical to those of the more enjoyable title. In study 2, more enjoyment actually coincided with reduced attitude change. This effect was linked to

reduced cognitive identification; as the players had more fun with the game, they saw the game as less effectively modeling the real-world issue of cotton picking practices, and were less persuaded. Although it is important to keep monitoring this experiential factor, it should be clear from the current results that the importance of enjoyment in persuasive games should not be overestimated.

Eudaimonic appreciation was related to persuasive games more strongly, differing between the persuasive games and the control game in the same direction as the attitudinal effect in study 1, and changing along with the procedural rhetoric strength manipulation in study 2. Although eudaimonic appreciation did not help to predict attitude change in the first study, the second study showed its influence was on par with that of the manipulation, while it also affected the empowerment attitudes that *My Cotton Picking Life* was designed to change. Eudaimonic appreciation likely worked through increased cognitive identification. Whether seeing the game as a better reflection of the real world caused an increase in appreciation of the game's meaning or the other way around is not quite clear from these results, but this relationship also effected stronger attitude change (regardless of the experimental condition). In all, players appreciated the depth of thought offered by the persuasive games tested here. During debriefings, players reported being pleasantly surprised that games were employed to discuss these topics. Eudaimonic appreciation is a more uniformly important factor in the experience of persuasive games, and designers and researchers – especially those working on topics as serious as these - should strive to account for this in their work.

Lastly, the influence of persuasion knowledge in advertising research has mostly been found to be negative (Cauberghe & De Pelsmacker, 2010; van Reijmersdal et al., 2015), although Vanwesenbeeck, Walrave, and Ponnet (2016) found an anomalous positive effect on purchase intentions among children. For non-commercial persuasive games that employ arguments to support their position, however, persuasion knowledge did not exert this effect. While not

predicting attitude change as a result of persuasive games in either study, it was decidedly higher for the persuasive games in study 1 and also for the strong procedural rhetoric condition in study 2. Persuasion knowledge was unrelated to both of the antecedent factors used in this study. Participants who knew they were being subjected to an attempt to persuade did not display reactance behaviors. Although it is certain persuasion knowledge is important in this area of research, obtrusiveness of persuasive intent should not be a cause for concern for persuasive game designers.

8.5.1. Limitations and Future Research

A small limitation of the persuasive game experience scale should be noted. The relationship of persuasion knowledge with the other variables measured in both studies was mostly benign; having more knowledge of persuasive intent coincided with greater eudaimonic appreciation, and did not hamper effects. However, the ordering of the items used to measure these aspects of the experience was set, with persuasion knowledge items posed last, directly after eudaimonic appreciation items. It is possible that the earlier subscales contaminated the participants' responses to persuasion knowledge. Seen in this way, participants could have realized, while responding to the eudaimonic items, that a game made them reflect on deeper issues. This might have stopped them from seeing attempts to persuade as a bad thing, steering their responses to the last items. In subsequent studies with the persuasive game experience scale, I advise that the ordering of scales is randomized – though placing the generalized numerical evaluation before all others is still recommended.

As the current study's analyses were only a peripheral part of the research designs for chapters 6 and 7, some obstacles can be found that hinder the generalizability of these results. The biggest limitation relates to the motivations of the studies' participants. All of the games' players were aware (and gave informed consent) that they were participants in our studies. As these studies were experimental, participants did not choose to play these specific

persuasive games. They were not natural players (see chapter 4). This leads to two limitations. Firstly, the artifice of the experimental settings could have affected players' willingness to engage with the game's message. Since both messages were pro-social, participants could have been displaying socially desirable behavior in their engagement with the games' messages, whereas they might have not tried as hard or long to do so if they were natural players. Secondly, the experiential constructs investigated here are related to motivations for playing games (Ryan, Huta, & Deci, 2008; Ryan et al., 2006); seeking enjoyment or eudaimonic appreciation can both be reasons to start playing a (persuasive) game. By only observing artificially motivated players, no insight is gained into how the motivations for players to start playing persuasive games relate to their experiences. Enjoyment is not important for the games' effects among these samples, but it might factor into natural players' choice to play at all (All, Núñez Castellar, & Van Looy, 2015). Still, this is undoubtedly a more pressing issue among educational serious games where sustained or repeated play sessions are necessary for the games to work (e.g. games to learn arithmetic, Núñez Castellar et al., 2015), than it is for the usually one-off experiences the persuasive games discussed here tend to offer. Among persuasive games, the biggest threats presented by unenjoyable gameplay are reduced word of mouth (limiting games' visibility) and a disincentive to try similar games in the future (leading to a saturation point after a novelty effect). As it stands, it is unclear whether eudaimonic appreciation prevents these issues. To combat this uncertainty, future research should apply a multidimensional experience scale like the persuasive game experience scale in surveys of natural players. Natural players can be asked for their motivations to have started playing, their post-play satisfaction, and their intention to play more games like this or spread the word about them (also described as social facilitation, Neys & Jansz, 2010). By applying this kind of survey to different kinds of games that are distributed through diverse channels, we can start generalizing the enjoyment, appreciation, and persuasion knowledge that persuasive games elicit.

Another limitation posed by the current study's design is the inability to draw causal inferences from all of the analyses presented. Although conditional differences in the experience scale were almost certainly the result of differences between the games, it is unknown whether increased appreciation of *MCPL* caused players in study 2 to change their attitudes more, or whether greater attitude change caused players to appreciate the game more. Similarly, the finding of reduced enjoyment and greater appreciation with cognitive identification could be interpreted in both ways. Solving this issue requires experimental manipulations which need to be carefully designed. Changing enjoyment could for instance be done by manipulating participants' moods (Mackie & Worth, 1989; Perloff, 2014) before play, or by changing the design of the game to be less enjoyable – though the latter can easily affect the game's influence in other ways. Care needs to be taken to avoid hindering players' elaboration, among other things. However, such a direct manipulation of enjoyment would help to determine if enjoyment is indeed at all important for the effects of persuasive games in a more conclusive way than the current dataset allowed.

Although the three elements included in the persuasive game experience scale could be said to be the most universal and salient variables, other facets of players' experiences should also be considered. For example, presence could affect persuasion in different ways (Christiansen, 2014). The reason these more elaborate constructs were omitted for the current study, however, is generalizability. The games under investigation here were simple in design, with the most elaborate of the three being a 45-minute adventure game that is viewed from a top-down perspective. As these games are, on the whole, representative of a large group of persuasive games (chapter 3, Jacobs et al., 2017), evoking presence is not the priority in many currently playable persuasive games. I advise future researchers working with more elaborately designed persuasive experiences to include indicators of presence separately, alongside the persuasive game experience scale (Kors, 2015; Roomforthoughts, n.d.).

Lastly, study 2's failure to increase the cognitive load (operationalized as task load) of participants meant that our ability to draw conclusions on the kind of elaboration performed by players was hampered. Although enjoyment was not consistently related to effects in this study, enjoyment could affect the motivation to elaborate on a message by changing players' moods (Mackie & Worth, 1991). Future research expanding on the elaboration likelihood model and persuasive games should therefore include the persuasive game experience scale to determine the way enjoyment, appreciation, and persuasion knowledge affect players who elaborate more (or less).

8.5.2. Conclusion

We need to recognize that fun is just one of the many possible kinds of experiences persuasive games can offer. Persuasive games (and other serious games) invite players to think through a situation while they play. This is the primary motivation behind persuasive games' designs, and it is not something to shy away from. This chapter showed that, rather than being an a priori goal, the relative importance of enjoyment depends on the game's message. Based on the current data, the focus should lie with designing games that make their topics salient earnestly, providing engaging gameplay to aid eudaimonic appreciation instead of just being fun. Put simply, it is time for serious games to acknowledge their serious nature.

9. General Conclusion and Discussion

In this dissertation I tried to find answers to the questions (1) whether persuasive games 'work', (2) how they compared to other persuasive media, (3) and how they persuaded their players. In the introduction I also noted that, rather than conclusively proving the attitudinal effects of an entire medium, I intended to lay the groundwork for the research necessary to answer this question. This involved demonstrating how games' effects need to be studied from a perspective that includes elements from game studies and communication science, and delivering robust evidence to develop several research avenues.

9.1. Operationalizing the POPGEm

The Player-Oriented Persuasive Game Elaboration model (POPGEm) offered in fig 2.1 of chapter 2 (page 33) describes the elements in game, player, and play sessions that could add to persuasive influences. It also shows the mechanisms for these effects. Players engage with a game during a play session, forming a personal play context. The game comes into the session pre-equipped with gameplay elements, narratives, and a presentation style that allows it to deliver a message. This message is the game's *Attitude Goal State* (AGS), the total group of attitudes the game is intended to confer upon the player. By playing the game, experiencing its presentation, and following one or more of its narrative threads, the player engages with the AGS. The Elaboration Likelihood Model (Petty & Cacioppo, 1986b) would predict that whether or not players elaborate consciously on this AGS (i.e., negotiate its arguments) depends on the degree to which they are able and motivated to do so. Player and game variables can influence elaboration. From previous research it can be assumed that players with higher need for cognition, more personal knowledge, and for whom the topic is personally relevant are more likely to elaborate. The POPGEm posited that game factors have their own influences. Gameplay elements can motivate players by tying together the topic with in-game goals, and can affect their ability

to elaborate by (for instance) making a game more or less mentally taxing. Narratives can increase personal relevance when players can identify with in-game characters. Presentation elements can incite a certain mood, and might theoretically also influences the mental resources players have available to elaborate on the message. Based on this combination of play context, AGS, and ability and motivation to elaborate, players either process a message centrally (by elaborating more) or peripherally (where persuasion is stronger from peripheral cues). This processing extends even after gameplay has concluded, and leads to attitude change beyond the play session – which in turn could lead to behavior change.

The full effort of this dissertation was on answering the above research questions from the perspective of the POPGEm. Based on the results discussed in chapters 3 through 7, it is now possible to return to this model to determine what parts of the POPGEm have been addressed and which would benefit from follow-up investigations. Figure 9.1 describes the extent to which this dissertation covered the model.

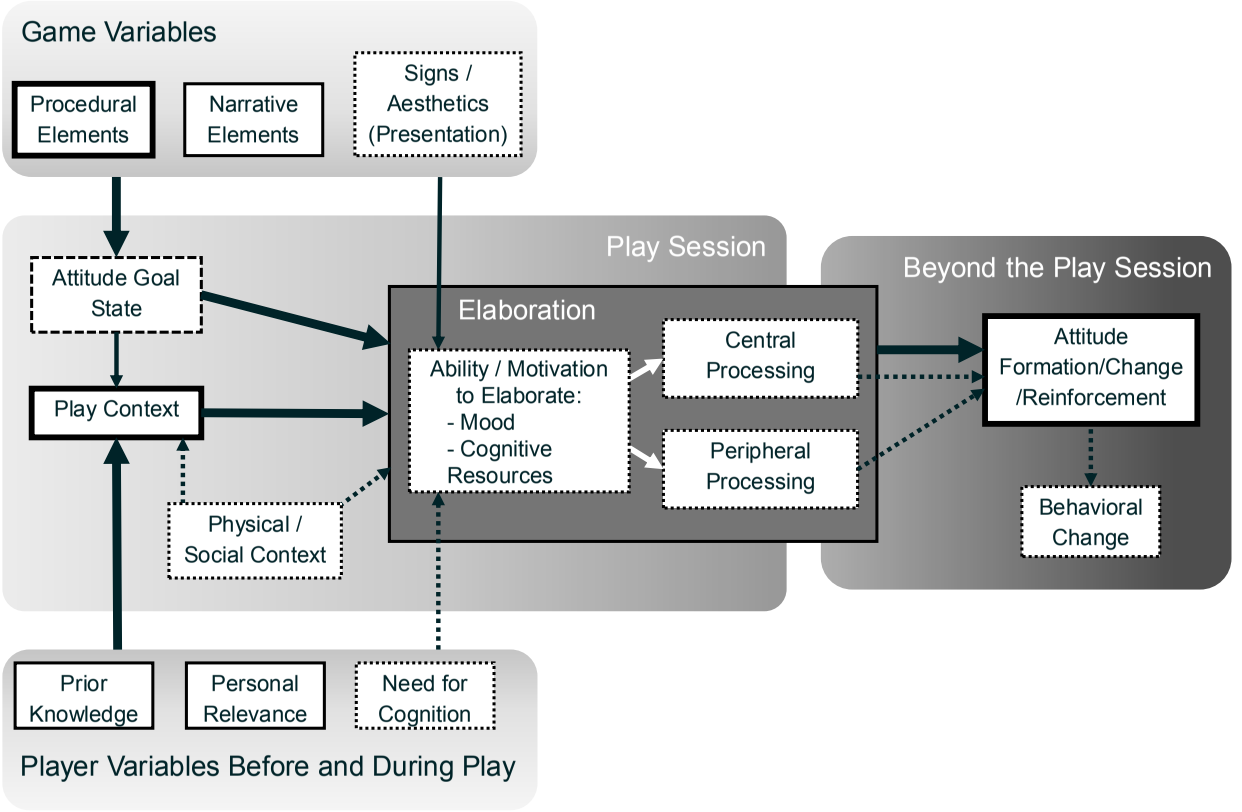


Figure 9.1: The Player-Oriented Persuasive Game Elaboration model (POPGEm) altered to indicate which elements and relationships have been addressed with empirical results in this dissertation (thick lines), which have been addressed but require follow-up (thin lines), and which have not been supported with data in this dissertation (dashed lines).

In chapter 3, 11 non-commercial persuasive games were discussed in terms of how they were designed to change different attitudes in their players. This qualitative study did not model the pathways in the POPGEm and it does not show effects of games, but it did affirm the factors included for the game and play sessions. The broad emphasis on procedural rhetoric across most of the sample lends further credence to the idea that existing persuasive games make use of this non-verbal argument (Bogost, 2007). For the purposes of validating persuasive games, new insight can be gained most efficiently by focusing on procedural rhetoric, as this factor is unique to games. Apart from procedural rhetoric, the games discussed relied heavily on linguistic elements, whether these were simply brief presentational elements or part of a longer narrative. The emphasis on text over other presentational elements can be attributed to the format of these games. They are often cheaply made by individuals or small teams, and are intended to engage players only as long as is needed to offer their message. They are not typically made for repeat play, and include arguments to support their points rather than relying on offering a positive experience and changing attitudes through affect transfer (like the type of advergames discussed by Waiguny et al., 2013).

The effect studies discussed in chapters 5 and 6 showed a direct link from the total game to attitude change beyond the play session. This link was established in chapter 5 by comparing *My Cotton Picking Life* to a YouTube clip on the same topic. *MCPL* and the clip conditions both saw attitude scores change from pre- to post-test, but those participants who played *MCPL* changed their workload attitudes more than those who watched the clip instead. In chapter 6, two games about teen dating violence were compared to a commercial-off-the-shelf entertainment game that was not related to this topic. The results of this study showed a specific influence of both games on the degree to which angry behaviors are tolerated and how players estimated their ability to respond to instances of abuse. Combined with the results generated outside of this dissertation (some are discussed in chapter 5),

evidence is mounting that games can indeed change attitudes with persuasive arguments. To provide an answer to this dissertation's first research question: Yes, persuasive games do work. They can change players' attitudes even after short play sessions. Still, the small effect sizes in this dissertation (and in other studies) and the null results encountered in some studies (e.g. Soekarjo & van Oostendorp, 2015) afford a reality check that is applicable to all types of effects of games. Persuasive games are one of multiple persuasive media, and though their effects might be different than other media, they are not a panacea. Some games will not work; this dissertation shows that a game can fail to change certain attitudes (among others) due to issues with the game's design, a mismatch between the game and its audience, or a failure to incite the processing route ideal to its specific message. When compared to non-mediated persuasion (e.g. being persuaded by friends, Perloff, 2014), effect sizes of their influences will likely always be small.

This dissertation also provides insight into how persuasive games work to change attitudes. There are indications that the mechanism of this influence runs through the specific AGS of each game. As the AGS is the sum total of all attitudes the game aims to change, exerted through procedural, narrative, and presentation elements, every specific game (or iteration thereof) has a unique AGS. *MCPL* as a holistic experience offered an AGS that was strongest on the workload attitudes (i.e. it made players visualize how difficult it must be to pick the daily quota of 50kg of cotton) compared to a non-interactive clip (chapter 5). Chapter 7 deepened these results by showing the AGS' focus on workload attitudes is derived from its procedural elements. By tweaking one aspect of the gameplay, the persuasiveness of the game as a whole differed considerably on the workload attitudes (but not the other attitudes), confirming that procedural rhetoric is a viable persuasive dimension that presents arguments non-verbally. More work is needed to show whether the AGS is dependent on *each* of these elements equally, as the only element manipulated to this end in this dissertation was procedural rhetoric (in chapter 7). On the face of it, the results of chapter 6

seem to deny that each game's AGS is unique; comparing two games on teen dating violence designed in completely different ways – one focusing on procedural rhetoric and the other on narrative persuasion – the results nevertheless showed absolutely no differences on their persuasive effects. The games could have balanced out their persuasive emphases towards the exact same message in such a way as to adhere to the criteria of the design challenge for which they were both conceived. Seen in this way, the games' near-identical AGSs were both constructed from different elements of the games. As the study in chapter 6 was sufficiently powered to detect even small effects, it is clear that any difference in effects that could theoretically exist between these games would be so minute as to have no practical significance. Whether the AGS can really be expressed in multiple ways without leading to persuasive effects can of course not be established based on these results, as it could also be the case that (for instance) procedural rhetoric is stronger than narrative persuasion, but that its specific execution in *Power and Control* was not as strong as *Another Chance*'s narrative persuasion (ultimately nullifying the difference).

This dissertation shows how the personal play context can provide insight into origins of effects specific to game-based persuasive elements. In chapters 6 and 7, media-psychological scales were implemented that can function as indicators of attitude change as a result of narrative persuasion and procedural rhetoric. The reliance on identification with protagonists (here termed 'character identification' for narrative persuasion is founded on the extant literature on (interactive) narrative persuasion (Green & Jenkins, 2014). Applying this scale in chapter 6 led to the inference (from interconditional differences in character identification) that *Another Chance* indeed offered a more engaging narrative than *Power and Control* did. The interpersonal differences on character identification among *Another Chance's* players had an effect that ran counter to the influence of *Another Chance* as a whole. Even though the game was more persuasive than the control game at least partly because of its narrative and protagonist, those identifying more with its

protagonist often had worse attitudes (i.e. more permissive towards abusive behaviors) than *Another Chance* players who identified less. Cognitive identification – the perceived similarity of gameplay systems and the real-world topic they aim to reflect – was included in chapters 6 and 7. Scores on this scale did not differ between players of *Another Chance* and *Power and Control* (in chapter 6), though they were higher for both persuasive games than they were for the entertainment game in the control condition. Similar to character identification, interpersonal differences in cognitive identification among players of *Power and Control* had effects on persuasion that ran counter to conditional differences. Since the persuasive games affected self-efficacy negatively, this means that players with higher cognitive identification felt *more* sure of themselves with regards to detecting and dealing with abusive relationships. In chapter 7, the relationship of cognitive identification with the other variables matched predictions more closely, partially mediating the effect of procedural rhetoric strength on attitude change. The interpersonal differences on both scales highlight the importance of applying antecedent scales with experimental manipulations, as the interpersonal effect was probably caused by a confounding variable outside of the study's design. The scales' usefulness in exploratory analyses and manipulation checks is significant, however, as they allow for a more in-depth look at the respective influences of otherwise entangled persuasive dimensions.

Chapter 8 also aimed to contribute to the knowledge base on the play context. By testing a new scale on hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge in the studies in chapters 6 and 7, the chapter makes clear that having fun is, in itself, not a good predictor of the effects of persuasive games. The results in chapters 4 and 5 on the (persuasive) influences of enjoyment were caused by an undifferentiated view of positive experiences during play. Notably, chapter 8 showed that eudaimonic appreciation – the experience of meta-emotions from meaningful play and the sense of personal growth – was more robustly associated with improved

persuasive effects. It makes sense that fun is not the state most persuasive games aim to evoke, as their topics are frequently not supposed to be fun. Persuasive games can be said to entertain us in the same way as tragic media would, offering personal growth and reflection through the conscious experience of emotions other than joy (Koopman, 2015). For the games and samples tested, knowing that the game is intended to persuade did not diminish its persuasive effects, and even led to higher general evaluations of the games. The small Persuasive Game Experience Scale offered in this chapter is of use to future researchers, especially when it is combined with antecedent variables such as cognitive or character identification and more specific sensations like immersion and presence.

While the link from game to play session to attitude change beyond the play session has been established in the previous chapters, this dissertation does not include studies directly investigating prior knowledge, personal relevance, and need for cognition and their influences on game-borne persuasion. Preliminary data at how especially the first two of these can affect the persuasive process is found in the discussion of chapter 4. This chapter describes how target audiences and actual audiences can differ considerably in their play context and perceptions of the AGS. Differences emerged from a survey among the natural player base of *Tweet, Chat, Like & Drive* that showed the game was liked more and caused more repeated plays in those players that were not legally allowed to drive. Self-reported message reception (the recognition of the game's status as a persuasive game) was also higher for this group. Crucially, this effect was not (completely) dependent on respondent age. The different results from these respondents are therefore linked to their inexperience with operating a motor vehicle and the behavior in question (i.e. smartphone use in traffic). It is probable license-less respondents had less prior knowledge and reduced personal relevance. As these two factors are positively related to elaboration, it is possible that message reception was in this case higher for players with peripheral processing routes. The pattern of increased plays and

greater enjoyment of the action-packed gameplay of *TCLD* found in this more appreciative crowd does fit well with an idea of a peripheral processing route affecting these players more positively (with regards to its negative message on behavior people typically have difficulty controlling) than a central one with greater elaboration. As the link between the message reception scale and actual attitudinal effects of the game is not proven, this mechanism is yet to be confirmed.

9.2. Future Research Directions in Persuasive Gaming

The POPGEm offers a theoretical scope to study persuasive games beyond the effects covered by the studies in this dissertation. In this section, the future research avenues previously presented in table 2.1 (on page 50) will be brought together with the current state of the model in figure 9.1, against the backdrop of the results obtained throughout this dissertation. Lastly, several research directions are highlighted that are not covered by the POPGEm.

The POPGEm, as a comprehensive model of argument-based persuasive game effects, highlighted five avenues of future research that would need to be followed to validate persuasive games (table 2.1). This dissertation provided data in three of these avenues: it added to the knowledge on the attitude-changing power of persuasive games (the first avenue), it attempted to disentangle persuasive factors in games (the second avenue), and it aimed to investigate how procedural rhetoric interacts with elaboration for its effects (the fifth avenue).

As discussed in chapter 2, more studies are needed on the effects of persuasive games. Future research should follow the strategy applied throughout this dissertation by carefully selecting or developing measures to accurately gauge each game's attitude goal state (AGS). While using pre-validated scales maintains construct validity, games rarely follow the same template. Moreover, regardless of whether a scale has been used previously or if it was designed for one particular experience, it is advisable to include multi-

dimensional attitude scales that operationalize the AGS with greater granularity. In all of the empirical chapters of this dissertation, effects were found in some, but not all of the attitude scales used. Researchers investigating effects of a persuasive game should extensively (play-)test (in a similar way to chapter 3's content analysis) the game in question for its AGS, and should either find validated scales or develop proprietary instruments that best match the AGS and (ideally) can be divided along the different persuasive dimensions used.

The same issue of persuasive game uniqueness complicates the choice of control stimuli. As discussed by Soekarjo and Van Oostendorp (2015), the control condition determines how the results can be generalized. In the effect studies in this dissertation, three different kinds of control stimuli are used, each with their own advantages and drawbacks. In chapter 5, the control stimulus was a non-interactive clip found on YouTube. Although this clip was close in AGS to *My Cotton Picking Life*, it was designed and published by an unaffiliated party, and its message was protesting a car manufacturer. In chapter 6, two persuasive games were compared against each other, with a COTS entertainment game seemingly without a message used as a control condition. In chapter 7, no external control condition was used; each of the four conditions was compared to the others. Which control stimulus is most useful for a study depends on the aims of the study. If the control condition needs to be a baseline to avoid test-retest effects or a no-treatment group, COTS games or other activities (such as cognitive tasks, puzzles, reading, or even simply waiting for a period of time) work best. If the question is whether a game is *better* at changing attitudes than existing media, competing persuasive messages are needed. If possible, specially developing a control stimulus to match the game's AGS in another medium is preferential (e.g. Peng et al., 2010).

In chapters 6 and 7, this dissertation took a few small steps towards disentangling heretofore holistically studied persuasive games. Being a combination of textual, audiovisual, and interactive elements, persuasive games almost always employ more than one modality in their attempt to persuade

players (de la Hera Conde-Pumpido, 2015, and chapter 3 of this dissertation). Future research should continue to manipulate parts of games to compare their effects, as was done in chapter 7. Procedural rhetoric's influence has more proof behind its effects in this dissertation, so finding the influence of narrative and presentational elements should take precedence. However, the problem with experimental manipulations of individual game elements is one of external validity. If existing persuasive games are used as stimulus material, it is easier to destabilize a game's collection of persuasive dimensions than it is to strengthen them. The most effective condition in chapter 7's study applied the version of the game that was most like the original *MCPL*. Game development is a difficult and often expensive process, and researchers should not underestimate the skill required to design comparable versions of games. On the other hand, comparing different games that had the same message (chapter 6) can adversely affect internal validity, making it unclear which of the multiple differences between any two games are causing effects to diverge. The use of antecedent scales (such as character and cognitive identification) that attempt to relate differences to specific elements of the game is advised in both types of study.

In chapter 7, the focus was on testing the effects of elaboration on the persuasiveness of procedurally delivered arguments. This study added to the knowledge base on persuasive factors in games and showed that modding persuasive games is a viable strategy, but the experimental manipulation to inhibit elaboration was not effective. Players who were exposed to more intense audiovisual elements did not perceive their cognitive load as higher, and ultimately did not change their attitudes more than those who had a more gentle experience. Possible explanations for this lack of difference were discussed in this chapter, with the chief reason being that the sedate nature of *MCPL* and the autonomy study participants had in playing the game until they were done might have given them the opportunity to compensate for the extra stimuli. These results underline the notion that successfully manipulating

cognitive load (or eliciting peripheral processing another way) while investigating procedural rhetoric is a delicate process. Further investigations should carefully balance alterations to the game on one level to avoid changing the procedural rhetoric of the game. A process of iterative testing and working closely with game designers seems optimal in this regard. More concretely, I advise subsequent studies to still attempt primarily audiovisual alterations, but in a game setting where players already have to make some timed or otherwise pressured decisions. Alternatively, players could be distracted with secondary tasks to be completed parallel to gameplay. Since this will alter the play experience, the study's results would not be useful towards the first avenue, but they would offer more fundamental insight into how players process procedurally embedded messages – which is arguably the more salient goal.

The third and fourth avenues in table 2.1 have not been addressed in this dissertation. It is an open question whether players can consciously infer a persuasive game's attitude goal state (which would be a prerequisite for elaborating on these arguments). One recent study into the abilities of players to verbalize the systems inherent in games found that these abilities should not be overestimated (Wasserman & Banks, 2017). However, persuasive games are typically short, and are only as complex as they need to be to exert their messages (chapter 3). While it is possible to address this issue as part of testing persuasive games' attitudinal effects by including open-ended or quiz-based questions before any attitude scales are shown to players, it is better to approach this issue qualitatively. This can be done by letting participants play games and write up their ideas of games' goals before interviewing them. The focus should lie with games that employ procedural rhetoric or combine multiple persuasive dimensions.

The fourth research avenue is concerned with the influence of player characteristics on the persuasive process. By including indicators for need for cognition, prior knowledge, and personal relevance as variables in quasi-experimental effect studies, the relative importance of these facets can be

established. Personal relevance can also be manipulated, by tweaking persuasive games to have some overlap with participants' lives (van Hoecke et al., 2016). Such a manipulation might again affect other parts of the experience, and so needs to be carefully designed. One issue that is critical is how need for cognition relates to elaboration in the context of game-based persuasion. Need for cognition has been found to increase (character) identification in interactive conditions but not in non-interactive narratives (Green & Jenkins, 2014). This highlights the gap in our knowledge when it comes to how need for cognition – which increases the tendency to elaborate in traditional persuasion – relates to different types of games. Including a need for cognition trait scale in studies investigating the link between procedural rhetoric and elaboration (the fifth avenue) is a good start to this.

The physical/social context during the play session (figure 9.1) is not included in any of the previously described research avenues, but its importance should not be overlooked. This factor could influence the personal play context and elaboration in ways that have not been investigated. The physical/social context has been a background factor in the studies described in this dissertation. Participants for the studies in chapters 4 and 5 could complete the study wherever they preferred, while the participants discussed in chapters 6, 7, and 8 were captive audiences, taking part in the study in a laboratory or classroom setting. One result of this switch is that *My Cotton Picking Life*, which was used as a stimulus in chapter 5 and 7, showed considerable differences in the average play time. Playing outside of the lab, participants played for less than two minutes, on average. By contrast, the version of the *MCPL* that had the shortest average play time in chapter 7 still lasted for almost six minutes. Although there were obvious other differences between the two play sessions, these exposure times show how different a playing experience can be in the lab or at home. Direct evidence from De Grove et al. (2012) on the differences between playing in a classroom or at home support the notion that this factor should be monitored – if not manipulated – in future studies.

The focus of this dissertation on short-term attitudinal effects means it provides little insight into what happens further beyond the play session. Although this is partly the remit of wider persuasion research (Ajzen, 1991), it is worth finding out whether effects of games have more permanence to them compared to other persuasive media – such as with the sleeper effect found by Ruggiero (2015) – or whether they are comparable to other single-exposure persuasion attempts. This should only be done for games that aim for such a permanent effect. The link to behavior change could also be more salient. In games where certain behaviors are taught and attitudes towards them are changed at the same time (e.g. *Underground*, Goris et al., 2014), barriers towards performing those behaviors (such as self-efficacy) can be more easily overcome than with traditional persuasive media due to the agentic nature of playing a game. The most efficient way to study both behaviors and long-term results is through a longitudinal study type (similar to the one used by Ruggiero, 2015).

Lastly, one important research direction outside of the scope of the POPGEm needs to be mentioned. Research into motivations to play games is maturing (Ryan et al., 2006), but it is very likely that people play persuasive games for different reasons than they do COTS games. Persuasive games are not meant to provoke a sense of accomplishment, and are sometimes even designed for players to fail (Ruggiero & Becker, 2015 and chapter 3), meaning that players do not get the same gratifications from these types of games. On the other hand, chapter 4's result that players often deny *Tweet, Chat, Like & Drive's* effects shows that many players were not playing this game to be convinced. As research builds towards a firm understanding of effects of persuasive games, the need arises to know why players would subject themselves willingly to mediated content that wears its intention to persuade on its sleeve. Unfortunately, this is easier said than done. Apart from smash hits like *Dumb Ways to Die*, which has accrued hundreds of millions of players (Metro Trains Melbourne, 2016), persuasive games are not yet part of the public eye. Conducting a survey among a general audience would therefore not be

effective. The best course of action is to collaborate with a party launching a new persuasive game by attaching a survey invitation to its end screen (as was done in chapter 4). If this is done as part of a multimedia campaign, the resulting buzz would generate enough interest to draw a sample. Making use of the Persuasive Game Experience Scale presented and validated in chapter 8 would aid researchers in finding correlations between interest (Jansz & Tanis, 2007) and motivations to play and to what extent expectations of more typical entertainment media were met.

9.3. Implications for Designers and Wider Game Research

Persuasive games *can* work. Their influences should not be overstated, and much is still not known about how they work, but from this dissertation it is clear that there are cases in which playing a persuasive game once can change the attitudes players hold immediately after play. This dissertation has implications for designers and the wider discussion on the effects of all types of games.

Although this dissertation was primarily meant to study effects (rather than design strategies), it is still useful to those having to take concrete design decisions. Although chapter 7 showed effects of games can hinge on key aspects, it is important to note we *broke*, rather than improved, *My Cotton Picking Life*, to test procedural rhetoric strength. Translating aspects of the real-world into elements to be embedded in a game and having them reappear as intended when the game reaches players is a process fraught with difficulties. That said, this dissertation should bolster the resolve of those looking to embed their message in a game. Once they are playing, players are open to arguments delivered in a novel way. For most participants, seeing the topic embedded in a game gave them a positive feeling (chapter 8). On both of the topics studied in chapters 5 through 7 (cotton picking slavery practices and teen dating violence), players had their interest piqued. Moreover, the results reported in chapter 3 show how even a small browser window can be used to exert powerful

messages on war, poverty, and life experiences. After players leave the game, they have been noticeably affected. Most importantly, they are affected by conscious reflection on the games' arguments. Even though it is definitely possible to affect players' attitudes without directly offering them a message, games can be more than this. They can be spaces where people can step in the shoes of someone they would never be, experiencing the world from another's perspective in a way no other medium allows. Players can then build attitudes from this assumed perspective. The most profound implication this dissertation has for designers, however, is the notion offered in chapter 3 (and tentatively supported empirically in chapter 6) that persuasive games can be designed in many more ways than is customary for entertainment-oriented game experiences. Persuasive game designers are not beholden to the same standards of long play times, progression systems, production quality standards, and even enjoyable gameplay (chapter 8). Simply put, they can design whatever it is they think will make players understand whatever the game is about in the clearest, strongest way. The results in this dissertation clearly demonstrate that players enjoy engaging with meaningful issues if they are embedded earnestly. Although the tentative idea is offered that multiple designs can end up being equally strong in chapter 6 (lending further credence to the creative possibilities inherent in persuasive game design), it is clear from these results that procedural rhetoric and narrative persuasion contribute to persuasiveness. Designs based primarily on either of these stand a better chance of persuading players than games in which these persuasive dimensions are not considered.

This dissertation also offers a novel position to the wider perspective on effects of games. Whereas the early response to videogames had been a fear of negative effects stemming from their often violent content (Elson & Ferguson, 2014), later sentiments were more often positive, saying games make us better at a myriad of things (Granic et al., 2013) or help to motivate us to weather adversity and unite (McGonigal, 2011). The current dissertation fits in between these two streams of thought. Games can persuade us towards certain attitudes,

especially if those attitudes can be evoked from personal experience with an issue. Whether this also works with anti-social, discriminatory, or violent attitudes is not something this dissertation can say. The current evidence on games influencing aggressive behavior or reducing empathy toward women is not robust (Elson & Ferguson, 2014; Ferguson & Donnellan, 2017). When looking at these studies from the perspective of the POPGEm, two explanations arise for why these negative effects are this way while the results of this dissertation point to a reasonably robust influence of persuasive games. Firstly, the POPGEm is focused on games that *intend* to persuade. The games tested are designed to discuss a real-world topic, and this is their (arguably only) reason to exist. Compared to commercial-off-the-shelf (COTS) games that primarily intend to entertain their players, persuasive games have a definable attitude goal state. In our model, this gives them an advantage, as it allows players to more clearly grasp what the game is about. The arguments COTS games could be said to offer in favor of violent behavior, sexism, or other attitudes are likely to be contradicted at different points in the game, or are at best secondary to games' entertainment motivations. Second, the absence of an AGS in COTS games problematizes the measures implemented in aggression research. Since it is safe to assume it has never been the goal of any gameplay, narrative, or presentation element to promote real-world violent actions or attitudes (even in the short term), attempting to gauge these attitudes and behaviors is not supported from a persuasive game perspective. These measures are distal; *if* a violent COTS game would promote violence, it would do so by normalizing in-game elements, such as that violence is an acceptable tool in the in-game situations. These attitudes would then have to carry over to often completely different external situations that most games do not reference[10]. Although it might be

[10] Although games like Grand Theft Auto V (Rockstar North, 2013) feature environments that are highly realistic, the same cannot be said for players' roles within these environments. Instead, players are required to commit criminal acts such as speeding, theft, and murder to progress, which distances the gameplay from everyday life.

said, when stretching the game's messaging, that players of *Wolfenstein: The New Order* (MachineGames, 2014) would be more inclined to commit violent acts, those acts would have to target enemies as uniformly evil as that series' Nazis to fit the game's attitudes. Support for this idea can be found in the application of ELM theories to attitudes towards weapons by Malliet and Martens (2010). By drawing the idea of what the game could theoretically be persuading players on from the games themselves instead of from the real-world issue of violence, these authors come a lot closer to finding negative effects of prolonged play of violent games by focusing on the weaponry involved in those games. It is not within the scope of this dissertation to determine whether COTS games have deleterious effects, but the application of the POPGEm to this situation holds that any such effect would have to be on a different level and through different mechanisms than the persuasive games in this dissertation make use of.

Over the course of this dissertation, I have spoken with people from different industry, academic, and lay backgrounds about persuasive games. To many, it is clear persuasive games have something to prove; they are games, after all, and games are still often thought to be non-serious ways to kill time. As the medium of games develops and serious games become more commonplace, this notion crumbles more and more; games are starting to play different kinds of roles in daily life. Still, as persuasive communication, they are more of an unknown entity than texts, documentaries, and door-to-door salesmen. The perspective seems to be that persuasive games need to prove not only that they work, but also that they deserve a place in persuasive communication by doing something unique. With this dissertation, I hope to have contributed in three ways: to the knowledge base around games' effects, to the ways persuasive games ought to be researched, and to the perception of the medium as a whole. I grew up while games were still considered either trivial fun or the best way to spoil a generation's worth of children. If this dissertation adds in some small way to the idea that games are not just capable of

persuasion, but are also worthy of being thought of as *persuasive communication*, I will consider it a win.

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Summary

This dissertation aimed to research the effects of persuasive games. This dissertation is part of a multidisciplinary project called 'Persuasive Gaming. From Theory-Based Design to Validation and Back', which was funded by the Netherlands Organization for Scientific Research and was started in 2013. Persuasive games are (digital) games in which the primary intention of its development is to shape, change, or reinforce attitudes towards a concept or object that is separate from the game to match a predefined attitude goal state. Even though these games are becoming more and more popular, effects-oriented research is scattered and in need of a theoretical framework. In chapter 2 of this dissertation such a framework is posited, and a call is sent for researchers to investigate persuasive games that offer arguments in favor of their position. In this summary I will outline the ideas, methods, and outcomes of each study. I describe six empirical studies on different facets of persuasive games, in pursuit of answers to the following research questions:

1. *Do persuasive games work?*
2. *How do persuasive games compare to other media and each other?*
3. *What are the mechanisms for the effects of persuasive games?*

Chapter 2, called ***A Validation-Oriented Approach to Persuasive Games***, contains the theoretical framework for the investigations described in later chapters. The Player-Oriented Persuasive Game Elaboration model is presented. This model builds from several models from game studies and persuasion research to offer a psychological perspective on what happens when a player sits down to play a persuasive game. Starting from the well-supported Elaboration Likelihood Model (Petty & Cacioppo, 1986b), it is noted that elaboration – considering an argument thoroughly – on game-borne persuasive arguments is a function of the ability and motivation of the player to do so. Next, Teresa de la Hera Conde-Pumpido's model of persuasive

dimensions (2015), separating these dimensions into pre-embedded elements and factors that are borne out during play. This distinction is important, as the play context itself is hugely dependent on the players and the physical and social setting in which play takes place. Players' agency is vital in two distinct ways. Firstly, the player, by playing the game, composes some interpretation of the game's message (termed an Attitude Goal State, or AGS). Secondly, the players hold motivations and propensities during play to start elaborating on this message. Depending on their level of elaboration, they can be convinced either by the arguments in the message or by cues in its presentation. Ultimately, players would change their attitudes (in the direction of the AGS) and, where applicable, their behavior. By centering this model on the experience during play on the basis of arguments embedded in the games, this chapter highlights the gap in our understanding of the processing of these arguments. The chapter engages with this gap, and concludes with five avenues for future research that will allow us to close it. The remainder of the dissertation follows three of these avenues.

Chapter 3 discussed *Key Features of Persuasive Games*. Using the model of 11 persuasive dimensions (de la Hera Conde-Pumpido, 2015) discussed in chapter 2, a total of 11 persuasive games were analyzed that were available for free online at the time of data collection. The list of games was not chosen at random, but as exemplars of well-known or salient persuasive games, representing different origins and topic areas. After grouping the games on three loosely connected themes (poverty and hardship, lived experiences and disorders, and violence and politics) each of these games were played to find which persuasive dimensions were emphasized. In certain cases, the persuasive emphasis seemed to muddy a game's message. Based on this sample, the conclusion can be drawn that online persuasive games provide an admirable array of persuasive dimensions in spite of the limited sensorial bandwidth they have available (i.e. a small window in a browser screen, with sound). They in most cases exert their message in more than one way, with the most emphasis

placed on procedural rhetoric (embedding a message in gameplay systems and rules), in-game text and visuals, and narrative elements. The simplistic (often 2D) designs mean that cinematic persuasive elements received comparatively little emphasis, and designers did not always capitalize on opportunities for social interaction. Overall, persuasive games were short, to the point, and were unconnected from design choices typically associated with commercial off-the-shelf (COTS) entertainment games. They were not made for the player to have fun, and were in some instances deliberately designed to make the player lose to get their points across. The games discussed in this chapter helped in the selection of games to study for the remaining empirical chapters.

The fourth chapter, titled ***Who's Playing Whom? Audiences of Persuasive Games***, describes the only study into a persuasive game's 'natural players' – players who were playing a persuasive game of their own accord. By placing a pop-up on the ending screen of the game *Tweet, Chat, Like & Drive* linking to an online survey, a sample was gathered that consisted solely of self-motivated players. Based on the game's topic of smartphone use in traffic, several factors relating to the game and the topic were generated. These factors were drawn from social cognitive theory (Bandura, 1986). The results indicated that there is much to learn from comparing natural players to those who play as participants in experimental studies. First and foremost, despite the game's objective of convincing players that smartphone use while driving a car is dangerous, a large proportion of its player base consisted of individuals without a driver's license. These often younger players were more consistently impressed by the game's presentation, gameplay, and message. While this might be partly due to the game's chunky aesthetic appealing to a youthful audience, recognition of the game's message was different for those with and without a driver's license, regardless of the players' age. Although this study was not equipped to determine effects, evidence is provided that playing this game more did not lead players to overestimate their ability to text and drive. At the same

time, however, most players did not see themselves as being influenced by the game.

Play to Win Over: Effects of Persuasive Games, chapter five, focuses on 'simple' effects of a persuasive game. Studies into persuasive games that compared their effects to a control group are discussed at the start of this chapter. Noting that most of the previous studies indicate some effects of the titles under study, the game *My Cotton Picking Life (MCPL),* discussed in chapter 3, was applied in an online experiment. The aim of this study was to compare the effects *MCPL* exerted - on its players' attitudes towards cotton-picking practices in Uzbekistan - to a video clip on YouTube on the same topic. The attitude goal states were operationalized as that picking cotton is hard work (workload), that the practice is modern-day slavery, and that consumers can exert some influence against it (empowerment). The results indicate that while the game and clip could not be differentiated in their effects from pre- to post-test on slavery and empowerment attitudes, the game was stronger than the clip in how it made players experience the workload involved in picking cotton. These results were notable, especially as an average play session lasted less than two minutes (slightly less than the clip) and the game's design was not complex. Based on these results, the conclusions is offered that persuasive games can be digital pamphlets, acting as non-intrusive interactive interstitials while still affecting attitudes in the short term.

The sixth chapter, carrying the title *Playing Against Abuse: Effects of Procedural and Narrative Persuasive Games*, centers on persuasive games that share the exact same goal. Developed as entries to an annual design challenge of a charity organization (Jennifer Ann's Group) working to reduce teen dating violence, two games were selected from among the growing catalogue of winning games. The first game, *Power and Control*, was selected for its emphasis on procedural rhetoric after being discussed in chapter 3. It was compared to a more recent contest winner, *Another Chance*, which emphasized its message through its linear narrative. Comparing two persuasive

games with different designs, presentational elements, and storylines on their shared message necessitated the use of two scales that would indicate attitude change through procedural rhetoric and narrative persuasion, respectively. Cognitive identification was operationalized from the concept of Williams and Williams (2007), measuring how closely a game's systems reflected a real-world topic. Character identification measured how close players felt to the games' protagonists, which is an indicator of narrative effects. Using attitude scales on the acceptability of abusive behaviors a study was performed among secondary school and university students. The results indicate both games affected some (but not all) of the attitudes compared to a COTS game control group. Specifically, the games influenced acceptability of angry and violent behaviors and self-efficacy. The scores on the latter scale were affected negatively, meaning players felt *less* confident in responding to abusive behaviors after playing either of the two games. The results also indicated no differences between the two games on their effects. Regardless of *Another Chance*'s greater character identification and the average play time being three times as long, it was not superior to *Power and Control* in changing attitudes. This chapter shares further considerations on why no differences were found, and note that there might be a sufficiency effect whereby games can affect players in multiple ways without one strategy overpowering the others.

The seventh chapter is called ***Procedural Arguments of Persuasive Games: An Elaboration Likelihood Perspective***. In this chapter, the concept of procedural rhetoric was operationalized from a perspective of persuasive communication. The aim was to replicate the elaboration likelihood model's (Petty & Cacioppo, 1986b) well-supported result - that the persuasiveness of verbal arguments relies on whether persuadees are able to elaborate on them – with gameplay-based arguments. Rather than test the presence or absence of these arguments, however, *My Cotton Picking Life* (analyzed in chapter 3 and tested in chapter 5) was modified to modulate the *strength* of its procedural rhetoric. One gameplay element was changed, making it much easier to

complete the game's previously impossible goal of picking 50 kilograms. Next, distracting visual and audio elements were included to generate high and low distraction conditions. The results support the idea behind procedural rhetoric; weakened gameplay-based arguments did not lead to the same level of attitude change as with versions where *MCPL*'s systems were left intact. The distraction manipulation did not affect the cognitive load of participants, meaning 'distracted' players were just as able to elaborate on the game's message as players in the low-distraction conditions. The chapter closes by discussing the way perceived workload (of playing the game) interacted with the attitudes towards cotton picking workloads, and offering advice for future research into this persuasive dimension.

The final empirical chapter (8: ***Hilarity Does Not Ensue: On the Role of Enjoyment in Persuasive Games***) engages with the traditional notion that serious games (and therefore persuasive games) need to be fun first, and effective second. While the rest of the media entertainment world has already moved on from unidimensional notions of enjoyment, serious games are still held to a limiting standard in design and in research. Here, a more nuanced perspective is offered on the experience of positive feelings while playing persuasive games, based on a distinction between simple fun (hedonic enjoyment) and more meaningful meta-emotions (eudaimonic appreciation). Eleven additional items were included in the studies described in chapters 6 and 7 that gauged these two types of experiences while also measuring persuasion knowledge and asking for a simple grade from 0 to 10 on how 'good' a game is. After demonstrating through exploratory factor analysis that this scale operationalizes the same three constructs (hedonic enjoyment, eudaimonic appreciation, and persuasion knowledge) in two separate studies with multiple persuasive games and varying samples, the chapter demonstrates that all three constructs contribute positively to the abstract numerical evaluation of a game. Based on these analyses, the Persuasive Game Experience Scale is offered; a 10-item scale to be used in future persuasive game effects research. The scale's

applicability in both studies is tested, showing that (1) hedonic enjoyment is either negatively related or unrelated to the effects of games, while (2) eudaimonic appreciation is more robustly linked to effects and relates strongly to cognitive identification. Lastly, (3) the influence of persuasion knowledge on persuasive games' effects is unlike its influence on advergame effects. Players who know they are being subjected to an attempt to persuade do not hold more negative attitudes, and greater knowledge relates to higher numerical evaluations. These results have implications for further research, noting especially that the persuasive game experience scale needs to be applied to natural players (as discussed in chapter 4), and lead to the recommendation that game designers and researchers alike step away from (hedonic) enjoyment as the benchmark of persuasive game experiences.

Chapter 9 concludes this dissertation by looking back on what can be said about the Player-Oriented Persuasive Game Elaboration model in light of the findings discussed in the empirical chapters. Advances were made on three of the five lines of research that the POPGEm pointed to. The dissertation focused on effects of different elements of persuasive games, and how the attitude goal state and play context can play an important role. Future research directions are apparent from the open research lines in the POPGEm and the gaps left in the studies that were performed. Primarily, these involve following up on effects research with a more focused look at which elements of games, players, and play sessions affect elaboration on games' messages. Insights beyond the POPGEm are also offered, pointing out how little we know of natural players of persuasive games and the motivations that cause them to seek such games out. Lastly, the wider implications this dissertation has are outlined. Designers could draw from the results of these studies that there are multiple ways in which they can try to persuade players, and that their efforts need not be constrained by commonly accepted criteria such as enjoyment. The results of this dissertation support the idea that persuasive games have effects when they are short and provide the player with eudaimonic gratifications (which is

more important than simply making the games 'fun'). A parallel is drawn between violence and aggression research – the negative side of the same coin of attitudinal and behavioral influences of games – and the POPGEm, offering an explanation for why negative effects of games are unlikely to be found on the same level as effects of persuasive games. This dissertation was intended to contribute in three ways: it added to the knowledge base of game effects, it showed the way forward in (persuasive) game research, and it marked a step in the development of the medium as a whole; persuasive games show that games need to be taken seriously as a medium of communication.

Nederlandse Samenvatting (Dutch Summary)

In dit proefschrift worden de effecten van persuasive games (rechtstreeks te vertalen als 'overtuigende spellen') onderzocht. Dit proefschrift is onderdeel van het multidisciplinair project 'Persuasive Gaming. From Theory-Based Design to Validation and Back', dat gesubsidieerd door de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) in 2013 van start ging. Persuasive games zijn digitale spellen die in beginsel ontworpen zijn om *attitudes* (houdingen) ten aanzien van onderwerpen buiten de gamewereld te vormen, aan te passen of te versterken om deze te laten te laten bewegen richting een doelattitude. Ondanks het gegeven dat deze games steeds populairder worden is effectonderzoek nog niet op gang gekomen. De onderzoeken die tot nu toe zijn uitgevoerd zijn versplinterd over meerdere onderzoeksvelden (zoals gezondheidszorg en politiek) en een theoretisch kader voor de effecten van persuasive games is tot nu toe niet geformuleerd. In hoofdstuk 2 van dit proefschrift wordt zo'n kader voorgesteld en worden onderzoekers opgeroepen op om juist persuasive games te bestuderen die door middel van argumenten hun standpunten bekrachtigen. Deze samenvatting beschrijft dit hoofdstuk en de zes daaropvolgende empirische studies. Al deze studies belichtten verschillende facetten van persuasive games met het oog op de volgende onderzoeksvragen:

1. Hebben persuasive games effect?
2. Welke effecten hebben persuasive games vergeleken met andere media (en andere persuasive games)?
3. Welke psychologische mechanismen worden door persuasive games aangesproken om spelers te overtuigen?

Hoofdstuk 2 (Een validatie-gerichte aanpak van persuasive games) bevat het theoretisch kader waarop de latere studies zijn gebaseerd. Dit theoretisch kader is de Spelersgerichte Persuasieve Elaboratie van Games theorie (SPEGt). De SPEGt bouwt voort op eerdere modellen uit gameonderzoek en persuasieve

communicatie om een psychologisch perspectief te bieden op wat er gebeurt als iemand een persuasive game speelt. Het basismodel van de SPEGt is het elaboration likelihood model (Petty & Cacioppo, 1986b), dat stelt dat elaboratie – het bewust nadenken over een standpunt – tijdens en na blootstelling aan een persuasieve boodschap een optelsom is van de mate waarin spelers gemotiveerd en in staat gesteld zijn om dit te kunnen en willen doen. Vervolgens wordt het model van elf persuasieve dimensies (de la Hera Conde-Pumpido, 2015) gepresenteerd. Dit model onderscheidt verschillende manieren waarop games boodschappen over kunnen brengen. De elf dimensies worden in dit hoofdstuk gescheiden in dimensies die voorafgaand aan het spelen door de designer in het spel worden verwerkt en in dimensies tijdens het spelen tot stand komen. Deze verdeling is relevant omdat de spelcontext in aanzienlijke mate afhankelijk is van de spelers en de sociale en fysieke omstandigheden waarin een game gespeeld wordt. Er wordt op twee manieren rekening gehouden met de autonomie van spelers. Ten eerste interpreteert de speler – door de game te spelen – welke boodschap (en dus doelattitudes) de game heeft. Ten tweede zijn spelers in meer of mindere mate in staat en gemotiveerd om tijdens het spelen actief na te gaan denken over de boodschap. Afhankelijk van deze elaboratie worden ze overtuigd door de argumenten in de game of passen ze bepaalde heuristieken toe op de manier waarop de game is gepresenteerd. Uiteindelijk schuiven spelersattitudes in de richting van de doelattitude, wat er ook toe kan leiden dat hun gedrag wordt aangepast. Door het model te richten op de ervaringen van spelers tijdens het spelen en op de argumenten die games aanbieden, leggen we de lacunes bloot in wat we weten over hoe spelers met deze argumenten omgaan. In dit hoofdstuk wordt deze ontbrekende kennis beschreven, en worden vijf onderzoekstrajecten geformuleerd die – mits ze gevolgd worden – ervoor kunnen zorgen dat de meeste vragen over de effecten van persuasive games beantwoord kunnen worden. In de empirische hoofdstukken die hierop volgen ga ik dieper op drie van deze trajecten in.

In het eerste empirische hoofdstuk (hoofdstuk 3: Belangrijke kenmerken van persuasive games) worden de elementen van persuasive games besproken die deze games hun overtuigingskracht geven. Met behulp van het eerder besproken model van 11 persuasieve dimensies is een kwalitatieve inhoudsanalyse uitgevoerd op 11 persuasive games die ten tijde van dataverzameling online speelbaar waren. Deze selectie was niet willekeurig. De games die besproken worden zijn voorbeelden van bekende en opvallende persuasive games. Tevens vertegenwoordigen ze het werk van verschillende soorten designers in wijd uiteenlopende velden. De games werden in drie thema's ingedeeld (1: armoede en tegenslag, 2: eigen ervaringen en aandoeningen, 3: geweld en politiek) om na het spelen van deze games te kunnen achterhalen op welke persuasieve dimensies de meeste nadruk werd gelegd. Hierbij werd bovendien gekeken of een dimensie ook in negatieve zin kan worden benadrukt (zodat het de boodschap van de game als geheel tegenwerkt). De analyse leidde tot de conclusie dat persuasive games die online te vinden zijn ondanks een beperkte bandbreedte (nl. een klein venster in een browser, met geluid) een indrukwekkend scala aan persuasieve dimensies aanspreken. Ze geven hun boodschap veelal op meer dan één manier door. In de meeste gevallen lag de nadruk op procedurele retoriek (het verwerken van een boodschap in gameplaysystemen en regels), inhoudselementen zoals tekst en beelden, en narratieve elementen. De simplistische (veelal 2D) ontwerpen beperkten de mogelijkheden om cinematografische elementen in te zetten bij het uitdragen van een boodschap. Daarnaast maakten ontwikkelaars niet altijd optimaal gebruik van sociale interactiemomenten. Over het geheel genomen bieden persuasive games korte, doelgerichte ervaringen die in de meeste gevallen niet overeen komen met commerciële games. Ze zijn niet ontworpen om de spelers te vermaken; in sommige gevallen dwingen ze de speler zelfs het spel op te geven om de boodschap te versterken. De games die in dit hoofdstuk werden besproken hebben de keuze voor stimulusmateriaal voor de volgende hoofdstukken geïnformeerd.

Hoofdstuk vier draagt de titel 'Met wie wordt er gespeeld? Het publiek van persuasive games'. In dit hoofdstuk wordt het enige (mij bekende) onderzoek beschreven dat de 'natuurlijke spelers' van een persuasive game centraal heeft gesteld. Door een pop-up link naar een online enquête te plaatsen op het eindscherm van de Nederlandse game '*Tweet, Chat, Like & Drive*' (*TCLD*) is een groep mensen aangesproken die geheel uit eigen beweging een persuasive game is gaan spelen. Voor deze enquête zijn vragen opgesteld over *TCLD* en over het onderwerp van deze game (het gebruik van smartphones tijdens het autorijden). De keuze voor vragen werd geleid door Albert Bandura's sociaal cognitieve theorie (Bandura, 1986). De resultaten van dit onderzoek gaven aan dat er veel te leren valt van het vergelijken van de natuurlijke spelers van een game met het beoogde publiek. Een aanzienlijk deel van de spelers van *TCLD* was niet in het bezit van een autorijbewijs, terwijl de game zich alleen bezig hield met het gebruik van smartphones tijdens het autorijden. Deze (veelal jongere) spelers waren wel meer onder de indruk van de game; ze vonden de grafische stijl mooier, vermaakten zich meer met het spel zelf, en waren meer onder de indruk van de boodschap over verkeersveiligheid. Hoewel dit deels toegeschreven kon worden aan de simpele en kleurrijke visuele stijl – die eerder een jongere doelgroep aan zou kunnen spreken – was de erkenning van de boodschap van de game ook anders voor spelers met of zonder rijbewijs terwijl de invloed van leeftijd statistisch constant gehouden werd. Ondanks het feit dat deze studie niet was ontworpen om effecten van de game vast te kunnen stellen, was er bewijs dat *TCLD* spelers niet in het verkeerde gedrag trainde. Spelers die *TCLD* vaker speelden schatten hun vaardigheden met smartphones in het verkeer hetzelfde in als spelers die het spel één keer hadden geprobeerd. Daarnaast was er over het algemeen geen tendens onder spelers om te erkennen dat het spel effect op ze heeft gehad.

In hoofdstuk 5 worden de 'eenvoudige' effecten van persuasive games besproken – de directe invloeden van volledige games in vergelijking met andere media. Aan het begin van dit hoofdstuk worden eerder gepubliceerde

onderzoeken bekeken. Met enkele uitzonderingen blijken persuasive games in redelijke mate in staat te zijn hun spelers op de korte termijn te beïnvloeden. Voor dit hoofdstuk werd de game *My Cotton Picking Life* (*MCPL*) toegepast als stimulus in een online experiment. Het doel van het onderzoek was de effecten van *MPCL* te vergelijken met die van een korte clip op YouTube over hetzelfde onderwerp – katoenplukken en slavernij in Oezbekistan. De doelattitudes van beide ervaringen waren dat katoenplukken fysiek zeer zwaar werk is, dat het een hedendaagse vorm van slavernij betreft, en dat consumenten een invloed kunnen uitoefenen om dit soort praktijken tegen te gaan. De resultaten waren samen te vatten als dat er geen wezenlijk verschil bestond tussen de game en clip op het gebied van slavernij en de invloed van de consument, maar dat de game spelers meer het gevoel gaf dat katoenplukken fysiek zwaar werk was dan de clip dat deed bij kijkers. Deze invloed is opmerkelijk, omdat respondenten de game maar kort speelden en de clip maar kort bekeken. Daarbij had de game een simpel ontwerp. Deze resultaten leidden tot de conclusie dat persuasive games digitale pamfletten zijn: ondanks dat ze maar kort de aandacht van spelers opeisen, kunnen ze toch gericht attitudes aanpassen.

Hoofdstuk 6 behandelt de effecten van games die op verschillende manieren proberen exact dezelfde boodschap bespreekbaar te maken. De games die hier zijn onderzocht gaan over mishandeling in relaties tussen adolescenten. Ze zijn ontwikkeld als onderdeel van een wedstrijd die jaarlijks wordt uitgevaardigd door een Amerikaanse liefdadigheidsorganisatie (Jennifer Ann's Group). Uit de groeiende catalogus van winnende games zijn twee games geselecteerd. De eerste van deze games, *Power and Control*, legt de nadruk op procedurele retoriek (en werd eerder besproken in hoofdstuk 3). Deze game werd vergeleken met een recente winnaar, *Another Chance*, die gebruikt maakt van narratieve overtuiging. Omdat we twee games vergeleken die ondanks hun gedeelde boodschap en doel volstrekt andere ontwerpen, verhaallijnen en presentatiestijlen boden, is ervoor gekozen om twee meetinstrumenten te gebruiken die als reagentia op moesten treden voor overtuiging door

procedurele dan wel verhalende retoriek. De eerste, cognitieve identificatie, had als insteek om te bepalen in hoeverre de spelsystemen in de gamewereld het beoogde proces in de echte wereld reflecteerden. Affectieve identificatie mat daarentegen de binding die spelers met de karakters in de games voelden (dat houvast geeft voor verhalende retoriek). Als hoofdinvloed van de games zelf werd gekeken naar de mate waarin mensen mishandelend gedrag accepteerden. Uit een experiment waaraan zowel middelbare scholieren als universiteitsstudenten hebben meegewerkt, blijkt dat de twee persuasive games invloed hadden op een aantal van de gemeten attitudes. Om precies te zijn verminderden de games de mate waarin boos en agressief gedrag acceptabel gevonden werd en *verlaagden* ze het zelfvertrouwen van spelers wat betreft het tegengaan van mishandeling. Hoewel dit laatste effect negatief lijkt, zou het gezien kunnen worden als een teken dat spelers gingen beseffen dat dit een groter probleem is dan dat ze het zich tot dan toe hadden voorgesteld. Eén van de andere resultaten was dat de twee persuasive games onderling totaal niet verschilden in hun effecten op spelers. Dat was verrassend omdat *Another Chance* spelers meer liet identificeren met haar speelbare personage en een speelsessie van deze game gemiddeld drie keer zo lang duurde als *Power and Control*. In dit hoofdstuk wordt gepoogd de vergelijkbare effecten uit te leggen. Games kunnen (door hun rijke scala aan modaliteiten) spelers op meerdere manieren beïnvloeden zonder dat één persuasieve dimensie noodzakelijk beter werkt dan anderen.

In hoofdstuk 7 wordt dieper ingegaan op de procedurele retoriek die eerder is besproken. Dit concept is geoperationaliseerd vanuit het perspectief van persuasieve communicatie door een breed gesteunde bevinding van het elaboration likelihood model opnieuw te testen bij persuasive games. Het elaboration likelihood model toont aan dat het effect van overtuigende boodschappen afhankelijk is van de mate waarin mensen kunnen *elaboreren*. Het is echter niet bekend of dit ook geldt voor procedurele retoriek - de non-verbale boodschappen die in gameplay zijn verwerkt. Omdat het simpelweg

weghalen van procedurele retoriek teveel gevolgen zou hebben gehad voor de ervaring die de game bood is besloten om de *kracht* van deze argumenten aan te passen. Hiervoor werd de game *My Cotton Picking Life* (eerder besproken in hoofdstuk 3 en 5) aangepast: door een kleine wijziging in de gameplay maakten we het eenvoudiger om het voorheen onmogelijke quotum van 50 kilogram katoen te plukken. Tegelijkertijd werden meer visuele en auditieve elementen gebruikt om spelers af te leiden. Deze aanpassingen zijn gebruikt in een experiment met vier condities (Twee versies met een goed en slecht werkend gameplayargument voor beide versies met veel danwel weinig afleiding). De resultaten lieten zien dat procedurele retoriek inderdaad slechter of beter kan werken; attitudes ten opzichte van katoenplukken waren meer aangepast door het sterke gameplayargument. De afleidingsmanipulatie heeft echter niet gewerkt. Spelers die aan veel visuele en auditieve extra stimuli werden blootgesteld hebben niet meer cognitieve druk ervaren dan spelers die een rustigere versie speelden. In de conclusies van dit hoofdstuk wordt naar voren gebracht hoe de ervaring van cognitieve druk (van het spelen van het spel) mogelijk gerelateerd was aan de attitudes ten aanzien van de zwaarte van het werk van de katoenplukkers. Hierop volgt een advies dat toekomstig onderzoek naar de verwerking van procedurele retoriek in goede banen kan leiden.

De titel van hoofdstuk 8 laat zich vrij vertalen als 'Onder deze pet zit geen pret: over de rol van plezier in persuasive games'. In dit hoofdstuk wordt het belang van plezier tijdens het spelen van persuasive games ter discussie gesteld. Gevestigde onderzoekers en ontwerpers van serious games (een bredere categorie waaronder ook de persuasive games vallen) zijn vaak van mening dat deze games in de eerste plaats leuk moeten zijn om te spelen en pas daarna effect hoeven te hebben. Mediaonderzoekers beseffen zich echter al langer dat er meer nuance zit in de manier waarop we media ervaren. Deze nuance wordt onderzocht met betrekking tot de positieve ervaringen bij het spelen van persuasive games door onderscheid te maken tussen simpel plezier (hedonisch plezier) en diepere meta-emoties (eudaimonische waardering). Er

waren 11 extra vragen meegenomen in de onderzoeken in hoofdstukken 6 en 7 die naast deze twee ervaringsvormen zowel de kennis van een poging tot overtuiging als een simpel gamewaarderingscijfer (van 0 tot 10) maten. Na het valideren van deze vragenlijst met behulp van exploratieve factoranalyse bleek dat het een goede maat bood voor deze drie ervaringsvormen (plezier, waardering en besef van de poging tot overtuiging). Daarnaast wordt aangetoond dat dat alle drie facetten *positief* bijdragen aan het waarderingscijfer voor de game als geheel. In dit hoofdstuk wordt de Persuasive Game Ervaringsschaal gepresenteerd, een batterij van slechts 10 vragen die toch robuust en wijd de positieve ervaringen rond het spelen van persuasive games meet. Door vervolgens met deze schaal opnieuw naar de effecten van hoofdstuk 6 en 7 te kijken werd het volgende vastgesteld: 1. Hedonisch plezier is niet of zelfs negatief verwant aan de effecten van persuasive games. 2. Eudaimonische waardering is robuust verbonden aan de effecten van games en correleert met cognitieve identificatie. 3. De invloed van het besef van de poging tot overtuiging is niet hetzelfde als bij advergames (games waarin een product of dienst wordt geadverteerd). Waar dit besef normaliter negatieve gevolgen heeft voor de overtuigingskracht van een advertentie, was het bij de persuasive games die hier zijn geanalyseerd geen tegenwerkende factor. Het droeg zelfs bij aan de waardering van de game als geheel. Op basis van deze resultaten worden aan het einde van dit hoofdstuk aanbevelingen gedaan voor toekomstig onderzoek, waarbij er nadruk wordt gelegd op dat de persuasive game ervaringsschaal toegepast zou moeten worden in onderzoek onder natuurlijke spelers (besproken in hoofdstuk 4). Daarnaast wordt ook gesteld dat gamedesigners en onderzoekers zich minder bezig moeten houden met plezier en meer moeten kijken naar de diepere emotionele ervaringen.

In hoofdstuk 9 trek ik algemene conclusies ten aanzien van de resultaten van de eerder besproken onderzoeken. Ik kijk met name terug naar de Spelersgerichte Persuasieve Elaboratie van Games theorie (SPEGt) uit hoofdstuk 2 om met de vergaarde kennis de vijf voorgestelde

onderzoeksrichtingen bij te stellen. Er is in dit proefschrift op drie van deze richtingen dieper ingegaan. Het proefschrift richtte zich op de effecten van verschillende onderdelen van persuasive games en hoe doelattitudes en spelerscontext hierbij een belangrijke rol vervullen. Daarnaast worden aanbevelingen gedaan voor vervolgonderzoeken die nodig zijn om een volledig beeld te schetsen van de effecten van persuasive games. Er moet voornamelijk vervolgonderzoek uitgevoerd worden door elementen van games, spelers en spelsessies te relateren aan het psychologisch proces van elaboratie. Naast de aanbevelingen die voortkomen uit de SPEGt wordt onderstreept hoe weinig we weten van de wijze waarop natuurlijke spelers besluiten een persuasive game te gaan spelen. Ten slotte plaats ik dit proefschrift in een bredere context. Game-ontwerpers krijgen op basis van de hier besproken resultaten het advies dat er meerdere manieren zijn waarop games spelers kunnen beïnvloeden en dat het verzorgen van een plezierige ervaring niet een vereiste is voor succesvolle persuasive en serious games. Er wordt ook een lijn getrokken tussen het onderzoek naar de effecten van persuasive games en effectonderzoek van games op het gebied van agressie. Hoewel ze als twee zijden van hetzelfde vraagstuk gezien kunnen worden, is het belangrijk te realiseren dat games die negatieve effecten toegedicht krijgen niet gemaakt zijn om mensen agressiever te maken. Hun ontwerpen staan daarnaast directe effecten in de weg. Op deze manier kan de SPEGt ook de effecten van games in bredere zin verklaren. Met dit proefschrift wilde ik op drie manieren een bijdrage leveren: ik wilde de kennis over de effecten van dit soort games vergroten, laten zien *hoe* persuasive games het beste kunnen worden onderzocht en aantonen dat games niet als speelgoed, maar als volwaardig communicatiemiddel gezien moeten worden.

Publications related to this project

Academic publications:

Jacobs, R. S., Jansz, J., & De la Hera Conde-Pumpido, T. (2017). The Key Features of Persuasive Games: A Model and Case Analysis. In R. Kowert & T. Quandt (Eds.), *New Perspectives on the Social Aspects of Digital Gaming: Multiplayer 2* (pp. 153–171). Oxford: Routledge.

Jacobs, R. S. (2016). Play to Win Over: Effects of Persuasive Games. *Psychology of Popular Media Culture*. http://doi.org/10.1037/ppm0000124

Industry publication:

Van Oostendorp, H., Warmelink, H., & Jacobs, R. S. (2016). The evaluation of health-oriented serious games and apps: A differentiated approach. Retrieved from http://growinggames.nl/results-validation-research/

Portfolio

Courses followed during the PhD-Project

Academic/Methodological:

- Workshop peer reviewing – RmeS (Amsterdam; December 2013; 1 ECTS)
- Master's course Advanced Qualitative Methods (CS5007) – ESHCC (Erasmus University Rotterdam; January-March 2014; 5 ECTS; grade: 7.4)
- Introduction to a PhD in Communication Science – ASCoR (University of Amsterdam; March-April 2014; 6 ECTS)
- Qualitative Methods – EGSH (Erasmus University Rotterdam; March 2014; 4 ECTS)
- Master class Eric Gordon – Netherlands Institute for Cultural Analysis (Free University Amsterdam; June 2014; 1 ECTS)
- Summerschool: Identity and Interdisciplinarity in Games and Play Research – Erasmus Intensive Program (Utrecht University; August 2014; 6 ECTS)
- Advanced Research Methods: Meta-Analysis – EGSH (Erasmus University Rotterdam; February-March 2015; 2.5 ECTS)

Didactic:

- Basic Didactics Crash Course – Risbo (Erasmus University Rotterdam; March 2014, 1 ECTS)
- University Teaching Qualification – Risbo (Erasmus University Rotterdam; September 2016 – February 2017)

Courses taught during the PhD Project

2013-2014:

- Communication Ethics – IBCoM BA-3 (one tutorial group)
- Research Workshop: Cross-National Comparative Research – IBCoM BA-1 (one tutorial group)
- Workshop Quantitative Data Analysis – Master's (two groups)

2014-2015:

- Quantitative Methods in Media and Communication – IBCoM BA-2 (three tutorial groups)
- Introduction to Statistical Analysis – IBCoM BA-1 (three tutorial groups)
- Communication Ethics – IBCoM BA-3 (two tutorial groups)
- Research Workshop: Cross-National Comparative Research – IBCoM BA-1 (one tutorial group)
- Internship coordination – IBCoM BA-3 (individual guidance, 2 students)

2015-2016:

- Quantitative Methods in Media and Communication – IBCoM BA-2 (three tutorial groups)
- Introduction to Statistical Analysis – IBCoM BA-1 (three tutorial groups)
- Communication Ethics – IBCoM BA-3 (one tutorial group)

2016-2017:

- Quantitative Methods in Media and Communication – IBCoM BA-2 (three tutorial groups)
- Introduction to Statistical Analysis – IBCoM BA-1 (three tutorial groups)

Conferences and academic workshops during the PhD Project

Conference: 24 hours of Communication Science (Etmaal)
Dates: 3rd - 4th of February, 2014
Hosting University and Location: Wageningen, The Netherlands
Work presented: Everybody's a Critic: The influencability of motion picture evaluations from expert and consumer reviews

Symposium: Big Data: Opportunities & Pitfalls for the Social Sciences
Date: 17th of June, 2014
Hosting University and Location: University of Amsterdam (Amsterdam), The Netherlands

International Summerschool: Identity and Interdisciplinarity in Games and Play Research
Dates: 18th - 29th of August, 2014
Hosting University and Location: Utrecht, The Netherlands
Work presented: Workshop Persuasive Gaming

Symposium: Playing God
Date: 17th of October, 2014
Hosting University and Location: Maastricht University, Utrecht, The Netherlands

Conference: ECC ECREA 2014
Dates: 11th – 15th of November, 2014
Hosting University and Location: Lusófona University, Lisbon, Portugal
Work presented: The Persuasive Properties of Games for Change: A Case-Based Analysis

Conference: 24 hours of Communication Science (Etmaal)

Dates: 2nd-3rd of February, 2015
Hosting University and Location: Antwerp, Belgium
Work presented: A Validation-Oriented Approach to Persuasive Games

Symposium: Surveillance, Big Data, and Digital Rights
Date: 24th of March, 2015
Hosting University and Location: Erasmus University Rotterdam, The Netherlands

Conference: Digital Games Research Association Conference
Dates: 14th – 17th of May, 2015
Hosting University and Location: Leuphana University of Lüneburg, Germany
Work presented: On the Reception and Influences of Persuasive Games: Play to Win Over

Conference: International Communication Association Annual Conference
Dates: 21st – 25th of May, 2015
Location: San Juan, Puerto Rico
Work presented: On the Reception and Influences of Persuasive Games.

Conference: Breakthrough Conference: Future Health Next Creativity
Date: 4th of June, 2015
Hosting University and Location: Hogeschool Utrecht, The Netherlands

Conference: Control Conference
Dates: 29th of September until the 1st of October, 2015
Location: Utrecht, The Netherlands
Work presented: Persuasive Gaming in Context project overview

ClickNL Research Meeting
Date: 12th of November, 2015

Location: Utrecht, The Netherlands
Work presented: Persuasive Gaming in Context project progress
Research Workshop: ECREA Digital Games Winter Workshop
Dates: 11th and 12th of December, 2015
Location: Ghent, Belgium
Work presented: Central, Peripheral, or Both? Toward a methodology for studying elaboration in persuasive games

Symposium: Serious Games Research Day
Date: 22nd of January, 2016
Hosting University and Location: Antwerp, Belgium

Conference: 24 hours of Communication Science (Etmaal)
Dates: 4th-5th of February, 2016
Hosting University and Location: Amsterdam (VU), The Netherlands
Work presented: The Persuasive Properties of Serious Games: A Case-Based Analysis. Second presentation: Play to Win Over: Audiences and Effects of Persuasive Games

Workshop: DiGRA.nl Pitching Event
Date: 28th of April, 2016
Location: Utrecht, The Netherlands
Work presented: Play to Win Over: Effects of a Persuasive Game

Self-hosted: PGiC Validation MiniConference
Date: 20th of May, 2016
Location: Rotterdam, The Netherlands
Work presented: Towards a validated model for the effects of persuasive games

Conference: International Communication Association Annual Conference
Dates: 8th to 13th of June, 2016
Locations: Tokyo and Fukuoka, Japan
Works presented: The Persuasive Properties of Games for Change: A Case-Based Analysis. Second presentation: A Validation-Oriented Approach to Persuasive Gaming. Third presentation: Play to Win Over: About the Effects of Persuasive Games

Conference: ECC ECREA 2017
Dates: 9th to 12th of November, 2016
Locations: Prague, Czech Republic
Works presented: A Validation-Oriented Approach to Persuasive Games

Workshop: DiGRA.nl Pitching Event
Date: 7th of February, 2017
Location: Utrecht, The Netherlands
Work presented: Procedural Arguments of Persuasive Games: An Elaboration Likelihood Perspective

Conference: International Communication Association Annual Conference
Dates: 25th to 30th of May, 2017
Locations: San Diego, United States of America
Works presented: Playing Against Abuse: Effects of Procedural and Narrative Persuasive Games

Workshop: DiGRA Flanders meeting
Date: 6th of June, 2017
Location: Ghent, Belgium

Curriculum Vitae

Ruud Jacobs (1987) holds a Master's degree in Psychology (cum laude, 2012, Twente University), and a Bachelor's degree in Psychology (2010, Twente University). While studying at Twente University, Ruud researched psychological determinants of movie downloading behaviors and the influence of movie reviews on reception modes and post-viewing evaluations. His bachelor's thesis was later published in *Computers in Human Behavior* in 2012, and his master's thesis was published in *Poetics* in 2015.

In 2013 Ruud started as a PhD candidate at the Erasmus Research Centre for Media, Communication and Culture (ERMeCC). His posting also included teaching duties in the International Bachelor of Communication and Media (IBCoM), leading to him earning a bilingual University Teaching Qualification in 2017. From 2014, Ruud managed the ERMeCC Digital Research Lab. In this capacity, he performed an inventory of research needs before designing a laboratory consisting of two physical spaces with various types of research equipment. He coordinates the lab's use up to the present, ensuring that the research staff at ERMeCC is able to make use of the lab's facilities when they need to. Between 2013 and 2017, Ruud participated in various international workshops and conferences. In 2016 he hosted a one-day conference on the effects of persuasive games in Rotterdam, the Netherlands. He was also a member of the ERMeCC PhD Club, participating actively in their bimonthly meetings.

As a media psychologist, Ruud is interested in how individuals engage with media. More specifically, Ruud investigates the persuasive aspects of media that are not typically considered persuasive (e.g. film reviews, games).


XIV

This dissertation describes four years of scientific inquiry into persuasive games – digital games designed to persuade – as part of a multidisciplinary research project funded by the Netherlands Organization for Scientific Research.

Playing to Win Over focuses on the effects of these games, with the aim to determine whether persuasive games 'work'.

This dissertation first proposes a theoretical model that describes the facets of game, player, and play context that are most important for persuasion to take place. Next, six empirical studies are described that highlight the relationships in this model, ultimately showing if and how persuasive games persuade their players.

ISBN: 978-90-76665-31-3