Persuasive gaming. From theory-based design to validation and back

1. Classification
GATHER (gaming) en Media & ICT

2. Project title
Persuasive gaming. From theory-based design to validation and back

3. Summary
Keywords: game; playful interaction; storytelling; persuasiveness; case-based validation research; research through design.

The research in this project is concerned with the characteristics, design principles, and effectiveness of persuasive gaming. We study gaming practices that combine the dissemination of information with attempts to engage players in particular behaviors and attitudes. A unique feature of the project is the collaboration with partners in the Dutch game industry enabling us to immediately relate and apply our knowledge drawn from Game Studies, Media Studies, validation research and research on Game Design to practical demands of the industry. Theoretically, we develop the innovative approach of a constant and intense interaction between what is drawn from theory with the actual design of game experiences. The subsequent merger between design and validation research provides a crucial testing ground to assess and validate the value of the knowledge we aim to produce. The process of persuasion is approached from a humanities perspective focusing on the interplay of different persuasive dimensions, including storytelling and playful interaction. The cases extend beyond traditional videogames incorporating also transmedia storytelling platforms and *ambient games* creating play experiences closely integrated in the context of e.g. city life, therapy or education. The ultimate goal is the construction of a dynamic model for persuasive game development and implementation that is accessible for the industry as well as the research community. We are confident that this close collaboration between the industry and the academic world will contribute to improving the international competitive position of the Dutch game industry.

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6. Discipline code

32.80.00: Media studies

7. Previous and future submissions

Niet van toepassing

8. Institutional setting

- Utrecht University, Faculty of Humanities, Research Institute for History and Culture (OGC)
- Erasmus University Rotterdam, Erasmus School of History, Culture and Communication (ESHCC)
- Eindhoven University of Technology, Department of Industrial Design

9. Period of funding

1 October 2013 – 1 October 2017

10. Composition of the research team and the participating partners

Consortium	**Name & title**	**Affilition**	**Period**	**Expertise; Role in project**
Main applicant	Prof.dr. Joost Raessens	Utrecht University	48 months	Media theory, game studies; supervisor
Co-applicants	Jan Willem Huisman	IJsfontein	36 months	Serious gaming, game design
	Prof.dr. Ben Schouten	Eindhoven University of Technology	48 months	Design of playful interactions; supervisor
	Prof.dr. Jeroen Jansz	Erasmus University Rotterdam	48 months	Validation research, game studies; supervisor
Scientific staff	Post-doc	Utrecht University	36 months; 0,8 fte	Persuasiveness
	PhD student; supervisor Prof.dr. Ben Schouten (Jansz, Raessens)	Eindhoven University of Technology	48 months; 0,8 fte	Design

	PhD student; supervisor: Prof.dr. Jeroen Jansz (Schouten, Raessens)	Erasmus University Rotterdam	48 months; 0,8 fte	Validation
Organization Synthetic model	Drs. Joke Witteveen	xmediaworks	36 months, part-time	Serious games consultant & producer
Consortium partners – cases	Bruno Felix	Submarine	36 months	Production studio, game design
	Jan Willem Huisman	IJsfontein	36 months	Serious gaming, game design
	Joke Witteveen	xmediaworks	36 months	Serious games consultant & producer
	R.J. Elbrink	Gemeente Eindhoven	24 months	Commissioner

Table 1: Composition of the research team and the participating partners

The main applicant Prof.dr. Joost Raessens (Utrecht University) is also leader of a project called *International Master Degree Game Studies*. Together with two Dutch universities (University of Technology Eindhoven, Prof.dr. Ben Schouten; Erasmus University Rotterdam, Prof.dr. Jeroen Jansz) and four foreign universities (see below) we are developing a joint degree master programme. As a first step towards such a programme we are organizing an intensive programme or summer school which will take place in 2013. The participating universities are:

- University of Tampere, Finland; MA Internet and Game Studies; Prof.dr. Frans Mäyrä.
- IT University of Copenhagen, Danmark; MSc Media, Technology and Games; Dr. Miguel Sicart, Dr. Gordon Calleja; Prof.dr. Espen Aarseth.
- University of the West of England; Digital Cultures Research Center/Play Research Group; Dr. Helen Kennedy; Dr. Patrick Crogan.
- University of Potsdam, Germany (Digital Games Research Center); MA European Media Studies; Dr. Mathias Fuchs.

Our research on persuasive gaming will play an important role in this programme; the researchers mentioned above will act as advisors.

11. Description of the proposed research

a) Innovation network and crossovers to other innovation networks

This proposal aims to build bridges between GATHER's research agenda's *Users and Interaction* and *Transfer of Gaming*, which includes design principles and effectiveness of games (GATHER, 2012, section 3.1). We consider this to be a timely endeavor as combining research on game content and playing games with research on game design and effectiveness promises to generate profound insights.

b) Scientific quality

Thus far, combining the contributions of different theoretical traditions has been rather uncommon in Game Studies. Our proposal is *innovative* in the sense that it critically integrates what has been accomplished in separate research traditions. Additionally, our collaboration with partners in the Dutch game industry enables us to immediately relate and apply our knowledge drawn from Game Studies, Media Studies and research on Game Design to practical demands of the industry. The cases of actual game design and validation included in this proposal provide a crucial testing ground to assess and validate the value of academic knowledge.

The research we propose is concerned with the domain of serious games (Ritterfeld, Cody & Vorderer, 2009; McGonigal, 2011). Serious gaming has expanded enormously in the past decade, but we share the conviction of many industry professionals and game researchers that the potential of serious games for health, education and civic engagement is far greater than what has been realized. Our contribution to future developments starts with narrowing the scope. We will build upon what game theorist Bogost (2007) has called "persuasive games", that is, gaming practices that combine the dissemination of information with attempts to engage players in particular behaviors and attitudes. This implies a focus on the positive effects of games as intended by their designers. As an aside, this also means that our proposal does not address the negative effects often attributed to entertainment games, for example regarding violence and addiction (Jansz, 2005; Raessens & Goldstein, 2005).

We organized our collaboration according to the model presented in Figure 1. Each pillar amounts to an accumulation of expert knowledge. The unique collaborative feature of this proposal is symbolized by the arrows representing the planned recursive interaction between different expertise areas.

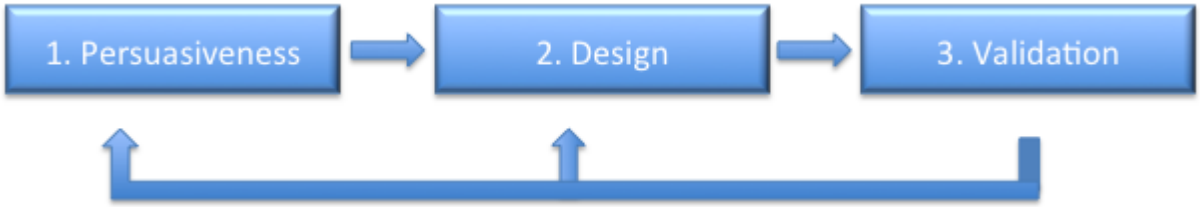

Figure 1: The research pillars Persuasiveness, Design, Validation, and their subsequent relations

Persuasiveness amounts to a critical assessment of previous theory and research on persuasive gaming and proposes storytelling in the context of playful interaction as a theoretical extension required by for the contemporary gaming landscape. *Design* covers research on design principles that are understood as the defining properties of persuasive games. *Validation* incorporates both previous research on effects of persuasive games and the case-based evaluation of new games and their impact. These pillars are translated into three *research questions* that also serve to underline the importance of the interactions between the pillars:

1. To what extent can the results of research on persuasive gaming be translated into design requirements?

2. In what way can design requirements be incorporated in validation research?
3. What does a case-based validation of new persuasive games offer to the design requirements and theory on persuasive gaming?

The close collaboration with our industry partners and their sponsors amounts to incorporating in our proposal the design, development and validation of actual cases of persuasive gaming. Table 2 summarizes the cases and their backgrounds. The Key issues embedded in the three pillars apply to all cases.

Case	Topic	Description	Key issues	Company	Commissioned by
Primary case: Depression Experience. Also: Alzheimer Experience; Handicap Experience	Health behavior, social support	A web experience that immerses viewers in the inner world of depression. The experience is a self-help tool also aiming at informing the depressed's social network	Persuasiveness (playful interaction, storytelling, rhetoric)	Submarine	Trimbos Instituut; Alzheimer Nederland; SIZA
KLOS, Kennis Ligt op Straat	Civic engagement, literacy	It aims at creating and disseminating general knowledge and media literacy and the role of the library in the process. It builds upon crowd sourcing and collaboration employing urban screens and smartphones	Design (iterative design, research driven design)	To be decided	OB Eindhoven, Gemeente Eindhoven
Non Zero Sum Inclusive Game	Inclusive working	An instrument to create awareness about an inclusive working environment. The hybrid game engine enables creating games with 'classical interventions' as well as 'persuasive gaming' interventions	Validation (case based validation, beta testing)	xmediaworks	Het Buitenhuis (part of Ministry of the Interior and Kingdom Relations), t.b.v. Belastingdienst, Rijksoverheid
Primary case: ABC game. Also: Afasie game	Health behavior, professional training	ABC is an anger management game providing health professionals with an immersive experience		IJsfontein	UMC St-Radboud; Erasmus MC

Table 2: The games that will be developed and used as cases in this Proposal.

The next section of our proposal provides detail for each pillar. After that we present in three sub-projects the theoretical and empirical research aiming at answering the research questions. The final section is devoted to integration by communicating our ultimate goal, that is, the construction of a dynamic model for persuasive game development and implementation that is accessible for the industry as well as the research community.

Ad. 1 Research on persuasiveness

Research on how audiences are persuaded by (mass-) media content is dominated by Petty and Cacioppo's (1986) Elaboration Likelihood Model. Although it has also been used in game research (Malliet & Martens, 2010), we find the ELM focused too much on individual psychological processes

to be applicable to the social features of today's gaming landscape. Its abstract nature also distances the ELM from helping game designers to develop more effective persuasive strategies. The alternative theory of persuasion we propose originates in the work of Bogost (2006; 2007) and kindred researchers (Flanagan, 2009; Brathwaite & Sharp, 2010). Inspired by Murray (1997) who identified procedurality as an essential property of games, Bogost's theory of 'procedural rhetoric' claims that computer games have unique persuasive powers because they can embed arguments in the rules of a game. Using procedural rhetoric in the analysis of persuasive games has proven its value, but has also shown the incompleteness of the theory (Raessens, 2009; De la Hera, 2012). We identify two problems resulting from its almost exclusive focus on game-rules. First, procedural rhetoric fails to address the presence of players and playful interaction as fundamental elements of the cultural context of gaming (Sicart, 2011; Salen & Zimmerman, 2004). Consequently, games developed within the proceduralist design paradigm are deprived "of the richness, pleasures and challenges that players bring to the game" (Sicart, 2011, p. 2). Our own recent work on *playful interaction* enables us to foreground 'play' in our theory of persuasion (Frissen, et al., in press).

The second problem is that procedural rhetoric tends to ignore the influence of other persuasive dimensions, such as texts, visuals, audio and narrative (De la Hera, 2012; Dubbelman, in press; Elias, Garfield & Gutschera, 2012). This problem has become even more pressing now that persuasive *gaming* extends beyond *games* in the strict sense as a result of the changing media landscape. For example, mobile access and pervasive or ambient play pushes persuasion across the boundaries of game procedures (Sturm & Schouten, 2011). We incorporate theories of 'transmedia storytelling' (Jenkins, 2006) and 'transmedial narratology' (Ryan, 2001, 2004, 2006) to emphasize the persuasive powers of stories to immerse or incorporate players in the game world (Calleja, 2011; Juul, 2005). Jenkins, for example, has shown how a fictional world can be created where media users feel the urge to track down bits of the story across multiple media channels. Ryan's work provides the basis to analyze *medium specificity*, that is, how stories unfold on and across different platforms. For example, in an online game, or a Facebook game in comparison to documentary and interactive video. The analysis results in a working theory on the persuasive power of stories in and across the different platforms that are and will be used in persuasive gaming.

Emphasizing playful interaction and storytelling in persuasion enables us to ascertain the specific contribution of game play and narrative content to the game's persuasive powers.

Ad. 2 Research on design

The design research in this proposal is guided by the influential MDA Model (Mechanics, Dynamics and Aesthetics) (Hunicke, LeBlanc, & Zubek, 2004). It conceptualizes games from the perspective of the designer who aims to develop an appealing game. The level of *Mechanics* describes the algorithms that determine the actions of game elements. The player's activity is irrelevant at this level as the mechanics are defined by the designer. At *Dynamics* player input does matter. Interactions between specific mechanics are conditional on players' input that may result in emergent game play that was not anticipated by the designer. *Aesthetics* describes the desirable responses of the players. Game design aims to develop games that evoke positive emotional player reactions, but obviously not all designs are successful in this respect (Tan & Jansz, 2008).

In the short history of games, the practice of game design mainly focused on games as a formal system (Mechanics), and less on the relations between games and players (Dormans, 2012). It often neglected the (emergent) qualities of games centered around player experience such as social inclusion or pleasure (Adams & Rollings, 2007). In redressing the MDA balance, this proposal puts Dynamics and Aesthetics in focus by developing a design theory that aims to translate player experiences into design requirements offering novel opportunities for play. We advocate the 'Research through Design' approach which implies that theoretical and practical knowledge is gained through the act of making (Zimmerman, Forlizzi & Evenson, 2007).

Two issues are fundamental in our design theory. The first is the design principles of persuasive games within the context of interactivity and narrative (Fogg, 2002). The underlying design assumption is that playful mechanisms, such as discovery, captivation or fellowship (Korhonen et al., 2009) can be used to persuade people to perform certain behavior by appealing to intrinsic motivations (Ryan & Deci, 2000). However, most of these assumptions have not yet resulted in clear design strategies. Our own research on exergames and playful interaction to fight obesity provides useful pointers for the theory's direction (Sturm et al., 2011). The second issue positions the aforementioned playful interaction in the heart of contemporary game design. The changing media landscape challenges design theory to become more open-ended, which means for example less fixed rules and opportunities for open negotiation between players. Again, a Dynamics and Aesthetics focused theory is still in development, but we are confident that working on the KLOS game offers valuable insights because it is meant to be an 'Always On' persuasive game that is not confined to one place, time or setting.

Ad. 3 Research on validation

In the past decade, a small research tradition emerged in Game Studies concerning the validation of games, that is, assessing to what extent a specific game succeeds in realizing its goals. The overall tendency in research on health games is optimistic. Despite the still limited amount of solid evidence, a substantial number of studies reported that games contribute to improving (young) people's knowledge, skills, attitudes and behaviors in relation to health (Papastergiou, 2009).

The research on games in school settings shows mixed evidence with respect to school related tasks and it underlines the importance of the actual context of play (Van Rooij, Jansz & Schoenmakers, 2010; Vogel et al., 2006). The impact on pupils' motivation is well supported and so are the positive effects on cognitive strategies (e.g. memory, problem solving). The evidence for substantial effects is very mixed. Some studies reported an increase in knowledge for specific subjects only and other studies found that pupils learned more from games in comparison with other methods (Huizenga et al., 2009; Wastiau, 2009).

Using games as a tool to encourage civic engagement is generally considered to be a promising avenue of research. To date, validation research in this domain is very limited. Our own research on political online games (e.g., Darfur is Dying) and PING (Poverty is not a game) showed promising results with respect to an increase in knowledge and a tendency to discuss the issue addressed with friends (De Grove et al., 2012; Neys & Jansz, 2010; Raessens, 2010).

Our critical assessment of validation research on serious games underlines the promising nature of this field. We also conclude that validation research has been rather narrow in focus. It was often done from a media effects paradigm, where the game is considered to be the stimulus and its response on players is measured. This causal model tends to ignore multiple contributing elements regarding the impact of games. We aim to develop a more balanced and a more complete theory by embracing a humanities perspective with an explicit focus on how players attribute meaning to what they play, which includes narrative content, game play and the Dynamics and Aesthetics of game design.

In short, the theoretical and methodological innovation of this proposal results from its integration of different research traditions in Game Studies, Media Studies and Design Research as well as the collaboration with industry partners. This kind of integration and collaboration has been rather uncommon in the international game studies research community. Consequently, the results of our research will be appreciated as an important contribution by game researchers across the globe.

c) Utilisation/relevance

The ambition of this proposal is to offer a scientifically based multidisciplinary contribution to the understanding of persuasive gaming that is closely tied to developments in the industry. Theory development in this proposal is innovative because it is embedded in and partly a product of the interactions with the research executed on design and validation (GATHER, 2012, section 3.1).

The ongoing 'ludification of culture' transforms the domain of play and games into something that is much more than a temporary and somewhat trivial escape from the seriousness of life (GATHER, 2012, section 3.1; Raessens, 2006, 2012). Furthermore, the cultural foregrounding of playful interaction in domains as, for example, education, communication, health, economics, warfare and civic engagement offers the Dutch gaming industry huge possibilities for economic growth and success. Dutch serious games companies have managed to establish an excellent international reputation in the past few years. It has resulted in numerous invitations to share knowledge and experiences in collaborative projects and at international conferences. In the coming years, it is vital for the Dutch industry to maintain and expand its strong position in this fast growing market. The intensive collaboration in this project between game companies and academic researchers with a clear focus on the demands of each community also aims to contribute to the improvement of the international position of persuasive games developed in the Netherlands.

d) Cohesion of the research

This proposal consists of one Postdoc-project and two PhD-projects. The Postdoc covers the aforementioned Persuasiveness pillar, the PhDs are concerned with Design and Validation, respectively. This practical division of labor is embedded in an organizational structure that aims to maximize substantial, methodological and executional *collaboration*. The project's organization underlines the recursive interactions modeled in Figure 1 (above) while also acknowledging that the landscape of persuasive gaming requires an agile crossing of disciplinary boundaries. The organization also includes a *synthetic study* aimed at comparing the sub-projects' results and integrating these into a general theory and model of persuasive game design (see Table 3).

Projects	Focus	Media	Cases
Postdoc	Persuasiveness	Social media, online game	*Primary*: Depression & Alzheimer Experience; NZS; ABC game; KLOS
PhD 1	Design	Ambient gaming	*Primary*: KLOS *Secondary*: Experiences; NZS; ABC
PhD 2	Validation	Social media, online game, ambient gaming	*Primary*: Experiences; NZS; ABC; KLOS
Synthetic	Persuasive Gaming in Context model	Convergence	All cases

Table 3: An overview of the projects to be executed as part of this proposal

Project 1 (Postdoc): Persuasiveness

This Postdoc project aims to advance our theoretical understanding of persuasion in relation to (transmedia) storytelling and playful interaction. Its theoretical focus is also meant to nourish Project 2 and 3 from the very beginning on. Therefore, we need an experienced game researcher in a postdoc position. The project is guided by three interrelated research questions:

1. how, and to what extent, can different dimensions of a game (*e.g.,* rules, texts, visuals, audio and narrative) be used for persuasive purposes?
2. what are the consequences of incorporating playful interaction as a fundamental feature of the cultural context of play for the persuasive properties of a game?
3. how can different media platforms be used in persuasive contexts in order to reach diverse audiences and to realize multiple goals?

Ad 1. The critical analysis of existing research and debates on persuasive gaming (see above) results in a detailed analysis of the role that audiovisual, visual and textual rhetorical layers could play in persuasive games, depending on the creator's persuasive intentions. Special attention will be paid to the power of narrative persuasion. We will not only ask if and how the use of narrative could help to reduce counter arguing and increase identification, but also how narratives can be used to provide information that might reinforce the procedural rhetorics (Dal Cin, Zanna & Fong, 2004; Heide Smith & Nørholm, 2009)

Ad 2. Playful interaction amounts to the player's experience of a game which generally amounts to a creative process of understanding and engaging in a dialectical relationship with the game system and, often, with other players. Previously, the different kinds of engagement have been theorized in terms of different levels of playability (Raessens, 2005; 2012; Rushkoff, 2012). Additionally, the theory of persuasion must take into account the player who breaks the rules, misunderstands them, and appropriates the spaces of play (Consalvo, 2007). This requires complementing procedural rhetoric with an account of playful interaction because play, for being productive, should be a free, flexible and negotiated activity, framed by the rules but not determined by them.

Ad 3. The critical analysis of transmedia storytelling (see above) is expanded into a detailed analysis of how contemporary persuasive gaming is put into play on different media platforms with a focus on

internet games and social media games. The potential (dis)advantages are identified and the analysis results in an assessment of potential target groups and ways to include multiple goals.

The research is partly theoretical-conceptual and partly case-based in order to ensure an immediate exchange between academic research and the game industry.

This project will combine different research methods. The primary method is the textual analysis of the different cases of persuasive gaming and the hypertext in which these products are embedded.

Project 2 (PhD): Design
This PhD project concentrates on the emergent development of design theory by using the cyclical methodology of the 'Research through Design' approach (Zimmerman et al., 2007). The research is organized in iterating 'design/make' cycles that enable us to distract knowledge from each step and to apply the knowledge critically in the next design step. The case based nature of this proposal using real cases guarantees feedback loops between our industrial partners, their sponsors and research, profiting from the results realized during Project 1 and Project 3. The PhD will also build knowledge by *reverse engineering* different cases in order to distract the design values and strategies. The project is guided by the following research questions:

1. what are the design strategies (tools, models and principles) that succeed in maximizing the persuasive properties of persuasive games?
2. how do we design for novel opportunities for persuasion across multiple platforms (apps, toys, social media) incorporating the open-ended nature of playful interaction in the present media landscape ?

AD 1. The PhD will develop tools, prototypes and proofs of concepts. The design values and core principles will be derived from theory and through exemplary design that builds on successful cases in which we focused on specific characteristics of the target group, emergent play and flow (Csikszentmihalyi, 1997; Hassenzahl, 2010; Deen & Schouten, 2010; Tieben, Bekker & Schouten, 2011). Consequently, MDA model's Dynamics and Aesthetics will be enriched and altered during the design/make cycles.

AD 2. The emphasis on novelty extends beyond the MDA model because it is too exclusively focused on in-game characteristics and related player experiences excluding other playful experiences stemming from players' needs, emotions or identity concerns (Jansz, 2005; Tan & Jansz, 2008). Little is known about the design values that could incite these player experiences and how to translate these into design strategies offering novel opportunities for persuasion. The focus is on current practices where games and playful interactions are embedded in trans-medial applications and games are more open systems in which players cooperate and create for instance in working and learning environments (education, training, lifestyle) (Sturm & Schouten, 2011; Sturm et al., 2011). Several mock-ups and prototypes will be developed targeted at specific groups, resulting in a set of exemplary designs and design guidelines, which will be used as input for Project 1 and 3. The results will be translated into procedures for *adaptive game design* and play practices. The KLOS game and its validation will serve as the primary case in the development of the design/make cycles.

Project 3 (PhD): Validation

The focus of this PhD project is on the impact of gaming on players in particular contexts. The project is guided by two research questions:

1. How do players of a persuasive game appreciate the game's narrative, the game play and the design features of the game?
2. To what extent succeeds the game in realizing its intended outcomes?

The questions will be answered in the four interrelated parts of this project.

Part 1: A critical assessment of previous research on the impact of serious games will be done from a humanities perspective in order to be able to include multiple factors that influence the game's impact. It aims to go beyond the simple cause and effects model in media-effects research by assessing the content of games as well as the player experience in the context of playful interaction.

Part 2: The development of a validation model for serious games. It consists in a set of criteria and the relations between the criteria. These are drawn from the results of Part 1 and subjected to a procedure to guarantee their practical value. Step 1 is the application of the criteria to 25 recent persuasive games in order to fine-tune the criteria as such. It is foreseen that the criteria need to be adjusted as a result of this application. Step 2 aims to profit from expertise in the industry. In depth interviews will be conducted with twelve game designers asking them to identify the factors contributing to high persuasive impact. They are also asked to give six examples of persuasive games with high impact. The Delphi method of meaning-making is used to analyze the interviews (Linstone & Turoff, 1975). This means that the researcher's interpretation of the interview is communicated back to the designers, inviting their feedback, which results in adjusting the interpretation. This interpretative cycle continues until shared meaning is established. Step 3 aims to profit from user's experiences. The top six games from Step 2 are used in a contextual play project. Each game will be played by four experienced gamers and by four members of the target group of that game. Think-aloud protocols are used to assemble the player's evaluation of the game. The protocols are linked to screen capture of play to enable minute comparisons between progress in the game and the player's self-reported experiences. The analysis of the protocols concentrates on deducting the implicit and explicit criteria used in the evaluation. In order to validate the researcher's interpretation, twelve of the participants will be interviewed in detail about their experiences and evaluation. The Delphi method will be used again in the analysis. Step 4 repeats Step 1 but now profiting from the knowledge produced in Step 1, 2 and 3. The result is an application of the revised validation criteria to 25 recent persuasive games.

Part 3: The impact of persuasive games in context. We propose to use a best-practice model in order to assess the impact of ten persuasive games in their context. The impact analysis includes players as well as institutions that commissioned the development of particular serious games (e.g., schools, health institutes, NGO's). This part starts with investigating the impact of six persuasive games that are already on the market and continues with the newly developed games that are part of this proposal.

Part 4: Constructing the validation model is the final part of this sub-project. It translates the results of the first three parts into a general model. Given the emphasis in this Proposal on the fruits of close collaboration between the game industry and research institutes, the practical applicability of the model is leading in this phase.

Project 4: Synthetic model of Persuasive Gaming in Context (PGiC)
The ultimate goal of this proposal is to synthesize the major results of the three projects into an innovative model of Persuasive Gaming in Context (PGiC) that is meant to be accessible for the gaming industry as well as the community of game researchers. It foregrounds *gaming*, that is, play on the multiplicity of platforms that is characteristic for the contemporary media landscape. The synthetic goal requires a critical comparison of the accomplishments of each project in order to select the elements contributing to the model. The three pillars of our present model (Figure 1 and 2) provide the starting point but the progress in our research will result in revising and complementing each pillar. Each project emphasizes one part of the model but also includes elements from the other parts. Given this emphasis on the relations between design requirements and persuasion in different contexts of validation, the model will have an extended theory of persuasiveness as its backbone profiting from the results of Project 1.

The actual development of the PGiC model starts in the second year and is completed by the end of year three. This time frame enables us to incorporate the first results from each project and to take the dynamism in media concerned with persuasive gaming into account and to draw conclusions about structural contextual features to be included in the final model. In organizational terms, the development of the model is a process that underlines the collaboration between researchers and industry. The elements of the model and the subsequent drafts will be critically evaluated at regular intervals by all researchers and the industry partners to make sure that the nascent model fits in both communities. As soon as possible, a draft of the model will be communicated in (inter)national forums to invite critical reactions for example at professional industry meetings and scientific conferences.

Word count: 4353 words.

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12. Work programme

We would like to emphasize that work programs are random indications rather than schedules that can be complete and exact. After all, as the domain of Game studies is characterized by continuous innovation, and subject of a rapidly evolving international research field, it is not unlikely that in the course of the research new applications, games or literature will have to be taken into account.

Collaboration between the researchers and the industry as well as within the research team is a key feature of this proposal. Monthly coordination meetings will provide a platform to discuss progress and issues among the postdoc, PhDs and their supervisors. In addition to the actual collaboration on the cases, the research team and the industry representatives will meet every four months to discuss progress and issues.

Work programme Project 1 (Postdoc): Persuasiveness

1 October 2013 - 1 October 2014:

In the first year, the postdoc will investigate how the different dimensions of a game in relation to its cultural context (*e.g.,* rules, texts, visuals, narrative, media platforms and playful interaction) influence or afford their persuasive strategies.

- Literature study: persuasiveness (Murray, Bogost, Flanagan, Sicart), transmedia storytelling/narratology (Jenkins, Ryan).
- Writing two state of the art articles about the dimensions of persuasiveness, one in an international peer-reviewed journal, and one in a games industry related magazine, such as *Control* or *Edge*.
- With the insights of this research, the postdoc will be able to support the other three projects, especially the development of the PGiC (Persuasive Gaming in Context) model.

1 October 2014 -1 October 2016:

In the second and third year, the postdoc will do the following:

- Further development the theoretical framework as researched in year 1, with a focus on persuasive gaming and transmedia storytelling.
- Further investigation of how different media platforms can be used in persuasive contexts in order to reach diverse audiences and to realize multiple goals.
- To relate this research to (inter)national case studies, especially the cases of our industry partners.
- Writing four state of the art articles about the dimensions of persuasiveness, two in an international peer-reviewed journal, and two in a games industry related magazine, such as *Control* or *Edge*.
- With the insights of this research, the postdoc will further support the other three projects, especially the development of the PGiC (Persuasive Gaming in Context) model.

Work programme Project 2 (PhD) : Design

1 October 2013 – 1 October 2014:

- Literature study: Assessment of (design) theory on persuasiveness in relationship to the different cases and in close collaboration with postdoc 'persuasiveness'.
- Analysis of a set of persuasive games that are already on the market, as well as the cases in the project.
- Design (Research) KLOS game: Analysis of target group KLOS Game, design requirements and first prototypes. In close collaboration with industrial partner.
- Interviews with 6 designers/experts from industry and design research.
- Writing and submitting the Review article (1), based on the above mentioned design research.

1 October 2014 – 1 October 2015:

- Interfacing (of transfer) design strategies to industry-cases.
- Interviews with second group of 6 designers/experts from industry and design research.
- Reverse engineering of specific and core design decisions of the several cases in this proposal.
- Revision and alteration of MDA model. Creating an alternative model for persuasive game design.
- Writing and submitting the article (2) on models for persuasive game design.
- Prepare selection of case-based games for validation (in collaboration with industry partners, postdoc and PhD validation).
- Knowledge transfer with industry (seminar, workshop).

1 October 2015 – 1 October 2016:

- From games to playful interaction. Literature study on persuasiveness and player experiences in transmedial games and playful interaction.
- Together with industrial partners. Selection and study of transmedial applications for play (case study).
- Design of several prototypes of playful interaction (in several domains) as the basis for design theory and knowledge building.
- Writing and submitting the article (3) on novel opportunities for persuasion and play across trans-medial applications, presented at the closing conference.

1 October 2016 – 1 January 2017:

- Validation of concepts of Play. Complete the case based validation study of Project 3.
- Writing and submitting the article (4) on business models and services for persuasive games and play.

1 January 2017 – 1 October 2017:

- Additional research to fill gaps and to incorporate recent developments.
- The articles submitted are the basis of the PhD thesis.
- Completing the PhD thesis with an Introduction and Conclusion.
- Rewriting parts of the thesis, finishing and approval of the PhD thesis.

Work programme Project 3 (PhD): Validation

1 October 2013 – 1 August 2014:

- Literature study: critical assessment of previous validation research and developing a humanities based alternative for this project.
- Analysis of a set of persuasive games that are already on the market.

- Interviews with 6 experts.
- Translating insights from literature, game analysis and interviews into elements of the PGIC model.
- Writing and submitting the Review article (1), based on the literature research.

1 August 2014 – 1 June 2015:

- Interviews with second group of 6 experts.
- Executing the contextual play project.
- Writing and submitting the article (2) on 12 expert interviews.
- Prepare selection of case-based games for validation (in collaboration with industry partners, postdoc and PhD Design).

1 June 2015 – 1 December 2015:

- Completion of the contextual play project.
- Executing the case based validation study.
- Translating the results from the validation study into elements of the PGiC model.
- Writing and submitting the article (3) on the contextual play project.

1 December 2015 – 1 March 2016:

- Complete the case based validation study.

1 March 2016 – 1 June 2016:

- Complete the first version of the PGiC model (to be presented at closing conference September 2016).
- Writing and submitting the article (4) on case based validation.

1 June 2016 – 1 December 2016:

- Writing and submitting the article (5) presenting the (revised) PGiC model.
- Additional research to be able to incorporate recent developments in persuasive gaming.

1 December 2016 – 1 October 2017:

- Additional research to fill gaps and to incorporate recent developments
- The five articles submitted are the basis of the PhD thesis.
- Completing the PhD thesis with an Introduction and Conclusion. Rewriting parts of the thesis, finishing and approval of the PhD thesis.

Work Programme Project 4: Synthetic model of Persuasive Gaming in Context (PGiC)

The development of a 'Persuasive Gaming in Context' model will be an iterative development process in close collaboration with researchers (integration research results) and industry (industry expertise and case studies).

1 October 2013 - 1 October 2014:

- Organization three expert meetings research team and industry, analysis of existing methodologies in relation to the development of the 'PGiC model'
- Linking cases industry partners with research
- Defining 'PGiC' model with research team

1 October 2014 – 1 October 2015:

- Organization three expert meetings research team and industry, with a focus on the input of the other research projects

- Organization of testing the 'PGiC' model on case studies industry partners
- Organization of the evaluation of the 'PGiC' model

1 October 2015 – 1 October 2016:

Dissemination. Characteristic to the iterative development process, the dissemination will be done throughout the research programme. As soon as possible, a draft of the model will be communicated in (inter)national forums to invite critical reactions for example at professional industry meetings and scientific conferences.

- Publication of the model
- Building a virtual knowledge website
- International dissemination through the organization of an international conference (end of year three).

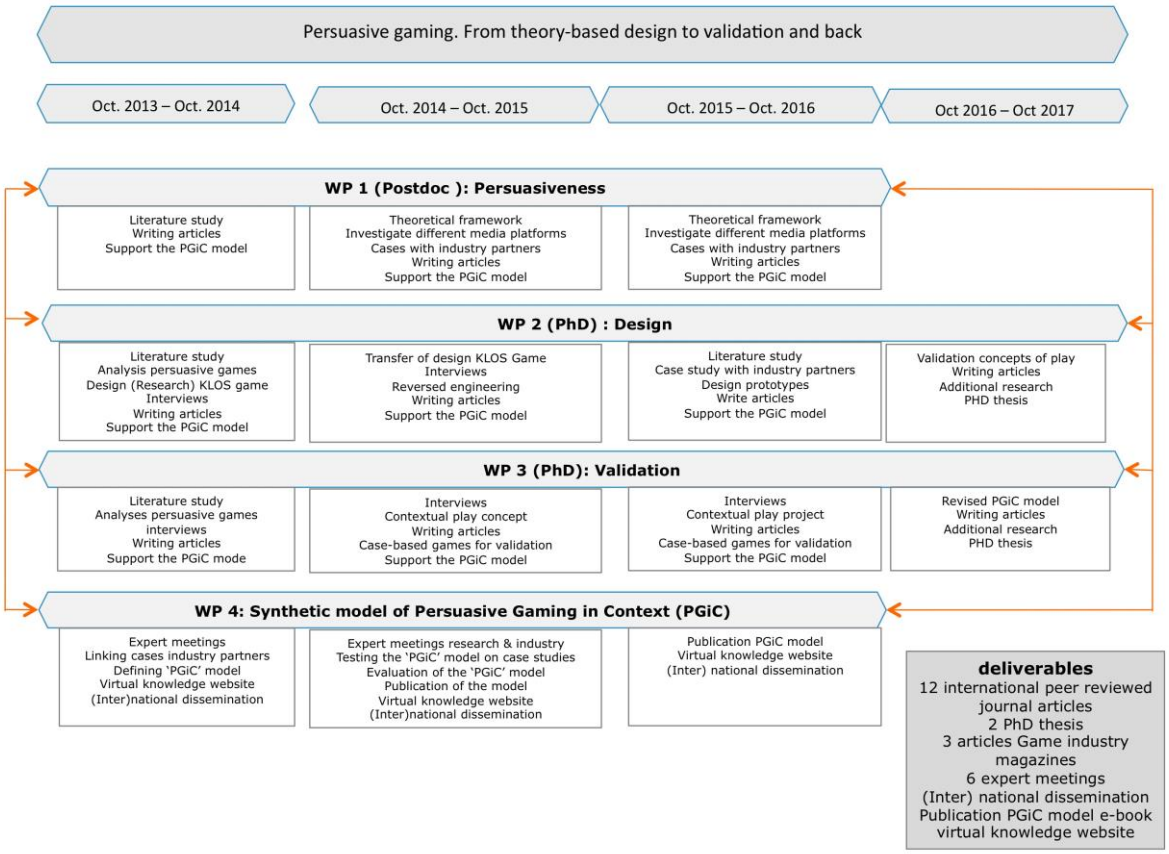

Figure 2: Persuasive gaming research process

13. Planned scientific deliverables and knowledge dissemination

Researchers of the projects and the supervisors will meet every month to discuss progress. The intended research results will be:

- Twelve international peer reviewed journal articles (Postdoc and PhDs), target: *Game Studies*, *Games and Culture*, *New Media & Society*, *Simulation & Gaming*, *Poetics.*
- Two PhD thesis (PhD project 2 and 3).
- Three articles in games industry related magazines, such as *Control* or *Edge* (Postdoc).
- Six expert meetings: research team, external experts and industry will meet to discuss the provisional results; an international conference to be held at the end of the third year, designed to present and discuss the final results; Presentations at (inter)national

forums: such as Serious Game conferences in Asia (Singapore, South Korea), Europe (Netherlands, France, Germany) and the United States.
- As the members of the research group have done in the past, they will also disseminate the results to a wider audience by means of public lectures, essays in popular journals and magazines, national newspapers, etc.
- PGiC model, published as an e-book.
- An English-language (virtual knowledge) website about persuasive gaming where we present and discuss (provisional) results, with an annotated bibliography, seminar/conference agenda et cetera.

14. Brief curriculum vitae of the principal applicant and the co-applicants

Prof.dr. Joost Raessens holds the chair of Media Theory in the Department of Media and Culture Studies, Utrecht University, The Netherlands. He chaired the opening conference 'Level Up' of the Digital Games Research Association (DiGRA, 2003) and is a member of the editorial board of *Games and Culture. A Journal of Interactive Media* (SAGE). He was one of the project leaders of the research programs Playful identities (NWO: 2005-2010), Design rules for learning through simulated worlds (GATE: 2006-2012) and Mobile learning-Citizen science (GATE: 2010-2012). His publications are in the field of media theory, new media and digital culture, and game studies. He is the founding member of GAP: the Centre for the Study of Digital Games and Play, Utrecht University (www.gamesandplay.org).

Prof.dr. Ben Schouten graduated from the Rietveld Art Academy in 1983 as a media designer. In 2001 he received his PhD in new media retrieval. This thesis was acknowledged with a Bronze World Medal for Design in New Media (New York). In the following years he worked at the Centre for Mathematics and Computer Science as well as at the Utrecht School of Art & Technology (HKU) in Interaction Design and Gaming. In 2008 he was appointed lector Serious Game Design at Fontys Hogescholen and in 2010 Full Professor Design of Playful Interactions (TU/e). His group focuses on Games & Play for social innovations, industry and culture. He is an advisor for the European Commission as well as for the Dutch Cultural Media Fund. He is also a board member of the Dutch Games Association.

Prof.dr. Jeroen Jansz holds the chair of Communication and Media in the Department of Media and Communication and ERMeCC (Erasmus Research Center for Media, Communication and Culture), Erasmus University Rotterdam, the Netherlands. His research is about the reception of new media. The appeal of video games on players is a long standing research interest as well as investigating games as tool for civic engagement. His research has been published in international academic journals. He was co-founder of the Game Studies group in the International Communication Association, and of DiGRA's Dutch chapter. He is a member of the editorial board of *Games and Culture. A Journal of Interactive Media* (SAGE). He often participates in public discussions about new media use, for example as board member of PEGI, the Pan European Game Information system. He is President of NeFCA, the Netherlands Flanders Communication Association.

Joke Witteveen is a producer, distributor and consultant in interactive media and serious games and is founder of xmediaworks (2004). She decided to specialize in serious gaming with a focus on human behaviour, technology and media after working for ten years as a consultant and manager in the interactive media industry. She develops instructive games for education, corporate training, health-care and public organizations. Next to that she is the initiator of the Dutch Serious Games Special interest group (part of DGA). This group of serious game companies has three interests: developing business models for the development of serious games, joint promotion of the Dutch serious games

and validating the effectiveness of serious games by working together with researchers at universities.

Jan Willem Huisman studied Interaction Design at the School of the Arts in Utrecht. He graduated in a Master of Arts at the Royal College of Art in London. With two partners he started IJsfontein in 1997. The organization is specialized in game development, web tools, interactive installations and cross-media concepts. Jan Willem experiences interaction as the best dialogue for the users. Real interaction is listening and responding. In this way a deep and meaningful encounter is created between content, design and delivery of interactive applications. This sincere way of designing was awarded in year 2008 with a Jan Kassies Oeuvre price of the Incentive Fund (Het Stimuleringsfonds). With the first game Master of the Elements IJsfontein won a British Academy of Film and Television Arts (BAFTA) Award. 'Playful Solutions, Serious Communication' is the foundation of the interactive media IJsfontein.

15. Literature

A) Selection of publications

De Grove, F., Van Looy, J., Neys, J. & Jansz, J. (2012). Playing in School or at Home? An Exploration of the Effects of Context on Educational Game Experience. *Electronic Journal of e-Learning (10),* 199-208, available online at www.ejel.org.

Deen, M., & Schouten, B. A. M. (2011). Games that Motivate to Learn: Designing Serious Games by Identified Regulations. In: Felicia, P. (Ed.), *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches*. Waterford: IGI Global, 330-351.

Jansz, J. (2005). The emotional appeal of violent video games for adolescent males. *Communication Theory, 15*, 219-241.

Neys, J. & J. Jansz (2010). Political Internet games: engaging an audience. *European Journal of Communication, 25*(3), 1-15.

Raessens, J. (2005). Computer Games as Participatory Media Culture. In: Raessens, J. & Goldstein, J. (eds), *Handbook of Computer Game Studies*. Cambridge, MA: MIT Press, 373-388.

Raessens, J. (2006). Playful Identities, or the Ludification of Culture. *Games & Culture. A Journal of Interactive Media*, *1* (1), 52-57.

Raessens, J. (2009). The Gaming *Dispositif*: An Analysis of Serious Games from a Humanities Perspective. In: Ritterfeld, U., Cody, M. & Vorderer, P. (2009*). Serious Games. Mechanisms and Effects*. New York: Routledge, 486-512.

Schouten, B.A.M., Tieben, R., Ven, A. van den & Schouten, D.W. (2011). Human Behavior Analysis in Ambient Gaming and Playful Interaction. In: Salah, A.A. & Gevers, T. (eds), *Computer Analysis of Human Behavior*. Heidelberg: Springer, 387-403.

Sturm, J., Tieben, R., Deen, M., Bekker, M.M. & Schouten, B.A.M.(2011). PlayFit: Designing playful activity interventions for teenagers. In *Proceedings of DIGRA 2011*.

Tan, E.S. & Jansz, J. (2008). The game experience. In: H.N. Schifferstein & P.P. Hekkert (Eds.), *Product experience* (pp. 531-556). Amsterdam: Elsevier.

B) (Inter)national literature

Bogost, I. (2007), *Persuasive Games. The Expressive Power of Videogames*. Cambridge, MA: MIT Press.

Hassenzahl, M. (2010). *Experience Design: Technology for All the Right Reasons. Synthesis Lectures on Human-Centered Informatics*, 3, 1-95. Burlington: Morgan & Claypool Publishers.

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Ryan, M.-L. (ed) (2004), *Narrative across Media. The Languages of Storytelling*. Lincoln: University of Nebraska Press.

Ritterfeld, U., Cody, M. & Vorderer, P. (2009*). Serious Games. Mechanisms and Effects*. New York: Routledge.

Salen, K. & Zimmerman, E. (2003), *Rules of Play: Game Design Fundamentals*. Cambridge, MA: MIT Press.

Salen, K. & Zimmerman, E. (2006), *The Game Design Reader. A Rules of Play Anthology*. Cambridge, MA: MIT Press.

Vorderer, P. & Bryant, J. (eds)(2006), *Playing Video Games: Motives, Responses, and Consequences*, Mahwah, NJ: Lawrence Erlbaum Associates.

16. Summary for laymen

Videogames bieden een populaire bron van vermaak. Dit onderzoeksproject stelt niet de mogelijk nadelige gevolgen (verslaving, geweld) maar de positieve aspecten van gaming centraal. Het is een bijzonder project omdat er nauw wordt samengewerkt met de Nederlandse game industrie bij de ontwikkeling van zogenaamde *persuasieve games*. Dit zijn spellen die bepaalde doelen willen realiseren. In dit project onderzoeken we niet alleen traditionele videogames maar ook spelervaringen die verder strekken dan het spelen voor een scherm, bijvoorbeeld door game elementen in het stadsbeeld in te bouwen. Deze vorm van *ambient gaming* wil burgers bijvoorbeeld

spelenderwijs helpen bij het vinden van complexe informatie. Een andere game ervaring in dit project maakt het mogelijk spelenderwijs inzicht te verwerven in hoe het is om te lijden aan de ziekte Alzheimer of aan een depressie. De wetenschappelijke bijdrage is dat wij onderzoeken wat wel en niet bijdraagt aan de overredingskracht van *gaming*. Wij bouwen voort op inzichten over de overredingskracht van verhalen. We vertalen dit naar de speelse context en naar de principes van game-design. Het is vernieuwend dat het onderzoek in dit project gepaard gaat met daadwerkelijk game design. De samenwerking tussen de industrie en wetenschap maakt het bovendien mogelijk om hetgeen wij vaststellen over de impact van de games bij de doelgroepen direct terug te vertalen naar de designprincipes. Wij verwachten dat deze unieke samenwerking bijdraagt aan een verdere versterking van de internationale positie van de Nederlandse game industrie.