Identifying Different Persuasive Gaming Approaches for Cancer Patients

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Abstract. Using as a starting point behavior scientist B.J. Fogg's conceptual framework on the role computer technology plays for users, in this paper it will be argued that persuasion through digital games can be approached from three different perspectives: digital games can be used as media for persuasion, digital games can be used as tools for persuasion and digital games can be used as social actors for persuasion. In this paper, I use four cancer gaming cases to illustrate how these three different persuasive roles can be used to accomplish different persuasive goals. The categorization proposed in this paper can serve to clarify what we mean when we refer to persuasion in relation to digital games and can be used as analytical approach for the study of persuasive gaming strategies.

1 Introduction

The persuasive potential of digital games has been proven to be useful to change, reinforce or shape the attitude and/or behavior of players in several fields such as advertising [1, 2], pro-social communication [3] or healthcare [4]. However, if we pay attention to the different academic definitions used for the concept of persuasive games, and the different categories of persuasive goals studied within this field, it can be concluded that researchers mean different things when they refer to the persuasive potential of digital games.

Persuasive games have been defined as "games that mount procedural rhetoric effectively" [5], "games explicitly created to change attitudes and behavior" [3], "digital games that aim to shape, reinforce or change the perceptions, emotions, beliefs, behavioral intentions and behaviors of players" [6], "games that aim to increase players' awareness of critical and timely social issue" [7], or "designed interventions with the primary purpose of changing a user's behavior or attitude in an intended way" [4]. It follows that, while some researchers relate persuasion through digital games to their capacity to convey persuasive messages [8], others focus their attention on their

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capacity to trigger specific behaviors [4] or facilitating specific interactions among players [9].

These differences in the way persuasion through digital games is defined and studied are the result of the complex nature of this practice. This complexity is not only due to the wide range of possible applications but also due to the complexity of the process of persuasion itself and how the specificities of digital games have an influence in this process. For this reason, it is necessary to provide theoretical frameworks that can serve not only to analyze the use of different persuasive strategies in relation to different persuasive goals but also that can become a useful tool to select a specific persuasive approach when designing persuasive games. The provision of new theoretical concepts and frameworks is of special relevance in the relatively new field of persuasive games, as these become relevant tools for scholars in the field, that can serve to better structure their work and communicate about their insights. This is, therefore, the main goal of this paper.

In this paper I use as a starting point the conceptual framework of behavior scientist B.J. Fogg [10], who described the overlap between persuasion and interactive technology, to argue that it is possible to identify three different roles of digital games when used with persuasive intentions. Digital games can be used as media for persuasion providing compelling meaningful experiences that convey specific messages, digital games can be used as tools for persuasion to persuade players in a number of ways such as making a target behavior easier to perform, and digital games can be used as social actors for persuasion "by applying the same persuasion principles that humans use to influence others" [10]. Fogg's framework, that is based on the role computer technology plays for users, does not explain how specific persuasive potentials of digital games can be linked to specific persuasive roles, a question that I address in this paper.

In order to illustrate my arguments, I will analyze how these three roles of digital games have been used in the field of healthcare, and specifically for the design of cancer games. In this paper I will use the *Re-Mission Game* [11], *The Cancer Game*, the *Cogmed Memory Training* [12] and *The Survivor Games* [13] as examples of how this topic can be addressed from different approaches when different persuasive roles of digital games are used to promote desired *sick-role behaviors* in cancer patients.

2 Digital Games to Support Cancer Patients

The positive effects of the use of video games in the field of health is a reality demonstrated by numerous research studies worldwide [14]. Video games are being used with excellent results to, among other things, overcome phobias [15], support rehabilitation therapies [16] or carry out neuropsychology therapies [17]. Among all its applications in the field of health, it stands out its use to help cancer patients (especially children and adolescent) to adhere to its treatment.

According to the World Health Organization cancer is among one of the leading causes of mortality worldwide, with 14 million new patients in 2012, a figure that is expected to increase by about 70% over the next two decades. There is extensive knowledge about the causes of cancer, how it can be prevented and how to manage the disease once it has been detected. Healthcare persuasion uses this knowledge to

promote *sick-role behaviors*. *Sick-role behaviors* are those undertaken by cancer patients to succeed in their recovery or to improve their quality of life while under treatment [18]. Healthcare persuasion to promote sick-role behaviors in cancer patients includes strategies to help patients to adhere to their treatments (e.g. taking a full course of oral chemotherapy), and to manage their disease (e.g. controlling anxiety, reducing stress, taking a balanced diet) [4].

Previous research has shown that digital games are an effective vehicle for cancer-related healthcare persuasive strategies [14]. Cancer treatments, especially chemo, are really aggressive treatments and with many side effects not always easy to cope with. For this reason, and especially in the case of children, support adherence to treatment becomes especially relevant. In this respect, there are three different challenges to overcome, and related to each of these challenges, there is a role that video games can fulfill to complement the support to the adhesion. The three challenges to which I refer are: lack of information, lack of motivation and difficulties in coping with treatment. In the following sections, I argue how digital games can play three different roles to support cancer patients to face these three challenges.

3 Digital Games as Media for Persuasion

The first challenge that digital games can help overcome is the lack of information about treatment, i.e. how it works and what effects it may have. There are numerous studies that show that many cancer patients have a misperception about their effects before starting treatment [19], often fearing worse side effects than those who are actually going to experience. For this reason, it has been demonstrated that providing complete and accurate information to the patient's reality is essential for adherence to treatment [20]. When we talk about children or adolescents, overcoming this challenge is more complicated than in the case of adults [20]. That is why looking for creative ways to offer treatment information, which is understandable to them and does not cause them fear, is something that especially worries health specialists. Digital games have proved to be an interesting media to transmit the desired information to children in a way that is well received by them.

In their role as media for persuasion, digital games can be used to promote *sick-role behaviors* of cancer patients by providing compelling experiences that help them to better understand what are they going through and how the therapies and life styles they are asked to stick to, can help them to overcome their disease. According to Fogg's [10] theoretical framework, this can be done by (1) allowing people to explore cause-effect relationships, (2) by providing people with vicarious experiences that motivate or (3) helping people rehearse a behavior.

An example on how digital games has been used already for this purpose, is the *Re-Mission Game* (see Fig. 1), designed to increase knowledge about chemotherapy, change perceptions of patient's ability to influence health outcomes, and to provide patients with confidence in their ability to meet the specific demands of cancer treatment and recovery. In the game, children control a character that navigates through the interior of the human body. Through the character, they can destroy cancer cells and

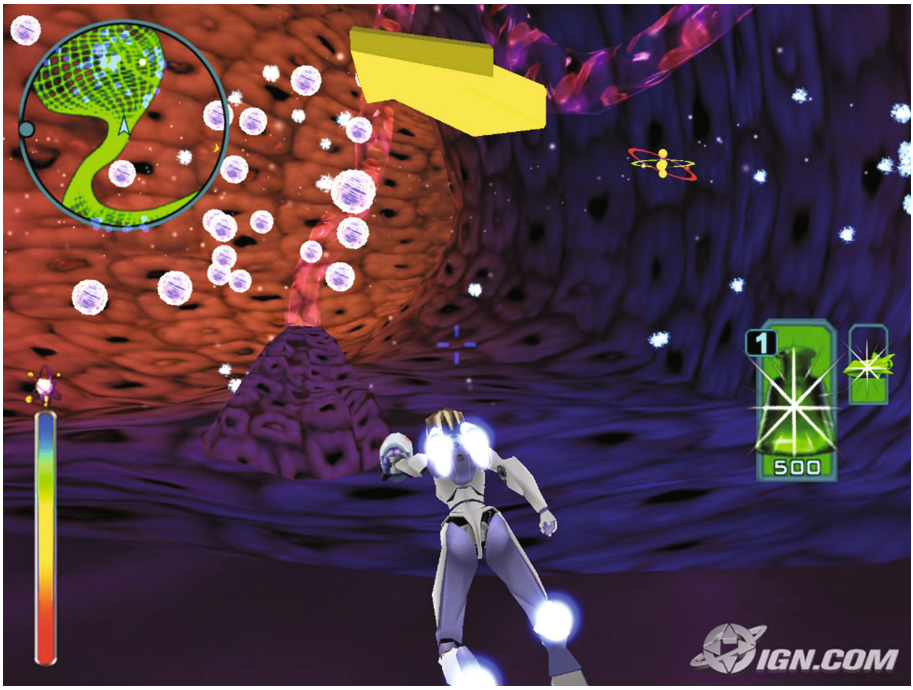

Fig. 1. Screenshot *Re-Mission*

defeat the main tumor. Through friendly design and simple game mechanics, children can understand a complex process.

This game becomes this way a medium for persuasion by allowing children to explore the cause-effect relationships of chemotherapy treatments. The mechanics of the game and the challenges they need to complete, allow children to explore through their actions in the game, which are the effects of chemotherapy in their bodies. By better understanding how this process work, they can be more open to undergoing their treatment, regardless of the side effects the treatment has in their bodies. Research on this game has indeed shown that *Re-Mission* is effective in increasing adherence to treatment among its players [21].

4 Digital Games as Tools for Persuasion

The second challenge is related to the lack of motivation to start or continue a treatment. As I mentioned earlier, cancer treatments or their side effects are often aggressive or difficult to cope with. The diagnosis and treatment of cancer is a stressful and threatening experience for children [22]. Although survival rates for childhood cancer are higher than ever before, the course of treatment for cancer, such as chemotherapy, surgery or radiotherapy, is still a very stressful experience in the life of a child. However, cancer patients may not only be at risk from adverse medical effects, their

psychosocial well-being may also be severely affected as a result of cancer and its therapy [23]. For this reason, even if patients have enough information on how a treatment works and its benefits, they may not have enough motivation to start or continue at a given time. Digital games can help in this regard, serving as a tool to motivate patients to comply with treatment guidelines.

During the past decade, there has been an increase in the use of therapeutic play intervention to help cancer patients cope with the stress of hospitalization and treatment [24]. Therapeutic play is a set of structured activities designed according to psychosocial and cognitive development of cancer patients and health-related issues to help them to cope with psychological and emotional difficulties [25]. The central goal of therapeutic play is to facilitate the emotional and physical well-being of patients [26].

In their role as tools for persuasion, digital games are designed to influence and motivate people in specific ways by making activities easier or more efficient to do [10]. Patients are often required to undergo procedures or engage in behaviors that are painful and aversive on the one hand (e.g., undergoing chemotherapy) or boring and mundane on the other (e.g., taking pills, exercising on a regular basis). These procedures and behaviors are often necessary to maintain and improve health or even to cure the patient's disease [14, p. 113].

According to Fogg's theoretical framework [10] in their role as tools for persuasion, digital games can be used to support cancer patients in undergoing painful or boring procedures by (1) reducing a complex activity to a few simple steps, (2) leading users through a predetermined sequence of actions or events, step by step, (3) suggesting a behavior at the most opportune moment, (4) helping people to monitor themselves to modify their attitudes or behaviors to achieve a predetermined goal or outcome, or (5) allowing doctors to monitor the behavior of patients.

An example of this is the game *Cogmed Memory Training* (see Fig. 2), developed to aid in the adherence to treatment of patients with cognitive problems, one of the side effects of treatments such as brain chemotherapy, among others. Neuropsychological rehabilitation treatments require the patient to repeat a series of simple tasks (such as associating objects of the same color and shape), in a continuous and intense way. The treatment can be really exhausting for patients, and it can become boring for children. For this reason, neuropsychologists are using games that help to work the same skills in a more entertaining way for patients. The game *Cogmed Memory Training* has shown, in this regard, to be an effective tool to support adherence to the treatment.

Going back to Foog's theoretical framework, the game helps to lead patients through the different steps of the treatment, this is done trough a series of mini-games focused on training different skills in patients, necessary for their recovery. The game keeps patients busy and focused on different challenges and levels, which help them to persist in the treatment. Besides this, the game helps patients and doctors to monitor their progress, which helps patients to increase their level of perception to be in control of their own health, and also helps doctors to adapt the treatment considering patients' progress.

Another example of how digital games can be used as tools for persuasion is *The Cancer Game* (Kristula & Oda, 2003), an online game designed to provide stress relief for cancer patients, in which they can visualize and destroy cancer on a computer

Fig. 2. Screenshot *Cogmed Memory Training*

screen. The game was designed by researcher Dave Kristula after having to deal with a cancer treatment himself. The game, developed in collaboration of Professor Yuko Oda, was designed based on previous research on the healing through visualization therapies focusing on stress relief.

The game fosters a specific behavior while the game is played: visualizing how cancer can be destroyed and helping patients to envision that desired moment. Besides this, the game leads also patients through a simple but predetermined sequence of actions, that help them to keep focus their attention on a simple activity and leave aside other thoughts that might increase anxiety.

5 Digital Games as Social Actors for Persuasion

The third challenge to which I referred at the beginning of the article was the difficulty in coping with treatment. It may be the case of a patient who has all the information about the treatment and who also has the motivation to carry it out, but who is in difficulties in the moment of coping. Examples of these difficulties may be anxiety or fear of how the disease will develop, discomfort generated by the treatment received or hair loss in the case of patients treated with chemotherapy. In this respect, the support of other patients who are going through or have experienced the same difficulties can be of particular help. However, it is not always easy to establish new relationships with other patients, or initiate conversations on issues that concern you with people with whom you do not have a close relationship. To support patients to face this challenge, digital games can take the role of social actors for persuasion and be used for the purpose of mediating the process of seeking social support. The persuasive potential of this role relies on the capacity of digital games to be used to persuade players "by giving a variety of social cues that elicit social responses" from them [10].

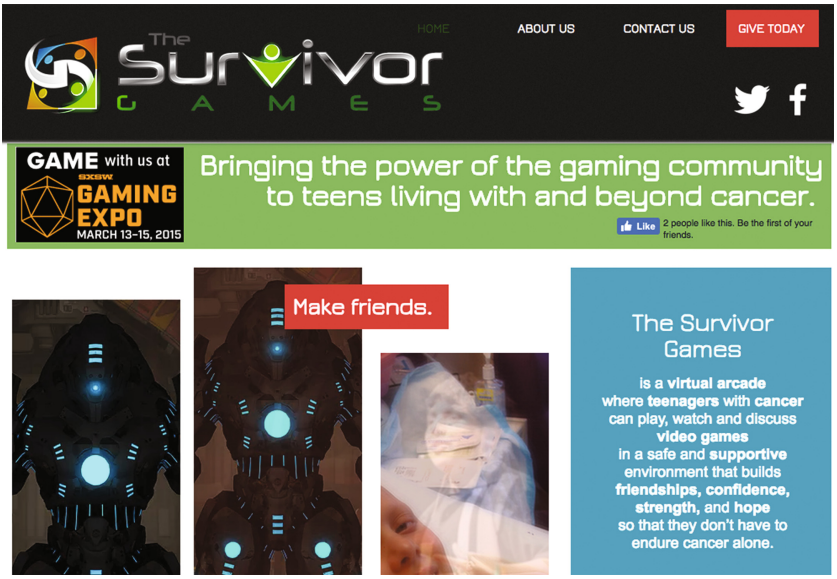

Fig. 3. Screenshot The Survivor Games

When used as social actors for persuasion, digital games may utilize either computer-human persuasion or computer-mediated persuasion [27]. Although computers cannot communicate in the same way as humans, there are studies that suggest that computer-human persuasion may utilize some patterns of interaction similar to social communication [28], whereas computer-mediated persuasion means that people are persuading others through computers, e.g. discussion forums, e-mail, instant messages, blogs, or social network systems. Recent research, for example, shows that dialogue support features play a significant role in relation to adherence to web-based health interventions, especially for young adults, who tend to be influenced by their peers [9].

An example of how digital games can play the role of social actors for persuasion is the platform *The Survivor Games* (see Fig. 3). This platform was created as a community aimed at patients and survivors of childhood cancer. On the web, its users can play a selection of multiplayer video games specially chosen for them. Video games become the point of union between players, who begin to talk about their games and the characters of their games, and on many occasions that the first contact evolves until a real friendship is established between two people who are going through similar difficulties. Thus finding a support for coping with them. This is related to the capacity of digital games to foster social interaction [29], and the tools implemented in the platform itself to facilitate this interaction, such as the chat box that allows players to chat while playing. Besides this, the context in which these games are played, a platform especially aimed at young cancer patients and cancer survivors, also becomes relevant in this process, as users might find it as a natural context to look for contact with other people going through similar experiences, which can help them to feel more

comfortable to disclose their personal experiences, share emotions and feelings and look for support. We can talk then about game-mediated type of persuasion, meaning that the game becomes persuasive when being played in a specific context with a specific purpose [30].

6 Conclusions

The four games mentioned in this article are just three examples of how digital games can help overcome the three challenges related to adherence to cancer treatments. Through these cases, I have illustrated how digital games can play three different roles in the process of persuasion, becoming media, tools and social actors for persuasion. The theoretical framework presented in this paper can serve to better understand how these roles can serve to achieve different goals when games are used for persuasive purposes. In a future paper, I will explain how specific properties of digital games are linked to each of these three roles.

References

1. Deal, D.: The ability of branded online games to build brand equity: an exploratory study. In: DiGRA 2005 Conference: Changing Views-Worlds in Play (2005)
2. Wise, K., Bolls, P.D., Kim, H., Venkataram, A., Meyer, R.: Enjoyment of advergames and brand attitudes: the impact of thematic relevance. J. Interact. Advert. **9**(1), 27–36 (2008)
3. Ruggiero, D.: The effect of a persuasive game on attitude towards the homeless. Children (2014)
4. Orji, R., Mandryk, R.L., Vassileva, J., Gerling, K.M.: Tailoring persuasive health games to gamer type. In: Proceedings SIGCHI Conference on Human Factors in Computing Systems - CHI 2013, pp. 2467–2476 (2013)
5. Bogost, I.: Persuasive games on mobile devices. In: Fogg, B.J., Eckles, D. (eds.) Mobile Persuasion, Stanford: Stanford University (2007)
6. De la Hera Conde-Pumpido, T.: Persuasive structures in advergames: conveying advertising messages through digital games, Utrecht University (2014)
7. Kaufman, G., Flanagan, M., Seidman, M.: Creating stealth game interventions for attitude and behavior change: an 'Embedded Design' model. In: Proceedings DiGRA 2015 Divers. Diversity of play: Games – Cultures – Identities, pp. 1–13 (2015)
8. Bogost, I.: Persuasive Games: The Expressive Power of Videogames. MIT, Cambridge (2007)
9. Kulyk, O., Den Daas, C., David, S., Van Gemert-Pijnen, L.: How persuasive are serious games, social media and mHealth technologies for vulnerable young adults? Design factors for health behavior and lifestyle change support: Sexual health case. In: CEUR Workshop Proceedings, vol. 1369, pp. 28–42 (2015)
10. Fogg, B.J.: Persuasive technology: using computers to change what we think and do. In: Persuasive Technology: Using Computers to Change What We Think and Do, vol. 5, no. 1, p. 283 (2003)
11. Hope Lab: Re-Mission (2006)
12. Pearson: Cogmed Memory Training
13. The Survivor Games

14. Kato, P.M.: Video games in health care: Closing the gap. Rev. Gen. Psychol. **14**(2), 113–121 (2010)
15. Miloff, A., Lindner, P., Hamilton, W., Reuterskiöld, L., Andersson, G., Carlbring, P.: Single-session gamified virtual reality exposure therapy for spider phobia vs. traditional exposure therapy: study protocol for a randomized controlled non-inferiority trial. Trials **17** (1), 60 (2016)
16. Reid, D.T.: Benefits of a virtual play rehabilitation environment for children with cerebral palsy on perceptions of self-efficacy: a pilot study. Pediatr. Rehabil. **5**(3), 141–148 (2002)
17. Hardy, K., Bonner, M., Willard, V.: Computerized cognitive training for survivors of pediatric cancer. Pediatr. Blood Cancer **55**(5), 776–777 (2010)
18. Baranowski, T., Blumberg, F., Buday, R., DeSmet, A., Fiellin, L.E., Green, C.S., Kato, P. M., Lu, A.S., Maloney, A.E., Mellecker, R., Morrill, B.A., Peng, W., Shegog, R., Simons, M., Staiano, A.E., Thompson, D., Young, K.: Games for health for children-current status and needed research. Games Heal. J. **5**(1), 1–12 (2015)
19. Wakefield, C.E., Butow, P., Fleming, C.A.K., Daniel, G., Cohn, R.J.: Family information needs at childhood cancer treatment completion. Pediatr. Blood Cancer **58**(4), 621–626 (2012)
20. Mitchell, W., Clarke, S., Sloper, P.: Care and support needs of children and young people with cancer and their parents. Psycho-Oncology **15**(9), 805–816 (2006)
21. Kurt, A.S., Savaser, S.: An effect of re-mission video game on perceived stress levels of adolescents with cancer. Acta Paediatr. Int. J. Paediatr. **100**, 98–99 (2011)
22. Hicks, M.D., Lavender, R.: Psychosocial practice trends in pediatric oncology. J. Pediatr. Oncol. Nurs. **18**(4), 143–153 (2001)
23. Langeveld, N.E., Grootenhuis, M.A., Voûte, P.A., de Haan, R.J.: Posttraumatic stress symptoms in adult survivors of childhood cancer. Pediatr. Blood Cancer **42**, 604–610 (2004)
24. Li, W.H.C., Chung, J.O.K., Ho, E.K.Y.: The effectiveness of therapeutic play, using virtual reality computer games, in promoting the psychological well-being of children hospitalised with cancer. J. Clin. Nurs. **20**(15–16), 2135–2143 (2011)
25. LeVieux-Anglin, L., Sawyer, E.H.: Incorporating play interventions into nursing care. Pediatr. Nurs. **19**(5), 459–463 (1993)
26. Vessey, J.A., Mahon, M.M.: Therapeutic play and the hospitalized child. J. Pediatr. Nurs. **5** (5), 328–333 (1990)
27. Oinas-Kukkonen, H., Harjumaa, M.: Towards deeper understanding of persuasion in software and information systems. In: Proceedings of the 1st International Conference on Advances in Computer-Human Interaction, ACHI 2008, pp. 200–205 (2008)
28. Fogg, B.J., Nass, C.: How users reciprocate to computers : an experiment that demonstrates behavior change. In: CHI 97, pp. 331–332, March 1997
29. De la Hera Conde-Pumpido, T., Paz Aléncar, A.: Collaborative digital games as mediation tool to foster intercultural integration in primary Dutch schools. e-Learning Papers, vol. 43, pp. 13–23 (2015)
30. De la Hera Conde-Pumpido, T.: Persuasive gaming: identifying the different types of persuasion through games. Int. J. Serious Games **4**(1), 31–39 (2017)