

Heuristic Evaluation of Persuasive Game Systems in a Behavior Change Support Systems Perspective: Elements for Discussion

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Abstract. This text reports the work-in-progress of a PhD project about the development of evaluation tools to assist the design of persuasive game systems. The theoretical framework provided by BCSSs can be used in the context of games through a redefinition of games as "systems" in order to highlight their persuasive intent, and to focus on their core quality of interactive systems. The PSD model can be used successfully in game design if integrated with knowledge about game elements that affect persuasion.

1 Introducing game systems

As the number of products and systems using the interaction modalities of games to affect attitude and behavior change increases, the need grows for appropriate evaluation tools to insure the effectiveness and ethical soundness of their persuasive strategies. Current design strategies for persuasive games rely heavily on the designer's intuitive skills and can refer to precious few theoretical frameworks, the most popular being the one considering persuasive games as argumentation instruments that persuade rhetorically by offering meaning experientially rather than literally, through the rhetorical tool called procedural rhetoric [1]. Even the definition of "persuasive games" is center of debate as different terms are used to describe similar artifacts in different practice contexts (serious games, games for change, games for health, procedural games, games with an agenda etc) [2]. These terms can refer to vastly different disciplinary and theoretical frameworks, ranging from information debriefing in educational games to media effects theories (for example Klimmt or Ennemoser in [3]). In addition to this, reflection on the evaluation of efficacy is usually conducted without reference to design issues [3], which doesn't help to focus on the pragmatic problem of understanding the persuasion dynamics enacted during game interaction. A newcomer to such debate is gamification, a design method that employs game elements and dynamics in non-game contexts usually with the goal of increasing engagement and often for behavior change, that does not offer a separated experience like most games do. While it is still not clear what is the rightful place of gamification in game research [4], it seems important to include it in a discussion about persuasion through games, because of the central part that persuasive strategies play in gamification design.

The notion of game systems, inspired by that of Behavior Change Support Systems [5], is here suggested as a way to concentrate on the persuasive qualities of interaction that happens when a situation is framed at some level as "game", following the root interpretation of games as human-computer interaction [6] and as systems of rules [7], in the attempt to avoid the debate about terminology and methods. A definition of persuasive games by their *intent* instead of their methods (such as procedural rhetoric) allows a larger view on the strategies employed for behavior change. The analogy with BCSS theory, that considers both systems using computer mediated communication and human computer interaction [8], enables us to look beyond the disciplinary divide that scatters reflection on persuasive strategies in different disciplinary fields, disciplinary jargons and methodologies [9] and to concentrate on the strategies employed and their effectiveness from a truly interdisciplinary angle.

2 PSD Model, Game Design and Game Effectiveness

There is no specific framework to assist the design of persuasive game systems except for the above-mentioned procedural rhetoric framework, which supports suggestions about composition and expressive effectiveness rather than persuasive effectiveness [10]. Aside from that, game design strategies in general lack methodologies, and the distance between industry methods of design and (mostly individual) academic frameworks is barely filled by scientific methods that are also employed within the industry, such as Design Patterns [11], the Mechanics Dynamics Aesthetics (MDA) framework [12] and the Machinations method [13].

Another issue is at which level of the design process can the evaluation of the persuasive structures be more useful. The Persuasive Systems Design model offers categories for the heuristic evaluation of different stages in the life of a product, and can consider together persuasive goals (intent), the design (strategy), and the user experience and context (event) [14]. In game research there is a strong separation between design methodologies and evaluation tools, which are usually employed in later stages to evaluate usability and playability [15] [16] and are scarcely present in the design process. Although a plethora of heuristic tools to assist the design can be found both in academic reflection and industry practice (for an overview, see for example [17]), there is little systematic effort in that direction, and very little existing methods employed to connect design practices with persuasive strategies (a theoretical effort in that direction can be found in [18] and a few others).

The challenges in developing such a method are several: the above-mentioned issues in the definition of what makes a game persuasive and a lack of general framework that includes different approaches to persuasion through games, at the moment scattered among different disciplinary fields; the difficulty in isolating specific elements in game design and in looking for correlations with persuasive strategies in other media or in interpersonal communication.

The work-in-progress reported here chooses as a foundation the Machinations model [13], because it offers a comprehensive overview of game mechanics and the possibility to combine them to categorizations of persuasive strategies.

3 Persuasive Game Elements versus Game Frame

What makes a game a game is the existence of rules and goals, and the shared acknowledgement that that situation is in some sense fictional (suspension of disbelief), and separate from daily activities; this is at least the original definition, that has been reviewed several times since for digital games [19]. The solidity of this definition is what creates a difficulty in understanding games for behavior change: if the game activity takes place in a separate moment, this leaves opportunities for attitude change in the way that any other mediated message would do (for instance a TV program) would do. The situation is different in the case of game elements disseminated during the performance of an action (gamification, although some products classified as games present the same characteristics): the (eventual) effects of game activity are directly influencing the performance or non performance of the primary task, and the situation is not different from most examples of persuasive technology. One first step in the adaptation of the PSD model to game systems is to understand which elements of game systems are inherently persuasive and which others can be persuasive when employed correctly.

At the moment three main areas of persuasive aspects of the game environment have been identified (which doesn't include the whole spectrum of game mechanics and dynamics but rather general elements):

a) *perceived elements*, which depend on an attribution of value by the user, such as

what Huizinga called '*the magic circle*', that is, the socially shared mental and physical space of the game, and the level of *fun*, which can depend on personal qualities of the user just as on the initial attribution (expectations);

b) *structural elements*: elements that relate to the structure of game systems and determine how the interaction with the system works, such as *rules*, *goals* and *agency*;

c) *perceptual elements*: elements that relate to the physical apprehension of the game system, such as physical arousal during activity, and elements related to cognitive immersion and transportation, such as in narrative persuasion.

The next step in the agenda will be how these elements typical of a game experience relate to the categories of primary task support, social support, dialogue support and credibility support exemplified in the PSD model.

4 Conclusions

By considering games and gamification as game-based information systems, and persuasive games as one particular kind of Behavior Change Support System it is possible to open new perspectives in the analysis of what makes a game persuasive and differentiate between different persuasive strategies. This document wants to assert the desirability and feasibility of adapting the PSD model to the necessities of persuasive game design, and propose a temporary plan of action in that direction.

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