Fun from Playing: The Role of Interaction

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Abstract

Fun is a very important aspect to any game because it causes engagement: the will to play again. Interaction is also an important aspect however because it provides the means by which games are played. The interaction occurs on two levels, human-world and human-human. The former stimulates fun through aesthetics, related to the acting and perception of the game world, and the latter stimulates fun from social interferences, which are extended from world level interactions.

Keywords: games, fun, interaction, aesthetic characteristics, usability principles

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1. Introduction

It is common sense that a game should be enjoyable and fun, simply because if it is not people may not want to play it [Sweetser and Wyeth 2005]. This is true for all sorts of games – including electronic games – and disregards any underlined purpose (entertainment, education, advertising, etc). As a consequence, the fun characteristic is considered an important aspect in the design of a game. However, the interaction is also a fundamental aspect to any game. The act of playing is achieved by the interactions with objects and with other people, to change the course of events and leave one's own marks on the world. By interacting at play, humans not only have fun but also develop their experiences of perception and get to better understand their capabilities, their relations with others and the world they live in [Pinheiro 2007].

Being two important components of a game, the relations between fun and interaction need to be well understood. This paper presents initial research results about the role that different levels of interaction may have in the fun characteristics of a game, attempting to provide an understanding about these levels and how they may produce the enjoyment that players experience during a game session.

The first part of the paper addresses what is fun and how this emotion is expressed in games. The second part of the paper addresses what is interaction and how it affects human-computer relations. And the final part of the paper explores how the latter stimulates the former.

2. The expression of fun in games

Fun, or enjoyment, is a human emotion and as such it is a very complex subject to discuss. Different authors have different ideas of what fun means, especially if their studies are originated from different areas of knowledge. In the domain of games, fun can be thought of as a way to achieve players' *engagement*, meaning the desired effect of causing the will to play the game again. This effect is produced by challenging physical or mental abilities or by appealing to players' fantasy and curiosity [Obrist et al. 2009].

This classification of enjoyment characteristics is also used by Malone [1980], to whom the challenge is expressed in terms of goals with uncertain attainment and difficulty aligned with players' abilities (either innate or acquired) in order to motivate and maintain interest. Fantasy is expressed as images of physical objects or social situations that may be either abstract or concrete and possible or not, intended to evoke personal emotions which may satisfy the players depending on variables such as experience, gender and age. Curiosity is expressed as novelty created with informational complexity compared to players' experiences in order to produce expectations about the results of actions.

Hunicke et al. [2005] refer to these characteristics as *game aesthetics*, which are the desirable emotional responses evoked in an enjoyable activity that can be divided in – but not limited to – eight components (table 1).

Table 1: Characteristics of game aesthetics

Sensation *Game as a sense-pleasure*	**Fellowship** *Game as social framework*
Fantasy *Game as make-believe*	**Discovery** *Game as uncharted territory*
Narrative *Game as drama*	**Expression** *Game as self-discovery*
Challenge *Game as obstacle course*	**Submission** *Game as pastime*

Sensation is expressed as tactile, auditory and visual experiences that the players have during a session and may cause curiosity. Fantasy is about underlined ideas and concepts in which the game play is immersive, and that may appeal to players' likes and dislikes. Narrative involves stories and characters used in the game, and it is intimately related to the fantasy. Fellowship is about social relations, supported or not by spoken or textual conversations, and which may cause attraction, dependence, interference, cooperation

or competition among different players. Expression is presented as the knowledge about oneself on different levels, such as one owns abilities, interests and flaws, and it is naturally related to the human need of self-improvement and comparison with others. And finally, submission represents conditions that lead to the achievement of fun by the elimination of boredom.

Being expected responses to an enjoyable activity several of these characteristics are usually pursued in a game, thought the enjoyment of a game is not limited to them since fun also depends on receptivity and expectations [Schuytema 2008]. Indeed this classification can also be criticized because of the tenuous frontier that exists among some of the items and their individual adequacy to the concept of "emotional". Nevertheless, it still seems to provide an objective basis for the continuity of the study proposed.

3. Interaction in game playing

Interaction is also a very complex subject, and even though it is not as closely related to a human emotion as fun, it involves how humans perceive and act upon the world. It is a phenomenon of mutual or reciprocal influence that occurs when two or more entities communicate with or react to each other, happening in the real world between animals and objects, and also between humans and computers [Dubberly et al. 2009].

This concept can be extended in the same way to the interaction between humans and electronic devices created to entertain, as *physical or social relations* that occur in a *fantasy world* among active or passive *entities*, and that cause these entities to *affect each other*. Since the entities involved can be either passive or active, it is natural to understand that the interactions in a game occur at two different levels: the human-world and the human-human levels.

The human-word interaction can be understood from psychology concepts originally studied by Gibson [1977 *apud* Norman 1999] and applied to interface design by Norman [1999]: conceptual models, affordances and constraints. When humans need to interact with an unknown object their decision is mostly based on *conceptual models* built from previous experiences that provide basic ideas on the mechanics behind possibilities of use. Such ideas emerge from properties extracted from the object itself by the senses, and are called *affordances*: depending on sensorial cues, an object affords to be pushed, grabbed, squeezed, etc. *Constraints* are social or cultural conventions that direct the use of an object. Objects with handles are supposed to be manipulated using their handles, even though they may be manipulated in any different manner. Games have these three dimensions for objects, weapons, symbols, sounds and control devices used to play.

The human-human interaction can be understood from a concept studied by Garcia and Sichman [2003]: *social interference*. When two or more entities coexist in an environment, their actions affect their own possibilities of reaching goals "*independently of their acknowledgement of this fact*". Thus, the human-human interaction can occur in two forms. It is indirect and reactive, in the case where the entities do not acknowledge their coexistence and change their course of actions merely from the perceptions of their own changes to the world, or it is direct and deliberative, in the case where the entities acknowledge each other and change their course of actions based on communications that explore cooperation, collaboration, negotiation or competition.

In fact, the idea of interacting to try to reach a goal is the bases of human *rationality* [Valiant 1995]: the attempt to do the best with all information available. The human-human interaction is commonly driven by the will to obtain more information and that is why the interaction usually follows an archetype of a feedback loop in which information flows from an entity to another and then back to the former after the effects of actions are measured and compared to goals [Dubberly et al. 2009]. But humans interact much more for non-rational reasons, related to emotions like love and friendship and yet, the social interference is still relevant.

Considering a game as a world in which the player can perceive and act, the human-human interaction happens through the human-world interaction and extends it, since even messages received can be thought of as a visual perception and as an affordance to acknowledge and respond. In any case, the player is the most relevant part in the two levels of interaction, simply because he is always an active entity. Using this player-centric view, the interaction can be studied with the categorisation presented by Van Welie and Troetteberg [2000] (table 2) as *principles of usability* that must be addressed when designing the interaction of a human with an electronic system.

Table 2: Usability principles in human-machine interaction

Visibility *Ability to figure out usage*	**Conceptual Models** *Model of understanding*
Affordance *Suggestion on usage*	**Feedback** *Indication of progress*
Natural Mapping *Relates goals to intentions*	**Safety** *Protection against mistakes*
Constraints *Limitation on ways to act*	**Flexibility** *Possibility of different paths*

Visibility is about interactions that allow guidance and incremental revelation, helping the player to figure out how to reach goals. Affordance is about interactions that provide perceptions of usage and metaphors that help the player in choosing the best actions to execute. Natural mapping are interactions that provide compatibility between the mechanics and

the player's previous knowledge, helping in understanding the world and breaking down its complexity. Constraints are related to interactions that reduce the number of ways that the tasks can be performed, and consequently help in avoiding mistakes.

Conceptual models are interactions that match the player's understanding, helping in predicting the effects of actions. Feedback is for interactions that provide information on the task status and allows correcting the course of actions. Safety is about interactions that protect the player against unintended actions or mistakes. And finally, flexibility is for those interactions that allow a player to do things in a different way from the designed intentions.

4. How interaction stimulates fun

Early games like Pong [Atari 1972] and Tetris [Atari 1988] basically explored the manipulation of objects on the screen to be fun, but even the avatars controlled by a player in modern games are entities that can be moved or changed through the game interface. Thus, the basic interaction in any game occurs at the human-world level, and it is related to the *Affordance* usability principle.

Affordance involves suggestions of use that the objects in a game provide to the player, and exist not only in the control devices, but also in the graphics. The buttons and knobs afford to be pushed and handled, but the most interesting manipulations are related to the results of those actions on the doors and the guns represented. Such manipulations are interesting because they allow interacting with the world in ways that are often too complex or impossible in other kinds of activities, and because they address the human natural desire to "*bring form to knowledge structures*" [Malone 1980].

A first aesthetic characteristic that is stimulated by *Affordance* is *Discovery*. Novelties on possibilities of manipulation generate curiosity and motivate learning about it. But *Affordance* also stimulates the production of *Submission* and *Sensation*. If one's interests are matched in a game that make possible a new experience in an easy and quick way, the curiosity about interacting with it may be plenty of motivation to play – especially if the reason to do so is the fleeting desire of spending time. Also, the interaction always happens through the game interface: the player acts in the world by using controls, and perceives changes from graphics and sounds. Thus, any emotion (good or bad) that the game may cause necessarily happens through human senses.

The more unfamiliar a game interface seems the more curiosity and sensorial stimulus it may produce, in a way that the learning process itself can also result in *Challenge*. Though, it is required that the game world and interface have at least some familiarity to the player's previous experiences, otherwise it may fail in addressing some elements of the flow experience and cause the feedback perceptions to be incomprehensible or the goals to be unclear.

For this reason the *Conceptual Models* and the *Natural Mapping* usability principles are also involved in stimulating the production of *Sensation* and *Challenge*. The former involves defining the world in a logical way so the player is capable of understanding it, while the latter involves creating goals that have familiar ways of accomplishment. In this way, no matter how difficult goals are it shall still be possible and interesting to learn how to overcome them. Modern games like Guitar Hero [RedOctane 2005] and Heavy Rain [Quantic Dream 2010] extensively explore new interface technologies and strategies to design goals using well-known sensations of the real world, like shaking a guitar-imitation gadget or moving down the pad to reach for an asthma pump.

Many of the other usability principles are also related to the stimulus of *Challenge* or *Sensation*, because they are strongly attached to how the player acts and perceives the world. *Visibility* involves interactions that help the player figure out goals and the ways to achieve them, like the camera flying over platforms in the game Prince of Persia [Ubisoft 2003] to show to the player how to progress. *Feedback* involves interactions that not only show possible goals but also allow the player to acknowledge and evaluate the results of actions, like the sudden appearance of sword sounds in the game Age of Empires [Microsoft 1997] to indicate a distant fight. And *Flexibility* involves interactions that allow the player to explore different paths to accomplish a goal, which are common in games with a large world to explore.

Constraints and *Safety* seem also to influence the maintenance of the flow experience when *Challenge* is produced. The former imposes limits in possible actions that serve not only to diminish the complexity of the game but also to balance the difficulty against player's abilities. And the latter removes worries of fatal failures and thus helps to keep the player's immersion in the game. Common examples are doors that close behind the avatar or saving points found along the way.

Fantasy, *Narrative*, *Fellowship* and *Expression* seem hard to directly relate to any of the principles, and a reason for that may be due to the existence of a stronger connection to the human-human interaction. *Expression* involves self-discovering, achieved in games by the comparison of abilities and results with others – for instance, when high scores are recorded. Such emotion is only possible through competition, and therefore *Expression* is stimulated by *Challenge*. From the comparison players learn how their actions affect others, and consequently *Expression* is also stimulated by *Discovery*.

Games like Star Wars Galaxies [Sony and Lucas Arts 2003] group together millions of players, allowing them not only to compete but also to cooperate. In such large worlds, there is much to explore and perceive, and therefore *Expression* is also stimulated by *Sensation*. It is easy for players immerse in such worlds to exercise social emotions, like friendship and love, but yet there might be an additional motivation to interact socially: the possibilities on getting better results individually when helping each other. In this way, this social contact may also stimulate *Fellowship* from *Challenge*.

Fantasy and *Narrative* are both aesthetic characteristics which also seem to be stimulated by human-human interactions. *Fantasy* appeals to player's likes and dislikes not through object affordances, but through their semantic meaning – a box will always afford to be opened even if it is a pirate's chest or a mail box –, and *Narrative* creates stories from those semantic nuances. When the game contains a story the results of actions make it seem as if the player was part of it and stimulate *Curiosity*. Examples exist especially in games that break the fourth wall, like X-Men [Sega 1993] in which the player is requested to reset the console to stop a virus from being dispersed to the equipment.

5. Conclusion

The interaction in computer games can be divided in two levels: human-world and human-human. The first one is responsible for stimulating most of the aesthetic characteristics of fun from usability principles, due to its strong relation to actions and perceptions at the game world. The second is responsible for stimulating aesthetic characteristics related more to social relations produced by either rational or irrational reasons. It is then hard to directly relate the stimulus of aesthetic characteristics of fun to usability principles at this second level.

All social aspects experienced in the human-human level of interaction are only possible as an extension of the human-world level, since all communications, direct or indirect, are performed through physical means of the game interface. It seems then that an interesting continuity to this research would be to explore how this extension is achieved, perhaps considering the emergence of some of the usability principles among players from irrational reasons, like friendship.

References

ATARI, 1972. Pong. A ball and paddle arcade videogame.

ATARI, 1988. Tetris. A puzzle arcade videdogame.

DUBBERLY, H., PANGARO, P. AND HAQUE, U., 2009. What is interaction? Are there different types? *Interactions*, 1 (16), 69-75.

GARCIA, A. C. B. AND SICHMAN, J.S., 2003. Agentes e sistemas multiagentes. *Sistemas inteligentes, fundamentos e aplicações*. Tamboré: Manole.

HUNICKE, R., LEBLANC, M. AND ZUBEK, R., 2004. MDA: A formal approach to game design and game research. *In: Proceedings of the Challenges in Games AI Workshop, 19th National Conference on Artificial Intelligence, 25-29 July 2004 San Jose*. Menlo Park: AAAI Press, 1-5.

MALONE, T.W., 1980. What makes things fun to learn? Heuristics for designing instructional computer games. *In: Proceedings of the 3rd ACM SIGSMALL Symposium and the first SIGPC Symposium on Small Systems, 18-19 September 1980 Palo Alto*. New York: ACM Press, 162-169.

MICROSOFT, 1997. Age of Empires. A real-time strategy videogame.

NORMAN, D. A. 1999. Affordance, conventions, and design. *Interactions*, 6 (3), 38-43.

OBRIST, M., IGELSBÖCK, J., BECK, E., MOSER, C., RIEGLER, S AND TSCHELIGI, M., 2009. "Now you need to laugh!": investigating fun in games with children. *In: Proceedings of the International Conference on Advances in Computer Entertainment Technology, 29-31 October 2009 Athens*. New York: ACM Press, 81-88.

PINHEIRO, C.M.P., 2007. *Apontamentos para uma aproximação entre jogos digitais e comunicação*. PhD thesis, Pontifícia Universidade Católica do Rio Grande do Sul.

QUANTIC DREAM, 2010. Heavy Rain. An interactive drama console videogame.

REDOCTANE, 2005. Guitar Hero. A music simulation videogame.

SCHUYTEMA, P., 2008. Design de games: uma abordagem prática. São Paulo: Cengage Learning. Translator: BELHASSOF, C. M.

SEGA, 1993. X-Men. An adventure videogame.

SONY AND LUCAS ARTS, 2003. Star Wars Galaxies. A massive multiplayer online videogame.

SWEETSER, P. AND WYETH, P., 2005. GameFlow: a model for evaluating player enjoyment in games. *Computers in Entertainment*, 3 (3), 3-3.

UBISOFT, 2003. Prince of Persia: The Sands of Time. An action-adventure videogame.

VALIANT, L. G., 1995. Rationality. *In: Proceedings of the Eighth Annual Conference on Computational Learning theory, 05-08 July 1995 Santa Cruz*. New York: ACM Press, 3-14.

VAN WELIE, M. AND TROETTEBERG, H., 2000. Interaction Patterns in User Interfaces. *In: 7th. Pattern Languages of Programs Conference, 13-16 August 2000 Monticello*. Saint Louis: Washington University in Saint Louis, 13-16.