

Interface Design Strategies and Disruptions of Gameplay: Notes from a Qualitative Study with First-Person Gamers

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Abstract. This paper presents the results of a study about how first-person players perceive and describe their gameplay experience, what type of interface representations they consider disruptive and why. The intention to unveil fine-grained information by giving voice to players required the adoption of qualitative methods. In qualitative research, the size of the sample is less important than its adequacy. We worked with an information-rich sample of seven male volunteers, ages 16 to 40, which took part in an experiment composed by a profiling questionnaire, a two-step individual gaming session with DICE's *Battlefield 3* and semi-structured interviews. Results indicate that the integration of interface elements to the gameworld can be disruptive even when it does not compromise usability or efficiency. Smooth gameplay experience requires (a) careful balance of the level of information available at any given point and (b) aesthetical and functional coherence, internally and in relation to the gameworld.

Keywords: Entertainment and game user interface, Experience design, Graphical user interface, Interaction design, qualitative methods.

1 Introduction

Computer games shift the question of user experience from usability and efficiency to pleasure and flow, posing new challenges for interface design. Literature on the subject is growing, but much needs to be done to understand the ways in which game interfaces affect gameplay experience.

Games in first-person differ from other genres by the alignment between the points of view of the player and his representation in the gameworld. The intention of this strategy is to reinforce players' identification with the character, increasing the sense of presence and facilitating immersion [5]. However, the first-person point of view is believed to make elements that are not part of the gameworld, such as interface buttons and menus, particularly disturbing. This appears to have been the starting point of the arguments in favor of integrating interface elements into the gameworld to avoid interfering with players' immersion [15]. On the other hand, this type of strategy can compromise interface clarity or functionality unnecessarily, because it could be that explicit, superimposed interfaces do not necessarily affect immersion [4]. This debate appears to be heading towards a consensus that interface elements should be

integrated to the gameworld when possible, but not at the expense of functionality, clarity or consistency [7], [12]. This is a more balanced approach to the question, but fails to address two important assumptions behind this debate: (1) that the integration of interface elements to the gameworld is important for the experience of immersion; (2) that superimposed interface elements are disruptive of that same experience.

We addressed these points with a qualitative study that focused on how first-person players perceive and describe their gameplay experience, what type of interface representations they consider disruptive and why. In the next section, we present some theoretical understandings that guided our experiment.

2 Interfaces and Gameplay

Game interfaces tend to be understood as the buttons and menus that support user interaction with the game or “all informative elements within the game” [7]. Fagerholt & Lorentzon’s understanding of the interface as “a system that provides the player with gameplay relevant information and with the right tools to interact with game” brings the user into the equation [12]. Bayliss expands this understanding by proposing that the interface is “the site or space where the interaction between the player and the game results in the particular experience we call gameplay” [1].

Our notion of interface is a development of this proposition. We understand interfaces not as a space, but as the artifact through which the player and the game interact with each other. This places the player as the most important source of information about the effects of interface design strategies on gameplay experience. On the other hand, interface features exist prior to their social use and can be discussed in terms of design strategies.

2.1 Types of Interfaces

As the mediating ground that connects the player with the gameworld, interfaces are a necessary condition for interactivity. It is debatable whether interactivity enhances immersion or makes it more difficult. On the one hand, the fact that the actions of the player interfere with the gameworld should strengthen identification with the character and increase awareness of the game environment, facilitating immersion. On the other hand, that interference takes place across two ontologically different realms: the gameworld (where the character exists) and the physical world (where the player exists). Interactivity depends on the translation of the actions of the player into the gameworld and, therefore, demands two more levels of mediation than previous media such as cinema or television. The first of these extra layers of mediation is technological: it handles the flow of information between hardware and software. The second is cognitive, and refers to the recognition of the causal link between the corporeal actions of the player and their consequences in the gameworld.

There are several possible ways to refine this basic differentiation between hardware interfaces (physical devices such as screens, controllers and speakers) and software interfaces (graphics, sound and text). In this study, we focused on software interfaces. Game software interfaces have been understood in terms of two design paradigms, as previously mentioned: interface elements are either integrated to the

gameworld, or they are not [15], [4], [7]. In this study, we consider the existence of three types of interfaces, each one resulting from a different design strategy. In two of them, interface elements are integrated into the gameworld. In the first one, 'material' objects of the gameworld are used as interface elements. An example in *Battlefield 3*, the game used in our experiments, is the guns that players can collect from the floor and see in their hands. These guns 'exist' as material things in the gameworld and, at the same time, are interface elements that deliver information to the player. We call integrated interfaces that follow this strategy '**material**' interfaces. Another form of integrating interface elements is to present them as representations internal to the gameworld: for example, as images on the HUD of a helmet the user character is wearing. It is important to notice that the acronym HUD has been loosely used to refer to any representation overlaid to the gameworld. In this study, we call HUD the simulation of a 'real' HUD. Thus, the HUD is not superimposed but part of the gameworld. It respects the alignment between the point of view of the player and that of his representation in the gameworld and conveys information as visual representations within the gameworld. The images on a HUD are of a different nature than the transparent layer they are superimposed to: they are visual representations, projected light. No matter how transparent, the support upon which they are projected is a material object in the gameworld: it can be touched or broken. Thus, we understand the simulation of a HUD as a middle ground between the integration of the interface with physical elements in the gameworld and outside of the gameworld. Other examples of interfaces that follow this design logic would be images on a screen or voice instructions received through a communication device. We call integrated interfaces that follow this strategy '**semiotic**' interfaces.

A different paradigm of interface design is the enunciation of interface elements independently of the representation of the gameworld. This can be done by superimposing interface elements to the representation of the gameworld, as if they belonged to a transparent layer on top (and independent) of it. Another possibility is to use split screens, placing the representation of the gameworld and the interface side-by-side, for example. We refer to interfaces that follow this logic as '**external**' interfaces.

2.2 Immersion, Engagement and Flow

It is common to find references to the experience of gameplay as immersion, that is, as the impression of being surrounded by a fictional world and unaware of our physical surroundings. Douglas & Hargadon consider the possibility of immersion, but relate it to predictability and low levels of cognitive work. In situations that involve challenge and effort, they see a different type of involvement, that they call engagement [5]. The authors also introduce Csíkszentmihályi's notion of 'flow', i.e., "the feeling of being intensely engaged in an activity for its own sake. During flow, the passing of time seems to disappear due to the deep focus of the activity" [8]. Flow has been considered a particularly appropriate description of the involvement between players and games [1], [8], [4], [12]. It combines characteristics of immersion, such as deep and intense involvement, with the challenging and active character of engagement. It is also convergent with the idea of a state of double consciousness in which the player is fully aware of the artificiality of the game situation [14], but acts as if he believed it in order to intensify the pleasure of gameplay. "In the flow experience, the

player's sense of self is not so much lost as it is expanded, such that the player can have a feeling of union or involvement with the game, whilst remaining aware of the contextual situation in which they are engaged" [1].

The development of haptic and motion-tracking controls and other similar devices is driven by the idea that approximating hardware interfaces to what happens in the gameworld can facilitate or intensify immersion, engagement or flow. The logic is similar to that behind the alignment of points of view in first-person games. However, neither of these strategies can erase the ontological difference that separates the player from game characters. To affirm this is to deny that the differences between the actions on hardware interfaces and their representations and effects are a transitory condition that is already been left behind with the popularization of motion-tracking interfaces such as Nintendo's *Wii-Remote*, Sony's *PlayStation Move* or Microsoft's *Kinect*. It must be taken into account that these are initial developments for the home market and that, in combination with multi sensorial and more responsive output systems, motion-tracking devices can reduce the mismatches between the physical actions of the player and their effects in the game. However, they cannot eliminate the additional levels of mediation that are a condition for interactivity. The dream of total alignment of hardware interfaces is akin to the idea that the ideal game interface is that in which all elements have been successfully integrated to the gameworld. We see it as the myth of representational transparency and the desire of immediacy [2] transposed to hardware interfaces. Dourish called attention to the embodied nature of our existence and, by extension, of our interactions: "we inhabit our bodies and they in turn inhabit the world, with seamless connections back and forth"[6]. No matter how advanced our interfaces, we cannot experience symbolic, immaterial worlds the same way we experience the physical world.

3 Method

Our study focused on the perception of the players about their experiences of disruptions in first-person games, especially on the identification of connections between interface representations and disturbance of the gameplay experience. Quantitative methods such as surveys and questionnaires are efficient to reveal general trends and answer broad questions [4], [5]. The detailed information we wanted to collect could only be obtained with a qualitative approach and research techniques that gave voice to the players. Previous studies have shown the power of qualitative methods to unveil fine-grained aspects of the perception and opinion of the players about their own gameplay experience [7], [9]. In this type of investigation, the size of the sample is less important than its adequacy to the research goals. Accordingly, our sampling process did not intend to identify a representative sub-set of the universe of first-person gamers, but to build an information-rich group [8].

The sample was built with a combination of purposeful choice and snowball techniques. The first three participants were chosen to maximize the probability of composing an information-rich group [13]. Two of them contributed for the snowball process. All volunteers were asked to complete the profiling questionnaire. Seven male subjects fulfilled the requirements to participate in the study, namely, to have a certain level of experience with FPS and with game consoles. Table 1 shows their

age, area of expertise and previous experience with games in general, consoles (*Playstation* or *Xbox*), FPS, *Battlefield* series, BF3 in campaign mode and BF3 in multiplayer mode. All names have been changed.

Table 1. Sample Profile

Name	Age	Area of Expertise	Previous Experience with					
			Games	Consoles	FPS	BF Series	BF3 Campaign	BF3 Multiplayer
<i>John</i>	16	(School)	High	High	High	High	High	High
<i>Leonard</i>	20	Visual Design	High	High	High	Low	Low	Low
<i>Wilson</i>	23	Visual Design	High	High	High	Good	Good	None
<i>Phillip</i>	21	Automation Engineering	High	Good	High	Regular	Regular	None
<i>Simon</i>	40	Architecture	High	Regular	Good	None	None	None
<i>Michael</i>	28	Computing	High	High	Good	High	High	High
<i>Robert</i>	16	(School)	High	High	High	Regular	Low	Low

Data collection was composed by two-step individual gaming sessions with BF3, followed by semi-structured interviews. The reduced size of the sample allowed for longer observation and better customized interviews. The gaming sessions intended to provide a common ground for all players to refer to the same sub-genre of first-person game, the same game situations and the same interface representations. The first part of the gaming session was in single-player mode. Subjects were invited to play the campaign 'Operation Swordbreaker' for up to 15 minutes. Operation Swordbreaker presents a considerable variety of game situations and interface design strategies in a short period. As the first campaign of the game, it is not as explanatory as the tutorial, but not too difficult to compromise the chances of success of participants who were not accustomed to the specific type of controller used in the experiment or had no previous experience with this particular game. For the second part of the session, the player was positioned in 'Damavand Peak', to play in Rush Squad mode, as an Engineer equipped with an M4A1: this situation and location allowed for different types of action at a slower pace than other options and presented the user with a significant variety of interface elements. Gameplay was followed by the interviews about their general gameplay experience and, more specifically, the occasional disruptions and their possible relation to hardware input devices and graphic interface design strategies.

4 Results

The purpose of this study was to understand how FPS players perceive their gameplay experience, which type of interface representation they considered disruptive and why.

4.1 General Gameplay Experience

All participants used the word 'immersion' at some point during the interview, and explained its meaning in the broad sense of 'the feeling of being inside the game'. Five participants reported to experience immersion very often with games, and more than one affirmed to have become immersed during one or both sessions of the experiment, despite their brief duration. The intensity of the immersion of one player challenged the idea of double consciousness [14] and even the principles of embodiment [6]:

Did someone come in while I was playing? No, I didn't see or hear anything! I was totally immersed, for me you were all sat there quietly while I was playing (...) It happens at home as well, [when I play] I am out of this world (Simon)

Not all players were positive about immersion: one participant laughed at the idea, that he considered naïve, and said he never experienced anything like it, with games or other media. Another player said he does not *usually* experience immersion and referred to his experiences of gameplay in terms of engagement [5]:

...multiplayer is the one that creates tension. As you play as a team, at times someone does something wrong, gets in the way... multiplayer does not increase immersion but involvement, [due to] the difficulty, the interaction with others (Wilson)

There appears to be a relation between the description of gameplay as immersive or engaging and the preference for campaign or multiplayer mode. Subjects who played immersively tended to talk about the importance of narrative and players who prefer multiplayer referred more often to challenge and commitment. Players were unanimous about the improvement of gameplay by two other factors: the first-person point-of-view and meaningful interactivity. The first-person point of view was confirmed to facilitate identification with the character:

In these first-person games, you put yourself in someone else's shoes (Leonard)

Interactivity was as an important difference between games and other media, but pleasurable and compelling gameplay required more than feedback. Basic interactivity is not sufficient, there have to be meaningful effects on the gameworld – and evidence of them. The absence of immediate and meaningful feedback was mentioned as particularly disrupting. For example, in Operation Swordbreaker, the squad runs through a passage, at the end of which there are a gate and a door. A dog appears behind the gate as the soldiers proceed towards the door. One of our subjects turned to the gate and shot the dog, to no effect:

Narrative is very important in the offline [campaign mode] (...) There must be a range of options, with consequences, like killing the dog: you shoot the dog and it really dies. Someone could swear at you for doing that, it would increase involvement (Leonard)

Lack of meaningful feedback from hardware interfaces was also mentioned as a source of disruption.

4.2 Hardware Interfaces and Gameplay Experience

When asked about what disturbed their gameplay experience, six of our seven players first referred to the console controller. Complaints were about imprecise or delayed feedback and, in some cases, lack of familiarity with that specific hardware:

The difficulty is because I still don't know much this control¹ so it told me to press X and I had to look to see which button was X. But I would soon get used to it and then it would become natural (Simon)

The computer was clearly the favorite platform of those who prefer the multiplayer mode. Speed and precision were the reasons for this preference:

There is a big difference between playing with the keyboard and mouse and with controller. [With the controller] you cannot aim properly, it is troublesome (Phillip)

The mismatch between the actions required by the input devices and their effects in the gameworld was mentioned by several players. Some were of the opinion that motion-tracking interfaces are 'fun', or 'cool', but most had doubts about their real advantages. Recurring references to poor feedback suggest that technological improvements could change this scenario, but only one of our subjects mentioned a positive impact on gameplay – but at a cost:

If I play the campaign, then I would play with the rifle [CTA's Assault Rifle Controller]... because I don't worry with... it is not as complicated as the online, where you die all the time. I think I feel more inside the game with the rifle, so it does not bother much, it bothers, but immersion becomes more interesting (Robert)

The reference to the rifle 'bothering, but not much' suggests that this player, as all others in our sample, considered the quality and speed of the system's response more important than erasing the evidences of the technological and cognitive mediation between the physical world and the gameworld.

4.3 Software Interfaces and Gameplay Experience

The observations of gameplay sessions suggest that BF3's semiotic interfaces are smooth in campaign and in multiplayer mode. Sound interfaces were not mentioned in the interviews and did not appear to be a source of disruption. Contrarily to our expectations, even players accustomed to play online did not complain about the absence of a microphone. We attribute this to the fact that the conditions of the experiment did not allow for proper team play: subjects could not choose the other members of their squad and knew that the gaming session was likely to be brief. Subjects' opinions about visual interface elements were also significantly convergent.

External interfaces were not considered particularly disruptive, but most players admired the design strategies of integrated interfaces. One player disliked superimposed

¹ The player was accustomed to play with an Xbox and was more familiar with its controllers, but it was not the first time he used a PS3.

elements unless he could incorporate them in the gameworld. To this end, he created sub-narratives that transformed external interface elements into semiotic interfaces, at times in spite of disagreements with the internal gameworld coherence.

...the floor is in perspective and it [an interface button] appears flat, there is nothing holding it. But the orange dots [signals indicating the location of targets] ... you can think the soldier is wearing a helmet or binoculars with points that indicate distances (Leonard)

When confronted with the fact that the behavior of the elements he considered possible to interpret as part of the gameworld behaved as inconsistently as the others, the interviewee contradicted himself. However, there was evidence that the difference between the elements he considered possible to integrate as part of a semiotic interface and the ones he could not was aesthetic.

Aesthetic coherence (use of the same color palette, related shapes, textures and levels of transparency) was decisive for the identification of different elements as part of one or other types of interface (external, semiotic or material). Transparent colors blend more smoothly but an excess of transparent elements and a repetition of the same colors can compromise clarity:

Those [superimposed transparent information boxes] didn't work. It is the colors (...) that light blue, it does not call attention. They just oblige you to concentrate more (Robert)

Independently of the mode of representation, information that the researchers had considered explicit was not noticed by several users during gameplay. Different interface elements and layers dispute player's attention at some points. Discreet interface elements and elements that are always on the screen tend to disappear from view, but elements with strong colors or that appear sporadically tend to be a source of disruption:

At times, they give you an information when you are paying attention to the game, someone can shoot you, then either you pay attention to what is written and the game stops, or you don't stop, but you can miss something important (Michael)

The solution appears to be the convergence of all information needed to the main focus of attention. One possible way of doing this is to integrate interface elements into the gameworld, but not all forms of integration are well accepted. For example, as several other FPS, BF3 interfaces do not include a health bar. Loss of health is represented by the appearance of an increasing volume of bloodstains and fading of the gameworld colors. A more abrupt color fade is used to indicate that the user has gone out of the limits of the combat area. In this case, a red warning and a counter appear on the centre of the screen, signaling the need to return.

Things like 'press R1' or whatever, these don't disturb me, not as much as any time I die and ... when there is damage, this type of thing, and the screen starts to get kind of grey, that throws me out of the game (John)

The majority of external interface elements were not considered disruptive by any of our interviewees. They convey information more clearly and were considered particularly helpful in difficult situations. On the other hand, as the game becomes

more challenging it demands more attention from the player, reducing the amount of on-screen information they can handle. This optimal informational level, i.e., the balance between too much and too little information, varies from player to player and changes over time. The research team considered BF3's external interfaces highly redundant and expected players to complain about excessive repetition of commands and directions, especially in campaign mode. However, there were no complaints about external interface elements being excessive or disruptive.

BF3 has goals and has an indication there, of what you have to do, who you should follow and who you want to kill. That [orange shape indicating where to shoot] does not bother, no, it is there because it is necessary to guide the player over time (Wilson)

One particular external interface element was considered disruptive and strongly criticized by all players. At a certain point during Operation Swordbreaker a cut scene shows one of the soldiers of the players' squad being shot by a sniper and falling in front of him. The player's character advances to pull him back inside a building. The cut scene ends and a representation of the X button of the PS3 controller appears superimposed to the image of the gameworld. The X button on the screen continuously pulses to indicate that the player must press X several times to carry his companion successfully. The cut scene was considered a source of disruption, but, surprisingly, the most frequent complaints were about the inconsistency of the scene in relation to the storyline instead of the interruption of gameplay.

That guy advanced to rescue the other who was shot and I didn't even know why, I would have left him dead there and go on shooting (Simon)

One interface element of the sequence described was mentioned by all players as the most incoherent and disruptive in the gameplay sessions: the pulsing 'X' button.

That X didn't follow any pattern, it .. it was too big on the screen, it did not match anything else (Leonard)

The mismatch was not only aesthetic. The action required by the pulsing (repeatedly pressing the X button on the controller) was different from any other hardware input required by the game up to that point. Nearly all players had difficulty to change from one type of physical interaction to the other. Even those most used to the PS3 controller and who had played the game before hesitated before starting to press the X.

5 Discussion and Conclusion

Results obtained with a small sample and qualitative methods should not be generalized. Accordingly, the intention of this study was not to reveal patterns, but to gain rich, in-depth information about the way players experience gameplay disruptions and how they relate to interface design strategies. To this end, we performed a 4-phase experiment with a small sample of players and DICE's game *Battlefield 3*.

Our study indicates that most players feel immersed in the gameworld, to the point that some are not aware of their surroundings even during very brief gaming sessions.

Others, however, referred to the way they experience games in terms of engagement rather than immersion. All players confirmed that their gameplay was enhanced by the alignment of the fields of vision through the first-person point-of-view. The alignment between the actions performed by players and their effects on the gameworld via motion-tracking hardware interfaces was not said to improve the gameplay experience. This can be a temporary condition, as most players said they did not like to use this type of interface due to the lack of precision. Interactivity is important but engrossing gameplay requires more than basic feedback. The effects of the player's inputs on the gameworld have to be meaningful, explicit and immediate – otherwise, interactivity can be a source of disruption.

The use of semiotic interfaces was well received. Sound, for example, was not mentioned as a source of disruption by any of our subjects. This does not mean that the integration of informational elements as sound is always a good solution, but that the way it is done in BF3 appears to be well resolved. However, not all ways of integrating information to the gameworld were so widely accepted – 'image filtering' [7], for example, is a strategy acclaimed by some authors [7], [15], but our players considered it disruptive. External interfaces were better accepted, even when the elements used were absolutely alien to the gameworld (for example, textual information above characters heads or explicit instructions like 'PRESS R1'). The relation between disruptions of gameplay and the integration of interface elements to the gameworld was weak. Aesthetic and functional interface coherence was the decisive factor for a good game experience was. Use of the same color palette, similar shapes, types of texture and levels of transparency can create a pleasant and highly informative composition. In our experiment the presence of elements that conflicted with the general aesthetic and functional pattern was reported as a main source of disruption. On the other hand, there were indications that the use of a palette that is too restricted or a library of shapes that does not allow for sufficient variation could result in excessive similarity amongst interface elements, leading to confusion.

Previous authors [4], [12], suggested that clarity and functionality are more important for game interface design than integration into the gameworld. The responses we obtained converge with their opinion that users prefer information to be explicit, easy to find and easy to monitor over time. External interfaces were not considered disruptive unless they break the aesthetical or functional coherence of the interfaces or of their relation to the gameworld. We consider this to be an important finding, which extends previous considerations about the importance of the internal coherence of the gameworld [11] to the interfaces. Coherence proved to be a major element integrating material, semiotic and external interfaces, i.e., the three types of software interfaces we had identified theoretically and according to which we organized our experiment, analysis and discussion. This conclusion also applies to the hardware interfaces considered in our study.

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