Epistemological Issues in Understanding Games Design, Play-Experience, and Reportage

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ABSTRACT

This paper presents a philosophically grounded argument for examining how second-order analysis can be approached with regard to epistemologies of game design and play-experience. Games are presented as multiple 'units of being' sharing relationships of dependency and transformation, which can be approached differently by different audiences. To demonstrate how such relationships can function between units of being, examples from game analyses are discussed with particular attention to the role of cognition and memory in reporting on the play-experience specifically. Implications for design practice, player studies, game analysis, and games criticism are discussed throughout the argument, working towards a theoretical foundation for enabling more deeply informed interpretation and analyses.

Keywords

Epistemology, Units of Being, Game Design, Play-Experience, Cognition, Memory, Reportage, Analysis, Criticism.

SECOND-ORDER PROBLEMS

Game design has been described as a 'second-order design problem', a term initially posited by Salen and Zimmerman (2004, p. 168) and reapplied across a range of game design and game studies literature. Game designers are tasked with designing enjoyable interactive player experiences but can only ever do so indirectly. The designer creates game mechanics and content, constructing a designed *play* experience, which then supports an eventual *player* experience. However, because any individual player experience is inherently emergent, via dynamic interaction between the player and the game's mechanics, it is impossible to directly design a *specific* player experience. Each player will have different experiences of the same game. This is based on the underlying designed game systems but differentiated through dynamic emergence of behaviours from interaction with those systems.

The second-order problem not only applies during the design and development stages of a game however. When designers, analysts, or critics want to examine the design

process itself or endeavour to understand player experiences with a particular game, they face a similar issue: a 'second-order analysis problem'. When an individual is playing a game, their experience is internalised, taking place in their mind. From an analytical perspective, this internalised experience of *in-the-moment gameplay* is only externally accessible once the player has reported on it in some way, usually by way of recall of their memory of their experience. However, memory recall is never a literal reproduction of past events or experiences. Instead it is a selective, reconstructive process prone to distortions and inaccuracies (Neuschatz et al., 2015). It is dependent on factors such as accuracy of the original encoding of the experience, individual bias, pre-existing memories, and spatiotemporal or sociocultural contexts.

The second-order analysis problem applies even when individuals reflect on their *own* gameplay experiences; the reflection process is still reconstructive. Thus, analysis of any player experience is always at least once removed from the in-the-moment gameplay experience. Any process, whether in industry or academia, that takes as its focus the design, development, or play experience of specific practitioners or players can therefore be viewed as a process of interpreting reconstructed memories.
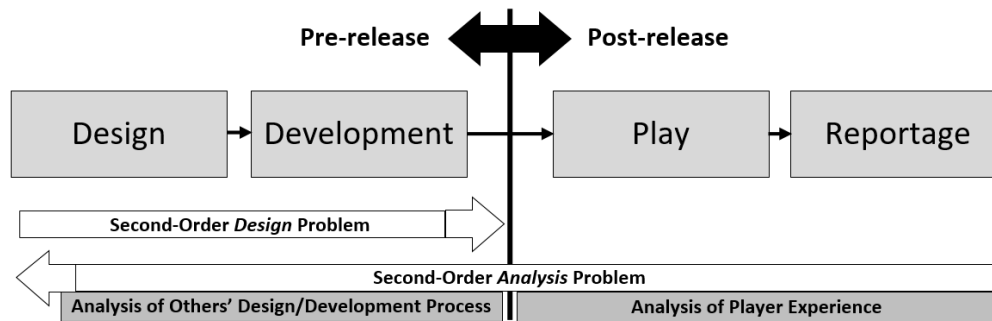

Figure 1: Second-order problems in pre- and post-release stages of a game's lifecycle.

The key stages in the lifecycle of an individual game (Figure 1) present problems of a 'second-order' nature throughout. In design and development, the problem is second-order design; understanding the *intended player experience* and subsequently designing a supporting *play experience*. At the other end of the lifecycle, endeavouring to understand the *received player experience* via analysis of recall and reportage by players presents a problem of second-order analysis. The same problem is also encountered when endeavouring to understand any aspect of another's design and development process, if relying on their recall and reporting of such.

There are thus ontological and epistemological issues to address with each lifecycle stage, from the perspectives of designer, developer, player, and analyst. No individual, other than a designer making, playing, and reporting on their own game (a process still affected by the reconstructive memory problem) can know comprehensively and objectively the details of the full lifecycle of a game. Instead, individuals from different fields (e.g. the industry, player communities, games media, and games academia) have different degrees of access to different stages of the lifecycle and thus, access to different forms of knowledge about particular games.

We present an ontology through which to examine the different stages of a game's lifecycle, the transformative relationships between these stages, and the impact of such on epistemologies of game design and of play-experience. Particular attention is given to the activities of recall and reportage of player experiences and the underpinning theories of cognition and memory in a game studies context. Examples are drawn from the games industry and prior analyses of commercial games to demonstrate our argument and outline implications for future work.

THE 'GAME SPACE' MODEL

The *Game Space Model* (Figure 2) presents an ontological structure in which games exist in conceptual *game spaces* within *real-world space*. Each *game space* contains sub-spaces for the lifecycle stages of *design*, *development*, *publication*, and *interaction* with an audience. The stages are connected via relationships of dependency (e.g. a published game is dependent on a designed and created game) and/or transformation (e.g. a design philosophy can change the design process).
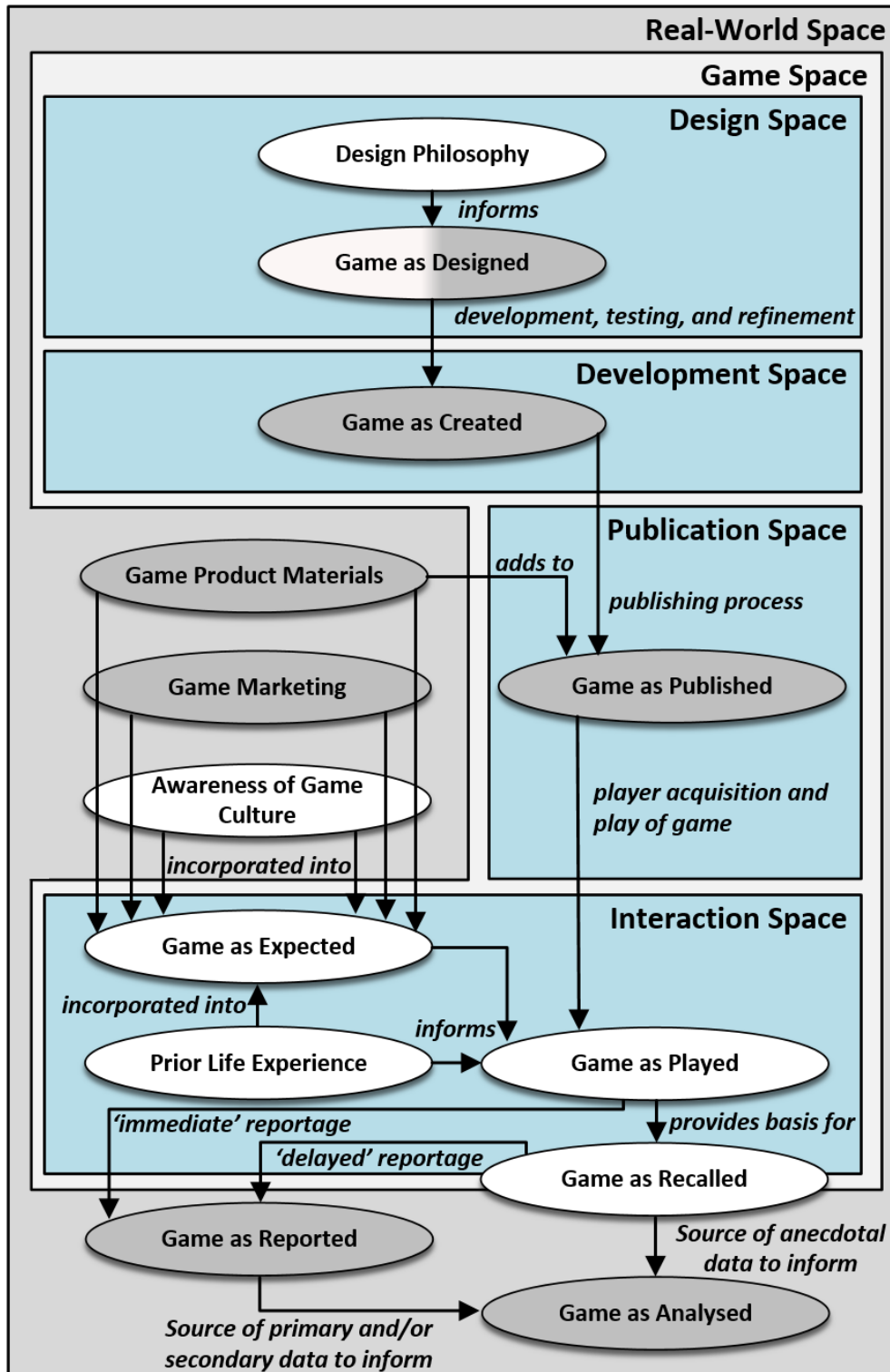

Figure 2: The Game Space Model.

Bogost's (2012) work on *flat ontology*, which itself is built upon the thinking of Bryant (2011) and DeLanda (2002) affords a basis on which to elaborate the structural features of this model further. Bogost's flat ontology states that "all things equally exist, yet they do not exist equally" (Bogost, 2012, p. 11). This equally applies to corporeal entities and incorporeal entities; they all have the same ontological status as a 'unit of being'. Importantly, these units of being are not part of a hierarchical system, "there is no ur-thing, no container, no vessel, no concept, that sits above being such that it can include all aspects of it holistically and incontrovertibly" (2012, p. 12).

For example, Bogost offers a range of different units of being that the videogame *E.T* (Atari, 1982) may take the form of, including a collection of opcodes and operands, a moulded plastic cartridge, a system of rules and mechanics, an interactive player experience, and a cultural symbol of the 1983 videogame crash. Some units of being may be dependent on, or have a transformative relationship with, other units of being. For example, '*E.T.* the system of rules and mechanics' is dependent on the simultaneous existence of '*E.T.* the source code'. '*E.T.* the cultural symbol' has a transformative value-based relationship with '*E.T.* the boxed retail product'. "*E.T* is never only one of these things, nor is it only a collection of all of these things" (Bogost, 2012, p.19). A flat ontological perspective makes it possible to understand the unit of 'game-as-code' separately to the unit of 'game-as-play' without need to invoke an overarching unit of 'game' as a higher-order form.

The Game Space Model takes a similar approach and applies it to the different 'units of being' that a game may exist as, during its lifecycle, and how those units may transform other units via proximity or interaction. We identify eight different units of being for the '*game as…*'; the game as designed, as created, as published, as expected, as played, as recalled, as reported, and as analysed. Potential transformative relationships and unit dependencies exist between many of these units, such as the addition of publication materials (e.g. a box and manual) to the *game as published*, or the reporting of a recalled gameplay experience by a player to create a *game as reported*.

A game's lifecycle stages are either *concrete* stages (the grey ellipses in Figure 2) or *abstract* stages (the white ellipses in Figure 2). A concrete stage of the game has a real-world referent (e.g. some written game code, physical game media, or a piece of written analysis) while an abstract stage does not (e.g. a player's in-the-moment gameplay experience, or a designer's philosophy). While ontologically this difference is irrelevant as all units of being equally exist whether they are corporeal (i.e. concrete) or incorporeal (i.e. abstract), the separation of concrete and abstract stages is of epistemological importance. A concrete stage can be directly analysed (e.g. one could directly view and discuss a game's source code, or directly read and discuss written game reportage and analysis), while an abstract stage always requires second-order analysis of information (e.g. analysis of a player's recalled 'in-the-moment' gameplay experience, or recalled pre-play expectations).

When discussing a particular game, it is important to identify the particular stage(s) of the game's lifecycle (i.e. the relevant unit(s) of being) that are being discussed, as well as who is involved in the discussion. For example, discussion of a released commercial game (i.e. a *game as published*) involves different subject matter and a different context compared to discussion of an in-development game (i.e. a *game as designed* or a *game as created*). Post-release analysis (e.g. a *game as analysed*) of a game from the designer's perspective (e.g. 'postmortem' reports) is different to analysis of the same game from the perspectives of other development team members, play-testers, or the players themselves. Furthermore, designers and

developers operating within *game design space* or *game development space* will be utilising prior knowledge of game design and development (e.g. what has been successful and well received by players in the past) in an attempt to 'know' the eventual experience that their players will have as a result of their work. All participants in a games-based discussion are themselves units of being; individual players, YouTube personalities, the media, government departments – each is a unit that can have a transformative relationship with the game under discussion.

UNIT RELATIONSHIPS IN GAME DESIGN EPISTEMOLOGY

In *design space* (Figure 2), a particular *design philosophy* or design aim (e.g. designing with the aim of eliciting particular emotions from players) informs the creation of the *game as designed*; this may take the form of concrete design documentation or may simply be a set of abstract design intentions in the mind of the designer. At this stage, the concrete reality of the game artefact itself is not fixed and it may change significantly before it becomes a playable game. The *game as designed* consists of a combination of concrete design documentation and abstract design intent in the mind of the designer. This is then developed (e.g. via an iterative prototyping, development, testing, and refinement process) into the playable *game as created* ready for publication. This effectively finalizes the game's core 'play experience', as it is unlikely that significant changes to the game's core components will occur during publication.

The publisher adds production materials (e.g. a box and game manual) to the *game as created* resulting in the *game as published* (e.g. a physical, boxed game or a digital product on a digital distribution platform). The *game as published* thus alters what can be known about the game and how that knowledge can be acquired (i.e. the game's epistemological status). Specifically, it expands the game's 'play experience' into an 'interactive media experience', situated in a sociocultural and creative industries context and, dependent on how it is delivered to the player, a physical or digital games retail context also.

Before the game has reached players, it has transitioned through a number of abstract and concrete stages and thus, different epistemological concerns apply. Discussion of design and development practice, along with analysis of game artefacts and their play, should consider what can be known about the game at each stage. From a perspective external to any game's particular design and development team it is not possible to reliably, comprehensively know the underlying design philosophy or authorial intent. They can be inferred by careful consideration of the more readily available relevant units of being and their relationships to each other (e.g. the *game as published*, the marketing material, the games industry and/or marketplace) but there remains uncertainty in this approach. In their work on 'abusive game design', Wilson and Sicart (2010) argue that a game intentionally designed to be abusive (e.g. to be intentionally obtuse, punishing, or antagonistic) may look similar to a game that is accidentally abusive through a combination of design failings. The intentionally designed game represents a particular design philosophy operationalised into a product while the other represents a failed attempt at operationalisation of some other design philosophy.

A design philosophy or design intent may be apparent in concrete design documentation such as the *game as designed*. Even then however, such documentation may be a filtered interpretation of the designer's philosophy, modified to fit the pragmatic design requirements of the game. Directly asking designers about the underpinning philosophies for their work will elicit subjective data that, additionally, may be filtered by the designer to present both themselves and their products in a positive light. Thus, any post-hoc explanation of their design philosophy

may be modified to fit more accurately the eventual *game as created* or *game as published*.

For the external commentator (i.e. the games researcher, the critic, the player, or whosoever may be involved in a discussion outside of a game's design team) there is no avoiding the second-order nature of analysis. However, it is possible to identify and give appropriate weight to different units of being and their relationships in analyses of games and their design. This is only one part of the larger issue of developing an understanding of a particular game's design of course. The players' experiences of a game are a key component in understanding not only the 'success' or 'failure' of a particular design philosophy but also, in understanding why reportage, analysis, and criticism of a game within the wider gaming community may emerge in particular ways. While players, as a unit of being (both individually and as a collective) may have little to no interaction with a *design philosophy* or *game as designed*, they may have varying relationships with other pre-release material, with (games) culture more broadly, and with each other. The range of potential transformative relationships between so many units of being is substantive, however the contents of *interaction space* within the Game Space Model point to some key relationships between players and particular units of being of a game that deserve further attention.

UNIT RELATIONSHIPS IN PLAY-EXPERIENCE EPISTEMOLOGY

Numerous contextual factors may influence the ways in which an individual's interaction with a game (i.e. the *game as played*) may proceed, as well as how follow-up activities of recall, reportage, analysis, and/or criticism (i.e. the *game as recalled, the game as reported*, and the *game as analysed*) may proceed.

The first component within *interaction space* is the *game as expected*, which is also closely tied to a player's *prior life experience*. These expectations and prior experiences are transformative of the attitude with which a player initially approaches a new game, as well as how players later reconstruct memories of their player experience. There is a range of potential stimuli that a player may encounter before playing a game that will influence their expectations of, for example, what it will play like, what the story may be about, and what type of emotional experience it will provide.

Iacovides et al. (2015) identified a number of factors influencing the formation and subsequent effect of player expectations. Of particular note in the context of the Game Space Model and of a flat ontological structure, their work suggested that "interactions with player communities, whether directly through talking to others or indirectly via paratexts, do contribute to [the formation of] player expectations of gameplay" (Iacovides et al., 2015, p. 217). The relationships and interactions between individuals and collectives, and between human (e.g. players and player communities) and non-human (e.g. paratexts) entities, create and transform expectations.

In the Game Space Model, units of being such as 'player communities' and 'paratexts' are contained within *awareness of game culture*, alongside awareness of concepts such as game genre, common design patterns, or established game tropes. Much of this awareness is outside of the context of any one *particular* game but provides important context for developing expectations of such. Howell (2016) explored the role of these expectations in the context of a case study of *Amnesia: A Machine for Pigs* (The Chinese Room, 2013) and the player community discussions that took place post-release. The study found that expectations had a significant effect on the player experience, as well as post-play reflection on that experience (i.e. the

type of reflective activity that would support reportage, analysis, and/or criticism). Misalignment between the player's expectations of play (i.e. their *game as expected*) and the reality of the player experience (i.e. the *game as played*) can have detrimental effects on player opinion and critical reviews. For example, it was found that:

> When players felt there was a mismatch in the alignment between the marketed game and the actual game, this resulted in [. . .] particularly strong negative feedback in many cases. [Additionally], it is evident that different player knowledge and how a game does or does not align with expectations, can place limitations or freedoms on how those players are able to evaluate a game. (Howell, 2016, pp. 10-11)

In the particular case of *Amnesia: A Machine for Pigs*, this study noted that player discussion and post-play criticism of the game was frequently framed in the context of how it compared to the earlier title, *Amnesia: The Dark Descent* (Frictional Games, 2010). The study also found that pre-release media, such as trailers and screenshots, were similarly frequently referred to in post-play discussion, with players often commenting negatively on the differences between the marketed and the published game. Other notable examples of such discussion include *Brütal Legend* (Double Fine Productions, 2009), criticised for being presented as a third-person action-adventure in its pre-release media but which contained a significant portion of real-time strategy gameplay in its later stages, and *No Man's Sky* (Hello Games, 2016), which was heavily criticised for not containing some advertised gameplay mechanics and game content on its initial release.

These examples demonstrate the formation of expectations based on a game's marketing material, which is a concrete component of the Game Space Model; it is made up of real-world referents that can be directly examined. However, player expectation can be influenced by other components of wider games culture that are more abstract in nature. For example, different genre labels, such as *Role-Playing Game* (RPG), *First-Person Shooter* (FPS), or *Multiplayer Online Battle Arena* (MOBA) imply particular design features or gameplay experiences that will support the creation of player expectations, based on a player's past experiences with similarly labelled games (Lindley & Sennersten, 2008). As players experience more games categorized with a particular label, they will start to associate common design or gameplay features and corresponding gameplay actions with that genre category as a whole, rather than to any individual works within it (Clarke et al., 2017, p. 447).

A genre label itself thus provides an initial cue for players to recall information from memory related to prior experiences of games in that same genre. While a player's knowledge related to a particular game genre label forms a part of that player's *awareness of game culture*, it is also individualized by his or her own specific experiences with similarly classified games. For example, a player whose only experience of the FPS genre is fast-paced competitive games, such as the *Call of Duty*, *Battlefield*, or *Titanfall* franchises, will have a different set of genre-based expectations than a player whose genre knowledge is built on slower-paced, narrative-driven titles such as *Metro: Last Light* (4A Games, 2013), *Deus Ex: Mankind Divided* (Eidos Montreal, 2016), or *S.T.A.L.K.E.R.: Shadow of Chernobyl* (GSC Game World, 2007).

Clarke et al. (2017, p. 455) note that the concept of 'genre' can be prescriptive and artificially restrict an individual's imaginative thought, creativity, or likelihood to explore novel perspectives on the particular text in question. While the authors apply this argument in a pedagogical context, referring to the impact of genre on how

students approach game design analysis and criticism, the same concerns of prescriptiveness apply to players also. Post-play discussion that is constrained by pre-play expectations (whether based on genre labelling or otherwise) may be notably biased towards discussion of those expectations and the ability of the game to fulfil them, in turn potentially missing important aspects of the player experience. Howell's (2016) study of *Amnesia: A Machine for Pigs* found this was apparent in post-play discussion, with a clear division between players based on how their expectations of a game fitting the 'survival-horror' genre label differed. Players that associated the label with psychological, story-driven, implicit horror (i.e. the type of experience offered in the game) were more positive in their criticism of their player experiences than were players associating the label with visceral, action-oriented, explicit horror.

Numerous other factors may prompt players to form expectations of a game, with varying degrees of depth and detail, prior to play. Factors drawn from wider games culture may include awareness of pre-release rumour, player speculation, previews, or pre-release reviews in the wider gaming press. Players may also be unintentionally exposed to 'spoilers' or other information that will eliminate aspects of surprise or discovery from their player experience, which in turn may affect the player's post-play opinions of the game itself. At the point of purchase, be that a physical or digital store, players are exposed to a game's product materials (e.g. box/cover artwork, screenshots, or sales blurb). As explored in greater depth in other research (e.g. Burgess et al., 2007; Near, 2013), box art can clearly communicate values engendered in the game and establish player expectations. Lastly, a player's existing awareness of a particular development studio, publisher, or indeed individual developer, may function as a cue for constructing stylistic or mechanical expectations about a game based on past titles from those sources. In some cases, the associations between game elements and individual developers may be particularly influential if that developer has an 'auteur'-like status in the games industry with a history of games containing particular artistic 'stamps' in their audio-visual, mechanical, or narrative designs (Ensslin, 2014, p. 141).

An epistemology of play-experience must consider the in-the-moment experience of playing a particular game (the *game as played*). This is abstract, internal to the individual, and not directly observable. Thus, it is necessary to look instead at the externalised, concrete units of meaning that reflect that internalised player experience. The different knowledge bases of each individual player lead to different expectations and thus, different player experiences and different post-play reportage. This in turn raises the epistemological concern that to know adequately the full context of an individual player experience, one must endeavour to know their pre-play expectations and the attitude with which they encountered the game initially. It is possible to know that player expectation (i.e. the *game as expected*) has a transformative effect on the player experience (i.e. the *game as played*) and, to an extent, what some of the likely relationships between the relevant units of being may be in the formation of those expectations. It is also possible to acquire qualitative, subjective data from players regarding the perceived nature of that transformative effect. Yet the functionality of human cognition, along with the biases and errors that human memory and recall are susceptible to, means that care must be taken in how such player data is acquired and interpreted.

TRANSFORMATIVE RELATIONSHIPS AMONGST PLAY, RECALL, REPORTAGE, AND ANALYSIS

As presented in the Game Space Model (Figure 2), there are two methods of reportage applicable to generating an individual *game as reported*. Immediate reportage minimises the time between the 'in-the-moment' *game as played* and the creation of the *game as reported*. This provides less opportunity for the reportage to

be influenced by reconstructive memory errors but also, potentially alters the play experience itself if the reportage activity overlaps with the activity of play. Delayed reportage meanwhile takes place longer after play has finished, requiring the individual to actively recall their play experience from long-term memory. This is less likely to directly influence the play experience but in turn, is more likely to allow reconstructive memory errors to affect the reportage. Craik and Lockhart's (1972) Levels of Processing theory offers a cognitive foundation for this difference between immediate and delayed reportage, suggesting that different encoding processes applied to incoming stimulus information create memory traces with varying 'strengths'. 'Shallow-processed' information is more susceptible to decay (i.e. forgetting) while 'deep-processed' information is more susceptible to distortion (i.e. reconstructive memory errors). From the perspective of play-experience epistemology, there are issues associated with each of these reportage methods.

Immediate Reportage as Minimally-Filtered *Game as Played*

Methods of immediate reportage are, pragmatically, as close as it is possible to get to an unfiltered version of an individual *game as played* but are prone to problems that may distort the reportage.

In playtesting and in player-based research, immediate reportage procedures such as think-aloud may be used to gather players' thoughts as they engage with a game in-the-moment. Information gathered in this way is reported before it is 'deeply processed' and, potentially, altered by additional contextual information drawn from the individual player's existing knowledge and experiences. However, as both Fullerton (2014, p. 296) and Schell (2015, p. 444) note, many people struggle to verbalise their own thinking whilst they play a game. This means that, in typical playtesting scenarios, the test coordinator must often prompt the tester to keep thinking aloud. In doing so, the context of the experience is changed, and the information gathered regarding the player's thoughts is information about a different type of player experience, a different *game as played*, one in which the player is engaging in an artificial activity alongside their gameplay. This may be a very different player experience to one taking place in a natural, non-experimental environment.

The think-aloud process is similar to the process underpinning the popular *Let's Play* video genre in which players capture a video stream of their gameplay whilst recording a voiceover commentary of their actions and thoughts. This type of reportage may offer a close approximation of the 'in-the-moment' *game as played* that can be analysed by others, however the think-aloud method itself and the ontological status of the *Let's Play* style of reportage present epistemological issues that must be considered if utilising this form of information to understand a game or a play-experience.

As with the problems outlined above regarding the frequent need to prompt playtesters to continue thinking aloud, the type of player activity being undertaken when producing a *Let's Play* video is also notably different to the 'average' player experience of a game. Depending on the particular video producer, the aim of the video may be to provide humorous commentary alongside gameplay, or possibly to provide a critical commentary in a review-style video. In the majority of cases, such videos must also appeal to a particular audience to increase their monetisation potential. Thus, the ontological status of the *game as reported* via a *Let's Play* is one of a commercially or socially motivated media artefact, rather than a neutral account of player experience. Glas (2015, p. 1) suggests that many *Let's Play* videos offer people non-ludic engagement with the ludic form through an activity of vicarious play. As such, the epistemological value of such artefacts with regard to

understanding the game from which they derive may be limited. Their primary purpose may not always be to offer reportage on a game but rather, to use a selected game simply as a basis for the production of a wholly new, separate, media artefact. In such cases, the relationship between the *game as played* and the *game as reported* is driven by the requirements of creating the *Let's Play* video artefact rather than of offering an accurate report of the player experience of the source game.

Other forms of immediate reportage may assist in developing a more holistic, triangulated view of the player experience in certain situations, such as the collection of biometric data or gameplay metric data during play. Such methods are different to those described previously as they are reported automatically by either the game or the biometric equipment, rather than being volunteered by the player themselves. It is beyond the scope of this paper to consider these analytic approaches in greater depth but we note them to demonstrate that immediate reportage has a number of different approaches that may be triangulated.

Delayed Reportage and The 'Rosy View'

Delayed reportage includes activities such as writing game reviews, game analyses, blog articles, or producing similar audio-visual content for platforms such as YouTube. It also includes data collection methods that may be employed in games research such as asking players to keep a gameplay diary (e.g. a written diary or audiovisual-recorded diary) over a period of time. This type of reportage also includes post-play community engagement, such as posting to game discussion boards. There is a significant period of time between the player experience of the *game as played* and the production of the delayed *game as reported*. Neuschatz, Wetmore, and Gronlund (2015) state that:

> People encode bits and pieces of information or *details* they experience, and these details are then *integrated* with other sources of information. Thereafter, memories continue to be acted upon and influenced by pre-existing knowledge and newly learned information. Memories are fluid entities that change, sometimes dramatically. Every time a person thinks about an event—revisits his or her memory—the memory has the potential to change. (2015, pp. 1-2, emphasis original)

Thus, delayed reportage will be a more filtered version of the in-the-moment play experience, subject to memory encoding and recall biases and errors. These types of delayed reportage provide a likely source of secondary data for much games analysis and criticism. However, the reconstructive memory process may distort the information in a delayed *game as reported* and there are epistemological implications of such for understanding different aspects of particular games.

The ways in which memories can be changed, or biased, are numerous. Schacter (2001) for example provides a comprehensive analysis of many such biases, grouping them broadly based on their relation to memory distortion, to forgetting, and to the persistence of 'intrusive' memories that one would prefer to forget. While it is beyond the scope of the current paper to discuss different memory biases at length in the context of games, the concept of the *rosy view* (Mitchell et al., 1997) provides a particularly timely and industry-relevant example to demonstrate the potential impact of such biases on epistemological concerns around player experience.

Positive and negative memories fade from memory at different rates, with research suggesting that negative memories fade faster, thus leaving behind a greater proportion of positive to negative memories (Walker et al., 1997, p. 411). This results

in people holding a positivity bias, also referred to as *rosy retrospection* (Mitchell & Thompson, 1994), in their recall of past events. Similarly, other research has identified that predictions made prior to an anticipated event tend to also be more positive than the actual in-the-moment experience; a form of *rosy prospection* (Mitchell & Thompson, 1994). Combined, these tendencies towards constructing positive, optimistic expectations and memories are referred to as the *rosy view.*

In the Game Space Model (Figure 2), numerous information sources influence the formation of the *game as expected*. These are the game product itself (e.g. physical case, box/cover art, manual, digital storefront information), the game's marketing (e.g. trailers, publications, demos, advertising), presence of the game across games culture (e.g. genre labelling, series/franchise history, user reviews, spoilers), and the individual player's prior life experiences. In many cases, there will be a substantial amount of material available supporting the formation of player expectations that combine the effects of both rosy retrospection (e.g. memories of experiences with similar games, or other games in the same franchise or from the same developer) and rosy prospection (e.g. based on carefully edited and presented game trailers or marketing material).

For example, in Howell's (2015, 2016) analyses of player discussion of *Amnesia: A Machine for Pigs* in relation to its predecessor *Amnesia: The Dark Descent*, the rosy view was particularly apparent and something that was noted by forum users themselves. As one user states, "it seems people remember [*The Dark Descent*] more fondly than it actually is [sic]. They make it seem like the best thing ever created and [suggest] that it didn't make any of the same mistakes [as *Machine for Pigs*]" (jacksepticeye, 13 Sept. 2013). Other forum users refer to the idolization of *The Dark Descent* and to a subset of players treating *The Dark Descent* as "some mythical thing [. . .] some unachievable, amazing, perfect thing" (HamStar, 9 Nov. 2013).

A player that has constructed overly optimistic expectations (i.e. rosy prospection) about a game may well experience heightened feelings of disappointment when the game fails to live up to those expectations in the *game as played*. Meanwhile, the effects of rosy retrospection and memory transience, whereby memories become less specific and more generalised as temporal distance from the experience or event increases, may lead to non-specific, generalised positive memories of gameplay experiences in the more distant past. Where players may be able to recall more specific details of a recently played game, this ability is likely to fade over time. Thus, this presents a greater likelihood of a more recently played game being viewed comparatively more negatively to a game played in the past.

Indeed, the distorted, 'idealised' version of *The Dark Descent* remembered by some players was demonstrated in relation the games' enemy agents and artificial intelligence. Player criticism of these systems in *Machine for Pigs* was more frequently specific with examples of particular enemy encounters and breakdowns of the perceived behaviour of the enemies. Comparisons made to *The Dark Descent* were instead more frequently punctuated with references to a much more general "Amnesia experience", or references to more generalised emotional responses. While some players did still refer to more specific events when discussing the older game, such instances were infrequent, demonstrating a degree of transience of player memories in relation to the older and newer games.

Beyond this particular example from the *Amnesia* games, the effects of rosy retrospection and prospection on an epistemology of play-experience are also more broadly relevant in the current games market. For example, Švelch's (2017) examination of 'representative' trailers for games demonstrated that different sections

of the player community were likely to form expectations of differing depth and accuracy based on the content of game trailers alone.

> While a certain degree of something that might be called "trailer literacy" is spreading through player communities and some members actively educate their peers about notable cases of disillusionment over trailers, other viewers still read and interpret these audiovisual texts rather naively. (Švelch, 2017, p. 30)

The effect of rosy prospection may bias player construction of the *game as expected*, which in turn has a transformational relationship with the *game as played* and the *game as reported*. Game trailers and other marketing material may compound this biasing effect by presenting an overly polished vision of what the final game may look, sound, and play like. While developers and publishers have little control over many of the factors influencing the player's formation of expectations, they usually have direct control over the marketing material itself. Thus, while marketing material must necessarily make the game product as appealing as possible, the longer-term risks of supporting the creation of unrealistic player expectations should be considered also.

CONCLUSION

Games can be viewed as collections of units of being. One way of formalising some of these units of being and their dependent and transformative relationships is via the Game Space Model, in the context of a game's lifecycle stages. Games are epistemologically challenging because there is no single, objective version of a particular play-experience or a particular design practice. We are dependent on subjective interpretations of reconstructed memories of design, development, and play for much of our understanding of such, even when considering our own memories of these activities.

We have demonstrated via discussion of different play-experience reportage methods some of the cognitive biases and errors that can have significant impacts on the information provided in such reports. Design and development post-mortem reports, critical reviews, player community discussions, Let's Play videos, and other forms of reportage are created in the contexts of the current games industry and marketplace, and the pre-existing knowledge and memories of the individuals involved in the reporting. This in turn has implications for anybody using such reportage as a data source for supporting future design and development work, or undertaking games research or criticism.

Applying theories of cognition, recall, and memory to analyses of games and players, such as those drawn from discussions of *Amnesia: A Machine for Pigs* and other contemporary examples such as *No Man's Sky,* helps identify the mechanics of the relationships between units of being (e.g. between the *game as expected,* the *game as played*, and the *game as reported*). This supports an ontological repositioning of game analysis. Specifically, it allows a move away from a broad-stroke awareness of there being *an* influence from existing player knowledge on specific play-experiences towards an understanding of which *specific* cognitive processes are at work and how they may fit into epistemologies of game design and play-experience. In turn, this affords development of more robust epistemologies that consider those specific processes, allowing for more deeply informed interpretation and analysis of game design and game play.

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