

Story as a function of gameplay in First Person Shooters and an analysis of FPS diegetic content 1998-2007

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Declaration

Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

I have wrestled with death. It is the most unexciting contest you can imagine. It takes place in an impalpable greyness, with nothing underfoot, with nothing around, without spectators, without clamor, without glory, without the great desire of victory, without the great desire of defeat, in a sickly atmosphere of tepid skepticism, without much belief in your own right, and still less in that of your adversary.

Joseph Conrad, Heart of Darkness (1899)

You can dress it up in many ways, but the game still comes down to: go here, touch this, go there, fight, etc.

John Carmack, lead programmer, Doom (1995)

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Here's to the next generation of players....

Abstract

The relationship between game content and gameplay remains underexplored. High level debate about the relative narrativity of games remains common, but there is a gap in the understanding about the particularities of how diegetic objects relates to the business of managing player experience and behaviour at the heart of gameplay.

The first half of this thesis proposes a new model for understanding gameplay as a network of affordance relationships which define supported actions. The theoretical focus upon supported actions rather than object characteristics enables a better understanding of the framework of gameplay created by a complex system of interrelated objects. In particular, it illustrates how the essential ludic structure of first-person games can be described in very simple terms, thus defining a discontinuity between complexity of experience and simplicity of structure. It is proposed that story is a primary means of managing this discontinuity to provide an immersive and seamless experience.

Traditional models of narrative and interactive narrative are discussed to illustrate the problems of attempting to apply them directly to gameplay, and this is summarised in a discussion of the narratology/ludology debate. Instead, a new conceptualisation of narrative, drawn from the use of narrative as a model and metaphor in psychology, and based on schema theory is offered. It is argued that this new, game-specific conceptualisation – of a network of protonarrative units – maps efficiently and effectively onto the affordance model of gameplay and thus resolves the historical problem.

In the second half of the thesis, evidence is offered to support the argument that not only can story be understood as a form of affordance, but that by examining commercial FPS titles, it is clear that story is used to manipulate player behaviour – that it serves a distinct gameplay function. This is achieved by analysing core elements of story: worlds and their populations; the avatar as a key device in managing the player/system relationship; and plot as the predetermined changes to object relationships over the course of a game.

It is concluded that when gameplay is understood as a network of affordances, and story as a network of protonarrative units, and when the genre is analysed with this model in mind, not only is an understanding of the gameplay function of story evident, but this analysis yields a deeper level of understanding about the nature of FPS games and gameplay than has previously been available.

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CONCERNED
the half-life and death of gordon frohman

#172

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Fig 1. The breakdown of diegesis and gameplay (Livingston 2006)

Part One: A Model for Story as a Gameplay Function

Section One: Introduction

Section 1: The Problem

No-one has ever carried out a qualitative analysis of computer game content¹ across a representative sample of an entire genre. This represents a glaring omission in the literature.

Malliet (2007) puts it thus: “Only a few researchers with a background in media sociology or psychology have done the effort of analyzing a number of games, taking into account aspects that go beyond the binary oppositions of ‘violent vs. non-violent content’ or ‘sexist vs. non-sexist content’. His study, concerned with the representation of violence, analyses 11 games from across several genres. Malliet cites a number of other scholars: Dietz (1998), Smith et al (2003) and Brand et al (2003) also carrying out content analysis, each with larger samples (33, 60 and 130 games respectively) and all tightly focused around a pre-existing thematic. Appelman (2007) recently presented a meta-analysis of game research published in the three DiGRA international conferences; although there are a substantial number of game analyses, he has confirmed that there has not been a single instance of a genre-wide content analysis programme submitted to DiGRA, nor is he aware of any existing elsewhere in the literature (personal communication 2008). Put simply, the published paper that analyses the content of games across a single genre, searching for patterns, themes, symbols, structures and their relationships to gameplay and game mechanics does not exist. This is a quite extraordinary situation.

The reasons for this may be pragmatic. Even a simple, relatively short FPS game such as *Halo* (Bungie 2002) takes in 10-12 hours of play. Assuming the analysis will be carried out with only a single play through, with no retrospective analysis of footage captured during play, no cross-referencing to the literature, walkthroughs, reviews, and so on, this represents a significant time commitment to any such project. There may also be theoretical and philosophical issues operating against such an endeavor. For the last ten years, a debate about the relative narrativity of computer games, and the dominant conceptual approach to their study has raged in the field of game studies (Section 4). Although this does appear to have subsided somewhat in recent years, it has drawn the attention of many scholars in the field, arguably sidelining the issue of game content to the question of how one should investigate it.

¹ Content refers to the game's media assets, thus those elements included within the system. The OED defines content as “the substance or material dealt with (in speech, work of art, etc) as distinct from its form or style.” (8th Ed. 1990). This is analogous to the division between rules and worlds made by Juul (2005), to which we will return in Section 4

Deep analysis of game content has been made in relation to individual titles, such as Davidson's discussion of *Ico* (SCEE 2003) or by comparing titles across genre, as in Atkins' argument for the game as a fictional form (2003), but what is lacking is a map of any given genre's content. What does happen in a game? Are there prototypical plot structures or archetypical characters? What generalities, assumptions and core devices are ubiquitous across a genre? These are important questions currently without answers. As such, it is thus immensely problematic to discuss genres in any great detail, as baseline knowledge about their diegetic landscapes is missing.

For example, consider the Hero's Journey, originally conceived by Campbell (1949), and periodically proposed as a model for game plot structures (Adams & Rollings 2007: 207, Jacobs 2007: 27-29, Zehnder & Lipscomb 2006: 250). Campbell developed the Journey through extensive analysis of folk tales, extending the archetypical elements and structures he found to psychoanalysis in general. The fact that this extension is both dated and, even as a historical artifact, stretched to breaking point, has not diminished its impact, perhaps because the idea of core underlying structures has clear appeal. Thus, via Volger's updating of the structure for Hollywood (1998), articles like Dunniway's (2000) advice for using the structure in game design appear in industry sites like Gamasutra. Volger does qualify his use of the Hero's Journey, stating that not only do not all stories take this form, but many Hero's Journeys adjust or omit parts of the model, which, if anything, makes its application all the more troubling; with such a loose definition, calling it a distinct construct seems rather unreasonable. Do games really use the Hero's Journey or have they developed their own generic plot structures that are led by a combination of bolting plots onto already finished games, around the gameplay that already exists, and building on what appears to be successful in other commercial releases²? Without analyzing content across a genre, it is simply not possible to comment and, given that the Hero's Journey has undoubtedly been touted as an important structural model, it is a question that deserves attention. Other components also require analysis, for example, what is really known about the conceptualisation of persistent Non-Player Characters? They are ubiquitous devices in FPS games, but nowhere is there a map of their characteristics in terms of gameplay impact and diegetic representation.

Alongside this, there is the unresolved question of the relationship of game content to game action. Content is normally ordered into some form of network that develops over the course of the game, and this normally takes the form of a story. In other words, story is a type of arrangement of content over time, a particular type of management of presented information, that can be found in every single-player FPS game: story is simply the dominant temporal structuring device applied to FPS content. The ludology/narratology debate may have more or less fizzled out, although judging by the 'last word' papers appearing annually in conferences and journals, it

² Noting that any game studies research which fails to take into account the economic pressures underlying commercial development cannot really claim to represent the medium at all.

is clinging to some form of life. However, it has left the question of how to bridge its key divide. How tightly woven together are story and gameplay? Is story simply a reward system, context provider or even just epiphenomenon? Is it the case, as Carmack has said of *Doom* (id Software 1993), that “You can dress it up in many ways, but the game still comes down to: go here, touch this, go there, fight...” (cited in Kushner 2003). This is an impossible question to answer without a theoretical framework which allows a bridge to be formed at an analytical level between formal gameplay structure (i.e. rules), and content. Creating this enables an analysis of content to be carried out to investigate apparent gameplay functions of these devices, and particularly how they are structured by story. It may indeed be that, as Carmack suggests, you can wrap whatever content you like around the gameplay and, provided the gameplay holds, this wrapping remains largely irrelevant. Until it is understood exactly *what* content is out there, a secure theoretical position regarding this content cannot be adopted.

Section 1.2. The research programme

This thesis analyses story in first person games, more commonly referred to as first person shooters (FPS). Through a qualitative comparative analysis of major titles in the genre released between 1998-2007, it will make two interlinked arguments:

- That a ludological analysis of story in these games leads to a better understanding of the relationship between story and gameplay. This means the analysis will focus specifically upon games and be drawn from the data found in games as primary sources. This is aligned with Juul’s notion of ludology as being primarily a study of games as systemic objects.
- That, in particular, this analysis clearly demonstrates that story has a direct, dynamic and epistemological function in supporting gameplay and managing player behaviour. A functional understanding of story elements provides a sharper understanding of this relationship than is currently found in the literature.

The basis for this approach is justified by the lack of existing models offering anything other than a superficial or flawed understanding of the function of story in these games. This relates specifically to the discontinuity between the simple ludic structure and experiential and ecological complexities of FPS games. For example, Juul posits a binary relationship between rule and fiction (broadly analogous to what content) that leads to three means of communicating information and relating to gameplay:

If we assume the perspective that games have two complementary elements of *rules* and *fiction*, all content in a game can either be purely fictional and not implemented in the rules (such as in the case of a game's back story), purely rules and unexplained by the fiction (such as the multiple lives of a player), or in the zone in between, where the rules of the game are motivated by the game's fiction (cars that can drive, birds that can fly, etc.). The combination of rules and fiction is sometimes described as *virtual* or *simulation*. (2007)

However, this still leaves the question of what occurs in this interim zone – the mechanism by which rule and fiction come together (it should also be noted that in the above Juul distinguishes between story and fiction). The example of the car is one of the few points of agreement between Juul and Ryan, who agrees that a representation can be an effective tool for managing gameplay:

If an object on the screen is an abstract shape, we must learn from the user's manual how to manipulate it; but if it looks like a car and it is involved in a narrative scenario relevant to cars, the user will know that it can be used to move around (2006: 202)

Aside from noting Ryan's addition of the narrative scenario to Juul's fiction (all Juul is talking about is representation, after all), what is left is really a very superficial level of understanding. What about adjusting the speed of player's movements around an environment, or their strategic approach to a situation, or their expectations of what the game will provide them with in terms of orientation or information load? These kinds of gameplay factors operate clearly above a representational level, but neither are they purely rule based. What is meant by saying that *S.T.A.L.K.E.R.: Shadow of Chernobyl* (GSC Game World 2007)³ just feels like a more frightening game where one simply cannot rush around all guns blazing, compared to *Bioshock* (2K Games 2007), or *Half Life 2* (Valve 2004)? On the rules side, it is a superficially 'more difficult' game, but it's just as easy to get killed in *Half Life 2*. *S.T.A.L.K.E.R.* has its anomalies – dangerous static objects in the environment – but they are visually distinct. Much of *S.T.A.L.K.E.R.* takes place underground, in the dark, where perception is artificially manipulated (you can't see very far) – this could be seen as purely rule-based, with fictional justification, but it doesn't get us very far. More to the point, *S.T.A.L.K.E.R.* offers the same basic ludic activity as *Half Life 2*, but it feels completely different. There is a discontinuity between the similarity in structure of *S.T.A.L.K.E.R.* and *Half Life 2* and the dissimilarity in affective experience, and it seems that this is a product of relatively small differences in the rule set meeting apparently larger differences in the fictional set in the third, virtual space. The larger discontinuity that is produced may be analogous to sets of ripples meeting in water to

³ Hereafter referred to as simply S.T.A.L.K.E.R. Given the length and complexity of some game titles, where appropriate these will be abbreviated for readability. In these instances, a footnote will make this abbreviation explicit.

produce more chaotic patterns, but there is an underexplored phenomena occurring at this point that specifically relates to how gameplay and fiction meet and interact.

Essentially then, what this thesis is all about is the discontinuity between the experiential complexity of FPS diegeses and actual FPS ludic-affordance structures. Traditional, comparative media approaches to story in games simply cannot tackle this discontinuity and are either forced into a position of adopting a position on a false dialectic, normally characterised as the ‘ludology vs. narratology’ debate (Eskleninen 2004, Pearce 2004, Murray 2005, Juul 2006, Aarsenault 2005), or accepting a conciliatory but undetailed and unapplied position such as Juul’s. What is presented here is thus an alternative approach that avoids this dialectic, bridges the worlds/rules divide, illustrates the functional nature of story and content and, in doing so, begins to chart a more detailed map of story and content within FPS games than has previously been offered anywhere else.

In order to make the case for this new approach, then, it is first necessary to identify this discontinuity, explain what is meant by it and offer evidence for its existence. For this, the concept of affordances is adopted from Gibson’s ecological perception theory (1979), which has already been applied to virtual environments (Zahorik & Jenison 1998) to offer an alternative conceptual structure of what gameplay is. This model relates very easily to ‘presence’, which has been noted to be an important factor in player experience (Calleja 2007, Nunez & Blake 2005). Furthermore, the directness of the perceptual mapping between player and avatar in FPS games means they can be described as mass market virtual realities. This is in keeping with Steuer’s influential definition of virtual reality as “a real or simulated environment in which a perceiver experiences [tele]presence” (1992 – brackets mine). One of the clearly identified factors in creating and maintaining a sense of presence is an unbroken experience, devoid of what have been termed ‘breaks in presence’ (Slater & Steed 2000, Brogni, et al 2003), and a growing emphasis on this unbroken experience can be traced in the way in which contemporary FPS games are configured and presented. Breaks in this experience may be a result of poor design: for example, a player getting lost or trapped in an environment, or forcing a player to engage with the game on a system level, in essence, forcing them to consider the system itself, or the fact they are playing a game. Most contemporary FPS games tend to minimise this system-level activity using a number of design tricks to incorporate this activity into the presented world. Consider the following two examples:



Fig 2. An interactive terminal in *Quake 4* (id Software 2004).



Fig 3. A hacking interface in *BioShock* (2K Games 2007)

In the first example from *Quake 4* (Fig 2), the word 'Interactive' is superimposed upon an object. This is information that comes from outside the game reality. It refers to the act of playing the game, rather than to

an object or action within the world of the game. In the second example (Fig 3), hacking in *Bioshock* is accomplished by routing the flow of water through a circuit. Although it is clearly an embedded micro-game, it nevertheless exists fully and appropriately within the presented world of Rapture. There are even more explicit and simple examples of this division: consider a damage upgrade. This can be handled either by an in-world device (you pick up a box of explosive bullets) or a system-level, outside-world device (you run over a Quad damage icon). Terms from narratology can be appropriated to better describe this difference: those items existing within the presented reality are referred to as homodiegetic; those that fall outside it, or refer to the system containing the world are heterodiegetic. Genette (1980:244-5) uses the distinction in relation to narrator position in traditional narratives: homodiegetic narration refers to that which is told by a figure inside the story, as opposed to heterodiegetic narration, where the narrator stands apart, external to the events.

The term diegesis can be co-opted to refer to the reality of the game. Those devices that fall within the reality presented by the game can be described as *ludodiegetic*: within the reality of the game. This includes *Bioshock's* hacking system, *Half Life*'s Gordon Freeman (Valve 1998), decals and textures, Doyle's instructions to Carver in *Far Cry* (Crytek 2004) or a biomod upgrade in *Deus Ex* (Ion Storm 2000). Non-ludodiegetic devices include traditional save game functions, messages that say "You have died" or loadscreen instructions about how to play the game ("Try crawling past your enemies, you will be harder to hear").

On one side of the equation then, is the notion of ludodiegesis: those devices and structures that combine to create an engaging game world. On the other is the ludic structure of the game system. This is analogous to Juul's concept of "real rules and fictional worlds" (2006: 196) and, indeed, what will be presented here is a means of collapsing that traditional division. It will be argued that there is both an extremely simple ludic structure underlying all FPS games and that, in fact, in even the more apparently complex titles, the actual range of what can be done remains very small. This is achieved through an affordance-based model of gameplay (Section 2).

Section 1.3. Contribution to knowledge

This thesis offers three major contributions to knowledge. Firstly, it argues for a theoretical framework which bridges the normal divide between game structure and game content and offers a reconceptualisation of both that enables direct links to be drawn between the two. In other words, what is presented is a structure by which content and story can be mapped directly across to gameplay; a theoretical position whereby story can be understood as gameplay. This is achieved through the redefinition of both gameplay and story and by the argument that traditional applications of narrative and interactive narrative to games, even when not sidelined

into the ludology/narratology debate, do not really come to terms with what may be considered to be the central issue: the relationship between story and gameplay. Another way of putting this is as follows: what follows is not principally concerned with whether games *are* narratives, but how games *use* narratives. This is an amazingly underexplored area.

Secondly, and most simply, the programme presents a method. Using the theoretical framework to justify the atomisation of story and content in a network of discrete protonarrative/gameplay-affording units, games can be analysed without prejudice. There is no complicated theoretical position or method to this, in effect, what is argued for is quite literally standing back and counting the barrels. In this way, a map of the genre is created. The idea of an open content analysis, what Strauss & Corbin (1990) call “open coding”; an inductive process that leads to the suggestion of categories and patterns rather than arriving with them already established and in need of support, is neither radical nor difficult, just surprisingly absent. Indeed, the only assumption taken to the analysis is that, if the theoretical model holds, content in games can be demonstrated to have a gameplay function, through the management and manipulation of player expectation and behaviour.

The results constitute the third contribution and stand alone from the method and the theory. Regardless of their use as evidence to both justify the method and support the theoretical framework, a map of FPS content will be offered that is both missing from the field and an important contribution to it. It will offer baseline information that can be utilised by other scholars to support diverse research projects: number and types of environments; depth of information attached to avatars, plot structures, conceptualisations of agents, social intelligence amongst factions and so on.

Section 1.4. Structure of the thesis

The thesis is divided into two parts. In the first, the theoretical model will be assembled. In the second, the results of the analysis and a discussion of their implications to the theoretical model will be presented.

The argument of the first part of the thesis can be summarised as follows. Firstly, the construct of affordances is co-opted from Ecological Perception Theory (Section 2.1) to reconceptualise gameplay as a network of objects, acting upon one another according to attached affordances mediated by distinct parameters (Section 2.2-2.4). This is extended to include those actions available to the player via the special object of the avatar (Section 2.5). All this is used to argue that the essential ludic structure of the FPS game is extremely simple, despite the experiential complexities of titles in this genre (Section 2.6-2.7). The discontinuity between ludic structure and

presented reality, and how it relates to story and gameplay, is the focus of this thesis. A theoretical perspective is thus required that reconciles the historically antagonistic constructs of story and gameplay. The affordance based conceptualisation of gameplay offered in Section 2 is therefore extended by the application of a similar process to narrative in Section 3. This enables a game specific understanding of narrative that clearly demonstrates that it maps across to gameplay without any issue.

Section 4.1 firstly deals with the ludology debate, noting the difficulties with applying traditional narrative models. Section 4.2 expands on this by asking whether FPS games can be seen as interactive narratives, and exposes both the conceptual flaws in an over-inclusive definition of interactive narratives and the problems with applying the model to games. Via Lindley's gameplay gestalt (2002), it is argued that an understanding of narrative from a psychological perspective may prompt an alternative conceptualisation that better fits the medium. Through this, schema theory is introduced (Section 4.3)

Schema theory is combined with aspects of the structural model of narrative developed in Section 2 to argue for the application of the concept of protonarrative units embedded in the environmental set which not only control gameplay, but, together with gameplay affordances, tend towards a particular interpretation of the action within a predetermined range. The total set of objects operating together to create this predetermined interpretation through gameplay is defined as a ludodiegesis, requiring no division between story and gameplay, a singular set of objects with common properties (Section 4.4).

Part two of the thesis presents a content analysis carried out across FPS titles between 1998-2007. Most major releases are dealt with, giving a total of 34 titles in the analysis. Results and discussion are split into four Sections. The first three (world, agents, avatar) deal with the principle objects within the ludodiegetic set; the fourth and final deals with predetermined temporal associations within this set, the equivalent of what is normally termed plot. The thesis concludes with a consideration of the results to the underlying theoretical structure presented in part one.

Section 2. AFFORDANCES AS ANALYTICAL TOOLS

In this Section, a model for defining and describing gameplay based upon the capacity of objects existing in the game system to affect both their own, and one another's states is offered. This approach is drawn from the construct of affordances defined by Gibson's ecological perception theory. An affordance based conceptualisation of gameplay allows us to see clearly how even those games which appear to have complex experiential structures

are actually based upon manipulations of a very limited set of relationships between objects. Thus, there is a discontinuity between the complexities FPS game superficially present and the ludic structures underpinning this. It is suggested that game content that does not have a direct ludic function is often used as a means of virtually expanding the ludic experience to achieve this complexity. It is also noted, however that this expansion means the discontinuity between rules and content requires management and that story has a role to play in this.

Section 2.1. Ecological Perception Theory

There are two major schools in perception theory: Gibson's ecological perception theory, and the majority consensus which is that perception is to some degree mediated and directed. Bruce et al (2003) call these theories ecological and cognitive respectively. Whilst the criticisms of ecological perception add up to a convincing repudiation, affordances are nevertheless very useful concepts for examining gameplay. It is thus worth briefly introducing the theory in order to properly define the concept of the affordance in relation to gameplay.

Perception, depending on one's affiliation to one of the camps, is either directed or direct. In other words, it is either mediated or controlled (and it should be noted that this does not necessarily mean conscious control), or it occurs without mental processes being required. The latter is the essence of Gibson's model; that all necessary information exists in the environment and percepts (mental models) are simply extraneous and therefore highly unlikely. This stands in direct opposition to the cognitive view, that information obtained from the environment is processed in relation to held information in order to yield a mental representation of the world part-based upon prior experience, innate percepts, assumption and prediction. Hochberg describes Ecological Perception thus:

...[Gibson's] proposal is that many or most of the properties of the perceived world are evoked directly by the variables of stimulation that the sensory system receives from the normal ecology, and are not the end-products of associative processes in which kinaesthetic and other imagery come to enrich two-dimensional and meaningless visual sensations with tri-dimensional depth and object meaning.
(1974:17)

In other words, Gibson argued against the existence of percepts, three-dimensional generalised versions of discrete environmental units, that convert signal into meaning (though it must be noted that it is not, however, necessary for percepts to be mental images explicitly; schema theory, connectionism and the somatic marker hypothesis (Damasio 2000) all offer ways in which percepts can instead be thought of as patterns of activational

tendencies). Instead, Gibson argued that the environment contains enough information in itself and introduced the concepts of invariance and affordances to support this idea. An *Invariance* is a fixed point of reference within a visual field that provides unambiguous sensory data. For example, whilst one can rotate an object in three dimensions in a visual field, certain of its characteristics remain invariant, thus enabling it protrude from the field as a distinct object. *Affordances* have proved both very useful and highly contentious as constructs for interactive media, particular within the field of virtual reality (Flach & Holden 1998, Sheridan 1999, Biocca 2001) as they replace the phenomenology of physical properties with an action-based set of properties. Zahorik & Jenison sum this up:

A basketball is not represented by the features round, orange and rubber, but instead is viewed for its *throwability*, its *rollability*, or its *bouncability* by the system. (1998: 84)

Affordances are a powerful tool in ludic analysis precisely because games are vastly reduced and artificial environments whose affordances are, by definition, non-accidental. In other words, although there remains space for the interpretation of devices, events and sequences, fixed and self-evident affordances can nevertheless be extracted from the field of stimuli. Or even, it can be asserted that everything in a game exists for a reason, whether or not this is explicitly designed into the action structure.

Despite the usefulness of this particular construct, the ecological approach is rife with flaws. Empirical evidence has suggested that perception is indeed, to an extent directed. Land & McCleod (2000), for example, tracked the saccades – the constant rapid movements of the eyes - of (cricket) bowlers between ball and bounce point and found that experts began a distinct pattern of saccades consistently before novices, which would strongly suggest that some degree of prediction and direction is occurring. Prediction, of course, relies upon prior knowledge and information about the properties of an object moving in space and time being held by the subject. It is difficult to not arrive at percepts when considering this. Fodor & Pylyshyn have also savaged the theory as suffering from definitions that are vague to the point of meaninglessness and offer a compelling example of the essential problem with direct perception, insisting there is a difference between seeing and seeing-as:

Here is Smith at sea on a foggy evening, and as lost as he ever can be. Suddenly the skies are clear and Smith sees the Pole Star. What happens next? In particular, what are the consequences of what Smith perceives the Pole Star as. If, for example, he sees the Pole Star as the star that is at the Celestial North Pole (plus or minus a degree of two), then Smith will know, to that extent, where he is; and we may confidently expect that he will utter “Saved!” and make for port. Whereas, if he sees the Pole Star but

takes it to be a firefly, or takes it to be Alpha Centauri, or – knowing no astronomy at all – takes it to be just some star or other, then seeing the Pole Star may have no particular consequences for his behaviour or his further cognitive states. Smith will be just as lost after he sees it as he was before. (1981: 189)

Marr (1982) also criticises the ecological theory for vastly underrating the difficulty in extracting invariants from a field, and insists that this is essentially “an information processing problem” and thus inherently cognitive in nature, unless Gibsonians are prepared to afford some cognitive capacity to the sensory system. Marr’s model acknowledges some of the principles of ecological perception – the richness of information present in a given environmental field, for example – but combines this with a predominantly cognitive, or top-down perspective. However, rather than seeking fully-formed percepts, Marr postulates a mediating level of algorithms that may be roughly analogous to Selfridge’s demons (1956)⁴; in other words, his theory of perception is mediated, but not fully cognitive in all its stages.

Criticisms of ecological perception theory notwithstanding, affordances are powerful as they enable more subjective interpretations of the relative interactivity or complexity of an environment to be supported or bypassed altogether, and, critically, expose any difference between the experiential complexity of a diegesis and the actual complexity of the underlying system. A game such as *F.E.A.R.* (Monolith 2005), for example, has an immensely interactive environment at a superficial level: most items can be shot at, resulting in large clouds of debris and general chaos, however, the range of *types* of interactivity within this environment are extremely limited – occasional answerphone messages and the ability to upload information to Betters, one of the game’s *persistent NPCs (PNPC)*, deliver bursts of narrative information, and there are the usual health kits, a small range of weapons, armor and ammunition – but when the actual supported actions operating between objects, and the types of objects themselves are considered, the sense of scale of interactivity reduces drastically (Section 2.2). By creating a taxonomy of the types of affordances found attached to objects, and those available to the avatar, the essential simplicity of FPS environments can be demonstrated, using this to support a base ludic structure and leading to a consideration of the relationship between the simple structure and simple environment, and the often highly complex experiential diegesis. An affordance is thus defined, after Zahorik & Jenison, as the functional input-output relationship of an object in the context of an environment. In other words, an affordance in a ludic space is ‘what it lets or makes it happen’.

⁴ Selfridge’s early AI model essentially argued that rather than a single, high capacity and centralised problem solving device, intelligence could be comprised of many, very simple process operating in a network. As such, it is the prototypical model of connectionism, discussed in Section 4.3.

Section 2.2. States and parameters

In order to classify the ludic space, firstly the relationship between those components of the environment not directly under the player's control should be analysed. A number of initial divisions can be made to structure this. A distinction between objects with one state and those with at least two states can be made. A *state* is defined as a set of properties that defines the object and its relationship to its context; therefore, any object capable of changing these relationships is a multiple state object. It should be noted that this does not extend to location: a chair that is moved six feet away still affords the same activity – how the object is defined and how it relates to its surroundings has not altered. What *may* change is the significance of the chair, in terms of it now adjusting play activity (it may be used to reach a ledge or window, or block an agent from entering a room), thus movable objects *may* have a more complex relationship with the environment than those which are static. A stackable crate is a more complex object than a floor: but note that this does not necessarily extend to significance, as a floor is a highly significant object. Significance is often a property of the moment of play, this study focuses upon the properties of objects pre-existing this moment.

So a distinction can be made between those objects with only one internal state (in other words, those whose affordances only take one form and cannot be altered by gameplay) and those with multiple states (which can be altered, the simplest form of which is being removed from the world). Every object has a number of affordances – supported input/output relationships with the world they are embedded in. These affordances may change as play occurs; they are defined by a series of parameters (normally integers) which determine how they are enacted. A crate that can be broken, for example, has a parameter that defines the total damage it can take before changing state from being whole to being broken. In this case, the crate has two states, and its affordances are determined by which state it is in, and the state itself is a description of the objects parameters. These states are fixed: so either the state is triggered when the parameters are aligned with this template (such as the depreciating damage counter of the crate reaching zero) or by an instantaneous shift in parameters to a predetermined set (a door's parameters, defining affordances like whether one can move through it, see through it, etc, may be fixed to two states – open and closed). As a metaphor, the relationship between affordances, parameters and states can be seen as being like a graphic equalizer. Bass, middle, treble, and so on, may all be independently adjusted on their scale, yielding a different sound. However, the system may also include a number of presets, for classical, dance or rock music, which instantaneously shift all parameters (bass, middle, treble) to predefined points on the scale. Thus, an object is said to have more than one state, it means that the object has at least two predetermined and fixed sets of affordance relationships, whether the parameters defining these may then be also individually manipulated or not.

To illustrate this, consider the following examples. A static, unbreakable crate is defined by a number of parameters: its x, y and z co-ordinates. It may afford cover, or reduction in sightlines, or the ability to adjust the z co-ordinates of an avatar if it can be stood upon. It has no states however.

If the crate in question is breakable, it has two states, controlled by a single parameter: the damage it can take. On taking damage, the parameter is altered, as the integer defining this parameter reduces. When the integer reaches a certain value (normally zero), a state change is effected. The other parameters defining the object are instantly changed so, for example, the corresponding visual representation of the object is replaced with, say, a pile of debris, which no longer affords the ability to adjust the z co-ordinate of the avatar, or the ability to take cover and so on.

Now assume the crate can be pushed around by the avatar (a new affordance is added). Its other affordances remain constant, although its significance for gameplay may be adjusted by the player now taking advantage of these affordances (now the avatar can use the z co-ordinate adjustment to reach a new area, for example). By moving the crate, the parameters defining the object: its x and y co-ordinates are altered, but the state remains constant; there are no immediate shifts to the defining parameters across the board. This is an entirely distinct process to the state change that happens as a result of reducing the damage-taking parameter to the pre-determined value (zero). In the same way, a light switch has two states: on or off, and alongside the locational parameters defining it, a single binary parameter determining whether the surrounding area is illuminated or not. In this case, the only parameter shift that can be enacted is linked absolutely to a state change.

	Static	Movable
1STATE	Graffiti and posters on walls Textures Architecture Static Lights Unbreaking Windows Lava, Slime, Anomalies, Steam, Flame Jets Ladders Unbreaking Crates and Barrels Weather	Unbreaking Crates and Barrels Desks, Furniture 'Moving Architecture' such as Halo's Scarabs Cups, Glasses, small items
>1STATE	Use is highly constrained	Use is less constrained
	Health kits, ammo packs, weapons, etc Breakable Crates and Windows Lifts, Doors Buttons, levers, dials Spawn points, cutscenes and triggers Vending Machines Flushing toilets PDAs and Journals Exploding Barrels Lights that turn on and off Bosses Keys and Keycards Gravchutes, Spirit Walks	Vehicles Agents Animals (Seagulls, Pigs)

Fig 4. Division between 1State and >1State objects

Within those objects with multiple states, a division can be noted between those whose use is controlled by the system, or locked to a specific time, place and use, and those that can be manipulated more freely by the player. In other words, a button is tied to an absolute location and function even though the player is free to operate it *when* they want. This is very different from a Warthog in Halo, or the tanks in Crysis, that can be used as and when the player decides, and as the player determines. A player can, in the latter, enter and exit a tank wherever they want and decide how it moves about the environment and how it interacts, within a set of constraints. A health kit, on the other hand, can only be used in one way, whether it is activated by co-location or added to an inventory. An initial division can thus be made (Fig 4).

Another basic division can be made between affordances related to *gameplay*, and those related to *diegesis*. This division also divides those affordances that have the capacity to affect other objects – their states or relationships to other objects and the environment - and those that have no effect upon the avatar – but may well exert

considerable influence upon the experience:

Objects whose affordances and states affect gameplay	Objects whose affordances and states are only diegetic
Architecture	Weather
Static Lights	Graffiti and posters on walls
Unbreaking Windows	Textures
Lava, Slime, Anomalies, Steam, Flame Jets	Animals (Seagulls, Pigs)
Ladders	Cups, Glasses, small items
Unbreaking Crates and Barrels	PDAs and Journals
Health kits, ammo packs, weapons, etc	Flushing toilets
Breakable Crates and Windows	Cutscene triggers
Lifts, Doors	
Buttons, levers, dials	
Spawn points and triggers	
Vending Machines	
Exploding Barrels	
Lights that turn on and off	
Bosses	
Keys and Keycards	
Gravchutes, Spirit Walks	
Unbreaking Crates and Barrels	
Desks, Furniture	
'Moving Architecture' such as Halo's Scarabs	
Vehicles	
Agents	

Fig 5. Division between gameplay and diegetic objects

Finally, in each of these categories a scale of significance can be found: some objects have gameplay significance but this is small and/or irregular and/or less likely to be drawn upon, whilst others are hugely significant. Barrels may be used as cover, for example, in many games, but *Half Life 2* greatly increases their significance with its use of the Gravity Gun, turning them into objects to be manipulated and used extensively in play. Beyond a level of significance, objects become critical – their affordances will always or must always be triggered for play to progress. Keycards that unlock previously inaccessible areas are a generic device of this type, as are the Gravity Pathways and Spirit Walk Sections of *Prey* (Humanhead Studios 2006).

By definition, a critically significant diegetic affordance must also be a gameplay object: a code in a journal is not simply a story affordance but renders the journal itself a critical gameplay object. However, a scale of significance in diegetic objects can be tracked; textures and posters may not contribute directly to stories or story progression, but act as corroborative detail, supporting the general diegesis. This is in contrast to those objects that explicitly contribute to the story: diaries, journals, audio logs, and so on. In Section 3.3, Barthes' atomization of narrative units will be discussed which relate directly to this network of related elements in how a diegesis is delivered. There is also a natural link here to Morie & Williams' 'Gestalt for Virtual Environments' (2003), which argues for a three-tiered system of using content to increase engagement: corroborative detail, coercive narrative and emotional score. This is discussed in more detail in Section 4.2.

		Generic Gameplay (likely to actively impact on play)	Critical Gameplay (will/must always be triggered)	Corroborative Diegetic (no gameplay or story significance)	Story Diegetic (no gameplay, but story information)
1 STATE	Static	Architecture Lights Unbreakable windows Ladders Static Crates Anomalies (STALKER), lava, slime Flame jets, steam etc		Weather Textures	Posters Graffiti
	Moveable/Moving	Moveable Crates Desks, Furniture (FEAR) Moving architecture (SCARAB – HALO3)	→ May also appear here	Cups, glasses	
>1 STATES	Controlled Trigger (Finite/Infinite)	Exploding Barrels Parameter Triggers (health, damage, ammo, guns, items etc) Breakable Crates + Windows Buttons, levers, valves, dials Spawn point	Keys/Keycards Cascading sequences Goal triggers (also be Parameter Trigger) Steam, fire etc (that links to being turned off) Spiralwalks+ gravchutes (PREY) Vehicle bridges (QUAKE)	Light switches, flushing toilets	Cutscene triggers PNPCs
	Multiple Trigger (Finite/Infinite)	Doors, Lifts Vehicles (HALO, FC) Vending Machines (BioShock)			PDA's Book of Dagon (CTH)
	Independent Object	Agents (Hostile or Non-Hostile)	Bosses PNPCs	Seagulls (HL2) Pigs (Far Cry)	PNPCs
Effects avatar			Doesn't effect avatar		

Fig 6. A taxonomy of environmental objects

Section 2.3. Relating States and Parameters to Affordances

Fig 6 shows a combination of these divisions. This is not an exhaustive list but it is indicative of the range of objects to be found in FPS environments. However, it also demonstrates that this range actually reduces to a small number of object types – all objects fit into one of the classes created by analyzing their make-up according to parameters and states. Having noted this, these findings should be applied to how the state and parameter make-up of objects mediates the supported actions, or affordances of a game system.

In the 1STATE category, there are two basic classes of object: *static* and *moving/movable*. These objects cannot be altered by the act of play; although in the second class their location can change. Their impact upon gameplay and the avatar is limited to response only. In other words, a floor may damage an avatar who reaches it via a lengthy fall, likewise a lava or slime pit will also cause a negative health state change to an avatar, but it requires the avatar to come into contact with it. A ladder affords the avatar the action of moving vertically up or down without shifting their position horizontally. There is only one type of static-critical object, the architecture supporting all action in the space (no floor, no game!), which, in some cases, such as *Prey*'s shuttle sequences, is better thought of as the boundaries to the playing area.

The best example of a *corroborative object* is a texture, which does not contribute to the development of the story or deepen the player's understanding of the experience, but remains important to supporting the presented diegesis. The eponymous castle in *Return to Castle Wolfenstein* (Gray Matter 2001) has old stone walls and floor: it looks like a castle. *Story objects* literally have something to say, they afford an increase in knowledge about the diegesis or push the plot forwards. The first time the player sees the “Who is Atlas?” posters in *Bioshock*, they are directly confronted with a question of whether their guiding PNPC is all he claims; likewise, when, later, they read “Will you kindly?” scrawled across the wall of Ryan’s office, the penny is being quite deliberately encouraged to drop. Thus, the affordances attached to corroborative objects can be seen as epistemological in nature; they support a greater understanding of the diegesis and its stability. Story objects afford a better understanding of the context of the action, and may be specifically attached to ludic information – in other words, they may afford the understanding of what to do next, and how (with the corroborative diegetic wrapping of *why* this should be the case).

Movable objects may occur as critical objects, but are more normally found in generic gameplay. There is a wide spread of significance here: the increasing use of physics engines means it is now unusual to find a game where bumping into a chair does not knock it over, or it is not possible to stack crates and barrels. There are two normal

gameplay functions to this: the first is the deliberate use of movable objects for the player's advantage. A desk thus affords the properties of either using it to block off a space, or to climb on (altering the vertical position of the avatar in a less temporary way than jumping). On the other hand, physics is now frequently used in conjunction with artificial intelligence; movable objects make noise, which can be used to attract agents, either deliberately or accidentally. Thus, at one end of the significance scale is re-arrangeable furniture as an insignificant feature of gameplay (with a parallel in diegetic corroboration), at the other, crates to be stacked to provide access to new locations. Finally, in the case of *Half Life 2*'s gravity gun -and its clone in *Resurrection of Evil*'s grabber (Nerve Software 2005) -the ability to manipulate all movable objects becomes centralized in gameplay. In the *Half Life 2* episode "We Don't Go To Ravenholm", the use of movable objects replaces normal weapons; likewise in *Half Life 2: Episode 1*'s "Urban Flight" (Valve 2006)⁵, the gravity gun is used to block Antlion spawn points. Unsurprisingly, given the normal usage of movable objects, it is near impossible to find an example of a story diegetic object in this category. It should be noted that there are, of course, links between some gameplay objects and story, for example a bomb to be delivered to a location that is not added to an inventory but is represented onscreen at all times, such as *Half Life 2: Episode 2*'s (Valve 2007) Magnusson devices⁶. Movable objects thus expand the affordances of some static objects by placing greater control over *how* these affordances are used in the hands of the player.

Objects with more than one state (>1STATE) are divided into three categories: controlled triggers, free triggers and independents. The latter defines agents and PNPCs and thus deserve special attention.

The majority of objects in FPS environments are *controlled trigger* objects; they are the devices that control the gameplay and diegetic experience. Simply put, a controlled trigger object is one that can only be utilized in a defined way and normally just once. At one end of the scale, exploding barrels change state when their predetermined parameter trigger is activated: they effect a negative parameter shift on the environment and objects around them and are then removed from play. Buttons, levers, valves and gears are used to initiate embedded sequences and cannot be drawn upon in any way other than to do this, frequently as part of a larger sequence of controlled triggers. Fire and steam jets are on until turned off; cutscene triggers push plot forwards and then revert to inactivity. Toilets may be flushed and taps turned on and off, but there is no extension of this basic affordance set and frequently no ramifications to the act. Often, what are touted as gameplay features are simply variations on this object type with a diegetic dressing: *Prey*'s spirit walk sequences and gravity-bending walkways are simply controlled trigger objects with multiple usage (see Section 6.10); as are *System Shock 2* (Looking Glass Studios 1999) and *Bioshock*'s vending machines (including the U-Fix invention machines). In all

5 Hereafter referred to as simply *Episode One*.

6 Hereafter referred to as simply *Episode Two*.

cases, the system absolutely controls the allowed inputs and the corresponding outputs and, as should be clear from the above, this follows for diegetic objects as much as gameplay ones. There are two special subclasses to this set: *goal triggers* and *parameter upgrades*. Parameter upgrades are an important subclass that require a full discussion in relation to avatar affordances and will be discussed in Section 2.5. Goal triggers, which may also involve parameter upgrades, conclude a gameplay Section: forcing a non-returnable shift to a new environmental state, whether that means a break for level load, or a permanent alteration to the environment and system state. Examples of the latter include the release of the Flood in *Halo* (Bungie 2002), or a factional shift in *S.T.A.L.K.E.R.* (attacking the Freedom stronghold will make an enemy of all encountered Freedom troops from that point on). Goal triggers make repeated use of an environment possible – the underlying principle of sandbox level concepts – as they shift the input-output channels of the environment whilst leaving it apparently unchanged either visually or in terms of generic gameplay. These kinds of triggers frequently serve a double-purpose as critical story diegetic objects or, to put it another way, goal triggers are often encased within a strong diegetic device. Finally, goal triggers may exist as both visible objects within the environment, or ‘invisible objects’. This includes both cutscene triggers, but also scripted attachments: “when the last agent in location X is dead, activate this trigger”⁷. In all of these cases, the affordances of controlled trigger objects are system defined and normally specific: these objects have affordances that *do* something as much as they *enable* something.

Free trigger objects are much less common than controlled triggers. They are limited to objects such as free use vehicles, lifts and doors. The latter are often actually controlled trigger objects, but occasionally a greater degree of player control is allowed: in *Call of Cthulhu: Dark Corners of the Earth* (Headfirst Productions 2006)⁸, some doors can be bolted as well as closed, and the decision to bolt a door, leave it open or close it can have a highly significant impact on gameplay (a bolted door will stop enemies, a closed door will reduce the likelihood of being discovered, but leaving a door open means a few less critical seconds when trying to run away, something Jack Walters spends a large amount of time doing in this particular game). In *Halo*, the player has a high degree of freedom in terms of when they can use a vehicle; they can make a choice between Warthog and Ghost, and can use these in the exterior locations more or less how they like (though the game limits their use to exterior environments, thus bottlenecking gameplay). Affordances attached to this small set of objects thus normally focus upon mediating other affordances in the ludic space: movement, ability to affect other objects, damage capacity, and so on.

In terms of diegetic objects, those that can be repeatedly referred to fall into this category: audio logs and emails,

⁷ It should thus also be noted that objects with greater than one state may have an additional important parameter (with state change) that defines how often the affordance may be triggered.

⁸ Hereafter referred to as simply *Cthulhu*.

often attached to the diegetic device of a PDA, as is found in *Doom 3* (id Software 2003), *S.T.A.L.K.E.R.* and *System Shock 2*; or their written equivalents such as tape recorders or journals in *Cthulhu*, *Bioshock* and *Undying* (Dreamworks Games 2001). Some parameter upgrade objects are effectively free trigger objects, such as sniper scopes or *Deus Ex*'s biomods, and these, like other triggers, may be finite in usage.

Finally, the set of *independent objects* basically comprises of those multiple state objects with a fixed-state artificial intelligence system attached to them: agents and in-game PNPCs. The general population of an environment: hostile agents and in some cases, non-hostiles such as those found in *Halo*, *Half Life 2*, *Quake 4*, *S.T.A.L.K.E.R.*, and *Deadly Shadows* (Ion Storm 2004)⁹, amongst others – are objects with a set of independently controlled affordances. Although they certainly have the capacity to affect the avatar, they will navigate the environment on their own and do not always require an input to be triggered (in other words, a spawn point). This is best illustrated by those games which allow inter-factional conflict; *Halo*, *Far Cry*, *S.T.A.L.K.E.R.*, *Resistance: Fall of Man* (Insomniac 2007)¹⁰, *Bioshock*, *Quake 4* – where it is possible to simply observe the agents interacting with one another independently of player activity. As with the other categories, however, independent objects can be graded according to their primary roles in gameplay and diegesis, and their significance to either. For example, a boss or sub-boss such as Robert Marsh in *Cthulhu*, or Sergeant Kelly in *Doom 3* is a critical independent object, as there is no way to avoid them and engaging with them is essential to progression. Some PNPCs also fall into this category – Alyx Vance is a critical gameplay object in *Half Life 2*.

General populations are less significant in these terms, as it is not always necessary to interact with them in order to progress. *S.T.A.L.K.E.R.*, for example, spans a wide environment with a replenishing stock of agents and it is simply impossible (or, at the least, highly improbable) that the player will ever exhaust the supply of agents. Similarly, many contemporary games actively encourage avoiding direct confrontation with agents, from *Deadly Shadows* to *Far Cry*.

However, there are occasional independent agents that play no significant role in gameplay or story: *Half Life 2* has its crows and seagulls, and *Far Cry* its pigs. Both of these may be seen as corroborating the diegesis, and supplying an additional point of interest for inquisitive players. In terms of story diegetic classification, it should be noted that not all PNPCs are independent objects at all. Cortana, though critical to *Halo*'s diegesis, does not exist in the game as anything other than a series of audio files and cutscenes triggered from the avatar's position in the environment and relative to goal triggers. Essentially, the game's most important PNPC is actually a string of story-diegetic controlled trigger objects.

⁹ Hereafter referred to simply as *Deadly Shadows*.

¹⁰ Hereafter referred to simply as *Fall of Man*.

Every single object existing in an FPS environment can be placed into this taxonomy, from PNPCs to buildings, barrels and health kits. It is thus evident that despite the great experiential range of FPS worlds, the functional architecture of the environment is vastly simpler than its diegetic overlay. The types of affordance these objects enable can be classified in a similar way.

Constraining and enabling movement and perception are the basic affordances of any object with a physical presence in the environment: all architectures and props afford the actions of navigating around the space (and may be co-opted for cover, although this can be seen as using the affordances relative to another agent strategically, thus part of the same basic affordance). Constraining movement is a vital part of controlling experiential gameplay, so it is not as simple as blocking a player; indeed walls and doors should be thought of as devices which enable gameplay to be meaningful and enjoyable because they do some of the work of exploration for the player. These constraints also apply to agents and PNPCs.

An affordance that yields a *change to the environmental parameters* means a shift in the entire set of objects – which may be an alteration to physics or, more commonly, the removal of an object, or objects. When a crate is broken, or a barrel destroyed, or an agent killed, it makes sense to consider these removals as changes to the overall state of the environment, as well as individual parameter shifts, as once activated, the object ceases to have any states at all (being removed). Spawn triggers are also environment parameter shifts as they add objects to the environmental set; however, it is the first type of environmental parameter shift that is of real importance. Understanding that the final operation of any finite-parameter affordance (i.e. one that only has a number of actions to afford, or can only contain a finite number of negative state change shifts) is a change to the environmental set in the form of the removal of one object provides evidence for an underlying principle of FPS play: that as play progresses, the environment set simplifies. Spawn points may increase the number of objects in the environment temporarily, but otherwise, play is the process of an inevitable decrease in the number of objects, and number of affordance activations left in each finite state object. The core action of FPS games – shooting at things – is thus tied to a general, ongoing set of alterations to the environment set and this outcome is linked to many of the objects found in the environment.

Thus, any object that can be interacted with (in other words, that has a supported action or input/output relationship attached to it) yields a parameter change, that may or may not result in a state change. When a barrel is pushed, the parameters defining its co-ordinates alter; when it is shot at, its damage parameter reduces and may force a state change. *Changing an object's parameters*, with the important subset of *changing its location*, represents

the fundamental activity of gameplay – the manipulation of objects, according to a set of predetermined rules, by the player.

In terms of controlled trigger objects that afford a parameter shift to the avatar, such as a health kit, therefore, it should be noted that at least two affordances are triggered simultaneously – a change to the object's parameters and a change to the avatar's parameters. If the object in question has reached the end of a depreciating use count parameter, a third affordance is also effected – change to the environment set. Thus, in the case of a single-use health kit, if the affordance is activated, there is a parameter shift to the avatar's damage-taking capacity (i.e. health) and a change to the environmental set (health kit is removed from play). Likewise, a health kit in *S.T.A.L.K.E.R.* is not immediately activated but adds to the avatar the capacity to heal itself an additional number of times (1 per kit), but it is removed from the environment. It might even be suggested, therefore, there is no object state change when a kit is picked up, instead there is a parameter shift to the avatar and a reduction in the environmental set. Any power-up – be it health, ammo or temporary boosts like *Quake 4*'s Quad Damage – fires three affordances simultaneously and only once.

There are thus two types of shifts to object parameter that can be attached to any given object: the capacity to shift its own parameters and the capacity to shift another object's parameters (including independent objects, or agents). Finally, the capacity of change the parameters of the avatar as a special case should be distinguished.

So, an exploding barrel can be described as a >1STATE movable object with the following affordances: Change Own Location (it can be moved around), Change Own Parameters (takes damage then explodes with a state change), Change Object's Parameters (when it explodes it inflicts damage), Change Avatar's Parameters (in the same way) and Change Environment (when it explodes, it is removed from play). As a controlled trigger object, the last three of these are tied to the state change. A static, unbreakable crate (1STATE, Static) that cannot be climbed upon is linked to only one affordance: it constrains movement and perception. A light switch (1STATE, Controlled) is linked to two: Change Own Parameters (a binary integer state change) and Change Environment (by altering the local illumination). A Warthog (>1STATE, Free) is linked to may be used to Change the Avatar's Parameters (for moving and shooting), Change Own Parameters (it can be occupied or not, it can flip over), and Change Object Parameter (agents may enter it and also have their parameters shifted). It also constrains movement and perception to a limited extent (you can't move through a Warthog, or see through it very well). Finally, a Covenant Brute (>1STATE, independent) can Change its own parameters (move around, take damage, shift into different states as dictated by contextual AI), change other object's parameters (shooting at things) and, of course, change the avatar's parameters in the same way. Its constraint over movement and perception is

relatively negligible compared to most static objects (and would not normally be expected as a gameplay function).

Finally, there are the two diegetic affordances. Corroborative objects- those that are not explicitly linked to story development but support the general semantic presentation afford a stable diegesis and reinforce expectations and assumptions about this. The entrails twisting through Mars City are often attached to walls and floors (1STATE, Static, Constrains Movement and Perception) but they also support the idea of a Hell-invaded base and assist in maintaining the general ambience. On the other hand, many of *Bioshock's* audiotapes not only supply this affordance, but also directly afford a greater degree of knowledge about the story – they afford increases and decreases in plot complexity and player understanding. The affordances attached to types of objects can be summarised as follows:

Pertaining to the environment set (I.e. the environment and everything in it)	Constrain/Enable Perception and Movement Change Environmental Parameters
Pertaining to the object itself (an internal affordance)	Change Own Parameters Change Own location
Pertaining to another object(s) in the environment (including the avatar)	Change Object's Parameters Change Avatar's Parameters
Pertaining to the diegesis (without gameplay function)	Support Diegesis Manage plot complexity and transparency

Fig 7. Summary of affordance types

All of the affordances available to, or through, environmental objects across the classifications reduce to a basic set of six gameplay affordances and two diegetic affordances. In the case of environmental objects, whether they are single or multiple state, these affordances are for the most part controlled, specific and predetermined. In the case of two special classes of object however, there is a much greater degree of complexity in how these affordances are mediated and enacted. Agents and avatars should thus be considered in more detail.

Section 2.4. Agents and Affordances

Agents refers to those objects in the environment with some form of artificial intelligence attached to them, normally in the form of a fixed-state system¹¹ of input/output contextual relationships, that exercise self-contained control over the application of the affordances available to them. The concept of state being defined

¹¹ In this instance, fixed-state is not to be confused with the notion of state being developed here and is offered for reference only on this one occasion.

here enables a simplified understanding of independent objects to be established. Whilst the term fixed-state AI is often used to describe the behavioural systems associated with agents, it can be understood that what is actually created is a set of input-output relationships with the environment, mediated by a series of parameters. Again, it is perhaps best to understand states as fixed points of reference, that lock defined parameters to defined points upon their scales. Thus, a state change is a move from one pre-defined set of parameter-mediated affordance relationships to another. This definition efficiently encompasses controlled-and multiple-trigger objects, as well as agents, and has the added advantage of bypassing problematic terms such as interactivity and agency (the relationship between agency, intentionality and artificial intelligence is discussed in more detail in Section 7.1).

From this definition of states, the concept of a parameter is clarified as a mediating variable, affecting the affordance relationships inherent in an environment set. As an example, one very simple state system existing for all agents comprises of ALIVE and DEAD. Each of these states has a pre-determined set of affordance relationships with the environment set, which control movement, perception, reaction to events, and so on. This corresponds to a single sliding scale which determines the state: a health bar, represented by an integer value decreasing every time the agent is affected by a [CHANGE AGENT/OBJECT PARAMETERS/STATE] action with a negative health parameter specification. At a certain integer level – normally zero – the agent state changes from ALIVE to DEAD and its affordance relationships immediately shift to the second, predefined, set. However, within ALIVE, each defined affordance relationship may have at least one mediating variable attached to it. In other words, a simple computational rule may exist that states:

IF [CHANGE AGENT/OBJECT PARAMETERS/STATE] = reduce HEALTH by 10 or more, THEN:

HEALTH = HEALTH – N(>10)
MOVE = MOVE + 10
RESPONSE TIME = RESPONSE TIME +20
% OF SHOOTING = % OF SHOOTING + 20
ACCURACY = ACCURACY – 20¹²

This is obviously a highly simplified version of events, particularly with more modern agents, but what it does demonstrate is that by adjusting even a small number of pre-existing variables, there is the potential for quite a substantial shift in the kind of interpretative data available to the player. In the example above the agent, on being wounded, will move faster and react more quickly. It is much more likely to fire on any object that fits the template for this affordance's trigger (at the most simple, an object moving within a defined field relative to the agent), but it will be much less accurate. Anthropomorphising this, a subjective interpretation of rage or panic

¹² Each of these represents a different parameter mediating the way in which affordances are carried out. What is described therefore is a state change, as a predefined configurative change across a number of parameters is put into play.

may be inferred – it perhaps even resembles the ‘fight or flight’ reflex. Thus, with a small network of parameters, acting on one another, and the capacity to fix sudden and holistic predetermined shifts to ‘locked down’ parameter configurations (states), the illusion of complex behaviour can be created. What is interesting here is that this process does rely on a degree of anthropomorphisation on the part of the player, otherwise known as adopting the intentional stance.

The extrapolation of parameters shifts in affordance relationships to intentionality will be discussed in more detail in Section 7.1, what is important at this stage is two properties of this approach: that each object is composed of at least one state, defined as a predetermined set of affordance relationships with the environment; and that these affordance relationships are further and independently defined by their parameters (the mediating variables). The underlying, structural model of an independent object according to these terms, thus looks as follows:

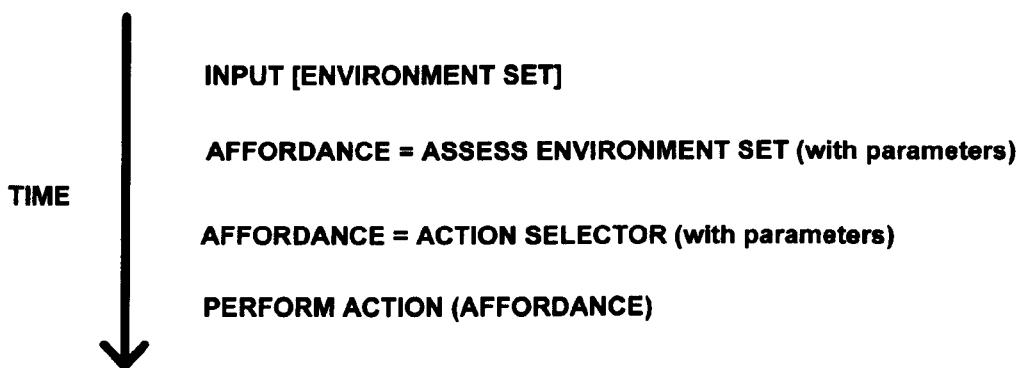


Fig 8. Structural model of an independent object

An independent object has two special affordances that make it unique. The first is the capacity to perceive the environment set, mediated by a set of parameters that create the illusion of sensory information; the second is the capacity to select an output from a set given this input information (giving rise to the illusion of reasoned action). Thus unlike a controlled trigger, which has a vastly reduced or singular input-output system, or one which is fundamentally predetermined and locked to a specific context: agents are capable of determining, to an extent, how this system operates. Note that this does not require a great deal of complexity, as the options and parameters within the self-determined system can be extremely simple. Further, the actual affordances underlying the outputs fit without issue into the gameplay affordances proposed in Fig 7: CHANGE OWN LOCATION (applied to the agent itself); CHANGE OBJECT'S PARAMETERS (normally by attempting to impose a negative parameter shift upon its health). Every action an independent object may carry out fits these basic

gameplay affordances, from team communication and social behaviour (**CHANGE OBJECT'S PARAMETERS**) to projected mood states, as noted above. This is not to denigrate the complexity of game AI, but it is nevertheless important to understand that the experiential complexity is without doubt greater than the structural complexity, and approaching the issue from the perspective of affordances makes this extremely clear.

Finally, parameter upgrades can be returned to, in order to understand how these important and numerous game objects operate. By defining an agent's behavioural and action responses in terms of affordance relationships, it becomes clear that when an agent behaves differently, what is really occurring is a shift in the mediating variables by which it selects or conducts actions or, in the case of a state change, makes a jump to a predetermined set of parameter-mediations. Just as a negative change to an agent's health integer may alter parameters that mediate its **ASSESS** and **SELECT** affordances, it may affect its direct capacity to undertake or exploit gameplay affordances. A heavily damaged agent may also be constrained in movement; it may have a causal relationship between the parameters mediating its health and the parameters mediating its movement. These causal relationships can be extended to other gameplay affordances, including **CHANGE OBJECT'S PARAMETERS**, and these may also be directly shifted by such affordances being initiated by another object in the environmental set. If agents picking up Quad Damage upgrades is enabled within the system, then co-locating with such an object changes the parameters by which the agent utilizes these two affordances by increasing the negative health parameter shift caused by an accurate hit. Running over a health kit likewise alters the parameters of the health integer, with potential knock-on effects to the parameter structures described elsewhere in the state.

Similarly, when a player selects a weapon from a list, what is really happening is that the parameters by which they can apply the gameplay affordance **CHANGE OBJECT'S PARAMETERS** is altered, using the mediating factors of range, accuracy, local damage, splash damage and so on. This affordance is normally locked to a decreasing integer (an ammunition count), so that with each shot, the integer is decreased until it reaches a point where it is no longer usable. For this reason, jumping between weapons should be considered as state changes (as several depreciating counts are attached to a predetermined set of mediating factors, 'describing' each individual weapon). Thinking in this way, picking up an ammo clip can be seen as a parameter upgrade – it increases the otherwise decreasing ammunition integer – which mediates how many times that affordance can be carried out within that particular state. A new weapon or ability can be understood then as **CHANGE AVATAR'S PARAMETERS**, in the form of the addition of a new state, as it defines a new predetermined set mediating variables for applying this affordance. Finally items such as health kits may be seen as fundamentally environmental, controlled trigger objects that locate a parameter shift to a specific location, or they may be general parameter upgrades that increase the avatar's capacity to cause a parameter shift in itself, at any point. As

well as this, alongside these forms of parameter upgrade objects, there are more permanent upgrades, as with new weapons, that add new predetermined input-output and affordance relationships to the avatar – in other words, they create new states. This discussion of upgrades naturally leads to a consideration of avatars in more detail.

Section 2.5. Avatar affordances

The list of what it is that avatars actually *do* in games, is in fact very short, with a larger number of mediating parameters most of which are locked into specific states¹³. For instance, walking, crawling, running and even swimming are all states within the basic affordance of moving. Each of them mediates the affordance in a particular, different and, for the most part, fixed way. Running increases the speed of movement whilst normally leaving other axes of movement unchanged. It often also changes the parameters of the avatar's presence in the environment (by making more noise, it effectively alters other agents' ASSESSMENT of the environmental set). Crouching reduces speed and noise and drops the avatar's presence visually along the vertical axis. Swimming enables the avatar to not only move forwards but up and down too, though there is often a decreasing integer attached to how long this affordance can be carried out without negative parameter shifts or even state changes (running out of breath). Jumping temporarily shifts the avatar along the z-axis. All of these really fall under CHANGE OWN LOCATION and in some cases (swimming, sneaking, running) CHANGE OWN PARAMETERS.

Changing weapons, applying health kits or using any item such as *Deus Ex*'s biomods, *Crysis*' (Crytek 2007) binoculars, *Perfect Dark Zero*'s (Rare 2005) probe or the many examples of Sniper scopes, can also all be classified under the pre-existing CHANGE OWN PARAMETERS.

Interacting with the environment has been re-conceptualised here as triggering affordances, and avatars have the capacity to do this in one of two ways. In the most simple, co-location is enough, and the affordance is best thought of as purely environmental – a controlled trigger item. Some controlled triggers also require use buttons, as do most free trigger items, but in all cases, the same basic affordance is applied: CHANGE OBJECT'S PARAMETERS (from 'off' to 'on', in most cases). Any kind of shooting, including grenades and melee are applications of CHANGE OBJECT'S PARAMETERS, mediated by range, accuracy, damage, etc. Reading journals and audio logs are CHANGE OBJECT'S PARAMETERS to trigger SUPPORT DIESESIS or PROGRESS PLOT. Talking to other agents may cause them to do one of the above. As with objects, the real complexity and experience of gameplay comes from the mediation of parameters, through which a complex

13 See Section 8.1 for a full discussion of avatars' functional capabilities

subjective experience can be created. For example, choosing to switch from pistol to rocket launcher in a combat sequence may be represented by a new animated weapon on screen and the ability to fire over walls, bounce shots around corners and cause damage to a whole group of agents at once, but in reality, all that has happened is the parameters mediating the affordance of CHANGE OBJECT'S PARAMETERS have been adjusted for range, behaviour on contact with an object and damage radius. There is no actual change of object, just a state change shift in the avatar that applies new values to pre-existing scales.

Over the last few sections, it has been demonstrated that gameplay can be understood as a network of affordance relationships existing between objects in an environment, and that both the types of object and types of affordances they have the capacity for are relatively small in number. All activity in a ludic space can be reduced to a small number of affordances, enacting mediated parameter shifts in other objects (usually as a result of strictly predetermined triggers and locked to predetermined state changes). This includes the activity of agents, and even the activities of the avatar fit the small set of supported actions.

Section 2.6. Describing an underlying ludic structure.

If all activity in an FPS game reduces to the interplay of a small number of affordances, mediated by parameters that give the gameplay its tone, the underlying ludic structure of the genre becomes evident. In essence, the following is proposed as a summary of the essential structure, drawn from our analysis of titles ranging from 1998-2008.

- An environment is presented for exploration. The player's avatar may move through this environment in a number of standard ways (turning on the vertical axis 360°; moving in the four cardinal directions; possibly moving vertically by jumping, climbing or falling). *This corresponds to CHANGE OWN LOCATION. It also presupposes, as a minimum, an environmental set, which introduces the basic affordance of CONSTRAIN/ENABLE MOVEMENT/PERCEPTION*
- There is at least one other hostile avatar within the environment. This avatar may be controlled by a computer or another player (for clarity, the term agent is used, whilst recognising it may technically actually be the latter). *This establishes the existence of at least one INDEPENDENT OBJECT, which introduces the affordances ASSESS and SELECT, in the context of the affordances supporting the structure below.*

- The avatar has the capacity to negatively affect this agent's state (normally at a distance, within constraints such as range or accuracy). Usually, they will require 'line of sight' to affect this change. *Affordances here are CHANGE OBJECT'S PARAMETERS and introduce the idea of parameters being used to adjust this basic action (though these are clearly disposable to a large degree – requiring only a single predefined state to control the basic application of the affordance).*
- The agent has the capacity to negatively affect the avatar's state, with similar constraints, and will endeavor to do so. *This is an application of ASSESS and SELECT, in conjunction with CHANGE OBJECT'S PARAMETERS*

Both agent and avatar have a finite capacity for negative state changes. Beyond this point, either the avatar will die and the game will be over, or the agent will die and the game will continue. *This establishes a basic micro-goal, the application of CHANGE OBJECT'S PARAMETERS until a critical state change is triggered. At the simplest level (i.e. 1973's Maze War), this may be the game's end state; in more complex games alternate end-states are added (see below). Removal of the agent, if not an end-state, will trigger the environmental affordance CHANGE ENVIRONMENTAL PARAMETERS, reducing the number of objects in the environment set by one.*

In addition to these basic rules, modern FPS games also use an increasing amount of embedded objects to enhance play.

- In addition to static, passive, embedded details and decoration, the environment may contain a number of objects that will effect change¹⁴. These may be taxonomised as follows:
 - a. Objects which positively affect the avatar's state, for example health kits
 - b. Objects which raise the avatar's basic capabilities: new weapons or power-ups (these may be temporary or permanent)
 - c. Objects which negatively affect the avatar's state: slime pits or lava
 - d. Objects which may be manipulated to change the environment's state: doors, levers, buttons.

¹⁴ In what follows, agents may sometimes also be affected, or able to utilise objects.

Some of these objects will affect change automatically, through co-location or by proximity. Others may require active manipulation by the player. Thus, many of the key gameplay affordances that give FPS play their unique experiential flavour are additions to the central structure. The affordance CHANGE OBJECT LOCATION is a potential addition at this point. Also added is the potential for CHANGE OWN PARAMETERS, through power-up objects.

Further, FPS gaming can be split into single and multiplayer. The occasional cooperative multiplayer FPS notwithstanding, generally multiplayer games take place within a single map:

- Multiplayer FPS games are usually played with a set goal. Once this goal has been completed the game ends. Examples of this goal include:
 - a. Play continues until only one player is left. *Defined by a critical state in the environment set, achieved by the reduction of objects, i.e., the result of an application of CHANGE ENVIRONMENTAL SET.*
 - b. Play continues until the first player reaches a total score (usually determined by the number of kills they have accumulated). *Defined by a critical state attached to the avatar, a rising integer mediated by the successful application of CHANGE OBJECT'S PARAMETERS.*
 - c. Play continues for a predetermined time, after which the player with the highest score wins and the game ends. *As above, with a decreasing integer, non-mediated by gameplay and affordances, attached to the environment.*
 - d. Play continues until one player has achieved a predetermined goal, which involves affecting the environment in a particular way (the classic example of this being Capture the Flag, which requires a player to relocate an object from one set of environmental co-ordinates to another). *Achieved one of two ways. The carrying of a flag can be understood as a change to the avatar's parameters, so this is a combination of CHANGE OWN LOCATION with a successfully altered parameter (i.e., flagcarried=1, not flagcarried=0). Alternatively, in the case of bomb runs, where the object is fired into a goal, this is an application of CHANGE OBJECT LOCATION with the trajectory or final destination of the object in question being co-located with an 'invisible' CHANGE ENVIRONMENTAL PARAMETERS trigger.*

Some multiplayer FPS games allow players to co-operatively play in teams against opposing teams. In these cases, ‘player’ can be replaced by ‘team’ in all the above rules.

Single player FPS games tend to be episodic, and thus generally apply rule 6d in one form or another. Rule 6 can be written as follows for single player games

- FPS games are based around the completion of a set goal. This goal is achieved when a predetermined state is present in the environment. This state may be predicated on population of environment (nothing left to kill); location of player (found the secret room); manipulation of an object (flipped the switch); or relocation of an object (retrieved the circuitboard), find an object (get the gun). This list is not exhaustive, but represents the vast majority of all FPS goals. *Goals can thus be based upon CHANGE ENVIRONMENTAL SET, CHANGE OWN LOCATION, CHANGE OBJECT STATE/LOCATION or CHANGE OWN STATE/PARAMETERS.*

Finally, the seventh rule distinguishes FPS titles from other genres.

- All perceptual action in the game is carried out using a direct mapping between player and avatar perspective, even if these do not obey 'real world' rules of physics and perception.

Extrapolating from this structure, and with the support of the affordance analysis deconstruction, it can be argued that FPS games thus work within a very basic ludic structure. An (unknown) environment, filled with objects and agents is presented. As play progresses and through the application of the affordances available to the avatar and attached to objects, the environment becomes both more known and less populated – it simplifies. Generally speaking, at the point of highest simplicity, the game ends; in more prosaic terms, when there is nothing left to kill and no doors left to open, the chances are the level is complete. This can be represented diagrammatically, as below:

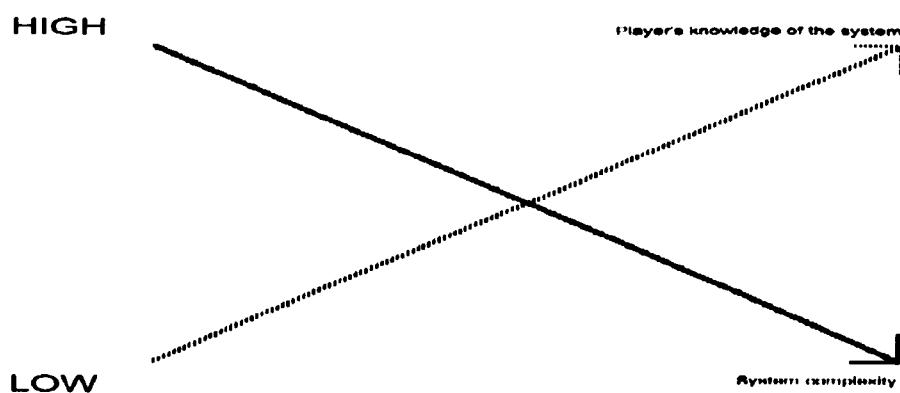


Fig 9. The most core structure of an FPS game

Section 2.7 The Affordance / Ecology discontinuity

Regardless of this essential simplicity, it is clear that contemporary FPS games do feel qualitatively quite distinct. *Quake 4* is not the same game, quite self-evidently as *S.T.A.L.K.E.R.*; *Prey* and *Cthulhu* are poles apart; *Half Life* 2 relates only superficially to *Portal* (Valve 2007) in any real gameplay terms (though they are visually very similar) and *Unreal Tournament 3* (Epic Games 2007) quite clearly operates at the far end of the scale from *System Shock* 2. There is a sub-genre breakdown that is often subjectively applied: *System Shock* 2 and *S.T.A.L.K.E.R.* belong with titles such as *Hellgate* (Flagship Studios 2007) under the loose banner of RPG-crossovers; whilst *Half Life*, *Doom 3*, *Quake 4* and *F.E.A.R.* are nominally classed as ‘run-and-gun’ shooters. Quite what these classifications mean in real terms is questionable. RPG-crossover implies a high degree of configurative ability, but certainly the claim that players’ role-play in FPS games, particularly single-player campaigns, has no empirical support. What then to make of a game like *Bioshock*, which has a degree of configuration in terms of combinations of plasmids and gene tonics, but is experientially far closer to *Doom 3* than it is to *System Shock* 2? Or *Far Cry*, and particularly *Crysis*, which both demand a strategic, often very subtle approach to combat situations? Does this strategic element make them belong in the same sub-class as what are sometimes termed first-person sneakers, like *Deadly Shadows*? *Cthulhu*, with extended sequences where the avatar has no weaponry at their disposal would also seem to belong to this class, yet it also appears geared very much towards the notion of role-playing, with one of the most visible characters found in the genre attached to the avatar.

At the root of defining sub-genres are the mediating variables: the parameters, attached to affordance relationships (particularly the defined sets), and breakdown of object types within the environmental set¹⁵. Thus, denying the avatar a state that decreases speed [CHANGE OWN LOCATION] but also reduces the ability of agents to ASSESS the avatar’s location in the environment – i.e. a sneak or crouch mode – establishes a play style by constraint. Likewise, ensuring that the ability of the avatar to CHANGE AGENT/OBJECT PARAMETER/STATE is mediated by high constraints in terms of accuracy, damage inflicted and number of applications allowed, means the player is actively dissuaded from the run-and-gun approach. Likewise, shifts to the environmental set, and the types of objects within it control player behaviour. A very limited number of >1 state objects, with multi-state objects confined to parameter upgrades simply does not allow for extensive configurative or environmentally explorative play, as typified by *Halo* and *Painkiller* (People Can Fly 2005). Alternatively, environments may be packed full of very simple single state objects which can only be interacted

¹⁵ Alongside, potentially, types of diegesis. This question will be returned to throughout Sections 6-9.

with in a very limited way, but when this does occur, it causes strategically important shifts to the environmental parameters (*F.E.A.R.*'s dust-cloud and noise generating furniture for example).

However, the player has to learn these rules, and not suffer the problem of their expectations outpacing the capacity of the system to deliver. Such instances cause a disruption to the flow of gameplay and are potentially highly problematic. A game is fundamentally a system for producing an affective experience within a pre-determined range, and this relies heavily upon players playing the game in the way in which it is designed to be played. The question then becomes how best to ensure this is happening. Overlaid heterodiegetic devices are one option: *Bioshock*'s golden arrow, or playing tips such as those found in *Cthulhu*, but these are clearly unsatisfactory if what is sought after is an immersive, unbroken experience. The alternative is thus a functional network of homodiegetic devices progressing alongside gameplay, to establish, support and manipulate player behaviour, and this returns us to the two non-gameplay affordances introduced in Section 2.3: the supporting of the diegesis and the progression of plot. The combination of these two is recognisable as what is normally called story.

Alongside this issue of directly impacting upon gameplay, it can easily be seen in contemporary FPS games an attempt to widen and deepen the affective experience of play. Freeman's albeit superficial concept of 'emotioneering' (2004) is recognizable in the attempts to attach emotional significance to the increasing numbers of persistent NPCs found in the genre, for example. The information loads of the environments are richer and more complex in structural terms. Temporal sequences and inferred histories are commonplace: inter-NPC relationships are more dynamic and more visible; non-ludically significant details fill the corridors and citadels. In short, the presented world has increased in complexity, which runs the risk of presenting a higher expectation of affordances, whilst the actual structure and affordance set available have remained consistent and small.

Section 3. TRADITIONAL MODELS OF NARRATIVE

By using affordances as an analytical tool to understand how FPS environments can be defined by how they are built into the system, and how all gameplay can be described as the enactment of these inherent affordances (mediated by parameters), a discontinuity can be seen between the ludic structure of FPS games and the complexity of their presented worlds. It was suggested earlier that story has a significant role to play in the epistemological and functional matter of supporting and manipulating player behaviour. This, in turn, enables a more seamless, immersive experience to be delivered within a predetermined affective range.

Story and gameplay have had a traditionally difficult relationship, as evidenced by the lengthy narratology/ludology debate. Over the next two sections, the reasons for this debate will be explored and a model developed that not only resolves the issue, but synchronises with the affordance based model of gameplay developed in Section 2. This will be achieved by exploring traditional models of narrative, then proposing a new structure that enables us to consider elements of narrative in relation to gameplay objects without requiring full narrative structuring to be present.

Genette distinguishes between story and narrative as ‘what is told’ and ‘how it is told’ respectively (1980: 25-27; 156n), noting that not all narratives are stories yet implying that all stories require narrative. Thus, narrative is defined as the means by which the story is transmitted. As discussed in Section 4.1, much of the debate surrounding games concerns their relative narrativity or whether they can be considered narratives which, according to Genette’s definition, translates into the degree to which they tell stories or the degree to which they are story-telling devices. As this thesis is primarily concerned with the relationship between story and gameplay, thus there is a need to explore narrative and its relation to games in more detail. In other words, to better understand the relationship between gameplay and *what is told* in games, what should first be considered is *how it is told* in games.

Thus, traditional models of narrative are introduced and deconstructed to arrive at a ludological version that better fits this purpose, including a redefined construct of story that avoids the problems inherent in the application of the traditional model to games. This is principally achieved through a discussion of the question of whether games can be considered narratives or interactive narratives – the ludology/narratology debate – and a consideration of how much this really contributes to a detailed understanding of the function of story in games.

Section 3.1. Traditional Definitions of narrative

Narrative scholars Onega & Landa define narrative as “the semiotic representation of a series of events meaningfully connected in a temporal and causal way” (1996: 3). In this definition key concepts may be isolated. Firstly, there is *representation*, in other words, not a thing, but a reported thing, with all the potential for manipulation, error and repetition, not to mention translation and remediation, this contains. In other words, narrative is fundamentally a re-presentation of events, not the events themselves. Secondly, *sequence*: that is, narrative is comprised of multiple units. A distinct temporal patterning is also required and, indeed, it is the particularities of this temporal structure that Juul uses to argue against the study of games as a narrative medium (2005). Thirdly, *meaning*: a narrative has semantic weight, it signifies. Finally, *causality*, the sequence either

contains, or is amenable to the projection of, a logical linking mechanism. Onega & Landa's definition is by no means universally accepted. Porter Abbott (2002) notes that for some scholars, the mediation of a single event is enough to constitute a narrative, provided other key factors, such as a narrator / narratee relationship, are present. Further, causality is not a defining factor for others, provided representation exists. For our purposes, however, it does define a good, centralized position that enables us to explore the factors and facets that fit within most definitions of narrative, allowing story to be positioned against this framework.

In order to narrate, two particular positions must be adopted. There must be a narrator, or point of origin, and a narratee, or receptacle. Prince (1980, 1982) makes it clear that these positions are to be distinguished from the author and reader, as both are virtual points within the internal topology of a narrative system. Further, both are potentially mobile, false and composite. The concepts of narratee and narrator are particularly useful when dealing with games, as additional points of distinction are required to cope with the multiple levels inherent in the experience – the player and their avatar, the antagonist as agent, the representation of the designer's goals and identity within the world, and plot devices like *Fall of Man*'s Parker or Call of *Cthulhu*'s Jack Walters as both characters and potential narrators, for example.

In order for presentation, let alone re-presentation, to occur, something to be presented is required. This distinction between what is presented and the act of presentation forms the crux of narratology. Common terms for the telling and the told, or the act of presentation and the presented are "discourse" and "story"; the Russian Formalist school opted for the more technical *sjuzet* and *fabula* respectively (Propp 1928). Note that unlike Genette, narrative thus becomes an overall construct that includes both told and telling, rather than being simply the latter aspect. It is the very fact that a *sjuzet* exists that ultimately constitutes a narrative, as it explicitly demands mediation, a separation of event from representation. This thus includes two entirely distinct temporal frames: the time attached to the events and the time of telling. It therefore forces a critical distinction between a sequence and a narrative. This distinction is ever more important as interactive narrative, and virtual environments are introduced.

Within the *fabula*, the sequence and events are anchored; semantic units: actions, objects, and characters are fixed co-ordinates within an action-environment, that is, an environment in which all the action of the narrative is supported. In *Undying*, for example, there are units such as Patrick Galloway, Jeremiah Covenant, the Covenant Mansion, the Ruined Abbey, Howlers and the legend of the *Undying* King; as well as temporally defined sequences: Patrick kills Lizbeth and releases her mother's spirit, Jeremiah pretends to have been killed, and so on. All of these units, whether objects or predefined causal relationships are encompassed within a single action-

environment, or fabula: the diegesis of *Undying*.

The changes to this action-environment are recorded in the form of alterations to the state: happenings, events or temporal markers. It is important to recognise that fabula is in no way an exhaustive, or even representative, model of the action-environment over the temporal frame. On the contrary, it is decidedly patchy, full of omissions, low on focus and definition; it may not even add up to a logical or non-contradictory whole. It is also important to overcome the assumption that fabula represents a truth, or a real. Just because the telling is split from the told, it should not be inferred that unreliability and partisanship are the product or province of the former. Nor should it be assumed that the author, let alone the narrator, has privileged access to the fabula. Before reaching sjuzet, several key characteristics of narratives are inherent in the base structure: ambiguity, perspective, conflict and dependence.

The structural characteristics of sjuzet are somewhat easier to deal with. In one sense, sjuzet is the process of mediation, or representation. However, it should be remembered that this does not imply that fabula is unmediated, nor that sjuzet is inherently unreliable, as this unreliability can be found deep within fabula itself. Sjuzet is the level of the narrator and the narratee, and allows an additional virtual environment to be constructed around the sequence within fabula. Discourse time may relate to event time in only a cursory manner: the events of a year may be condensed into a fraction of the overall discourse, whilst a moment may be protracted to enhance significance or up the emotional ante¹⁶. Sjuzet may house a roving point of view; in other words, the distance between the narrator and fabula may be mobile, or there may even be multiple narrators within a single sjuzet; *Roadside Picnic* (Strugatsky & Strugatsky 1977), the novel that eventual gave rise to *S.T.A.L.K.E.R.*, is a good example of the latter. It is from sjuzet that a level of diegesis is normally inferred, that is, a measure of the coherent and independent reality of the narrative. Heterodiegetic and homodiegetic positioning have already been distinguished; this kind of structuring can have a profound effect upon the perceived truth, stability or reliability of sjuzet and, indeed, the subject of sjuzet. That the term diegesis refers to the 'reality' of the narrative world once again points to the important distinction to be made between a raw sequence of events and fabula. That is, the reality of fabula is to be distinguished from its actuality, or its component elements. This separation of reality from its component parts falls in line with current theories of consciousness and perception, finding parallels in the process of distal attribution (Loomis 1992).

¹⁶ A good example of this kind of temporal shifting can be found in *Half Life 2*, whose events take place over two weeks (due to a temporal jump towards the beginning) followed by a two full days (then another temporal jump) followed by a final day long sequence, being represented in around 12 hours of play.

Section 3.2. Narrative devices: Focalisation, voice and closure

Perhaps above all else, the sjuzet is a device to ensure an outcome within a pre-determined range. The sequence of the fabula may be fixed, if uncertain, but the sjuzet is highly mobile and never accidental. Multiple sjuzets may correspond to a single fabula, just as elements or aspects of a sjuzet may be mapped across different media. In line with this, there are three internal devices to be found within the discourse level that control the experiential outcome, adjusting the flow and effect of the transmission of narrative: focalisation, voice and closure.

Bal (1983) defines *focalization* as those tools within the sjuzet that serve to control the act of reading. Focalisation shares with narration the potential for multiplicity and shift, but is not anchored to a virtual character, thus it is distinct from the point-of-view or significance attached by the narrator. Focal objects may be distributed throughout the narrative space: in a sense, they are the semantic architecture of the act of narration. The fact that focalisation is distinguished from narration, and implies that apparently passive objects and features of the diegesis can, in fact, operate as highly active and dynamically controlling tools, demonstrates the importance of non-textual (be it written or spoken) aspects of narrative, what Jenkins' calls "environmental storytelling" (2003: 121). This is clearly hugely important to games and it is worth briefly touching on two other media forms to make our conceptualisation of focalisation complete.

Firstly, films utilise focalisation in a highly visible way, provided one remembers that the camera is neither focalisation point, nor narrator (Deleyto 1991). A film does not require a narrator to exist as a character, this figure may be implied as co-existent with the viewer, for example; but cinematography is essentially a process of the effective mapping out of a territory of focalisation to ensure that the viewer (and, indeed, the narratee) follows a pre-determined path through the semantic and emotional trail of the narrative. Product placement in films is an illuminating, if crass, example of focalisation tools being deployed to adjust reading without disrupting the flow of narrative. Secondly, comics require intense focalisation devices as they primarily operate as primers for highly active reading: calls to action for the reader to tackle the explicit gaps existing in representation (pictures). McCloud argues that comic narratives are prime examples of iconic narratives, forcing this active reading style by presenting minimal cues alongside visible gaps in any given sequence of representation (1994). Thus, focalisation is directly about experiential control.

Where experiential control is directly attached to the narrator, focalization is recast as *voice*. In some cases, the narrator's voice is relatively quiet, there is an air of impersonal reportage, whilst in others the voice is strong and it is the narrator's relationship with the narrated that is pushed to the foreground ("Dear Reader, I married him"). It

should be noted that this does not necessarily imply that a narrator with a strong voice has to be implicated or involved in the action in any way; as with focalisation, it is a sjuzet technique for controlling reception and processing by the reader. As Keen points out however, it is important to note that, as with many of the terms introduced here, ‘voice’ remains highly contested and it may be argued that it is a property of the narrative as a whole, rather than the narrator individually (2003). Genette (1980: 213-262), when introducing the term, appears to use it to refer to the *relative importance* of the act of narration, of the presence of the narrator within the reader’s hierarchy of attention, which supports the conceptualisation detailed above. In either case, voice is once again a control tactic.

Finally, alongside Onega & Landa’s definition, three further characteristics to narrative can be identified: that they are non-accidental, that they are non-passive and that they are incomplete. In other words, the act of discourse is inherently conducted through a filter of intent and that the act of reading a narrative requires engagement with specific devices designed to control this act. In other words, there is no such thing as unmediated reading and reading is a matter of engaging with the devices designed to mediate the content, not the content directly. The relationship is thus dynamic, whether the reader wants it to be or not. Further, both sjuzet and fabula are sampled from the overall action-environment to create a diegetic subset. As Kermode notes, everything is perspective and no fundamental, *a priori*, truth should ever be assumed of the fabula (1979). What is presented is a necessarily incomplete network of nodes that the reader is directed through in a specific order and manner in order to yield the narrative experience. This process of creating a holistic experience from a fragmented set is called *closure*, probably the most powerful tool at the disposal of a designer of an interactive narrative, environment or game. Indeed, it is closure, via its natural counterpart in psychology (Section 4.3), that provides the basis for a model of story that is more applicable to games than the traditional fabula / sjuzet split.

Kermode wonders, “Why does it require a more strenuous effort to believe that a narrative lacks coherence than to believe that somehow, if one could only find it, it doesn’t?” (1979:53). Closure refers to the process of assembling coherence from the available evidence and has parallels once again to distal attribution. According to this, our understanding of the world is better understood as a process of assembly from data derived from the perceptual system, rather than a direct engagement (Loomis 1992). Similarly, closure is a process by which the incomplete data of fabula, mediated by the devices operating in sjuzet work to infer a wider, deeper and more coherent diegesis. It is in the gaps in narratives that these control devices operate, as it may be argued that the act of reading is the act of assemblage, from an ambiguous, faulty and incomplete set, a more-or-less unified experience that is afforded a perhaps undue level of reliability. Narrative is thus driven by the relationship between gaps and the process of closure: it is the desire for closure that drives reading forwards. Porter Abbot

(2002) reiterates the argument that conflict structures narrative and closure of some form is the natural, needed, or, at the least, expected outcome. Conflict should not be taken too literally, rather it refers to opposition between elements, be they human, anthropomorphised or otherwise. Bremond (1980) illustrates this process, that maps the need for resolution, conflict to achieve resolution and resolution itself as a model for narrative thus:

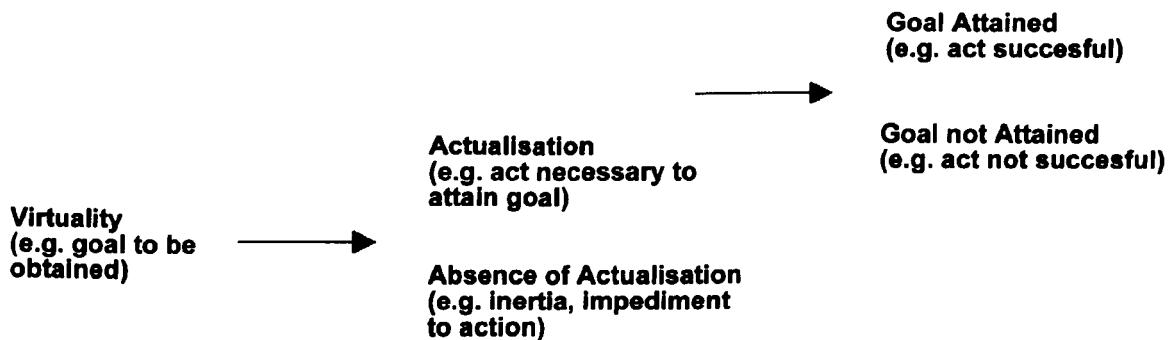


Fig 10. Bremond's model of narrative (1980)

The drive for closure means an inevitable tendency to make assumptions, misread, omit from memory, conjure elements and form connections that may not actually be present in either fabula or sjuzet. This highlights an important further distinction between narrative and the reading of the narrative, thus separating the processing of what is consumed from the process of consumption. This fragile and inherently unreliable series of steps offers endless potential for exploitation by narrative builders, indeed, the drive for closure on the part of the reader is what enables the narrative sting at the end of the thriller, or provides cover for the awkwardness of the *Deus Ex machina*.

Section 3.3. A proposed structural map of narrative

Focalisation, voice and closure expand upon the core definition of narrative as a represented, causal, meaningful sequence by drawing attention to the deployment of constructs at the level of sjuzet that manipulate or control the act of reading. In the case of focalization and voice, these are characteristics directly attached to objects or events and, as such, may operate at both sjuzet and fabula levels. Closure would seem to co-opt a basic understanding of narrative on the part of the reader to exploit expectations in the act of reading: the proposed relationships between psychology and narrative is returned to in Section 4.3, but it can be noted that this also may be a product of the arrangement of elements in fabula and pre-exist sjuzet. What is critical to note at this point is the lack of clear distinction between fabula and sjuzet; that is to say, it is frequently difficult to

distinguish between the tale and the telling, and this becomes ever more the case when the reader is given the potential to affect both directly, as is the case in interactive narratives. Before considering this, however, one further means of understanding narrative should be considered, in order to create a simple table of relationships that will enable us to examine interactive media and games more effectively.

Firstly, it can be asked whether it is possible to identify basic units, or building blocks of narrative, that can be identified and separated from the sequence, in other words, prior to the fabula as a composite entity. This has already been intimated in the discussion of fragmentation and gaps (for a gap to exist, discrete units must exist for there to be a gap between), and it does make logical sense that there must exist a level of analysis between the phonetic and the narrative. Indeed, this is one of the questions that Barthes sets out to address in *Image, Music, Text* (1977: 79-124), and this exploration is significant because it sets out a bottom-up foundation for deconstructing narratives.

Working within the principles of structuralism, Barthes begins by asking what the atom of a narrative is, and argues that it is the functional *unit*. At even the most basic level, everything within a narrative signifies, there is no partisan element (this is an inevitable result of representation). A variation on this argument can be also used to define a virtual environment¹⁷, rather than relying upon any technological differentiation in mediation. Importantly, Barthes anchors this function within the fabula as it relates to what something is, rather than how it is presented. He then seeks to classify these units according to their specialist role within narrative and, thus, assemble a typology of narrative, essentially from just above the phoneme upwards. Units are divided into *functions*, which relay action, and *indices*, which relate to abstract, atmospheric or psychological notions. For example, the unit “He wrote” would be classed as a function as it conveys an irreducible action, whereas “He was tense” falls into the category of indices. Both categories may be further defined; functions according to their relative importance and impact, and indices according to their level of abstraction or specificity.

Barthes classes functions as either *cardinal*, which are both consecutive and consequential, or *catalyst*, which are only consecutive. In other words, cardinal functions are critical to narrative progression, whereas catalysts may be crucial to sjuzet but their omission will not affect fabula. True *indices* refer to “the character of a narrative agent” (1977: 52), such as an emotion, mood or atmosphere, whilst the other sub-class, *informants*, locate within the temporal environment of the narrative. Barthes argues that everything within a narrative is essentially constructed from these four classes of objects. In itself, this taxonomy is important because it enables a structural, rather than semantic, classification to occur when approaching narratives, asking questions such as whether there is a dearth

17 Steuer's influential definition of virtual reality is based, for example, upon the creation of a sense of presence, rather than upon technological properties of a system (1992).

of catalyst functions (suggesting a lean, reportage style of text), or a large numbers of informants present (perhaps prompting a higher level of trust in the reliability of the narrative).

Thus, Barthes' system is a clear illustration of the blur between *sjuzet* and *fabula*. Whereas focalization, via Bal, has been introduced device operating within *sjuzet*; a way in which the telling of the narrative influences the understanding of *fabula* or base sequence (Barthes locates focalization, at least in part, within *fabula*). Indices and informants are essentially focalizing devices: they embed a predisposition towards a certain reading within what is read. In other words, by not distinguishing between those units which define the structure and those units which influence its interpretation, Barthes suggests that prior to *sjuzet*, *fabula*, by virtue of the number and types of units included within its set, already highly predisposes readers towards certain interpretations and, indeed, certain styles of interpretation. This relates back to the argument that *fabula* is already a highly sampled and directional set, not an inclusive or open one. Barthes' bottom-up approach to narrative also enables a conceptual bridge to be made between the structures of narrative and the structures of gameplay defined in Section 2. This will be explored in more detail in Section 4.3, but for the moment it can be noted that in some important ways, functions are not unlike affordances, in that they determine the types and forms of relationships it is possible to draw from what is presented, be it environmental set, diegesis or *fabula*. Likewise, indices are not unlike parameters, as they operate upon these to further predetermine the likely outcomes of a 'read' in a way which enables a much greater degree of subjective diversification (within a predetermined range, of course).

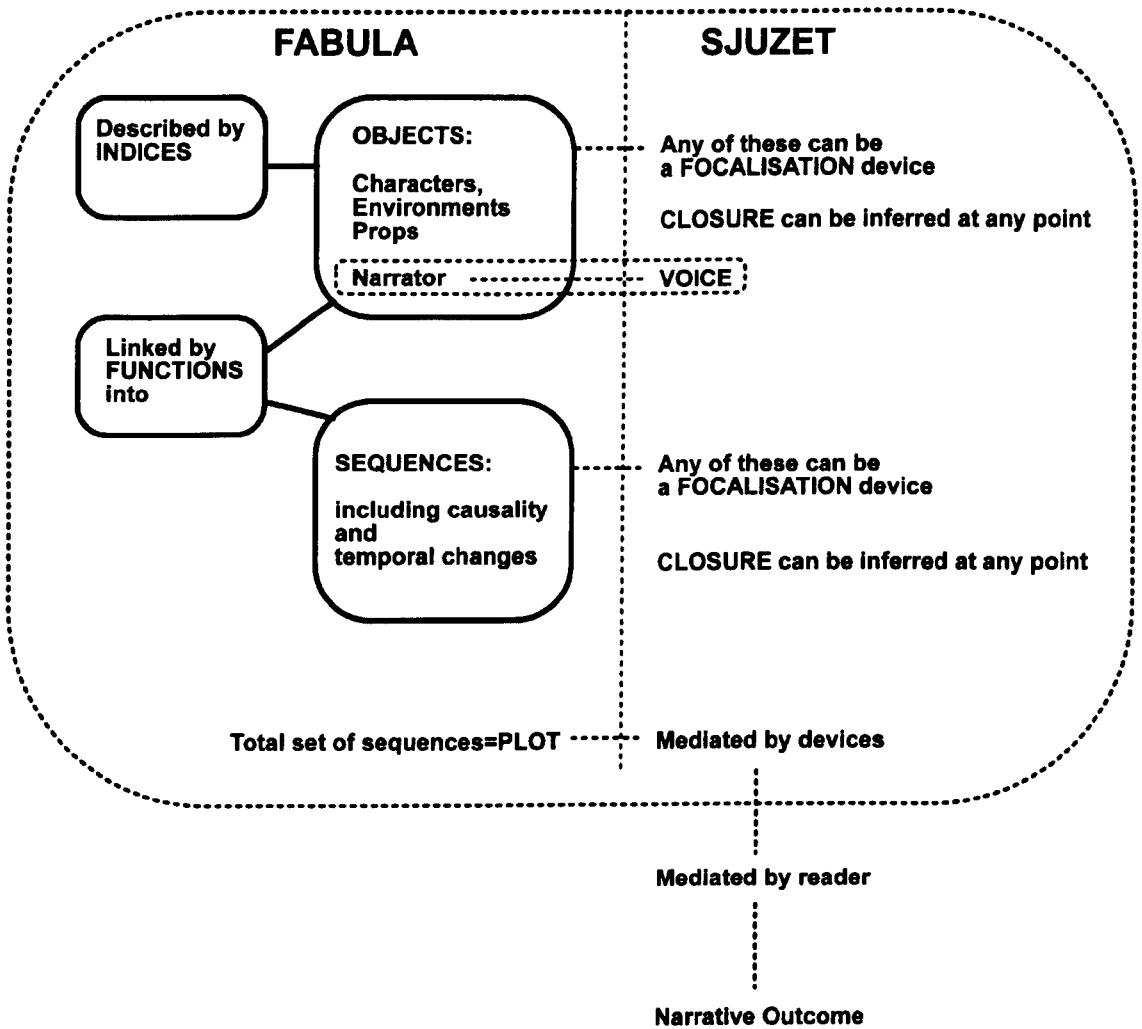


Fig 11. A structural map of narrative components

Fig 11 illustrates the structural map of narrative this section has described. Common narrative objects: characters, locations, items, and so on, exist within fabula, and are described by indices. These are then linked by functions into relationships which, when described over time, can be described as sequences, thus fulfilling part of Onega & Landa's definition. The sum total of sequences would normally be described as the plot: those causal shifts in relationships between objects predetermined by the functions embedded in fabula. This exists prior to sjuzet. However, any implication of a hierarchical relationship between the two is misleading. Any object in fabula can be a focalisation device (including the important, specific use of the narrator object as a voice device); and this is achieved through manipulation of the indices. Likewise, functions will essentially determine where focalisation occurs in terms of relationships and sequences. Equally, closure may be seen as determined in the same manner,

by indices and functions, but this time operating between narrative objects and devices, rather than through them. It is, essentially, the negative yin to focalisation's positive yang.

Thus, sjuzet is explicitly hardwired within fabula, not existing as an overlay. To alter sjuzet of a narrative, one must go back in and alter the indices and the functions, those units which describe its fabula. The properties of the objects in a narrative carry an embedded predetermination of their interpretation. Thus, plot, the sum total of relationships that exist in a system prior to the act of reading, can be understood as a function of a network of Barthes' units; not a process of taking jigsaw pieces and arranging them into a pattern, but a likely result of the combination of the described objects. Put another way, what happens in a narrative rests upon the characteristics of the objects within fabula, and the way in which a narrative is interpreted rests upon these very same characteristics. There may a degree of subjective interpretation occurring during the act of reading, but there is a high degree of predetermination established by the nature of the functions and indices operating. This is not dissimilar to the relationship between gameplay and game objects, as engaged with via their affordance, described and predetermined by their state and parameter characteristics.

Section 3.4. Plot and plot models

What exists within narrative, therefore, is a network of objects, with attendant characteristics, that predispose any reading towards a 'high probability interpretation'. The indices describing a character determine likely behaviours (described by functions), just as the parameters of an environment establish likely physics. This is the reality of focalization and closure: they manage expectation by managing significance, expectation and attention: a visible matrix of probability (or likely causal sequencing) prompts both a natural leap to conclude and, thus, the capacity to exploit this process to increase tension or invoke the unexpected.

Plot is thus defined as the predetermined manipulation of relationships between objects, in the environmental set, over time, and is best understood in relation to the interpretative act of reading. Rather than simply viewing plot as 'what happens', it can be seen as an interlinked network of parameter shifts. Within plot, temporal structures can be located: relative linearity, apparent causality, and degree of disorder and discontinuity. There is good reason to do this, as plot relates to the act of reading, thus the enactment of the potential and probable relationships described by the set. In other words, plot deals with the readers' view of this enactment, rather than the enactment itself. To use an example from cinema, when the narrator in Spielberg's *A.I.* (2001) tells the viewer that "Two thousand years passed", they do not experience this in set, or fabula, time (although in this case it may feel like it). What temporal discontinuities and nonlinearity enable is radical shifts in set relationships that would

disrupt expectations in a negative way, avoiding long periods of gently shifting relationships that the reader may find dull. In other words, when a reader engages with a narrative, they engage primarily with the plot, not the individual objects that comprise the full set of fabula. Another way of putting this is that the plot essentially operates as the cornerstone focalization device for the diegesis. This is a critical distinction, especially in terms of games, as the problem of relating what is normally described as story time and discourse time (relative to fabula and sjuzet respectively) lies at the centre of Juul's criticisms of narrative conceptualizations of games. Plot can also be distinguished from sjuzet, as the former is a presentation of the narrative, subject to narrator interpretation, whereas plot can be seen as fixed temporal relationship shifts that pre-exist the telling. In other words, it operates in an interim space between fabula and sjuzet, establishing the parameters for the latter whilst not being intrinsically fixed to the logic of the former (or the diegesis). Put another way, fabula, especially given the existence of focalization, carries a self-supporting network of probabilities and expectations, pre-disposition towards certain types of interpretation by the reader. Plot fixes some of these relationships to absolute points, over a predetermined temporal framework.

Generic plots are therefore frameworks of fixed relationships, coding highly specific relationships and developments over a temporal period that underpin and make explicit the causality and meaning required for the narrative to function. Thus, although both the fabula and sjuzet of a media artifact within the horror genre may shift, sometimes dramatically, it is through the visible relationships – the proto-forms of plot – that expectations are set. This is not to say archetypes or stereotypes should not be expected, but that these are principally defined by their predetermined relationships to other objects within the environment set. Equally, it follows that plot can be considered to be a *constraining* rather than *constructive* device, as it limits what can be achieved in terms of emergent relationships and interpretations by sjuzet. The interpretation “Yoda wishes to hurt Luke Skywalker” is prevented by the plot relationship between the two fabula objects. The interpretation “The Combine are a force of good in City 17” is prevented by them arresting, torturing and massacring civilians wherever possible. This alternate understanding of plot as a management device operating to focus (or rather, coerce) particular readings, as opposed to enable a path to be uncovered through an otherwise open fabula provides the opportunity to address the question of the particular plot models found in FPS games in greater detail than its alternative. In other words, rather than suggesting a player is drawn through an essentially open world by a golden thread, this model can be inverted, resulting in players being pulled through an essentially closed world with the plot reducing the interpretative field of vision to within the framework the system is presenting.

When discussing generic plots, therefore, it makes as much sense to ask, “what does this plot reduce action/interpretation towards?” rather than “where does it lead the player?” This inverts the normal

understanding of story as a progression and reward system, and casts it instead as a limiting, epistemologically manipulative aspect of the overall gameplay system presented by the game. Indeed, this notion is central to this thesis. Rather than attempting to apply fashionable but flawed imports such as the Hero's Journey, it can be questioned whether generic plot structures are found because they fix object relationships that fundamentally underpin gameplay. On a very simple level, this is the only really sensible answer to the question of the ubiquity of conflict in FPS games, but it also has much deeper implications for player behaviour.

Section 4. GAMES AND NARRATIVE

In this section, it is argued that defining a game as a narrative, even an interactive narrative, according to the traditional model of narrative, not only falls foul of some key conceptual issues, but is based upon a definition that is rendered useless by its overextension and overinclusivity. However, ludology does not offer any real explanation of how story and gameplay relate to one another and the question of story as a functional aspect of the ludic experience is left unaddressed. The use of narrative by psychologists is introduced to support the argument against the over-extension of the construct, but as this is considered, it leads to schema theory and the concept of narrative as an organising structure of a certain type, and the idea of generalised structures for dealing with prototypical situations.

Rather than attempting to apply narrative as a primary unit or indivisible structure, it is argued that by using the concept of a network of protonarrative units, based upon the structural map proposed in Section 3.3, gameplay and story can be quite easily reconciled. Indeed, it is noted that many games already use objects existing inside the reality of the presented world to exert a direct, functional influence upon player behaviour, and that analysing the potential gameplay implications of protonarrative units will yield a greater understanding of the role of story in games than has previously been achieved.

Section 4.1. The Ludology Debate

In 2003, Frasca delivered a paper entitled "Ludologists love stories too: notes from a debate that never took place" at the biannual conference of the Digital Games Research Association (DiGRA). This allegedly non-existent debate, between those who would seek to define games as narrative artifacts and those who stood against a conceptualisation of games as narratives, persists to this day. Two years later, scholars were still talking about it (Arsenault 2005, Spierling 2005) and, indeed, Murray prefaced her keynote at the 2005 DiGRA conference with "The Last Word on Ludology vs. Narratology" (Murray 2005).

Frasca admits responsibility for popularising the term ‘ludology’, which he defines by its search for “a set of theoretical tools that would be for gaming what narratology was for narrative” (1999, 2003). This was taken as an oppositional stance to a narrative approach to game criticism and studies in general and led to a series of papers taking relative stances on either side of the fence, despite Frasca clearly stating that his intention was “not to replace the traditional narratologic approach but to complement it” (1999:1).

Ludology has been characterised as an extreme form of game scholarship that dictates either a vastly reduced position, or no position at all for narrative within game studies (Ryan 2001, Klevjer 2002). It is clear from even a cursory examination of the work of the Ludologists, however, that this is simply caricature. For example, Juul (2005) openly acknowledges the place within games for narrative, and a degree of structural similarity, but argues that an understanding of games as narratives is essentially flawed. Similarly, Eskelinen recognises the potency of narratives in relation to games, but states categorically “I think we can safely say that we can’t find narrative situations in games.” (2004: 37). In the same volume, Crawford (2004: 45) suggests that this may be due to “our complete failure to produce a truly interactive storytelling product”. Aarseth precurses ludology by identifying the gap between games and narratives whilst highlighting the importance of noting the myriad areas of crossover between the two (1997).

The importance of visiting this debate is to further define the relationship between narrative and gameplay, particularly the function of the former as a component of the latter. In order to do so, it is necessary to correctly position the two relative to one another, and this means adopting a position relative to the question of the narrativity of games. This is not to necessarily dispute that games can be *fictional forms*, as Atkins has argued (2003); indeed, Juul explicitly defines games as a meeting point between “real rules and fictional worlds” (2005). However, although his position on narrative and games changed considerably between his early work (1998-2003) and the publication of *Half Real* (2005) in relation to the importance of narratives in games, it is fair to say that Juul’s take on the question of games as narratives has remained constant, and it rests on five major arguments.

The first two are attempts to characterise the narratological position. Calling games narratives, he claims, is normally done within a conceptual framework of calling everything narratives. The problem with this weak definition of narrative is that it renders the concept meaningless. If the definition of ‘frog’ is widened far enough, everything can be quite accurately described as a frog, the term ceases to function in any meaningful way or at any meaningful depth. Despite the antipathy for dichotomies that lingers around the aftermath of postmodernism, strong definitions may risk a multiplicity of forms, but they do enable a stronger process of

examination.

Secondly, Juul is happy to accept that games contain narrative features and structures. The question is not whether or not *Doom 3*, or *Tetris* for that matter, has a plot, but whether when a player plays *Doom 3* they are engaging in the form of behaviour that can be described as reading a narrative. This is also a question of narrative definition. If a narrative is the representation of a sequence of events, then it may be argued that in the short-scale temporal space of ludic activity, this sequence is not fixed, although it is highly predisposed towards a particular outcome (or an outcome within a given set of parameters). It could also be argued that, given this, the sequence is never represented (unlike a cutscene, whose sequence is fixed, therefore represented, therefore narrative in nature). Juul thus demands a distinction be made in the manner of the string-of-pearls model between interactive and narrative presentations within the game. Frasca makes a similar point when he states “we cannot claim that ludus and narrative are equivalent, because the first is a set of possibilities, while the second is a set of chained actions.” (1999: 7). The problem with this position is it fails to address where the narrative fits in a game such as *Half Life*, which clearly has a strong plot, characters, world – all the things expected of a narrative – and certainly feels like a story is being told. It is this problem which *Half Real* attempts, more than anything else, to resolve with its central model, and is certainly the core relationship under examination here.

These flaws in the narratological conceptualisation are followed by three arguments for not calling games narratives. Firstly, a narrative should translate across media. This argument is made explicitly by Ryan (2001) who would include many games within her Interior-Ontological category of interactive narrative, when she states that:

- The narrativity of a text is located on the level of the signified. Narrativity should therefore be defined in semantic terms. The definition should be medium free (2001: 2)

However, argues Juul, a narrative is defined by sjuzet as much as by fabula. In other words, the medium of representation is not necessarily fixed into the narrative, but the specifics of the presentation of fabula are, to some extent¹⁸. If transfers to and from the medium of games can only be accomplished at the expense of significant aspects of sjuzet, then there must be something about a game and a narrative that are fundamentally incompatible. He cites the Star Wars games franchises as examples of the story-to-game transition, noting that what is transferred are narrative elements, or units: characters, places, motives, backgrounds, rather than fixed sequences. “Star Wars the game can not be said to contain a narrative that is recognisable from Star Wars the

18 Note that this criticism is aimed at a more traditional split between sjuzet and fabula and not the interlinked model developed at the end of the last Section.

movie: Most characters are missing, and the few events that are included in the game have become simulations where the player can either lose or win" (2001: 4). Although Juul is citing a very old game, limited to a great degree by technological constraints, which does weaken his argument, even in modern franchise games, the vast majority of plot and character information is jettisoned, and the experience – normally lasting much longer than the movie – is packed with repetitive configurative activity. Likewise, when games port to movies, they do so with only the core elements remaining and entirely new fabula being designed around these. Any film genuinely based around the actual activity of even the most literary FPS would be excruciating, even for the most diehard fan; the film adaptation of *Doom* (Bartkowiak 2005) provides plenty of evidence to support this. If only part of fabula, and few or no fixed sequences, translate between games and other media, then it is difficult to justify the label of narrative.

Secondly, Juul defines narrative as a multi-temporal activity that encapsulates fabula-time and sjuzet-time (or, the time of the events, and the time of telling). This fits the classical definition expounded in Section 2 and, further, Juul draws attention to the relationship between these two temporal sequences as being one of the essential constituent factors in a successful narrative. By contrast, he argues, play exists in the present, there is a direct synchronicity between story and reading time and these points of convergence make a narrative conceptualisation illogical as "it is impossible to influence something that has already happened" (2005: 222). Interactivity and narrative cannot co-exist as the interactivity defines what is to be represented at the point of presentation: there is no space for representation in a game. Juul also comments that games cannot present any other time than the present; an argument which has been superseded by commercial developers in a number of ways. Certainly, the temporal sequencing in games does not seem to be fixed to a straight chronology: *Cthulhu* moves episodes of play backwards and forwards in time; *The Chronicles of Riddick: Escape from Butcher Bay* (Starbreeze Studios 2004) is entirely retrospective and includes a dream sequence; *Fall of Man* positions the action as if recounted by the game's core NPC, Parker. Even *Timeshift* (Saber Interactive 2007), which allows the player to slow down, stop and reverse time falls into this basic pattern. As with other bullet time functions (as typified by *F.E.A.R.*), what the first two options really do is slow down all the other objects in the environment – an illusion of time slowing when all that is actually happening is a generally applied parameter shift across the environmental set. This is also true of the reverse function: the temporal sequence of play remains linear, present and unidirectional. Thus, although complexities of temporal sequence and discontinuities can be seen in embedded narratives and non-ludic structures, and gameplay devices which create the illusion of shifts in diegetic time, it is actually impossible for the player to do anything other than progress forwards, in play time, without disrupting the experience (i.e. pausing the game).

Finally, Juul fixes on the relationship between player and game as critically different than reader and story. This is conducted along two lines. Firstly, he notes that players operate both inside and outside of the text: a significantly different and more complex relationship than found in other, narrative, media. He then makes the point that this dual position enables players to affectively engage with games as abstract entities. Normally, this engagement is enabled by the existence of “human actants” (2001: 8), without which, he argues, a narrative would be extremely dull. Despite the problems facing this line of argument from more abstract but recognisably narrative films like *Koyaanisqatsi* (Reggio 1982), where there may be human representation but nothing resembling character, Juul’s observation about the dual position is a crucial one. The popularity of entirely abstract games such as *Tetris*, *Breakout*, *MonkeyBall*, *Marble Madness*, *f1OW* and so on clearly testifies to the engaging potential of games without actants, and the ability for a player to engage with a game on an entirely formal level. This relegates narrative to a subsidiary function, or component which, whilst not negating the potential function of narrative in games, exposes the flaw in describing them as narrative systems.

Eskelinen (2004) wastes no time in disregarding a conceptualisation of games as narratives, placing them in an entirely separate order:

A sequence of events enacted constitutes a drama, a sequence of events taking place a performance, a sequence of events recounted a narrative, and, perhaps a sequence of events produced by manipulating equipment and following formal rules constitutes a game. This really is very trivial but crucial...(2004: 37)

Once again, temporal structures and the schism between object and diegesis forms the basis for Eskelinen’s argument, but he also focuses upon a crucial difference in user function. In games the dominant function is configurative, as opposed to interpretive. Interpretation is frequently sidelined or completely unnecessary: just as *SuperBreakout*’s rather odd, spaceship based, introductory narrative (reproduced in Salen & Zimmerman 2004: 377) is entirely superfluous to the task of progressing by directing a ball at a series of coloured bricks. Likewise, it is possible to see *Half Life 2*, or indeed any other FPS game as a goal-orientated system whereby moving objects must be targeted accurately whilst avoiding the impact of other moving objects in the environment, the natural extension of both Juul’s argument about formal systems and Carmack’s description of *Doom*. Such an experience would, it may be argued, be dull and disengaging. However, this does not change the fundamental property of games as systems of formal rules and goals. This is further supported by the massive popularity of multiplayer FPS systems such as *Counter-Strike* (CounterStrike Team 2000), *Enemy Territory: Quake Wars* (Splash Damage 2007) and *Unreal Tournament 2003* (Digital Extremes 2002) that function effectively as engines stripped down

the purest form of the experience, which Günzel summarises neatly as “to make an object coincide with the vanishing point” (2007). Aarseth suggests that the “drive to reform games as ‘interactive narratives’” (2004: 49) is the result of a mix of academic colonialism by theorists of other media forms, economic opportunism and an elitist cultural perspective, rather than having anything at all to do with the inherent qualities of games. Nevertheless, as an existing model which claims to reconcile the two aspects, it must be considered.

Section 4.2. Games as interactive narratives

Interactivity and narrative are generally agreed to be a problematic combination, primarily due to the issue of allowing noise to creep into the causality sequencing. This is more normally described as a conflict between user choice and author intent. The narrative-interactivity paradox is one of the core issues at the heart of the ludology debate, but it may be questioned whether it is actually something of a misleading dichotomy. Indeed, it is necessary first to decide just how interactive the narratives of FPS games actually are.

This should begin with the basic problem. *Narrative* is a designed artifact; it aims to provoke a predetermined experiential state in the reader. This is fundamental to the definition formulated in the preceding Section: there is no such thing as a free, or accidental narrative, because a narrative can only exist as a mediated representation, and therefore cannot exist outside of context. *Interactivity*, understood here to be the capacity for a system to enter into a cybernetic loop with its user (Wiener 1948), means that to some degree, the narrative itself must be open to manipulation, and this places an inevitable strain upon the delivery of a satisfying, predetermined outcome. This dilemma is encapsulated by Ryan thus, “How can the contributions of the reader-turned author be monitored by the system, so that the text as a whole will maintain narrative coherence and aesthetic value?” (Ryan 1994).

Interactivity is a problematic term that requires an extremely clear definition in what follows, and Montford’s suggestion that “Historically, ‘interactive’ has been used with precision to distinguish computer processes that respond to user input during execution... from batch processes... that are completely configured beforehand” (2005: 7) will be adopted. Thus, the first aspect of interactivity is input originating from outside the system having a non-trivial impact upon the activity of the system in runtime. Both the outcome of the system, and a representation of this input available to the user are also required or otherwise, this notion of interactivity becomes little more than throwing stones into a very deep well (in other words, the input becomes trivialised by its lack of visibility). Once a system is established in which input is received, implemented and represented, it can be presumed that the representation may influence further inputs, thus creating a loop. Indeed, it is not

problematic to collapse the user/system division and postulate a single system, comprising of user and artifact operating more or less seamlessly. Thus, an interactive narrative may be defined as a system that contains a functioning loop of user input, non-trivial application of this input to the architecture of the narrative and representation of the altered narrative that influences further user inputs. If this loop is broken at any point, the system has ceased to be interactive. What is important about this definition is that interactivity is not to be seen simply as the capacity for the system to cope with user input, but that a truly interactive system actually demands and relies upon user input. In other words, a system that can function without any input other than initiation (for example, a “next” button) is not interactive in anything other than a profoundly trivial way. Neither is the act of passing information backwards and forwards across a mediating divide, although one would normally expect to find this process as a function of an interactive system. Finally, note that there is a difference therefore between an interactive narrative and an interactive system containing a narrative. Whereas the first demands non-trivial application of the input to the architecture of the narrative, the second may simply include a non-trivial application of the input to the architecture of the experience without ever going anywhere near the narrative contained within. This distinction is absolutely fundamental.

Aarseth (1997) defines two key terms in his study of interactive narratives: cybertexts and ergodic literature. Although his work is positioned beyond the capacity or aspirations of FPS games or, indeed, most games in general, it is worth summarising here to pinpoint the relative degree of interactivity of the narratives found in the genre. Aarseth also begins his investigation by anchoring his definition to Weiner's cybernetics (1948), describing a cybertext as one that maintains a dynamic relationship with the reader. There is a crucial assumption inherent to this: an interactive narrative does not simply allow itself to be manipulated by the reader, it actively manipulates the reader right back, thus the whole process of reading is best thought of as a dynamic, ‘collaborative’ cycle.

It needs noting, however, that the term collaborative should be taken with a degree of caution, as the relationship is normally more troubled and less equal than collaboration would suggest. For example, the player is normally expected to conform to the constraints – parsing and otherwise – of the system, with the system making little compromise for the natural instincts or channels of the reader. Indeed, Aarseth's other term is borrowed from physics to describe an artifact in which “nontrivial effort is required to allow the reader to traverse the text” (1997: 1). In a similar way to McLuhan's notion of cool media (1964:22-23), which require active participation and work to engage with, the types of work Aarseth describes require substantial participation, and do not suggest a high level of passive immersion is possible. This fundamental characteristic, as opposed to hot media like television, is picked up by Ryan (1994), who draws attention to the difficulty in maintaining immersion due

to the fact that interactivity is constantly required and cognitively demanding. The relationship between games and immersion is difficult; according Salen & Zimmerman (2004: 450-451) there is a tendency for scholars and developers to fall into the ‘immersion fallacy’, essentially an over-association of immersion with success. More recently, Calleja (2007) has noted that the discussion of immersion and presence in gaming draw inappropriately from virtual reality research whereas the fundamental nature of games are quite distinct from these types of environment.

Aarseth’s typology covers the spectrum of paper-based and electronic texts and it is worth quoting him at some length to accurately the position FPS games in relation to interactive narrative.

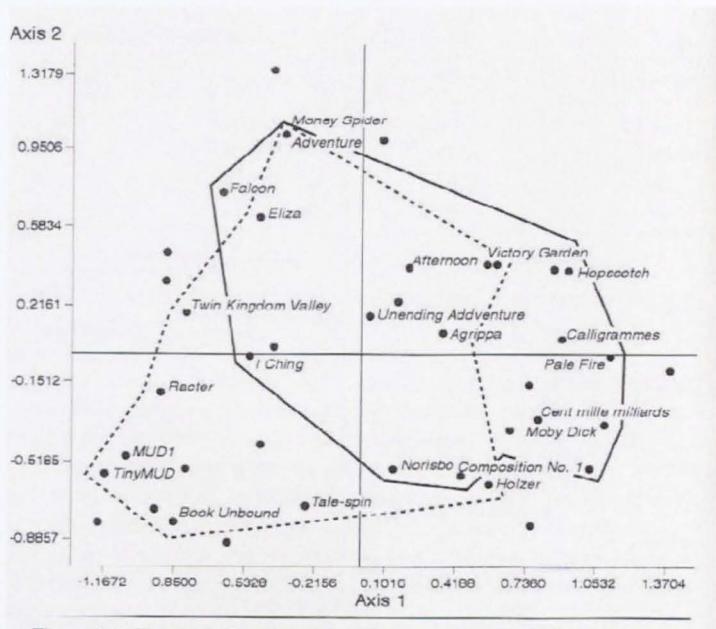


Figure 3.3. Electronic Text (dotted line) and Paper Text (solid line)

Fig 12. Aarseth’s typology of ergodic literature (1997: 72)

There seem to be at least three different ways to partition the material. The first and simplest is to follow the primary axis and divide the plot into two areas, west and east. In the west we find most of the ludic texts, those that invite the user to role-play and to creatively participate. In the east we find calmer, more contemplative texts, with fewer features but also freer access. If we divide the plot according to the second axis, we find a clear group in the north, identical to the adventure game corner of the triangle and dominated by intratextonic dynamics and the exploring user function; in the south there is a clear split between east and west. This brings us back to the triangle model, which provides three poles: static texts

(southeast), adventure games (north) and unpredictable texts (MUDs and text generators, southwest). North is further divided between adventure games (northwest) and hypertexts (northeast). The southeast is best described by interpretive user function and no linking. (1997: 72-73).

The question is thus raised: where would FPS games sit in Aarseth's taxonomy? Certainly, they fulfill some of the basic definitions Aarseth suggests: they require nontrivial effort to traverse, and they foreground the act of traversal, highlighting the choices being made and not just the consequences of this choice, but of the inaccessibilities surrounding both the choice and its consequences; Aarseth refers to these as the "paths not taken, voices not heard" (1997: 3). However, this still leaves unanswered the question of the relationship between these ludic choices and the games' narratives.

Summarising the traits of Aarseth's subdivisions: in the north (west) are adventure games, defined by features and ludically controlled or confined choice; in the north (east) are the hypertexts, still essentially exploratory but with less ludic emphasis. The southwest are high impact, more free form content generators such as MUDs, where user participation is fundamental to even basic narrative generation. Finally, the southeast texts provide highly free access and demand active participation but are relatively unstructured, requiring high levels of interpretation. It might be suggested that in McLuhan's terms, the temperature cools as one heads south.

Thus, FPS titles bunch together in the northwest of Aarseth's model, where the defining features are highly structured, ludically dominated interactions. This kind of text is typified by text-based adventures such as *A Mind Forever Voyaging* (Infocom 1985). The problem is that Aarseth's typology is nearly a decade old and, as such, really fails to deal with the level of graphic and visual storytelling found in contemporary FPS games. Not only that, but there is a question of where to place comic books which, as McCloud (1994) states, fall into the definition of cool media, requiring high levels of interpretation but whose dominant narrative remains fixed? Aarseth suggests that the southeast is the area in his typology where interpretation is most needed, which suggests that the opposite corner, where one would initially place FPS titles, is relatively fixed in terms of interpretation. Indeed, in text-based adventures with episodic blocks of fixed content joined by branches, this is the case. But what of a game such as *Half Life 2*? Here the *narrative* is almost completely linear, but the *experience* is, at least superficially, profoundly interactive. Certainly, non-trivial effort is required to traverse the ludic space, but does this non-trivial effort extend to the text? Provided the effort is made to progress ludically, the narrative makes itself available without further complication. Does this then mean that a split is demanded between narrative and ludic elements of the work; in which case, does it become inappropriate to speak of *Half Life 2* as a text at all? Certainly, it does raise the suggestion that although *Half Life 2* may be highly interactive in one sense, it is not

appropriate to consider it as an interactive narrative, whilst recognising that the narrative, unlocked by interactive activity, may have a direct effect upon the types and styles of interactive behaviour that occurs.

	INTERNAL	EXTERNAL
EXPLORATORY	Redundant Category? (see below)	Hypertexts e.g. Afternoon, Hegirascope
ONTOLOGICAL	Diegetic games e.g. Tomb Raider, Half Life	God Games e.g. Civilisation, The Sims

Fig 13. Ryan's taxonomy of interactive narratives

Ryan (2001) adapts the user elements of Aarseth's typology to better elucidate the types of possible interactions. She establishes two major divisions: internal / external and exploratory / ontological interactivity, thus simplifying the complex list of user functions that Aarseth presents. These divisions combine to create four basic groups of interactive narrative. Of these, Ryan suggests that External-Exploratory groups together hypertext novels, such as Joyce's *Afternoon* (1990), where the reader engages with a textual network, rather than having any form of immersive experience. External-Ontological texts seem to define 'God games' such as *The Sims* (Maxis 2001), or *Black & White* (Lionhead 2001); though Ryan also includes paper-based gamebooks in this category, thus seeming to deny their immersive potential and the evidence suggesting the contrary, usually collectively defined as 'the book problem' in presence research (Schubert & Cruisius 2002). Taking, for the moment, Ryan's position that a reader of a gamebook remains external to the diegesis and does not identify to the point of presence with their avatar, both of these groups can be discounted, as neither is comparable to an FPS experience. The couplings of Internal-Exploratory and Internal-Ontological are therefore left. The distinction between the two is straightforward, a reader of an Internal-Exploratory text is projected into the diegesis but is a tourist only – they may define their own subjective experience through controlling the perspective and by choosing the means, sequence and manner by which they consume the narrative but, crucially, they are "limited to actions which have no bearing on the narrative events" (2001: 8). In these cases, although a subjective reading may emerge from the experience, the actual narrative structure remains apart from any user activity. Thus, this type of experience arguably falls outside the definition of interactive narratives developed here, as the narrative itself is, by default, non-interactive. An emergent narrative may be produced that is qualitatively, subjectively different to another reader, but there is no scope within the narrative structure itself for non-trivial feedback. According to this model,

then, observers in *Counter-Strike* are each engaged in an interactive narrative, as they can observe a basic pattern of sequential, causal events without ever impacting upon them. This is clearly not a strong theoretical position to take. Not only does this stretch the definition of interactive narrative to include those experiences where there is interactivity but the narrative is not affected by this, but it risks the situation Juul warns against where the concept of narrative is watered down to achieve inclusivity at the expense of function. For this reason, it is argued that whilst it is possible to construct a conceptual category here, it is actually self-contradictory and serves no useful purpose.

Finally, the Internal-Ontological group, which Ryan identifies most explicitly with games, where experience is formed by the dynamic interaction of narrative and reader, from a position within the diegetic world of the text itself. It is this category that is most relevant, as FPS games, by definition, place the player within the diegesis, in a process of constant interaction with this environment. However, it must be noted once again that Ryan seems to consider interaction with the system as enough to constitute an interactive narrative, the weak or inclusive position noted earlier. This fails to make an important distinction: that it is self-evidently possible to have an interactive system containing a non-interactive narrative.

The other assumption clear in Ryan's groupings, although she does recognise that different narratives are more or less suited to different forms of interactive narrative, is that it is possible to layer interactivity onto narrative and produce an interactive narrative. Indeed, she states explicitly that "Narrative is independent of tellability" and that "Narrative representation is constructed by the reader". However, perceiving an event is not the same as constructing a narrative, as it does not *represent* the event. Representation requires a device for representation - telling, in other words – which necessitates a locating of narrative at source, rather than pushing the construction towards the reader. To put this another way, narrative is not *constructed* by the reader, it is *interpreted* by the reader: it exists in potential form in the artifact, along with the structural and symbolic framework for this interpretation process. Walking fifty yards down the terraces gives spectators a different perspective on a football match; it does not make the march itself 'interactive' (leaving the question of the extension of narrative to include such constructs as 'social' or 'cultural' narratives for the moment). Throwing a brick at the goalkeeper may result in him missing a critical save thus profoundly affecting the outcome of the match, but this is not to be confused with an inherent interactivity in the 'text' of the game, it is transgressive behaviour and that is fundamentally distinct.

Louchart & Aylett's Emergent Narrative theory (2003, 2004) abandons classical narrative theory, arguing that it is unable to deal with the fundamental paradox of user impact (Mallon & Webb 2000, Nath 2004, Steiner &

Tomkins 2004). They claim that any successful interactive narrative must be character-, rather than plot-based, in contrast to plot-based models such as Young's (1999, 2003, 2003), where characters primarily exist as functional objects. This debate about the role of characters within narrative is not limited to interactive narrative, or even new. Onega & Landa (2004) note that a "novel of character" as opposed to one of plot was seen as a mark of distinction in Victorian literature, and an equivalence can be seen at work in films which deal primarily in plot (action) and character (drama). Basing their model on a study of paper-based role-playing games, Louchart & Aylett consider narrative as an emergent property of dynamic and consistent character interrelations within a given structure, including goals and their resolutions.

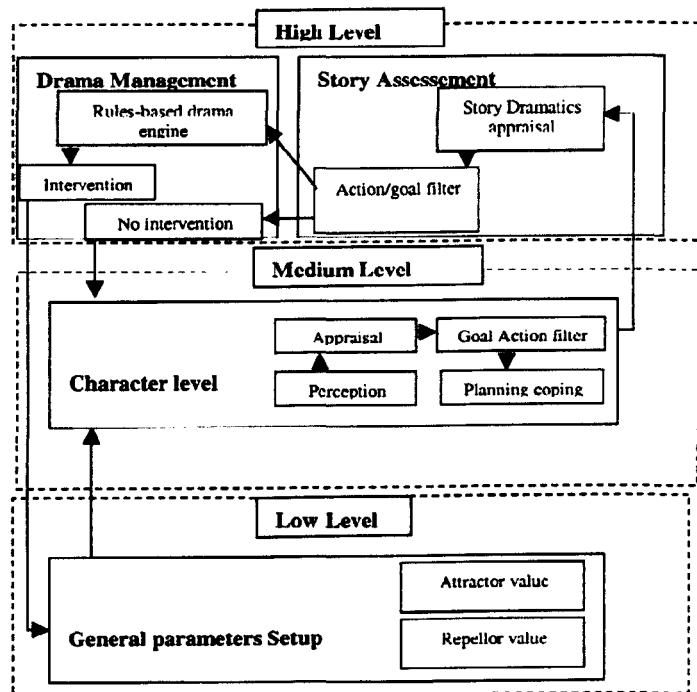


Fig 14. Emergent Narrative model (Louchart & Aylett 2004)

A conventional linear structure of beginning, middle and end is abandoned, indeed, what is presented is the case for an entirely new definition of narrative within an interactive environment that emerges from the interactions of agents. The high level systems serve to "monitor the level of activity within the system and determine its dramatic potential and interest" (2003: 31). It might be argued that Louchart & Aylett solve the interactive narrative paradox by abandoning narrative altogether. After all, as has been argued, narrative is fundamentally designed and its structure is embedded within an artifact, it is not an emergent property of reading. Neither is narrative reducible to character interactions, unless one is prepared to somehow discount the importance of non-

character interactions between units, or to extend the notion of character to include any object within the environment set, which seems like intellectual slight-of-hand.

What Louchart & Aylett really propose is a system by which subjective narratives may be formed from experiences with a loose structuring of relationships, in such a way that lend themselves to a controlled experience. It does not address the question of retaining narrative strength and integrity aside from leveraging in the type of proto-narrative constraints to action and interpretation discussed in Section 3.2. The only narrative generated is the subjective interpretation of the user. In other words, the model describes environments with the potential for a high post-experience narrative yield, and how this yield may be optimised and managed – Lindley describes it as “retrospective narrativisation of a character’s experience” (2005: 24). In other words, whilst Emergent Narrative theory refrains from suggesting that all experience is narrative, it does suggests that it is entirely possible to have a narrative experience that, nevertheless, does not exist as a narrative artifact. This, of course, runs contra to the definition developed here, as it once again runs foul of Juul’s criticism: if anything can be defined as a narrative, then the term ceases to have any meaning.

There are extremely powerful, useful aspects to Emergent Narrative, however. It offers a way of managing the persistence of agents’ lives within such spaces, as a key factor in the definition of a space as a virtual world (Bartle 2003), thus enabling a space to control an element of the narrative experiences it yields, rather than relying fully upon users. In this way, it progresses the traditionally limited function of bots within multi-user spaces and suggests a way for such environments to develop richer narrative potential.

Perhaps more importantly, Louchart & Aylett also offer support to the use of drama as a coercion technique in controlling player expectation and behaviour and thus their perceived range of affordances. In their study of role-playing games, they note that play is sandwiched between two levels: the *procedural* and the *games master’s subjective, defined or steered*. In other words, the study suggests that interaction and the yielding of a subjective narrative experience lies between fabula and sjuzet or, at the least, between the ‘grammar’ and the ‘semantics’ of the experience. Once again, note that this relies upon a strict division between fabula and sjuzet that the model proposed in Section 3.3 undermines.

This finds a natural parallel in Morie & Williams’ Gestalt for virtual environments (2003), which comprises of three levels. The first of these, *collaborative detail* aids the construction of a compelling perceptual reality, enabling an investment in the action to take place. Secondly, a *coercive narrative* actively steers the user along a predetermined experience. Thirdly, an *emotional score* ensures that this course is managed properly, steering the

user away from problematic aspects and focusing them with timed bursts of attention grabbing, emotion inducing events.

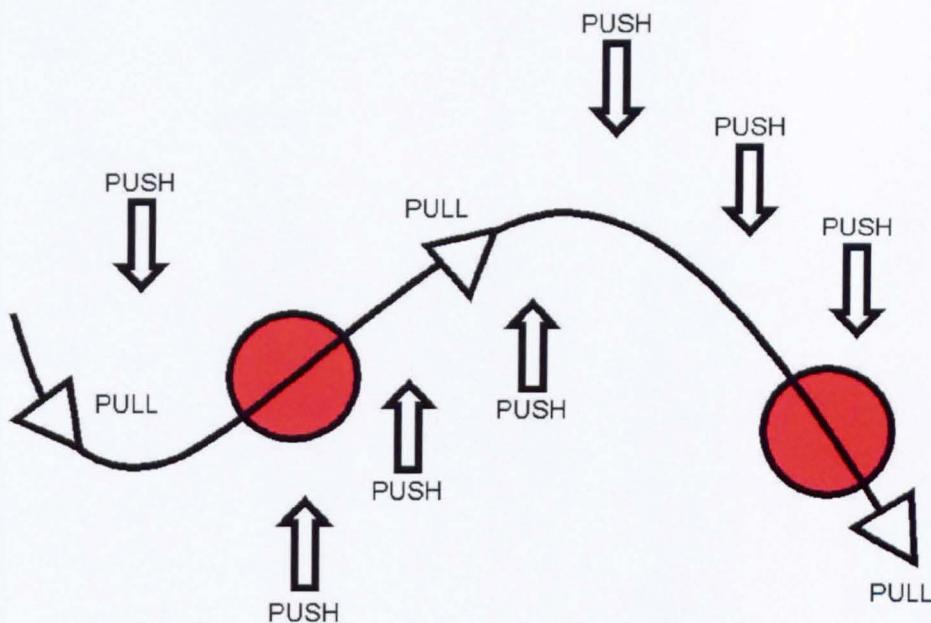


Fig 15. Morie & Williams' Gestalt (2003)

What can be seen here is rather than such an experience being described as an interactive narrative, that narrative is a component in an interactive experience. Further, there is an explicit recognition that whilst the options available to the player may seem wide, there is considerable pressure for them to conform to a set of behaviours, including interpretation that is predetermined. Indeed, since *Half Life*, the critical story path models that dominated FPS games have been replaced with more unbroken pathways that often create a sense of non-linearity whilst using a wide variety of mechanisms to draw the player towards this idealised or fully conformed play style. A leniency of interpretation of the ludic environment, rather than any specific choices, should perhaps be considered, thus distinguishing them from the branching narratives found in a very small number of FPS games such as the *Deus Ex* franchise. They propose the term *Corridor of Affect* could even be proposed for the structure of FPS games: a critical storiopath with reduced boundaries between narrative and ludic nodes. Instead, a relatively less linear ludic environment enables a greater subjective sense of impacting upon the overall environment, whilst coercive devices manipulate interpretation and behaviour to keep the player's ludic behaviour and affective experience within a predetermined range. In other words, a powerful illusion that the experience is more interactive and subjective than it actually is.

Thus, Morie & Williams' model is useful as a practical illustration of the relationship between narrative and FPS games in another way too. If a functional understanding of the relationship between story and FPS games is to be developed, this discussion of interactive narrative serves to make the argument that whatever the stories being told in FPS games are, they most certainly are not interactive narratives.

An interactive narrative is defined as a system that contains a functioning loop of user input, non-trivial application of this input to the architecture of the narrative, representation of the altered narrative and influence upon further user inputs. This is a more robust definition than the one offered by Ryan and Aarseth, as it requires, fundamentally, that user input relates not simply to generic interactivity, or even to subjective or emergent readings of the experience but directly to the narrative architecture itself. It is more appropriate, therefore, to describe a substantial number of the models normally described as interactive narratives as navigable narratives; that is, artifacts that may yield an emergent narrative by enabling a subjective positioning of the reader relative to the text. This can be called a *weak definition* of interactive narrative, and it should be distinguished from a *strong definition*, which requires the narrative architecture be non-trivially impacted by the activity of the reader. Using the weak definition, pretty much anything that takes in user input can be described as an interactive narrative; using the strong definition, the field is thinned considerably.

In *Half Life*, there is only one non-trivial interaction the player can have with the narrative embedded in the game: it ends or it continues, and even this is trivialised by the save game functionality to be expected in an FPS. Technically speaking, the subjective pathway through the game may alter from play to play and player to player, but common sense demands this is recognised as extremely limited and has absolutely no bearing on the overall plot. Just because events can be drawn into a causal sequence by dint of the player's choices and actions, these sequences may operate below the threshold of what can and should reasonably be called a narrative. Thus, the exact sequence of how a player negotiates the episode Questionable Ethics has no impact upon its overall narrative progression: the discovery that the scientists at Black Mesa have known about and indeed been studying the aliens for some time. Equally, the micronarrative (Jenkins 2003) describing the gunfight in the lobby with special forces troops is unlikely to yield a significant addition to the larger narrative (transgressive moments aside). In other words, the micronarrative may well be interactive, but the narrative itself is not, nor does the combination of a large number of subjective micronarratives add up to a wider interactive narrative. In other words, although these micronarratives may exist, they are equally well described by the general term *ludic activity* to denote the lack of wider narrative significance or explicit narrative impact (in either direction) of what is happening. The question of whether *Half Life* is an interactive narrative becomes "does the player ever affect the narrative architecture in a non-trivial way", to which the answer has to be an unambiguous no. Even the branch

at the end of the game is questionably an interactive narrative moment. Although it does yield a different end to the story, it is highly spurious. A game such as *S.T.A.L.K.E.R.* has a far greater claim to be an interactive narrative as the player's actions certainly do have a non-trivial (although not necessarily visible) impact upon the potential narrative yield of the experience. So, taking this example from the opposite end of the genre in terms of non-linearity and potential for fulfilling the strong definitional criteria of an interactive narrative, "does the player of *S.T.A.L.K.E.R.* ever affect the narrative architecture in a non-trivial way?"

In this instance, the answer would be yes. Depending on whether or not the player engages with the C-Consciousness plot – in other words, if they chose to follow additional missions that are introduced as extra to the general, ongoing ludic activity, they will develop an entirely different plot stream. Choosing to return to the Agroprom Research Institute to meet Doc has a non-trivial impact upon the narrative architecture of the game: it alters the parameters and environment sets of existing structures, provides a new level of understanding about the total presented diegesis, introduces an entirely new character and fundamentally alters the potential end point of the narrative and game. This can be distinguished from the options attached to the set of Wish Granter endings; those available to the player if they do not undertake the additional work necessary to unlock the C-Consciousness plot. The multiple Wish Granter endings are based upon specific conditions embedded in play: the amount of money generated, or whether or not NPCs remain alive.

What is important about the Wish Granter options is that in the first case, it is difficult to describe even the deliberate accumulation of large amounts of cash as a narrative act: money means better equipment, so there is a gameplay imperative to collect as much as possible. It is never flagged as narratively significant, which means that even though it could be argued the game predisposes the player towards a certain narrative outcome by rewarding a certain type of gameplay, the question remains of whether they are truly interactive as the player is unaware they are having an impact. Further, the player's choice of allying themselves with either Duty or Freedom, or deciding to assassinate the leaders of both factions is not placed in a context of having a significant affect upon the overall narrative. Thus, although that the player certainly does have an impact on the narrative architecture by undertaking these activities, it remains questionable whether the second part of our definition, the completion of the loop, exists.

The middle ground clearly is that *S.T.A.L.K.E.R.* does contain narrative architecture that is, in part, interactive. However, the qualified acceptance of this only serves to place in perspective how flawed it is, according to the strong definition to describe FPS games, even those which contain explicit branches such as *Half Life*, *Doom 3*,

Condemned: Criminal Origins (Monolith 2006), and *Deus Ex, Invisible War* (Ion Storm 2004)¹⁹ as interactive narratives. Returning to Aarseth's definition, they certainly fit the criteria as cybertexts, as non-trivial choice absolutely forms a basic constituent of their readings. However, describing them as interactive narratives mistakes a component of the system for the system itself. Thus, interactive narrative can be argued to be a flawed conceptualisation of FPS game narratives, and can be discounted from the ludology debate.

However, Lindley (2005) does point out that it is imperative to take into account the diverse gestalts of players and their reasons for playing in the first place, when considering the question of games and narrative, particularly in relation to the perceived problems with narrative breaking the flow of play. One player's irritation at a cutscene may, after all, be another's reward for undertaking the configurative activity. Rather than attempting to define games as interactive narratives, Lindley instead proposes that the relationship between games and narratives should be considered in terms of the psychological mechanisms and methodologies utilised in engaging with them (2002). Specifically, he argues that to understand a game or a narrative requires the development of an appropriate cognitive Gestalt:

In the context of a computer game, one must learn and then perform a gameplay Gestalt in order to progress through the events of the game. To experience the game as a narrative also requires the creation of a narrative Gestalt unifying the game experience into a coherent narrative structure. The tension between gameplay and narrative can now be viewed as a competition between these respective Gestalts for perceptual, cognitive and motor effort. (2002: 209)

In a sense, Lindley bypasses the entire debate about the conceptual nature of games by suggesting that games, along with other media, should really only be considered in relation to their processing. The physical disc and code aside, a game really only exists as a functional artifact when being played, thus it is here where attention should be focused. This *social conceptualisation* of games is therefore distinct from the *artifact conceptualisation*; or rather the systemic object approach. In the latter, the focus is upon what qualities, structures and affordances are located within the object; in the former it is the psychological process of engagement that create the game – in essence the magic circle first introduced by Huizinga (1950). Thus, when Neitzel claims that “it seems reasonable to assume that computer games tell stories” (2005), she is taking a systemic object approach.

Between them, Juul and Eskelinan offer convincing arguments that – at the very least – the dominant approach to games as systemic objects, that is, the study of how they operate as artifacts and the structures embedded

¹⁹ Hereafter referred to as simply *Condemned* and *Invisible War* respectively.

within them regardless of player activity, should not be one where they are conceived of as narrative objects. However, it is also important to consider the social/psychological approach and, in particular the question of whether gameplay is a predominantly narrative process, even if the games themselves are not predominantly narrative systems. This requires a brief exploration of the psychological literature and the question of the narrativity of mind.

Section 4.3. Narrative and psychology

Narrative has been proposed as not just the underpinning construct in media forms, but as both “one of a class of *framing* procedures, that is, strategies for organising and deriving solutions for problems” (Rein & Schon 1977, cited in Robinson & Harpe 1986) and even as a defining feature of mind (Nath 2004, Crossley 2000). Bruner argues for a “protolinguistic readiness for narrative organisation and discourse” (1990: 80). He supports his case by linking two perspectives; that “knowledge is never ‘point-of-viewless’” and that “we organise our experience and our memory of human happenings mainly in the form of narrative – stories, excuses, myths, reasons...” and argues that what follows, follows naturally. Thus, by considering all experience as mediated, Bruner positions a kind of internal narrator in consciousnesses. This is dangerously close to Gilbert Ryle’s ‘ghost in the machine’ (1949). However, when taken less anthropomorphically, what Bruner is really suggesting is that all experience is represented in some way. This has resonance with the concept of ‘distal attribution’ (Loomis 1992), that our construction of reality is, for a large part, inferred from data received from the environment that, in turn, resonates with the percept version of perception discussed in Section 2.1. If what is experienced is a sequence of events with both actual and inferable causality, and it is experienced it as a representation in the mind, argues Bruner, then what is experienced is a narrative.

Dennett (1991) also uses narrative as a metaphor for consciousness; in proposing self as a form of “centre of narrative gravity”, though he is careful to point out that this is just a metaphor and not to be over-extended. The problem with Bruner’s position is that it waters down the concepts of both representation and of a causal sequence. The gap between mediation and representation is actually very significant indeed. A mediated experience reflects an information processing system that means that ‘raw’ perceptual data is not responded to, in the same way that a reader does not consciously respond to the ‘raw’ data of a narrative, the phonemes. However, representation requires presentation to take place, and aside from positing a central executive in the brain, presumably complete with home cinema system, there is no evidence for this co-ordinated presentation ever occurring. A counter-argument to Bruner’s superficially commonsensical thesis may be found in responses to the equally superficially commonsensical explanation for Kosslyn et al’s mental imaging experiment (1978), which is

worth reproducing here in order to make the point explicit. Subjects are given a fictitious map to study, then, with the map removed, are asked to visualise traveling between two points on the remembered map. The time taken for this mental travel is usually proportional to the actual distance on the map, thus prompting the claim that somehow mental imagery is involved. However, it is also entirely possible that information stored in the brain relating to visual or physical objects contains spatial information *without there being any recourse to mental imagery whatsoever*. Just because narratives are clear, useful and generic means of conveying information from one human to another or, indeed, from oneself to oneself, it in no way follows that this information is stored or innately narrative outside this process. Narrative, far from being innate to subjective reality, may simply be a convenient, even innate, means of communication whilst never actually being an experiential state. So, when Bruner claims that "Narratives are... a version of reality" (1991:4), what he actually means is that narratives are one way amongst others of representing reality. The notion of narrative reality is in actuality a means of saying that narrative is a powerful and seemingly ubiquitous means of achieving this representation. This leads naturally to the question of the relationship between reality and the self, and the role of narrative in this.

This seems, initially, like safer ground. A narrative self lends itself far more to the concept of narrative. After all, autobiographical memory, is an established psychological construct (Tulving 1972: 385-387), and a narrative self is essentially formed from the representation of autobiographical or episodic memory. At root, the idea is simple: there is a coherency of perspective and response in such memory as it is applied to the environment. Damasio (1994, 2000) puts this down to second order mappings of the body-state triggered by similar stimuli, which provides clear theoretical support to a schematic mind and this coherency gives rise to the illusion of a self. Self is thus an illusionary assemblage of response to the world, in effect formed by the sense of validity of a series of predictions about one's own behaviour. By second order mappings, Damasio refers to the representation of body states within the brain, as a form of extended homeostasis, and it is this idea of neural mediation that enables a narrative conceptualisation to be formed. Not only are prior states represented, creating a virtual sequence, but it also the positions of narrator and narratee are virtually filled. It should be remembered that these roles are virtual and there is no suggestion of homunculus, or central executive, involved. The second order mappings give rise to a proto-self (*ibid*: 154) which, when subject to reference with earlier mappings yields predictable response sets, giving the illusion of a coherent, stable perspective. In effect, one might say that the act of narration produces both narrator and narratee; in layman's terms, that the self is formed by the stories it tells itself. Thus, the self is a narrative. Carr puts it this way:

...we are constantly explaining ourselves to others. And finally, each of us must count himself among his own audience since in explaining ourselves to others we are often trying to convince

ourselves as well. (cited in Wood, 1991:165)

This is the basis of the centre of narrative gravity, that is, the illusory point of reference about which narratives orbit. In a sense, narrative is thus seen as metaschematic or, as Sarbin describes it, an “organising principle for human action” (1986), though it must also be noted that elsewhere he explicitly describes narrative in a rather less revolutionary manner as “potentially a useful root metaphor for psychology and other human sciences”. The centre of narrative gravity construct argues that the explicit causal structures of narratives are exploited to both differentiate between the self and the world, but also to make sense of the self’s actions and the actions of others within the world. In effect, the narrative self establishes a dynamic cycle that takes in social narratives – myths, fairy tales and urban legends – and personal, developmental psychology. The innate predisposition towards narratives formed by the will to causality and the virtual narrator/narratee relationship formed by mediated body state representation and memory implementation, creates a world where storytelling is naturally ubiquitous. At the same time, the ubiquity of narrative and storytelling as a cultural device leads to the further development of the individual’s capacity to utilise narrative, and the conceptualisation of the self in narrative terms. Thus, argue Carr, Crossley, Sarbin and the other narrative psychologists, understanding the self as a narrative process is key to understanding the self at all.

However, just as with the idea of narrative reality, one could argue that just because our ability to express ourselves uses narrative heavily, it does not follow that the actually internal representation of ourselves is narrative. Robinson & Harpe make this point thus: “Experience does not automatically assume narrative form. Rather, it is in reflecting on experience that we construct stories” (1986:111). Crossley’s counter argument is that by planning our lives and ourselves, a filtering process is created, thus creating an ongoing fabula from the non-linear, frequently non-causal complexity of life and, further, these filtered events are internally represented (2000). Equally, actions and responses, including memories, are filtered and represented to form the self.

Alongside the familiar issue of over-inclusivity, the fundamental problem with the self as narrative is that it lacks any objective, empirical testability whatsoever: it is a product of an anthropologically and introspectively slanted perspective that, whilst useful and important from a therapeutic or cultural perspective, does not supply the means for self-evaluation by any means other than subjective report. At root, it is a folk psychology and, in fact, Bruner happily defends this position, stating, “It is in terms of folk-psychological categories that we experience ourselves and others” (1990: 15).

The concept of psychological narrativity should therefore be approached with caution and by making some

careful delineations along the way. For example, there is a substantial difference between adopting a position whereby subjective experience of reality, or the subjective construction of reality is deemed to be inherently narrative, as is argued explicitly by Bruner (1991); and one where the self is constructed via a series of dynamically referenced narratives, as postulated by Crossley's more psychotherapeutic approach (2000). In addition to these perspectives, a further distinction can be made regarding the position of narrative in relation to experience, such as Nath's contention (2004) that narrative is, in fact, a critical component of assembling a subjective stance and thus crucial to any experience. Nath cites Carr's work on temporality of experience, where he suggests that rather than sensations, abstract and meaningless units 'far from being elements of experience', events should be considered to be the basic units of experience. She defends Carr's thesis against what she sees as the dominant conceptualisation of narrative as an artificial construct, as opposed to a sequential, but essentially non-narrative, stream of human action. In essence, Nath's argument is simple: any self-awareness of action and reality (or self in relation to a perceived reality, as opposed to inferring a narrative reality in itself) requires a subjective stance and that this is inherently narrative. Indeed, she states that "Subjectivity is the experiential effect of narrativity", assuming that the reader will agree that subjectivity is also the experiential effect of human conscious reality. She further splits experience within a temporal frame into events and actions, assigning a passive and active role to the subject, or user respectively. Once again, this relies upon a conflation of representation with mediation, and of sequence with narrative. Further, for both Nath and Bruner, subjective experience is a dynamic relationship between incoming stimuli and what is stored in autobiographical memory. Thus, the latter in a sense functions as narrator, and the process of transaction between this store and the deployment of its content in a subjective experience is narratee. This model relies upon a strict division between an external world or reality, and a mediated, represented, internal and subjective one: dualism. The fact that this form of dualism has been convincingly debunked by a range of philosophers of mind and cognitive scientists (Churchland 1988, Dennett 2005) should thus give pause for thought.

An alternative to the more extreme position of a narrative self or narrative reality is the idea that narrative is a dominant, or at the least, powerful cognitive construct. This is inherent in Sarbin's "organising principle" and the references to the 'storytelling animal' that found across the literature (Schank 1990, Claxton 2006). Thus, Mancuso describes narrative as an "assimilating structure" (1986: 91). Likewise, Lee et al offer a definition of narrative as "a representation of events that provides a cognitive structure whereby media users can tie cause to effect, convert the complexity of events to a story that makes sense and thus satisfy their primitive urges to understand the physical and social worlds" (2006: 265). This definition is careful to conceptualise narrative as a media object that enables a particular form of cognitive activity, rather than describing a particular form of cognitive activity as narrative. In other words, it does not confuse an enabling structure with what is enabled. It

also thus avoids the kind of definitional expansion Juul and the ludologists lament. Note, however, that although Lee et al expect the structure to enable the user to “tie cause to effect” they do not explicitly require that this causal sequencing is inherent in the media object.

Pre-existent organisational structures are also expounded by Bartlett’s seminal work on memory, where he identifies a similar relationship between stored knowledge and dynamic processing (1932). Thus, given exposure, one will develop schema for a large number of frequent experiences: Bartlett famously conducted a study whereby native American myths with non-Western narrative structures were converted (mangled might be an alternate and appropriate word) in memory by Western subjects to yield more conformist and recognisable Western narratives (1932: 64-94). A *narrative schema* may then be inferred.

Schemata define causal sequences that operate both below the threshold of what would be conventionally called a story and do not require representation. In other words, understanding schema illustrates the difference between a represented media object, including narratives, and cognitive organising principles. This will, in turn, enables the introduction of the notion of the protonarrative unit with proper theoretical foundations.

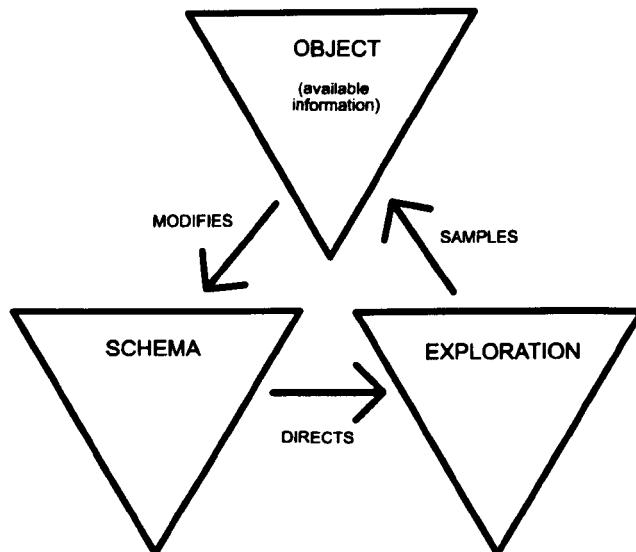


Fig 16. Neisser's dynamic perceptual cycle (1976)

Schema theory essentially posits a set of inbuilt and learned mental architectures that hold generalised situational knowledge. Neisser (1976) used schema to bridge Gibsonian ecological perception theory and more classical representational models by suggesting a set of dynamic perceptual schema acting as a cybernetic system between

the two mental operations. Schema may thus sidestep the debate over the existence of percepts and mental imagery by instead suggesting that rather than requiring even semi-formed mental images and objects, all that is required are rules or even algorithms, an idea exploited by a raft of artificial intelligence researchers and cognitive scientists. However, even this is argued against by Pylyshyn (1999), who suggests that all that is required is a set of "natural constraints" determined by the physiology of the perceptual system. In this way, Pylyshyn also enters into the middle ground between percept-based theory and the Gibsonian approach he has heavily criticised (Pylyshyn & Fodor 1981).

The most obvious objection to schema theory is its lack of specificity. Exactly what a schema is, or how it is comprised, formed or maintained is problematic, though one could cite Damasio's work (1994, 2000) as an attempt to create an essentially schematic theory of cognition and consciousness supported by extensive studies of neurological damage and disorder. It is worth considering two more modern variations on schema theory before considering media, games and narrative in particular relation to the concept. Minsky's 'frames' (1975, 1985) and Schank & Abelson's 'scripts' (1977) both come directly from the domain of cognitive science in general, and artificial intelligence in particular and, in discussing them, introduce connectionism as a radically different way of investigating cognition that may provide new dimensions upon the gameplay and narrative experience.

"A frame is a data-structure for representing a stereotyped situation," explains Minsky (1974:1), thus updating the terminology and application of what boils down to schema for a post-behaviourist, digital age. A simple frame can be represented as a bordered set of re-configurable and partially specified elements. It follows that frames may nest within each other, providing a means of both generalisation and lateral connectivity amongst elements. Indeed, the connectivity and nesting need not be restricted to lateral and vertical axes, but can be conceptualised as non-linear and recursive. Thus, a 'kitchen' frame may contain nested frames for cooker, dishwasher, as well as referral to the frame house it sits within. Whilst this does allow a problematic and indeed exponential expansion of content within each frame that can, it may be argued, render the entire model so complex it ceases to be useful, frames do nevertheless enable rough grouping of component parts of any scenario into some form of generalised and viable set. There is a clear line back through to the core concepts of Gestalt still at work here: a set can be taken as beyond the sum of its elements or, at the least, without a high proportion of cognitive resource being spent upon them. Just as Bartlett's schema enable memories to be ordered and manipulated according to generalised structures to reduce mental workload and increase their functionality; so frames suggest a link between core, stable – yet dynamic – structures that actually enable cognition by reducing the amount of sensory information processing required to manage frequent situations. In other words, one could argue that much of what is perceived is superfluous to the cognitive model, and only deviations and levels of

specificity above a stereotyped set are attended too. This is, in itself, a contentious view that preoccupies a great deal of research upon perception and it sits directly at the centre of the debate over Gibson's ecological theory.

Frames should be understood within the wider context of a computational model of cognition, and their relationship to other developments within the field of artificial intelligence should be recognised. In particular, Selfridge's Pandemonium (1959) architecture that may be seen as an early precursor to connectionism – though the field really expanded as a result of Rumelhart & McClelland's work and publications in the 1980s. Selfridge argues for cognition based upon the actions of a very large number of very simple devices, called demons after the original etymology meaning of the word, 'knowledge'. Demons are a means of reducing what seem like prohibitively complex operations into their constituent, vastly simpler parts – a kind of reverse Gestalt, whereby the whole is rather to be seen as an illusion of coherence formed by its multitude of parts in operation. This notion forms the centre of, amongst other things, Dennett's centre of narrative gravity model of consciousness (1981). The critical conceptual shift in demons, and connectionism in general, is that rather than any sense of holistic goal or aim to mental procedures, all that each demon or node is concerned with are patterns of activation, in the form of a change in chemical state in biological neurons or the change in signal in a neural network. Instead of seeking analogies between the brain and digital computers, an approach that has been heavily criticised on many counts ranging from the biological (Edelman & Tononi 2000) to the philosophical (Fodor 2001), connectionism is modeled upon the known properties of neurons themselves. In particular, connectionist networks simulate the patterns of activations found in the brain. Without diverting too far into the territory of neuroanatomical function, it is worth introducing a basic model here, to act as a support for frames as a theoretical construct. Neurons typically are composed of soma (body) and projections, which can be subdivided into dendrites and axons, acting as input and output channels respectively. The neurochemical state of each cell may be adjusted by incoming signals which, in turn, may or may not trigger one or more axons to fire, passing a signal on to responsive dendrites of further neurons and so on. Likewise, nodes in a connectionist neural network, upon receiving input may change this signals properties or value and, further, may output a signal to connected nodes. The shift in neurochemical state is simulated by attaching weights to signals and having nodes act as gates, with threshold requirements of signal strength to 'fire' and a corresponding effect upon the produced signal transmission. Whilst retaining an awareness of the potential for over-anthropomorphisation, each cell or node has no relation to 'thought', it does not 'know' its place within the network or process, it simply delivers or does not deliver a signal. Nevertheless, neural networks can be trained to emulate quite complex behaviour – certainly in a game context. For example, Chaperot & Fyfe (2005) have used neural networks to train virtual riders in motorcross games to ride in a more 'human' manner.

Connectionism, and the Pandemonium model can be used to counter the argument about the impossibility or artificiality of defining the boundaries of each frame, in effect sidestepping the issue of where they are by suggesting that rather than viewing frames as distinct items, one should see them instead as points of concentration, or frequently reoccurring patterns within an essentially meaningless network. Thus, when the 'kitchen' frame is activated, rather than argue over its contents or configuration, it makes more sense to understand it as a grouping tendency that makes other grouping tendencies more likely. There is an implied causality to this model that is made more explicit in Schank & Abelson's scripts and their more immediately narrative connotations.

Scripts grow in part from Schank's Contextual Dependency Theory (1972), which is an attempt to codify natural language into a set of generic rules and relationships. For example, Schank identifies eleven primitive acts that underlie sentence meaning, such as PTRANS, changing the physical location of an object. These primitives operate alongside states with corresponding scales, and objects themselves. Thus, Schank offers examples of CDT representations of natural language sentences like:

John told Mary that Bill was happy

John **MTRANS(Bill BE MENT.ST(5)) to Mary**

Which translates as 'John mentally transferred Bill's mental state as condition 5 (Schank's five suggested states within the scale MENTAL STATE being broken, depressed, all right, happy, ecstatic) to Mary'. Similarly

John read a book.

John **MTRANS(Information) to LTM(John) from book**

inst(John ATTEND eyes to book)

(all examples Schank & Abelson 1977:15)

Schank & Abelson apply a similar approach to the basic idea of frames, defining scripts as "a structure that describes appropriate sequences of events in a particular context" (1977:41). In essence then, scripts are a means of converting natural language experiences into a formal, computational format. CTD is embellished by the addition of stereotyped scripts, such as \$restaurant or \$payment, plus goals and delta goals (or generalised state changes). Thus, entire sequences of natural experience can, according to Schank & Abelson, be formally parsed according to this pared down language of nested, interacting contextual dependencies and goal-orientated, dynamic, generalised scripts.

It is important to recognise the context of Schank & Abelson's work as primarily informed by the intellectual climate of artificial intelligence research in the 1970s, and it suffers from most of the general problems of what Harnish describes as the "Digital Computational" approach (2002). That is, the brain does not function like a computer, and any computational metaphor must be approached with caution. The overly prescriptive, finite nature of scripts as conceptualised by Schank & Abelson may work in finite contexts, as realised by parsers or systems operating within a controlled semantic framework but, as with selection/rule-based systems, the search space rapidly becomes prohibitively large when placed within a real world context; a problem of storing or representing tacit knowledge. The filtering mechanisms by which a vast amount of this tacit information regarding the self as an-organism-in-the-world informs both thought and its self-reflective conceptualisation are tackled directly by Lakoff & Johnson in their metaphor-based understanding of consciousness and higher-order thought (1999). They argue that underlying most, if not all, mental structures and representations are base assumptions drawn from the experience of human physicality. For example, the attachment of a forward-motion to even abstract notions of causality is built upon direct physical experience of movement within the world. A more specific example of the physical roots to metaphoric language and experience is given as the 'Love Is A Physical Force' metaphor:

She knocked me out. I was bowled over by him. We were immediately attracted to each other.
There was a magnetism between us. We were drawn to each other. He swept her off her feet.
(1999:83)

Connectionism offers a way through this otherwise insurmountable problem²⁰. Although the formal, computational language drawn up for the implementation of scripts in an artificial system would seem to result in the constant bespoke addition of new states, goals, objects and definitions, with the result of a process that seems increasingly arbitrary and unwieldy, it is entirely fair to argue that the construction of a script-based mind would share these characteristics. Scripts are, after all, formed primarily from experience, with some underpinning of innate, physiologically based structures in the manner of Lakoff & Johnson's metaphors or Pylyshyn's early vision (1999). One can therefore conceptualise them as tendencies toward groupings or patterns

20 It should be noted that it is not argued here that connectionism is the only solution to the problem of mental representation. Firstly, connectionism is still essentially computational in nature and the criticisms of a wholly computational approach to the brain (i.e. it doesn't fit with current neurobiological understanding of the nervous system) still stand. However, as a theoretical device to explain how a formal structure like frames or scripts can relate to a massively distributed, parallel system, it seems fit to purpose. Further, although the brain is not a computer, it certain seems to demonstrate these last structural characteristics, and connectionism at least reverses the metaphor and attempts to build computers that are more like brains.

of activation across a network, rather than resorting to percept-equivalent objects. Gestalt, schema, frames and scripts all share a common principle; they are a means to understand how incoming environmental stimulation may be grouped in order to reduce the overall need for real-time processing, providing bridges between perception, knowledge acquisition and memory. Schema theory insists upon memory structures that manage accumulated experience according to dynamic, but essentially pre-defined rules and forms. Frames and scripts set up learned stereotypical experiences to act as centres of gravity for subsequent experience. This may be extended to include media experience, and gaming in particular. Indeed, IJsselsteijn (2003) argues that learned schema are fundamental factors in users' experiences of media:

From the anecdotal evidence accumulating throughout media history, it becomes clear that people's responses to media are not a linear product of the extent of sensory information that the medium provides, but are very much shaped by people's previous experience with and expectations towards media. It would seem a little odd to us now if people should panic and run out of a movie theatre at the sight of an approaching train on the screen. This is because our **media schemata**, or knowledge representations of what media are, and are capable of, tell us what to expect from mediated experiences, including the perceptual tricks that cinema or VR can play on us. (2003:37)

Such media schema would find their specific variant in games in general and FPS as a genre. A suggestion that there may be FPS schema was made by Pinchbeck et al (2006) in a pilot study tracking eye-movements in *Half Life 2*. They found that more experienced players tended to centralise their gaze and use the mouse to perceptually navigate, whereas inexperienced players' gaze was more mobile and the mouse moved less to look around. A likely explanation of this disparity in visual behaviour is that experienced players know that shots, when they need to be fired, will hit whatever is central on the screen, thus it is advantageous to synchronise the acts of visual exploration and aiming. Thus, there is a gameplay advantage in the first method, and it is not surprising that experienced players develop higher and more effective gameplay skills.. This is, nonetheless, suggestive of schema.

More to the point, as stereotypical instances of stimulus and response, schema are, at the very least, instances where there is an extremely strong tendency towards definable sequence. As such, they provide an important tool in addressing the issue of narrative in games as both narrative schema and gameplay schema can be identified. If schema are inbuilt and learned mental architectures that hold generalised situational knowledge, then narrative schema would be those schema that 'fire' when a situation fulfills the criteria to be taken as a narrative and in doing, predispose other forms of cognitive behaviour, including interpretation and expectations.

In other words, connectionism can be used as a metaphor to postulate a threshold, above which schema fire, and below which they do not. Further, when schema fire, they adjust the network, making other schema more or less likely to fire in turn: priming occurs. For example, narrative is closely tied to closure, thus when the schema for narrative fires, it may increase the expectations of closure and exert a subsequent influence upon the type of interpretive activity that may occur. Equally, once a situation crosses the threshold to be identified as a first-person shooter, the shooter schema fires and predisposes a certain type of perceptual activity and action, such as centralising one's gaze on the screen. Indeed, it is possible to return to the model of gameplay structure defined in Section 2, and describe gameplay as the development and application of a particular type of behavioural schema to the affordances of the ludic system. If narrative, from a psychological perspective, is to be seen as a particular form of schema with knock-on effects to other (behavioural) schema, this creates a natural theoretical bridge between narrative and gameplay. Rather than overextending the construct and describing all activity and experience as narrative, narrative can be seen to play a potentially significant and functional role in gameplay. However, given that it has been argued that games are *not* narrative objects, it is still necessary to illustrate how this narrative schema can be reconciled with a formal system. In other words, the next task is to drop directly into the abstraction that Juul positions as a buffer zone between his real rules and fictional worlds (2006).

Section 4.4. A ludodiegetic model of narrative in games

If the definition of narrative developed in Section 3 requires representation and causal sequences, then what of those related units which are neither represented, nor joined in an explicit causal sequence, but which nevertheless yield experiences that would ordinarily be described as narrative or story-based in experiential quality? Schema theory suggests that regardless of whether or not the incoming units are actually formed into a narrative, provided that together they cross the threshold – that is they appear “narrative enough” - then the narrative schema fires and they are *interpreted* as a narrative. In other words, a narrative interpretation of events can be triggered, even if the stimuli is not represented or causal. The idea of a particular set of interpretative responses or behaviours that appears *as if* in response to a narrative artifact, enables Jenkins’ problematic notions of enacted, emergent and invoked narratives to be drawn into in games (2004) without requiring games to be narratives themselves. In other words, when describing a linear narrative experience created from an interactive experience, what is actually occurring is that the ludic experience is recast according to the schematic framework of narrative, much as Bartlett’s subjects recast the Native American story *The War of the Ghosts* according to Western narrative frameworks. It would clearly be a mistake to thus describe *The War of the Ghosts* as being a Western narrative (at a system level, it clearly is not), or even that it gives rise to emergent Western narratives. This would be to retrospectively inject structures into a system that are, in fact, new structures created by

reported interpretations of the system. When recounting an experience of playing *Crysis*, a narrative may be created by the fitting of this experience to a narrative-schematic frame. It absolutely does not follow that just because the experience of *Crysis* can be recounted as narrative, that *Crysis*, as a systemic object, is a narrative. However, just as *The War of the Ghosts* was recognizable enough to be classified and interpreted as a narrative, so there are clearly structures within *Crysis* that lend themselves to a narrative interpretation. Not only is a story easy to extract from the gameplay, but there are interpretative narratives more likely to emerge from this than others. To put this another way, playing *Crysis* is likely to yield a particular narrative interpretation even if it is not a narrative object itself and this is especially important given its sandbox approach to level exploration. In layman's terms, games clearly do seem to both utilize highly recognizable narrative objects and structures and certainly lend themselves towards particular narrative interpretations: in answer to Juul, they certainly do seem to 'tell stories'.

Carr (1986) notes that whilst experience may not be formed of narratives, it can certainly be described as exhibiting protonarrative structures. In other words, it is composed of isolatable units that, whilst not containing explicit causal sequences, are shot through with the predisposition towards certain types of such sequences. Further, even without deliberate or artificial arrangement, the experience of groups of these units will prompt closure in a manner that lends itself to a pre-determined outcome. For example, consider a static presentation of an image comprised of the following objects: a prone figure, a ladder leaning against a house, and a spilled paint pot. This leads naturally towards a projected temporal and causal sequence: the house was being painted, the painter fell, the paint was spilled. It is less likely to evoke the alternate sequence: the painter was struck that he hadn't checked the paint job from all angles and lay down to appreciate his work from a very different perspective, knocking the pot over with his elbow as he did so. Although both are logically permissible, our prior experiences tend to lead us towards one interpretation over the other. The three composite units of the image are protonarrative; they all contain information that, taken as a whole and in conjunction with the viewer's operating schema, lend themselves towards a particular interpretation which, if *represented* artificially, could then be defined as a true narrative.

Given that a fabula is both inevitably and essentially comprised of a reduced set, that is, an artificially selected group of objects, and that sequences are formed of relationships coded into objects contained within the fabula as defined by functions operating on indices, fabula itself always already contains sequences and causality, to some degree or other. Freeman describes a protonarrative as a "not-yet story, waiting to be told" (2003: 122), and this description encapsulates the potential for narrative interpretation of a game extremely well. Protonarratives can be defined as an arrangement of objects that tend to yield a particular interpretation, with the structural

characteristics of a narrative (objects referring here to the environmental objects in a game discussed in Section 2.2). There is thus the potential for a direct mapping between gameplay objects and narrative objects. The arrangement of these objects forms a framework for ludic activity analogous to *sjuzet* but, critically, it is a framework within which the player can operate, rather than a fixed structure of presentation. Narrative principles – focalisation, voice and closure – are derived from the interaction of gameplay schema with narrative schema during the act of play. The result is an experience with many of the qualities of narrative, derived from a system utilising protonarrative elements but, crucially, not actually a narrative itself.

Thus, there is no particular need for any paradoxical issues between interactivity and narrative, or gameplay and narrative, because, in a well-designed game system, the protonarrative units *are* units of gameplay. That is to say, the protonarrative units of a game – as instantiated by the game objects and the relationships that exist between them – create a tendency towards a particular interpretation of the gameplay experience. They may also, by triggering schema, influence the act of gameplay itself. In both cases, there is no particular need to see protonarrative objects and gameplay objects as different systems. Protonarrativity, according to this model, is an affordance of gameplay objects; it is simply an extension of the ludic indices that describe their contextual relationships with other objects, via affordances, parameters and state changes. The protonarrative content of a game is not simply window-dressing, justification for action or a golden thread pulling the player through the game; it exerts an influence upon expectation and behaviour. This goes some way to addressing Eskleninen's argument about the fundamental dispensability of narrative in games. Rather than debate the perceived incompatibility of interaction and narrative, Eskelenen simply suggests that the former is fiercely dominant in a successful game: one can have a successful ludic experience with limited, weak or flawed narrative; one cannot have a successful ludic experience if the interaction design is weak or flawed, no matter how good the narrative. According to the protonarrative model, however, introducing a conceptual division between gameplay and narrative is redundant.

The ludodiegetic construct is fundamentally based on the relationship between protonarrativity and gameplay. It separates those aspects of the game that are anchored within the presented reality of the game and those which operate on a purely formal level. In other words, it is concerned with those units within a game system which are engaged with from within a presented world. It is proposed that this homo/hetero distinction is much more useful than Juul's division between formal rule and fictional world if a better understanding of how story functions in FPS games is to be formed; particularly how it is used to manage the discontinuity between the diegetic complexity of these games and the simplicity of the underlying ludic structure.

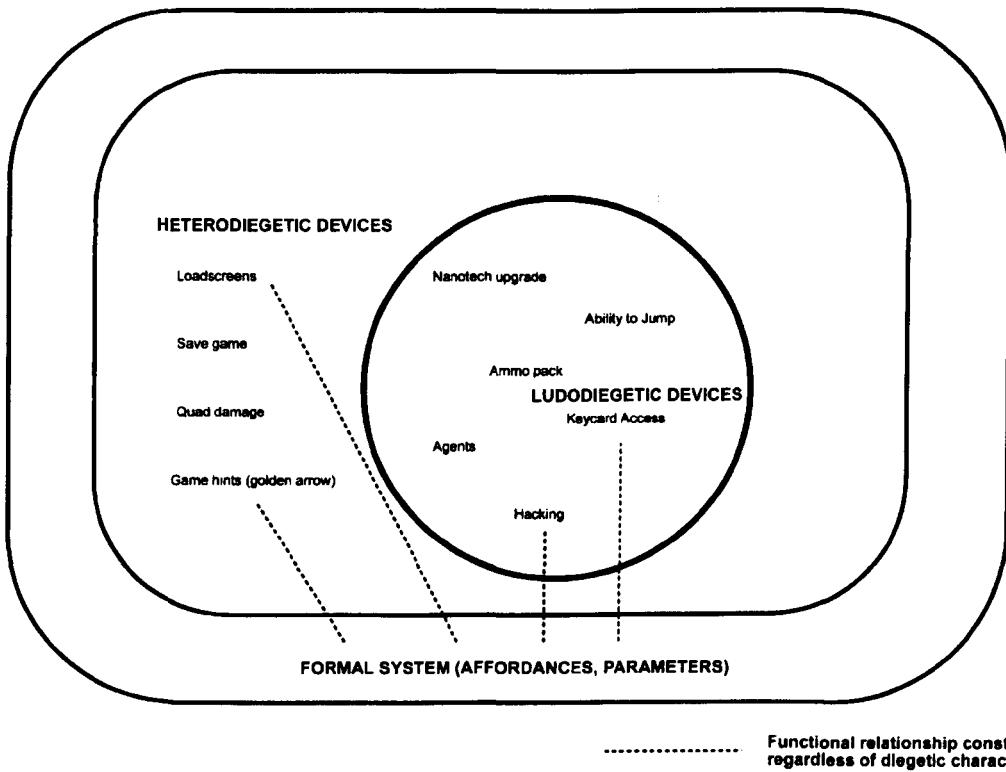


Fig 17. Gameplay devices operating inside and outside the limits of the ludodiegesis

The content of a game system (Fig 17), that is, the instantiation of the formal rules of the system, can be divided into those operating inside or outside the diegesis. Function therefore operates across the divide, and any given unit of content may contain both formal and protonarrative aspects. Thus, the traditional split between narrative and ludus can be collapsed by organising the content of the game system into hetero- and ludodiegetic objects, each with an attached set of aspects: this corresponds to the affordance mapping carried out in Section 2.2.

Many game scholars have co-opted Csikszentmihalyi's concept of 'flow' (1991) into their work (Adams & Rollings 2006, Erni & Mäyrä 2005, Sweetser & Wyeth 2005, Lemay 2007). Essentially, in this context, flow represents an optimum psychological state of play, where activity is seamless, highly engaging and highly rewarding. Bateman & Boon (2005) appropriate seven characteristics of flow states thus:

- Belief that the activity has a satisfactory conclusion that can be reached
- High levels of focused concentration upon the experience
- Clearly identified goals

- Clear feedback
- Lack of sense of effort
- Sense of control over the activity
- Altered perception of the activity, especially sense of time

Links between high levels of engagement and immersion and flow states are clear, as is the attraction for game designers to induce flow states in players. A player in a flow state, according to these characteristics, is focused, highly engaged to the exclusion of stimuli outside the experience, understands what is happening and responds positively, is synchronised with the feedback system (thus behaving in a way which falls into line with the system's capabilities and constraints) and is not breaking the ongoing stream of activity to work out what to do next. Particularly in a genre such as FPS where, by definition, there is a far greater degree of perceptual mapping between player and avatar, this kind of psychological response to the game system is clearly advantageous.

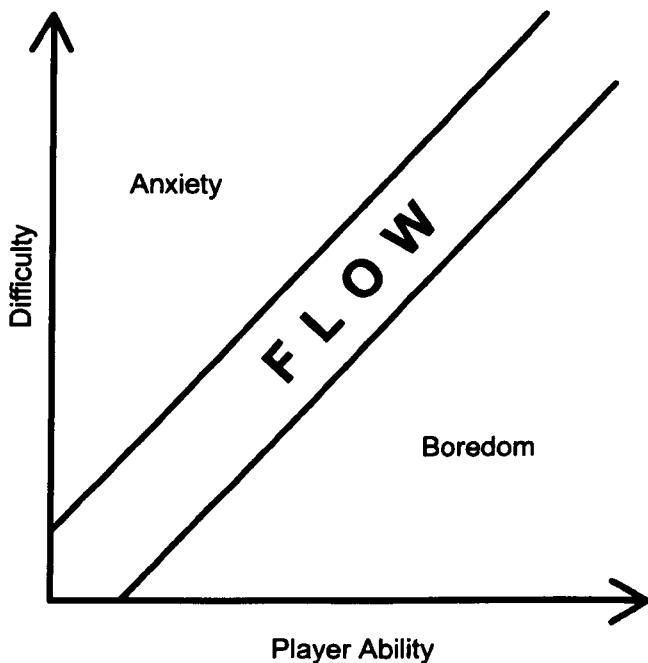


Fig 24. Adams & Rollings' application of flow to game difficulty

A connection between the notion of ludodiegisis and flow is thus suggested. If ludodiegisis is conceptualised as the set of gameplay objects operating within the presented reality of the game, then it can also be seen how important this set is to flow states. Moreover, a successful ludodiegisis operates with diminished reference to exterior objects: in other words, it stands a greater chance of increasing focus, locking goal to visible outcome,

presenting and managing feedback and creating artificial alternatives for normal time and space, than a system with a high level of heterodiegetic operators. In other words, a perfect ludodiegesis contains all necessary information to play the game. More than this, it contains information about how to play the game, and operates epistemologically to ensure player behaviour and response approaches the optimal predetermined affective pathway embedded within the system. Finally, a ludodiegesis manages the relationship between rule and experience, cloaking inherently crude and simplistic ludic activity in protonarrative trappings that allow a diversification of activity and expansion of the experienced world. A ludodiegesis is the optimum management tool for player experience in an FPS world, as it is a self-supporting translation device bridging the schism between rule and fiction.

At the beginning of this study, it was stated that the approach of traditional models of narrative to games failed to provide any real explanatory power in tackling the question of the actual relationship between story and gameplay. The process of the first half of this study has been to establish a theoretical framework which, by offering a model in which this relationship is made clear, enables a detailed analysis of the objects themselves to be carried out. Before moving on to this, it is necessary to provide a summary of the process of building this framework to set what follows in firm context.

Having claimed that there was a discontinuity between the complexity of the experienced reality of an FPS games and simplicity of its ludic structure, the concept of affordances was introduced as a means of understanding gameplay structure. This was defined as the relationship between the objects within the total environment set, each of which had one of a limited number of affordances attached to it. These affordances were mediated by parameters, which gave gameplay, and indeed, the titles within the genre, some of their different experiential flavour.

Nevertheless, defining gameplay by affordances does back up the claim that the ludic structures of FPS games are very, very simple. It was intimated that story was a primary way of expanding upon this simplicity, creating the reality of the game world to be experienced by the player, or diegesis. This, however, sets up a discontinuity that requires management. It was argued that, in a recursive fashion, homodiegetic objects are a principal means of managing this discontinuity through expectations and player behaviour.

In order to make this argument, traditional models of narrative were introduced and discussed to create a structural map of narrative. Narrative was defined as a represented network of related objects (with causal sequencing being the primary characteristic of these relationships). It can then be cross-referenced with the

network of gameplay objects identified in the first Section to begin to understand a narrative network, co-existing alongside affordances as characteristics of objects within the diegesis. Indeed, the case was made that it is fundamentally flawed to consider games as interactive narratives, although they may contain structures analogous to interactive narratives and, further, that considering games to be narratives at all confuses an aspect of the system with the system itself. It was then noted that, in psychological terms, narrative has been defined as an organising structure. Whilst refuting the notion of a narrative reality or self, it was noted that it did lead to schema theory and the notion of pre-existing structures of behaviour in response to stereotyped situations. It was argued that both narrative and gameplay schemas could therefore be expected, and that gameplay could be defined as the application of distinct schema to the affordances presented by a ludic system. By combining this definition with the idea of protonarrative units (the building blocks of our network of related objects), the construct of ludodiegesis was offered as the set of (gameplay) objects operating at the level of presented reality. Within this set objects can be found with both gameplay and narrative affordances; indeed, it collapses the conceptual division that is an inevitable product of a traditional narratological approach to games. *Story is a gameplay function: it has a direct influence upon player behaviour, managing both the discontinuity and what the player actually does whilst playing.* The second half of this study turns to the genre itself, to offer evidence to support this model. Moreover, it will also confirm that what has been previously written off as epiphenomenal or secondary to gameplay may in fact have a profound impact upon the interaction between player and system.

Section 5. Introduction to the Ludodiegetic Analysis

The analysis was carried out across major titles released between 1998-2007, thus representing a significant period of development in the FPS genre. The period for analysis starts with *Half Life*, generally considered a milestone in the genre, particularly innovative in its fusion of story and gameplay. It was deemed to be important to run right up to 2007, as it was something of a golden year for first person games, with ten important titles released: *Bioshock*, *Crysis*, *Fall of Man*, *Hellgate*, *Blacksite*, *Unreal Tournament 3*, *Portal*, *S.T.A.L.K.E.R.*, *Halo 3* and *Episode Two*.

Although the list is non-exhaustive, it covers the vast majority of major titles in the genre in this period and can therefore claim to be highly representative: covering fantasy, science fiction, horror and contemporary themes, with gameplay ranging from highly simple, linear run and gun shooters to more complex RPG crossovers. A total of 34 titles are included in the analysis. There were two exclusion criteria applied. Firstly, titles were required to be IP independent – in other words, movie tie-ins and franchises were excluded, meaning titles such as *Starship Troopers* (Strangelite 2005), *The Chronicles of Riddick: Escape from Butcher Bay* (Starbreeze Studios 2004), and *Star Trek: Voyager Elite Force* (Raven Software 2000) were not included. This is because the analysis focuses upon the bespoke construction of diegeses that are not constrained by existing symbolic and narrative structures. Secondly, historical shooters such as *Red Orchestra* (Tripwire Interactive 2006) or *Call of Duty* (Infinity Ward 2003) were excluded, as they are tied to a ‘reality’ that once again limits the potential for bespoke diegeses to be created around the gameplay requirements.

DATE	TITLE	DEVELOPER	PUBLISHER	PLATFORM
1998	Half Life	Valve	Sierra Entertainment	PC
1999	System Shock 2.2	Looking Glass Studios	Irrational Games	PC
2000	Deus Ex The Operative	Ion Storm Monolith	Eidos Interactive Fox Interactive	PC PC
2001	Return to Castle Wolfenstein Undying	Gray Matter Dreamworks Games	Activision Electronic Arts	PC PC
2002	Halo No-One Lives Forever	Bungie Monolith	Microsoft Game Studios Sierra Entertainment	Xbox PC
2003	Doom 3	id Software	Activision	PC
2004	Far Cry Deus Ex: Invisible War	Crytek Ion Storm	Ubisoft Eidos Interactive	PC PC

	Half Life 2 Quake 4 Halo 2 Thief: Deadly Shadows	Valve Raven Software Bungie Ion Storm	VU Games Activision Microsoft Game Studios Eidos Interactive	PC PC Xbox360 PC
2005	Painkiller Resurrection of Evil Perfect Dark Zero F.E.A.R.	People Can Fly Nerve Software Rare Monolith	Activision Activision Microsoft Game Studios VU Games	PC PC Xbox360 PC
2006	Condemned Call of Cthulhu Prey HL2Episode1	Monolith Headfirst Productions Humanhead Studios Valve	Sega Bethsheda / Ubisoft 2K Games Valve	PC PC PC PC
2007	S.T.A.L.K.E.R Crysis Blacksite HL2Episode 2 Fall of Man Bioshock Unreal Tournament 3 Timeshift Halo 3 Portal Hellgate²¹	GSC GameWorld Crytek Midway Games Valve Insomniac 2K Boston + 2K Australia Epic Games Saber Interactive Bungie Valve Flagship Studios	THQ/GSC Electronic Arts Midway EA Games SCEE 2K Midway Sierra Entertainment Microsoft Game Studios EA Games EA Games	PC PC PC PC PS3 PC PC PC Xbox360 PC PC

Fig 19. FPS titles included in the analysis.

Data for the analysis was gathered by multiple playthroughs, with footage recorded using screencapture software for post-play further analysis where possible (the reason for using PC versions of multiple platform games). In addition to this, walkthroughs and FAQs from fansites were consulted and cross-referenced. Official promotional material was constrained to information on the actual game packaging and manuals: expansions to the diegesis presented in a game was not considered, as this was deemed to be an optional expansion to the world. In other words, although Bungie have orchestrated an immensely rich mythos to accompany the Halo franchise, including comics, novels and even film rights, these are not necessarily part of the playing experience. In contrast, it is impossible to play *Halo* without being exposed to the character of Captain Keyes, the architecture of the Forerunner or 343 Guilty Spark's betrayal of the Master Chief.

The analysis is structured as follows. In the first three Sections, the environment set – the worlds and objects it contains – is considered. The first of these Sections deals with the world: environments, architecture and props. The second focuses upon agents; the third on the avatar as a special object representing the player's point of

²¹ It should be noted that *Hellgate* is only designed for FPS play for certain classes and objects. Guardians and Blademasters, the two melee classes, play and engage in combat in third person. Although they can revert to first person perspectives (as can Evokers and Summoners), FPS play is primarily aimed at Marksmen and Engineers.

engagement with the ludic system. This relates to protonarrative objects in terms of the indices and functions relating to epistemological and affordance-based aspects of gameplay; the relationship highlighted in the theoretical model. Finally, the fourth Section examines plot structuring, or the temporal hardwiring of objects' relationships over time. This focuses more on functions, and how predetermined relationships relate to gameplay. In both instances, the core dynamic is between the characteristics attached to objects and sequences and their impact upon not simply story, but directly upon gameplay via schematic manipulation of player expectation and behaviour. In all cases, attributes of the titles will be collated according to a number of key criteria, followed by a discussion themed around these attributes.

Section Six: Worlds

Section 6.1. Initial Realities

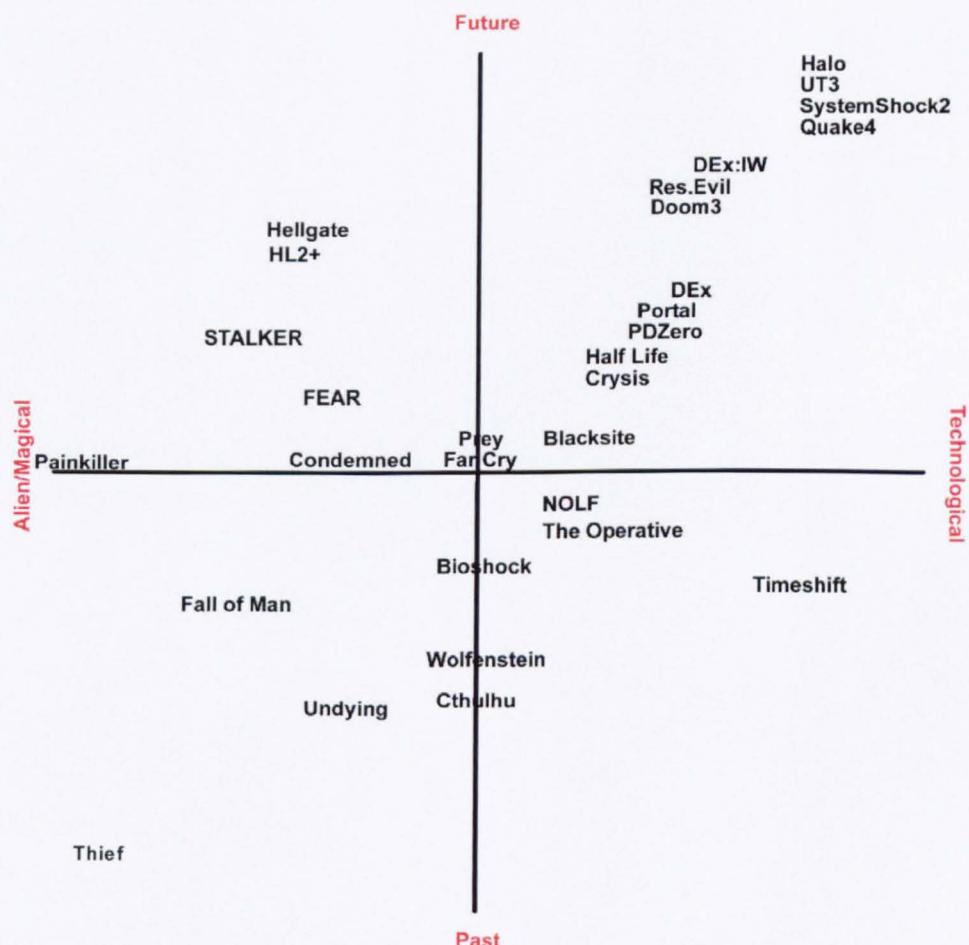


Fig 20. Initial realities.

The first major question is the basic setting of the world. The reality *initially* presented at the outset of the game - as experienced by the avatar - can be mapped onto two axes: the temporal/historical and the fantastical. Of these, the former locates the game world relative to our current reality, ranging from pseudo-medieval worlds such as *Thief* through more or less contemporary settings like *Far Cry*, and extending into the far future backdrops of *Quake 4* and the *Halo* series. The second axis locates the game relative to normal reality (no aliens, no demons, no spells and no nanotechnology). Games can be placed along this axis towards a totally fantastical setting by deviating from our normality towards either high technology, in other words, fantastical, but both logical and understandable as an extension of currently understood science and technological progress; or high alienity, be it supernatural forces or alien worlds. In the latter case, the emphasis lies upon the occult, the unknown or the ineffable.

The first thing to note is that only one game is split between being both supernaturally and technologically fantastic at the outset: *Hellgate*. Although *Quake 4*, *Doom 3*, *Halo* and *Resurrection of Evil* also contain strong alien/supernatural themes, these titles open with an emphasis on the technological: *Quake 4* on the human side of the war, *Doom 3* on the Mars Base, *Resurrection of Evil* with the search for a signal, *Halo* on board the Pillar of Autumn.

Of the games analysed, only five present what is ostensibly, initially, a condition of recognisable, historically grounded normality. *Far Cry* opens in the south pacific on a remote island chain; *Return to Castle Wolfenstein's* first levels are a straightforward historical shooter set in Europe in the second World War. *Cthulhu* takes place in 1920s America (it very quickly introduces supernatural elements, but the opening presents what is a disturbing, but nonetheless normal world); *Prey* in a contemporary reservation bar and *Bioshock* on board a plane in the 1950s. These can be described these as 'realistic', and from this point of reference group and categorise the rest of the opening conditions according to their deviation from normality.

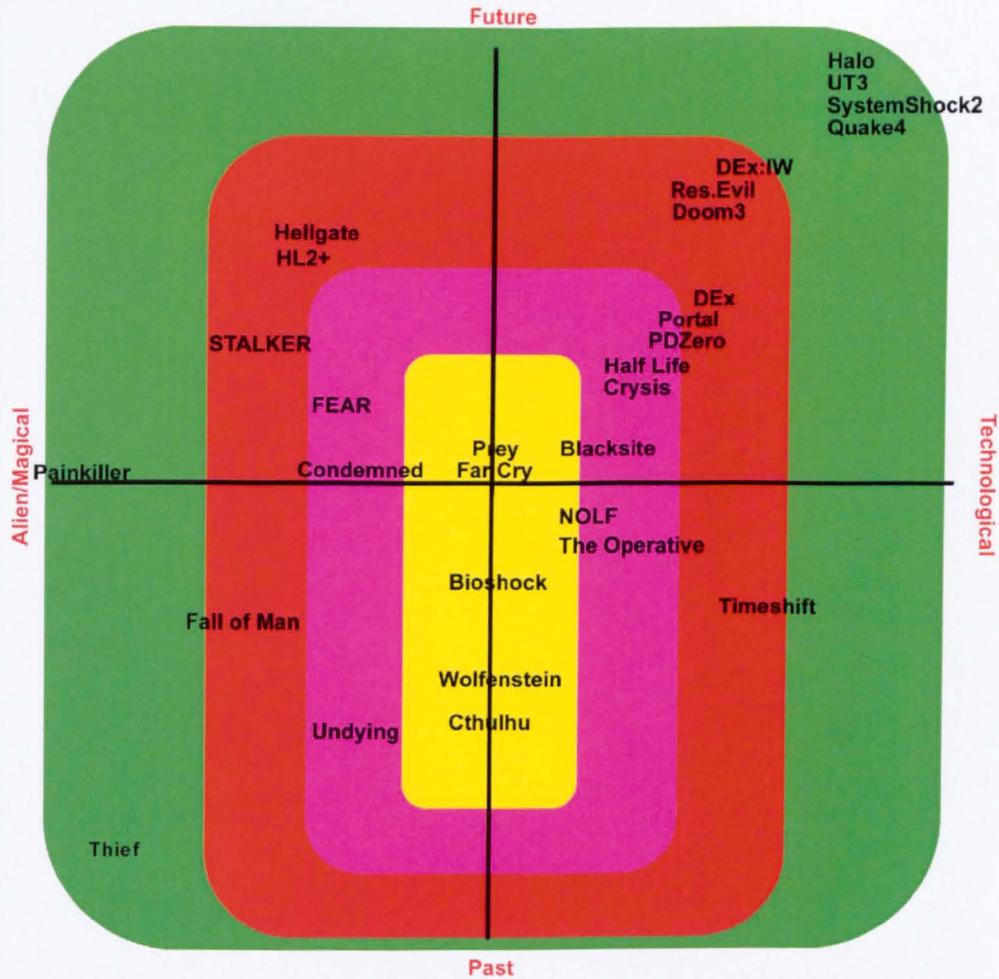


Fig 21. A map of the opening realities of the genre, grouped according to type

Fig 21. shows these groupings. In yellow are the *normal* realities. The next band out (magenta), can be categorised as *extended* realities; that is, games that are set in alternate but recognisable historical periods, current cultural reality, or near future. In these games, although there may be deep-rooted shifts in tightly defined aspects of the world, there is a clear and non-trivial basis in normal historical reality. *FE.A.R.*, for example, presents a world where the US government has been successfully experimenting with the paranormal, but bases this within a recognisable climate of corporatism, police procedures and loosely environmentally correct cityscapes. *Undying* may also spin an alternate history where sorcerers blasted each other with ethereal fire in the trenches of the Somme, but otherwise, it is 1920s Ireland as normal. *The Operative* (Monolith 2000) and *No-one Lives Forever* (Monolith 2002) posit a mildly fantastical James Bond take on 1960s espionage, allowing a more imaginative technological tool-kit than is historically possible; *Crysis* and *Blacksite* (Midway Games 2007) up the

technology available to the US military with nanosuits and genetic engineering but it is otherwise just the US military, going about its normal business. *Condemned* is situated in a contemporary US city, but from the outset, it is made clear that something unsettling is happening: things are not as they should be. Finally, *Half Life's* Black Mesa complex, for all its advanced science, is not placed either far into the future, or in an entirely novel world.

Further out are what can be defined as *transformed* realities. These are those worlds that are recognisably linked to normality, but have undergone transformations that have implications across the presented space. Whereas *F.E.A.R.*'s psychic soldiers are relatively self-contained and the rest of the world is a normal run of warehouses and offices, *Deus Ex* opens into a world ravaged by terrorism and plague, where bionics and nanoaugmentation are well established. It is still anchored in the world as it is, but the shifts to the general capabilities of its occupants is significant. *S.T.A.L.K.E.R.*'s Zone is populated by recognisable lowlives and misfits, toting recognisable, modern equipment and weapons, but they are placed into a world of anomalies, mutants and pseudoreligiously motivated civil war. In this grouping alien invasion and occupation are found. In the case of *Half Life 2*, *Fall of Man*, *Timeshift* and *Hellgate*, the world is a ruined version of its historical normality. *Portal*, *Perfect Dark Zero* and *Doom 3* are located in futures that are recognisable but are so significantly advanced in terms of technology to feel qualitatively different: they could be described them as future fictions rather than the more generic science fictions found in the extended reality set.

The final major category comprises of those titles set distinctly away from contemporary and historical reference: the Halo series, *Quake 4*, *System Shock 2*, *Deadly Shadows* and *Painkiller*. The first three are set far future, on alien or otherwise isolated worlds that do not require contemporary reference although they all still rely heavily on the presence of identifiable real-world markers to orientate action and the player. *Deadly Shadows* is set in a fully *fantastical* past, drawing upon well-established pseudo-medieval symbols and architecture (as presented through the filter of fantasy fiction such as Moorcock, Le Guinn or Eddings). Finally, in a space of its own is *Painkiller*, broadly set in a fully supernatural series of battlegrounds, the game opening with the death of the avatar and his subsequent existence in war-torn purgatory. Perhaps tellingly, this is the game with least in the way of plot, character, or other narrative features. Equally notable is the fact that even in these more fantastical settings, the initial world presented is often both recognisably human, and indeed, within the framework of the world, banal. *Doom 3* begins with a marine arriving at a working military base with control rooms, cafeterias, barracks and vending machines. *Halo*, though opening in the midst of a battle in an intergalactic war, gives the player time to orientate on board a human starship, again featuring identifiable environments such as mess halls and the like. Similarly, although the player is pitched directly into an environment already in a state of transformation in *System Shock 2*, both the overall layout of the world (Engineering, Medical, Operations, Recreation decks) and its

contents (Storerooms, Vending Machines, sofas and potted plants) provide a direct link to the everyday, the known.

Section 6.2. Transformations of initial conditions.

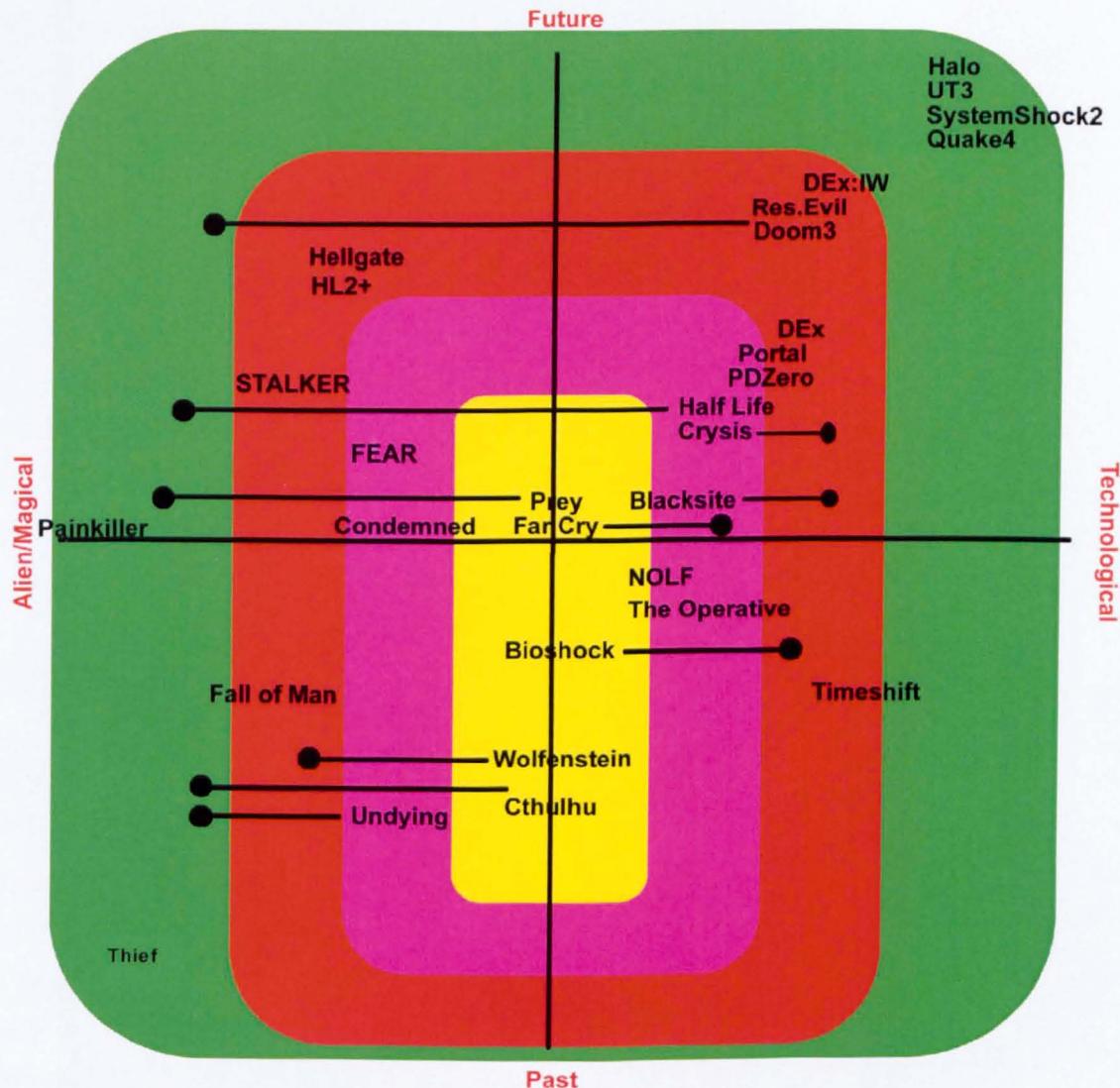


Fig 22. Moves from initial conditions to the main condition of the game

Initial conditions, for the most part, do not last, and the main action of FPS games tends to follow a shift from the relative normality of the opening to something further away from the centre point. As Fig 22 demonstrates, those realities that do not start extended, transformed or fantastical rapidly become so (this is to be distinguished

from the radical break that occurs towards the end of most FPS games and is discussed in Section 6.5). *Bioshock*, *Prey* and *Cthulhu* shift from normal to fantastic within the first level; *Return to Castle Wolfenstein* has made the transition into a transformed reality by mission 1, level 5. *Far Cry* takes a little longer, introducing the Trigens and thus extending the reality considerably in the fifth level, Research, about a quarter of the way through (although it should be noted that they are hinted at in the opening cutscene). From the extended reality category, *F.E.A.R.* progresses into a full-blown supernatural conspiracy thriller by the end of the first level; *Blacksite* wraps up the opening Iraq Section with the appearance of carnivorous alien beasts in a bunker complex that deviates substantially from historical accuracy; *Crysis* introduces its alien visitors in the first level; Patrick Galloway has visited the alien world of Oneiros before tackling any of the four major bosses in *Undying*; and Black Mesa is filled with aliens even before it starts physically manifesting signs of occupation (which really begins in the episode Blast Pit). Only *The Operative* and its sequel do not push reality further away from the point of origin or otherwise significantly change the opening reality (Fig 22).

For the most part, those titles beginning in a more fantastical or transformed world do not require the break away from normality typified by those with a more normal opening. What is interesting, therefore, is that no matter what the starting conditions of the game, it very quickly extends past normality into a transformed reality, unless it already is one. What needs consideration is firstly why these types of worlds can be found, and why they need to change so radically in the opening Sections of the games, especially given the ubiquity of this structure.

Turner (1969, 1974, 1982) writes extensively on the concept of the liminoid, that is, "any condition outside or on the periphery of everyday life", a ritual state of threshold. In liminoid phases, symbolic and performative actions, events and personae are ambiguous and shifting, enabling a transition between two distinct states. Luminoid phases are thus psycho-social realities in which normal rules are suspended and an artificial, reduced set are applied, through the application of which, the post-luminoid state is reached. Schieffelin's argument (1985) that a ritual consists not just of its symbolic content, but the establishment of a performative filter, an artificial set of supported behaviours, expectations and explanations should also be noted. Turner's concept of rituals as luminoid spaces, that is, transformative spaces that suspend normal social rules, constraints and affordances, has been co-opted by games theorists to describe the extra-daily structure of play (Dovey & Kennedy 2006, Flynn 2006, Pinchbeck 2006). Moreover, the abrupt transition from opening reality to transformed reality found in FPS games can be considered similarly, as should the fact that in those games where the transformation does not occur, normal reality has already been suspended prior to play. Consider *Halo*, which opens with the Pillar of Autumn blind-jumping into deep space, into the unknown, with the Master Chief starting in a state of suspended animation and woken into this unknown world. *Hellgate's* London is already twisted by the invasion of

Hell; *Half Life 2*'s City 17 is covered in the evidence of alien occupation; *Painkiller*'s opening premise is the death of the Garner and the war in heaven: a literal crossing from one normal world to another which is already in a state of conflict. *Quake 4* opens on the surface of an alien world; the Zone is already a hotbed of warping physics and mutation. In all of these cases, normality is disturbed.

Further, FPS games generally have a conclusion, from which may be inferred the existence of an exit condition which, cultural schema tells us, normally involves the righting of wrongs, or the transformation of the world. The playing of the game is the journey to this exit condition (see Section 9.5 for more discussion on plot resolutions). When book-ended with the suspension or destabilisation of normalcy, and given the fact that the only way to navigate through the gamespace is by highly codified, reduced behaviours, it is easy to argue for the conceptualisation of the action of the FPS game as that of a liminoid phase.

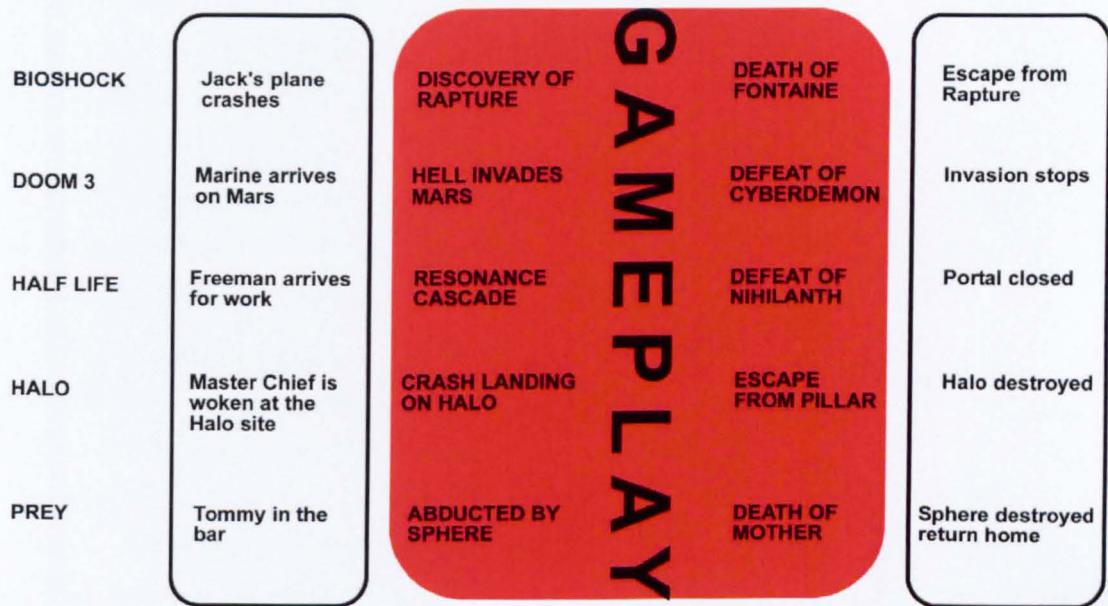


Fig 23. Gameplay and game content as a liminoid phase

Fig 23 illustrates this. On the left hand side is the opening normality. The crisis, initiating the liminoid phase follows, usually integrated in gameplay. At the other side, following the climax or final challenge of the game, the liminoid phase ends and either normality is restored, or a transformed but, crucially, a stable new reality is in place.

The liminoid state is chiefly characterised by detachment; it follows a process of separation from the existing state or rules. During the state, these normative rules are suspended and indeterminacy is paramount. Turner notes how liminoid personae in particular are ambiguous in personality, attitude and classification; how they occupy a lowly position within the system and are usually submissive to the embedded authority symbols and figures. This does not necessarily mean passivity, but more a state of malleability, a readiness to be inscribed with the rules and operating systems of the emerging end-state.

In simple terms, the combination of a degree of normality, in combination with extension or transformation (either prior to or during early play), sends a combination of messages to the player. Firstly, that 'real world' schema operate here: things function more or less as you would expect. This is not an insignificant piece of information; it establishes the basic rules and expectations of the game experience. This is followed very quickly, however, by the arrival of the liminoid state: things are not as they seem, or as you imagine. This is not normal, there are new rules at play, and these are not necessarily rules the player knows. In other words, to appropriate Juul once more, the fiction structures the rules and controls the player's expectations. Critically, the notion of a liminoid phase places the player in a highly specific relationship to the system, where some imported knowledge is assumed, but where the system defines the actual affordances according to a reduced set of functional behaviours. There is also a degree of justification for this reduced set of allowed actions inherent in the transition to liminoidity. The diegeses of FPS games justify the extraordinarily small range of options available to the player by placing their avatar in extraordinary times, and this extends to the types of behaviours that are allowed within the range. Even in the less fantastical games such as *Far Cry*, the avatar exists in a phase of extremes, where normal conduct is suspended. Thus, the violent, antisocial and even pathological acts committed by Jack Carver are, in a sense, justified by the unnatural situations they find themselves in, which stands in contrast to the options available to the player of *Grand Theft Auto: San Andreas* (Rockstar 2005). In a normal situation, Carver may not decide the only option is to go in all guns blazing but, of course, this is not a normal situation. Indeed, *Far Cry*, like many games, is set very deliberately in an isolated location aiding to this distinction from normality (Section 6.6). This distinction is made even more explicit in the more fantastic games in the genre, like *Doom 3* and *Painkiller*.

Section 6.3. Diegetic structures

Having argued that not only is there a limited range of types of reality presented in FPS games, and that all either open in a liminoid phase, or enter one shortly after play begins, it remains to consider the realities that are presented during the major part of play itself. This will lead to the issue of the radical break alluded to earlier as a

way of rounding off the total diegesis.

The overall settings of FPS worlds can be divided into two major categories. On one hand, there are those titles that deliberately separate the action into geographically distinct episodes. Of the thirty four games in the analysis, eleven have this structure; just over a third of the total number of titles. The remaining games all take place in either localised sites with clear definable boundaries, or larger settings that retain a strong, singular identity. Fig 24 illustrates this.

Distributed Structure	Bridging Structure
Discrete, geographically distinct play environments	Environments either contained, or linked by singular identity
Deus Ex	Half Life
Deus Ex: Invisible War	Undying
The Operative	System Shock 2
No-One Lives Forever	Doom 3
Halo	Far Cry
Halo 2	Half Life 2
Halo 3	Quake 4
Perfect Dark Zero	Thief: Deadly Shadows
Painkiller	Resurrection of Evil
Unreal Tournament 2	F.E.A.R.
Return to Castle Wolfenstein	Condemned
	Call of Cthulhu
	Prey
	HL2: Episode One
	S.T.A.L.K.E.R.
	Crysis
	Blacksite
	HL2: Episode Two
	Fall of Man
	Bioshock
	Hellgate
	Portal
	Timeshift

Fig 24. Distributed and Bridging diegetic structures.

The term *bridging* is proposed to draw attention to the conceptual flow from environment to environment. Although many of the games that use this structure are still episodic, and certainly most use load screens, the separate areas of play are assimilated within a singular geographical or conceptual structure. Thus, in *Cthulhu*, the action takes place around two geographical hubs: Innsmouth and, later, Devil's Reef. The transition between these two hubs is undertaken as the played level, A Dangerous Voyage. Likewise, *Fall of Man* takes place in

locations around the UK, but these are linked strongly together by visual appearance, architecture and the flow of the story from episode to episode. This can be contrasted with the transitions between *distributed* environments in *Deus Ex*: in the latter half of the game, Denton hops from the Vandenburg base to the Gas Station to the Underwater Labs to the Missile Silo to Area 51 on a level by level basis, undertaking discrete missions in each. *Perfect Dark Zero* is broken, very distinctly into chapters taking place in China, South America and Africa. Unlike a bridging structure, which defines the boundaries to action within the diegesis, a distributed structure does not clearly set the limits to where play may take the avatar, or conceptualise action as a journey of some sort (whether this is escape, as with *Portal*, or pursuit, as with *F.E.A.R.*). This is similar, but qualitatively different to the episodes of *Doom 3* and *Hellgate* set in Hell: these are either minor areas or radical breaks, on a completely different scale to the world hopping of *Deus Ex*. In other words, *Doom 3*'s marine diverts into Hell during the game before returning to the localised Mars Base, and *Hellgate*'s avatar makes occasional forays into Hell before returning to London, whereas in *Deus Ex* there is no sense of temporarily visiting a location before returning to the core environment. Radical breaks will be considered in Section 6.5. Finally, bridging structures do not necessarily mean smaller scaled diegeses: *Prey* is highly notable for its attempt to introduce a vast scale into its environment, but the Sphere nevertheless strongly links all environments within a singular aesthetic and conceptual frame.

It should also be noted that many of the global structured games belong to one of three franchises: *Halo*, *The Operative* and *Deus Ex*. If both lists are collapsed to include only one title per franchise, this splits the genre seven to nineteen, which retains the one third division of distributed structures. Some time should therefore be spent considering why the one structure should be favored, or rather what advantages it gives; particularly because it does not necessarily make the games any less episodic. Many include substantial temporal breaks for example: *Half Life 2* has a missing week; *Cthulhu* jumps backwards and forwards over a six month hiatus; *Quake 4* has an unquantified but significant gap when Kane is returned to command after Stroggification; and *Blacksite* has a three year break between the opening Iraq levels and the majority of the episodes set in Nevada.

In order to answer the question about the uneven occurrence of distributed and bridging structures, the initial distinction can be broken down further; first looking at how environments are related to one another and then considering how the environment maps against game levels and episodes. This will provoke a consideration of the environment as made up of a number of sets, and an investigation of the types of environments found in these sets²².

22 It should also be noted that there is no particular pattern evident between the titles that use distributed or bridging structures and initial-transformed realities (Section 6.1-2)

Section 6.4. Structural Relationships

The vast majority of FPS games are linear and mono-directional. The player can only move forwards within a relatively tightly defined corridor of action and cannot, once they cross the boundary of an environment or an episode, return to it. *Far Cry* and *Crysis* present very large environments, often termed sandboxes, giving scope for an apparently high degree of non-linear exploration, but each of these environments is still linked in this linear, monodirectional fashion. A smaller number are linear but re-use environments during the game, so players can return to the scenes of previous activity (*Deus Ex*, *Undying*, *Invisible War*, *Halo*). It should be noted, however, that although the environments are re-used, these remain linear and monodirectional; there is no choice made by the player to return to prior environments. Five titles allow free exploration of previous explored environments: *Deadly Shadows*, *S.T.A.L.K.E.R.*, *Hellgate*, *System Shock 2* and *Bioshock*. Of these, *Hellgate* operates by linking randomised environments to a series of centralised hubs – Covent Garden, Charing Cross and so on, and *Deadly Shadows* achieves a similar structure by anchoring discrete episodic environments (The Abyssmal Gale, Shaledale) to the more open, non-plot linked city environments. *System Shock 2* and *Bioshock* use a centralised device located at a single point in each environment that enables inter-environment movement: the elevator and bathysphere respectively. Finally, *S.T.A.L.K.E.R.*'s pseudo-rural setting allows the player to run freely between parts of the Zone, although, it does force a form of radical break by not allowing the player to return from the final Chernobyl NPP environment; this is a one-way trip. *Hellgate*, *S.T.A.L.K.E.R.* and *Deadly Shadows* all require backwards travel through previously explored environments as part of their gameplay structure. For *Bioshock* and *System Shock 2* it is optional, with the major attraction being revisiting store cupboards and upgrade dispensers.

All five of these games with bi-directional environment structures are found within the bridging group. Not only that, all are highly localised – that is, the environments are all linked within a single, well-defined world of a comparatively small scale. This may be because bi-directional environment structures *require* a certain type of environment set in order to enable these transitions in an acceptable way. In *Hellgate*, *S.T.A.L.K.E.R.* and *Deadly Shadows*, the protagonists simply run from one place to another, in real time (*Hellgate* also allows a technomagical relocation device to return to hub stations, but this is once again woven into the fabric of the presented reality). *System Shock 2* uses the highly prosaic device of a lift. *Bioshock*'s bathysphere is more fantastical, but is still firmly anchored within the world and not really any more extreme than jumping onto a tube train. In other words, transit between environments is feasible and, more to the point, realistic. Distributed environments and bi-directionality, whilst not contradicting each other, do not mix easily. Consider the implications for any of the games in the distributed set: JC Denton, having run out of ammunition in Paris, leaps aboard Jock's helicopter (cutscene) and flies to Liberty Island where, having filled up with supplies, he hops back on board (cutscene) and

returns to the fray. Joanna Dark, suddenly realising that the computer files she needs were on that terminal in Hong Kong travels half way around the world and back to South America to remind herself what she is supposed to be doing. An even more extreme example would be the Master chief having the option of returning to Cairo Station from Delta Halo.

What this means, in real terms, is that types of gameplay require types of environment structures and relationships and, further, that certain types of diegesis are particularly supportive of certain types of gameplay. In one sense, this alone counters the argument that story is simply extraneous wrapping, as it demonstrates that there is at the least a hierarchical relationship of need-and-provision occurring. It also begins to demonstrate why distributed structures are less common – they limit the type of gameplay that can be anchored within them diegetically. On the other hand, what they do enable is quite radical visual shifts between environments in the game without requiring buffer zones or singularity at the conceptual level of the environment set: South America can be qualitatively different from Africa without any problem. Unlike bridging levels which demand a conceptual relationship, a continuity between environments, distributed environment settings can literally be worlds apart. This is a powerful tool for games to create a sense of diversity in the gameplay experience.

Monodirectional structures, however, mean that the player must never want (as opposed to need) to return to a previous environment. This too has implications for both gameplay and story. To begin with, an entirely different playing style is implied by this structure and this must be supported. If an environment, once traversed, is permanently removed from play, then it is imperative that the player has initiated all the correct affordance relationships within it. In other words, a funneling or bottlenecking model, leading to the classic string-of-pearls (remembering that options for activity are being discussed here, rather than narrative) structure for how the environments are formed is necessitated. Indeed, this is usually the case, with single exit conditions being required to move from one episode to another. Bi-directional structures are free from this constraint and as a result have the capacity to separate game progression from environmental progression in significant ways. For example, the C-Consciousness endings of *S.T.A.L.K.E.R.* require the player to revisit previous environments, whereas older environments are a useful resource for *Hellgate* players as their stock of items is generated each time the environment loads. Using story to loop the player back through an already explored environment means the total number of environments can be reduced or, alternatively, this can be considered to be a means by which the simplifying trend of play is momentarily halted or reversed. Unidirectional environment relationships can take advantage of this economy too: *Halo* famously runs the entire Assault on the Control Room level backwards; *Crysis*, following the flash freeze at the research dome, makes the player backtrack through a significant amount of the environment they have fought through to get there in the first place. *Deus Ex* sends the player back to

Hell's Kitchen on three separate occasions, each time with relatively minor adjustments to the environment but with a new set of diegetic structures overlaid upon it. This is not just about an economy of production, although this in itself makes re-use of environments highly attractive, but it may serve to ground the player in the diegesis. After all, if the purpose of a diverse environment set, bridging or distributed, is partially to draw the player's attention away from the fact that they are essentially doing exactly the same thing in each environment, then a controlled burst of recognised repetition is a powerful device.

It is pertinent to also consider the relationship between environments and episodes as a means of illustrating the patterns of environmental structures found in the genre. Here, three basic models may be described; firstly, those structures where environments and episodes are synchronised; secondly, those where environments contain multiple episodes; and thirdly, those where episodes contain multiple environments. In order to make this distinction, an environment needs to be defined with a little more precision. For the purposes of this argument, an environment is a collection of objects in the set that function as a singular conceptual entity, containing a significant number of gameplay affordances or having a temporal span that constitutes a significant amount of overall gameplay. Accordingly, this definition, which contains an inescapable degree of interpretation, operates, generally speaking, above the level of individual buildings, but below the level of complexes. A few examples of environments may help to ring-fence the scale of the concept.

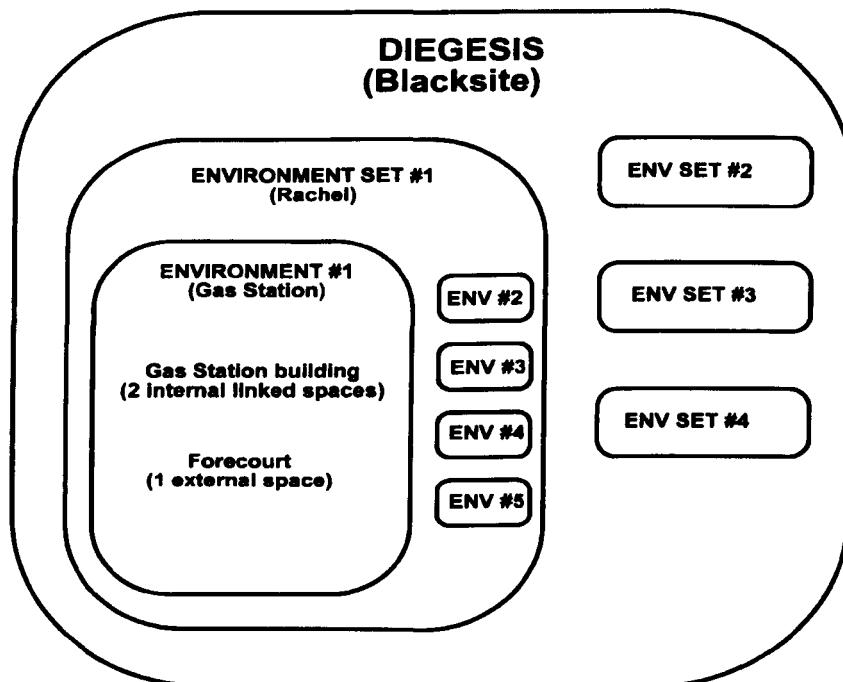


Fig 25. Breakdown of Blacksite into environment sets and environments.

Firstly, consider *Blacksite*. Within the town of Rachel, there are four very distinct environments. The first includes the gas station and its approach, the second a square surrounded by shops. These are directly connected. Following a brief *buffer zone* of alleyways, there is a third, the courthouse, with a small exterior and more substantial interior, including a very short rooftop sequence. This is followed by a series of backyards and suburban streets (the fourth), then a trailer park (five) and finally the drive-in movie theatre (six). Note that the individual backyards do not, in isolation, qualify as environments. Neither is the whole of Rachel described as a single environment as there is clear diversity and division between each of these; rather, the entire town can be described as a single *environment set* as it contains environments that whilst distinct from one another are conceptually singular compared to other environments elsewhere in the game.

Likewise, there are three distinct environments in *The Operative's* Berlin sequence: the nightclub, the warehouses leading to Doctor Schenker's offices and the offices themselves. These belong in the environment set of Germany, which also contains very distinct sequences in Hamburg, Frankfurt and Bremen but are, as a group, more distinct from the environments based within America, the Alps or on board the freighter (both afloat and submerged). Within the second environment, Frankfurt, a multitude of individual warehouses, yards and an office are found, but these comprise small sequences and can thus be treated as a collection of objects, each with its gameplay affordances.

It can be difficult, especially in less episodic games with large or sandbox environments to offer a total count of all the different environments presented. For example, although it is easy to distinguish the X16 lab complex from the exterior of Yantar in *S.T.A.L.K.E.R.*, it is altogether another matter separating the research complex found in the *Crysis* episode Relic from the rest of the vast level. Therefore, smaller environments are grouped here to provide a more manageable set. An environment set is defined as comprising those environments which are either accessible within a non-linear area without recourse to substantial travel either by cutscene or vehicle sequences or can be differentiated by a visual or conceptual singularity that marks them apart from surrounding environment sets. In some games, the episodic structure of gameplay acts as a powerful differentiating device; for example *Half Life* comprises of seventeen episodes, each containing a small number of environments linked by nonheterodiegetic loadscreens (the word 'loading' appears on the screen and the action freezes, but there is no cut away). These map relatively well onto the environments presented by the game, which usually form discrete areas bordered by generic passageways, ventilation ducts and pipes offering a more generalised, fuzzy area of transition between each one. However, what is interesting is that not only are multiple but distinct environments found in single play episodes (for example, the episode On a Rail includes both the underground transit system and the missile silo) but environments span multiple episodes and the environments are staggered across episode

boundaries.

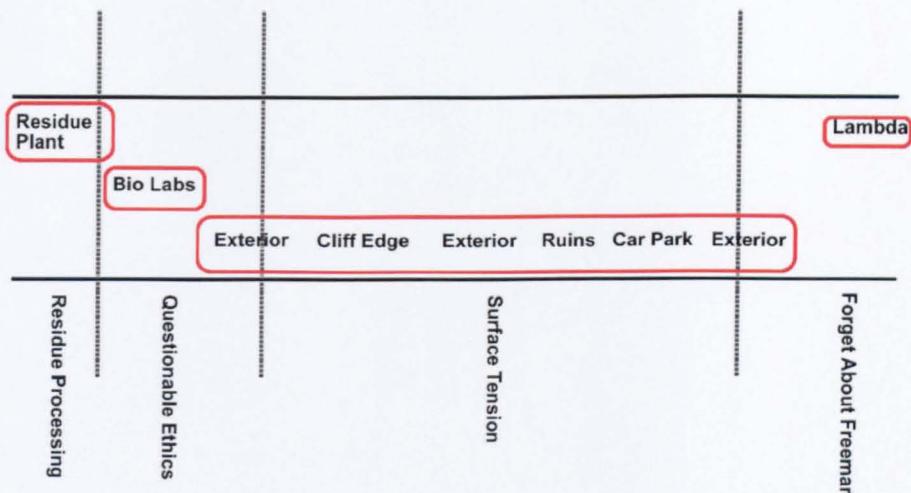


Fig 26. Episode and environment set mapping in Half Life

Fig 26 illustrates this. The episode Residue Processing takes place fully in the Residue Plant environment set. The following episode, however, spans two sets: the majority takes place in the Bio Labs set but the last Sections cross over into the Exterior set. This large set is used then for the whole of Surface Tension, but also introduces the next episode Forget About Freeman, which then moves on to the Lambda complex set. The Exterior set contains a number of environments, including the cliff edge, several above ground ruins and a car park, which vary in size (the car park is comparatively small), with a greater distinction to them than the BioLabs, which can be broken down into 3 areas: the lead-up to central atrium, the lower floor and the upper floor.

Further, some of these environments are actually very small, often used simply as a neutral transition, or *buffer zones*, between environments. It would not be useful to describe the tens of air ventilation duct transit Sections as separate environments to themselves although they can be distinguished from environmental objects such as the many small buildings buildings dotted around The Zone, or the albeit impressive cavernous machineries that litter the Sphere. A hierarchy can thus be proposed in relation to worlds:

Category	Example in Half Life	Example in Portal	Example in Crysis	Generic
Object	Pumping Room	Incinerator Room	Research Dome	Room
Buffer Zone	Ventilation Duct	Linking Corridor	Jungle Path	Corridor
Environment	Control Rooms	Test Chamber	Research Complex	Room
Environment Set	Blast Pit Complex	All the Test Chambers	Plateau	Street
World	Black Mesa	Aperture Science Centre	Lingshan Islands	City

Fig 27. Hierarchy of environmental objects in FPS games

This can be mapped across to different overall ludic progression structures. Before this is done, it is necessary to define what is meant by an episode. Every game in the analysis has clear divisions between gameplay episodes: artificial and visible thresholds that demarcate one set of sequences and activity from another. This is frequently synchronised with loadscreens; as the system loads in a new environment, there is a forced break, often accompanied by some form of visual or textual information about the environment to come (fig 32). Alternately, the information presented may re-affirm the goals of this particular episode (fig 33), provide general information about the game world (fig 34) or heterodiegetic information (fig 35).

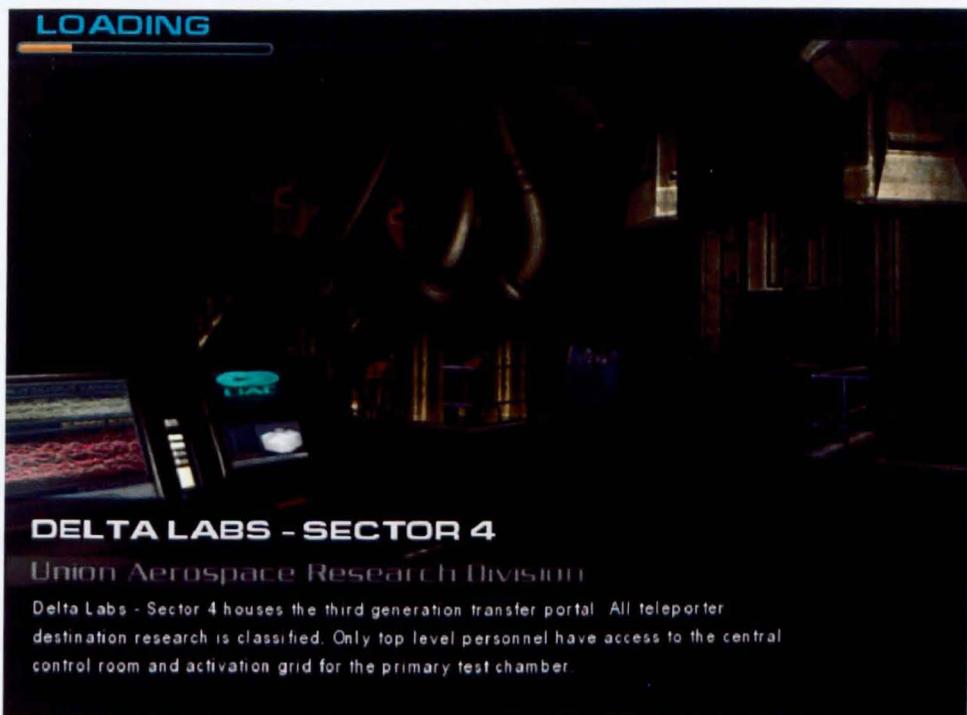


Fig 28. Doom 3 loadscreens with environment specific information

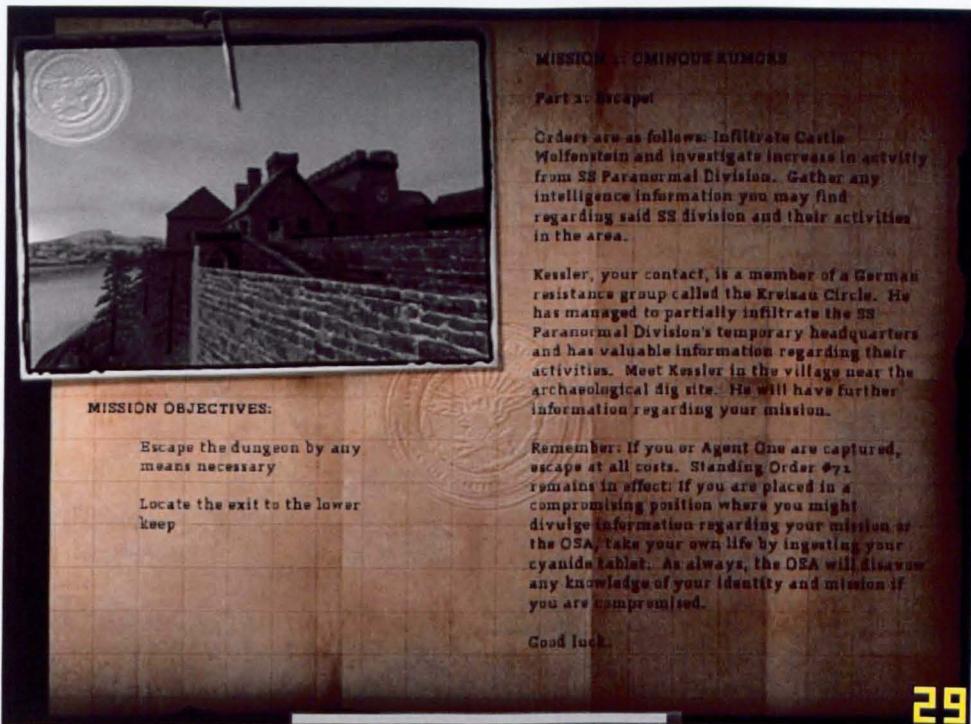


Fig 29. Wolfenstein loadscreen with goal information



Fig 30. Invisible War loadscreen with general information about the world

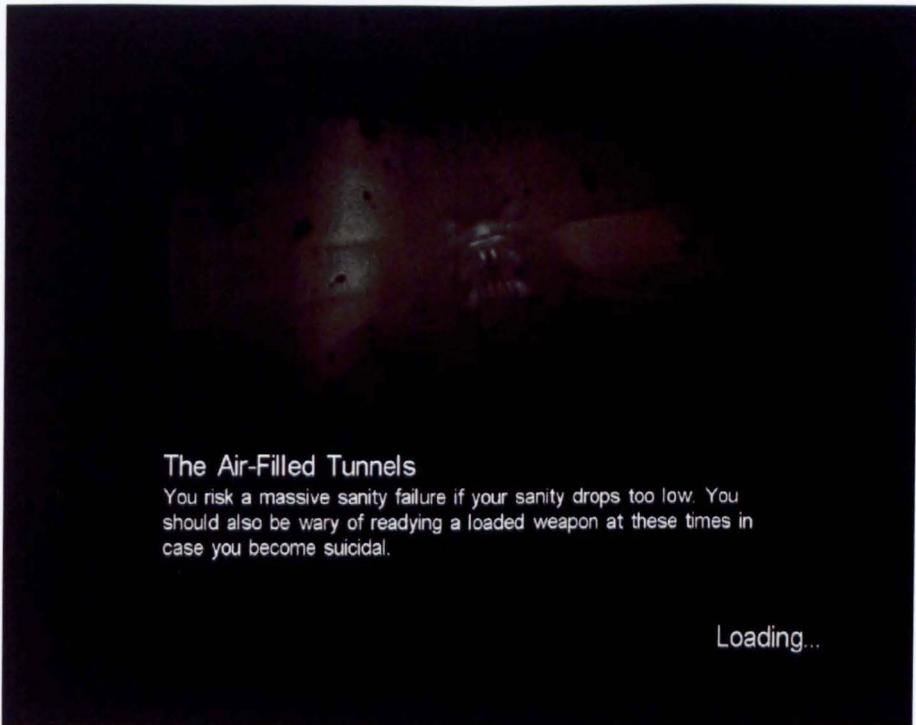


Fig 31. Call of Cthulhu loadscreen with heterodiegetic game information

Other games split episode thresholds from environments explicitly and, whilst effectively serving the same system purpose (loading in new environments) group together sequences within titled episodes based on action or plot. Rather than *Doom 3*'s Mars City, UAC Administration and Delta Labs, *Prey* does not distinguish parts of the sphere by name, but splits the action into titled episodes like Guiding Lights, All Fall Down and The Dark Harvest. Finally, some games title episodes even though they are linked directly to environments, such as *The Operative*. However, in these cases, the link to environment is deemed to be the primary factor. The breakdown across the genre is as follows:

Episodes are linked to environments	Episodes are distinct from environment
System Shock 2 2 Deus Ex The Operative Wolfenstein No-one Lives Forever Undying Doom 3 Invisible Wat Quake 4 Deadly Shadows Painkiller Resurrection of Evil Perfect Dark Zero Condemned S.T.A.L.K.E.R. Fall of Man Bioshock Unreal Tournament 3 Hellgate	Half Life series Halo series Far Cry F.E.A.R. Crysis Blacksite Prey Call of Cthulhu Timeshift

Fig 32. Episode / Environment relationship

It is probably not surprising to find the genre tends towards environmentally linked episodes, as these form natural breaks in the gameplay. It should be also noted that non-environmentally linked games include two major franchises (Halo and Half Life) and both Crytek games (*Far Cry* and *Crysis*) which are conceptually very similar. With the exception, interestingly, of Halo, all the distributed games use an explicit link between episode and environment.

Episodes are thus defined as an explicit point in gameplay where the transition from one sequence of activity to another is signaled by the game. Although *Half Life's* episode titles and environments are sometimes asynchronous, the very fact of a title appearing on screen is an unambiguous message to the player: a part of the game has concluded and another part is starting. A further distinction can thus be made between titles in the first group, by noting where episodic structure, although occurring at points of environmental transition, does not occur at every environmental transition. So, for example, *Condemned's* episodes are linked to new environments, but not every new environment. Instead, the major episodes in *Condemned* enclose several distinct environments, but at the boundaries of environment sets. The genre can be grouped according to these divisions, firstly in relation to individual environments, and then in relation to environment sets (Appendix A).

What is immediately striking is that most FPS games break down comfortably into between 7 and 11

environment sets, noting that these sometimes contain quite distinct environments with a singular conceptual link (such as the final US levels of *Deus Ex*). This is suggestive of a generalised structure of games in the genre and may serve an epistemological purpose in signaling to the player roughly how far through the game they are or, at the least, reinforcing the plot indicators of the same information. In other words, a bridging structure normally leads fairly explicitly towards a predetermined location – the player knows where they are going. From *Half Life's* Lambda Labs to *S.T.A.L.K.E.R.*'s Chernobyl NPP, the climax of the game is geographically located and the player is aware of this; even if, as is the case with *Half Life* and others, this may be a false climax. Thus, by embedding particular locations along the bridge, the player can recognise their position along the game's arc. This directly linked to plot sub-climaxes, which are again discussed in Section 9.4., and in a very real sense, the environments are required to support these orientating sub-climaxes. Consider some examples:

Bioshock's mid-point climax occurs with the murder of Andrew Ryan and the discovery of the player's identity (although, as with most games, this actually occurs nearer to two-thirds or three-quarters of the way through). This is preceded environmentally by the Hephaestus complex, which is architecturally distinct from the areas visited by the player before. This distinction increases the environmental complexity, supporting the proximity of the player to Ryan by signaling a visual shift in the experience (this is not to underplay the fact that the goal structure at this point is an explicit search for components to open Ryan's office – but it should also be noted that this is combined with the player fundamentally altering the diegesis, by turning off the reactor core of Rapture).

Likewise, *Quake 4*'s sub-climax (the first fight with the Makron) and its plot hinge (Kane's Stroggification) is preceded by the Nexus Hub, visually and architecturally very different to its predecessors. *System Shock 2* uses the transition pods between the Von Braun and the Rickenbacker to signal an acceleration towards the plot's resolution; *F.E.A.R.* shifts from warehouse and offices to a distinct derelict urban space; *Crysis* uses the radically different environment of the alien ship to support the game's reinvention mid-point; *Fall of Man* uses the Cheshire Gorge followed by the tunnels – an environment not experienced before - to achieve the same purpose.

What is important is that it is not simply a matter of environmental diversity: with the exception of titles such as *Doom 3*, *Fall of Man*, *Far Cry* and *Crysis*, most shooters are careful to provide highly distinct levels to keep things interesting. Indeed, distributed structures are probably the most explicit version of this: by locating the action at geographically remote points with cutscene transitions, diversity is easy to achieve without worrying about whether such environments flow naturally and intuitively into one another. Environments are used to signal to the player their relative progression through the game: a highly distinct environment, without any supporting

plot delivery, still indicates that something is happening and this gives clues as to where the player is located along the arc of play. The most explicit variation on this is the radical break.

Section 6.5. Environment Characteristics: Radical Breaks

A large number of shooters use a dramatic shift in the environment towards the climax of the game: this is distinct from mid-point environment shifts, as there is no reversion to recognisable previous environment types. This is sometimes attached to a specific gameplay device, or shift in parameters.

For example, *Bioshock* reverts, after the Ryan mid-point climax, to recognisable Rapture environments in Olympus Heights and Apollo Square. This is accompanied by a temporary parameter shift – the player loses the ability to select plasmids. However, once reaching the Proving Grounds a second gameplay shift occurs, the transformation of Jack into a Big Daddy and the new mission type of protecting Little Sisters. It should be noted that these are simply diegetic wrappings around pre-existing goal structures: collect multiple items (already carried out in the Arcadia levels) and protect the NPC (not used previously in *Bioshock* but a common FPS goal). However, in this instance, the environment does not really change radically in itself.

This can be compared to *Half Life*, which uses the transition of Freeman to Xen as a radical environmental transformation with accompanying gameplay shifts. Firstly, gravity is altered profoundly in the Xen levels; secondly, Vortiguants will not target the player unless they are fired on, prompting a shift to gameplay tactics, which forces the player to literally think more carefully about their behaviour and thus pay attention to the environment. Together with the new gravity, this increases the environments significance, meaning the player has to attend to gameplay, in effect, re-focusing them on the game. Finally, the Xen levels contain not just the final boss, Nihilanth, but a sub-boss, Gonarch, again indicating that the end of the game is in sight. F.E.A.R.'s final lab complexes are visually quite distinct; *Return to Castle Wolfenstein* returns to a very different version of the castle the game began in; *S.T.A.L.K.E.R.* places the player in the near pitch-black of the Chernobyl NPP; *Crysis* follows a completely new sequence of gameplay in the VTOL Section with a new environment type (the aircraft carrier); *Far Cry*'s volcano adds a completely new colour to the environment in its lava flows; *Painkiller*'s hell offers a landscape frozen in mid-destruction and new rendering of agents; *Fall of Man*, after the precursory environmental shift of frozen London moves into the alien architecture of the Chimeran tower; *Invisible War* has both a mid-point signal shift in the Antarctica labs (and dream sequence) and a radical break in the return to the destroyed Liberty Island (the opening Section of the previous game, a clear indication that resolution is on its way); *Doom 3* has a mid-point shift with a small Hell level and returns at the climax; *Quake 4* returns to a new

variation of the mid-point Nexus architecture; *Cthulhu* moves from human architecture to the city of the Deep Ones; Condemned moves away from urban decay to a rural setting; *Blacksite* moves from above ground to an underground lab complex, and so on.

Radical breaks are important because they are a clear case of the interweaving of the diegetic environment and gameplay: they are signaling devices about the progress of the player though the game, as much as they are about any superficial visual shifts or diversification devices. Together with what has already been noted about environment sets, it can be argued how the structure and arrangement of the total set of environmental sets serves a powerful orientating purpose. However, it should also be noted that radical breaks become noticeably *less* radical as the overall scale of the diegesis expands (see Section 6.7); in games that are more highly localised, the breaks tend to be truly radical (*Hell*, *Xen*) as opposed to extensions of the world (*Chernobyl NPP*, *Apple Orchard*). *Bioshock* is something of an exception here: it is highly localised, but rather than a true radical break, it relies heavily on narrative progression to shift gameplay. This is discussed in more detail in Section 9.3.

At a local level, within each episode, the core structural dynamic of FPS play can be found: the simplification of the environment as play progresses (Section 2.6). The simplification of the environment is a feedback device, it tells the player how far through the Section they are. The common synchronisation of environment set and episode continues to remove any ambiguity about the player's position relative to this Section of play.

In other words, supporting the microfeedback level of moving and combat is the core ludic structure of simplification. Above this is synchronisation that lets the player know where they are relative to the boundary between episodes, and above this, common devices can be identified, such as the mid-point shift and the radical break. These supplement the normal number of environmental sets and episodes to let the player know how far through the whole game they are. Bridging structures, which can establish from the beginning a geographical end point to the game – Delta Labs, Lambda Labs, Chernobyl NPP, Area 51, the Armachan Facility, etc - are naturally more robust and effective ways of establishing this orientation structure (even though the target location is frequently the *Portal* to the radical break, rather than the conclusion itself). It is simply more difficult to signal the player's position through the game using a distributed structure, as there is inherently less continuity between environmental sets. Instead, many distributed games opt for a narrowing or linearisation of the environments themselves, or by changing the internal structure of the environment set. *Deus Ex* is a good example of this: in the earlier New York and Hong Kong sets, the player moves freely backwards and forwards through environments within each set. By Paris, this free movement has ceased and the player is running in a purely monodirectional manner, with no re-use of environments. At the same time, continuity between environments reduces, so when

the US Sections start, the player hops between a number of environments very quickly (Vanderburg labs, Gas Station, Underwater Labs and Missile Silo). This would seem to be a good example of the use of environmental structuring to increase tension, especially as, once the player hits Area 51 and play reverts to the more open environmental exploration of the early part of the game, there is a clear indication of climax. It is perhaps telling that, of the games using a distributed structure, both *Undying* and *Return to Castle Wolfenstein* settle structurally into longer bridging Sections as they move into their second halves.

Section 6.6. Environment Characteristics: Localisation

Having noted that the structural formation of worlds actually serves a distinct orientation function, the types of reality presented in Sections 6.1 and 6.2 should be returned to, questioning why the particular environments should be found in the genre. At one level, any FPS diegesis must, of course, support the central action of gameplay; that is, they must be environments where combat can occur and the types of affordances, including object-based parameter shifts required to support all other aspects of gameplay can be located without disrupting the ludodiegesis. In other words, the environments must do certain things. They must enable movement and perception, and allow these both to be channeled by design. They must be conducive to bursts of action and they must be spaces where finding ammunition, health kits and other essential FPS items is not hugely unlikely. That is not to say, of course, that there cannot be a juxtaposition between the world and gameplay, as has already been noted in the discussion on the transformation of reality. Further, the types of structural relationships illustrated in the previous Section also constrain the diegetic characteristics of game worlds. Whereas a distributed structure allows for highly separated environment sets, bridging structures which, although advantageous from a functional perspective, require continuity, which, in turn, dictate some of the boundaries impinging on diegetic content.

Thus, the majority of FPS worlds are enclosed, or isolated spaces; whether this be a remote island chain (*Far Cry*, *Undying*), a distant starship (*System Shock 2*, *Halo*), a secret research facility (*Half Life*, *Doom 3*) or an infernal realm (*Painkiller*). In fact, relatively few attempt to create the impression of a wider city (*F.E.A.R.*, *Deus Ex* series, *Half Life 2* series, *Fall of Man*) and only *Quake 4* attempts to give the original conditions a global scale – though even here, situating the game on the Strogg's homeworld isolates it from normality. In addition to themes of conflict or invasion that are commonplace, this isolation allows the diegesis to progress in a controlled way; that is, its ramifications can be localised. This has links back to the discussion on the liminoid in Section 6.2. This is not to suggest a lack of diegetic, as opposed to ludic, scale in the environments however. Regardless of the localisation of the situated action, a substantial number of titles (*Deus Ex* series, *Half Life 2* series, *Quake 4*, *Halo*

series, *No-one Lives Forever*, *Fall of Man*) explicitly infer a substantially wider virtual setting for the action than is represented by the game system. Whilst *Doom 3*, for example, is highly local, limiting its initial world to the Mars Base, *Halo* situates the Pillar of Autumn's opening action within an interstellar frame of reference. Likewise, *F.E.A.R.* and *Condemned* open locally, implicitly situated within contemporary cities, whereas *Deus Ex*, in contrast, opens with a local instance of an explicitly referenced global crisis.

Once again, a number of conclusions can be drawn from this. With even a basic knowledge of the pragmatics of game engines, it is evident that large environments are difficult to handle. It is really only *Crysis* and *S.T.A.L.K.E.R.* that offer actual sandbox levels, in all other cases (such as *Halo*), large environments are actually highly linear. Localised conditions allow tight control over necessary information, but this requires management in diegetic and epistemological terms. The symbolic content of the original conditions therefore operates to legitimise the necessary system and ludic constraints. Isolation reduces options, particularly when the game is established in either a remote or altered version of reality and the vast majority of these options can be legitimately cut away. Thus, *Far Cry*'s opening level occurs on a highly remote island, with Jack Carver swimming ashore after his boat is struck by a missile. In this location, there is no civilisation to offer any option of alternate escape, enabling the game to legitimately draw the player almost instantly into its plot. *Doom 3* limits the player's exploratory options to the Mars Bars by literally stranding them on a world where to go outside means death. *Prey* begins in a toilet.

Localisation reduces the need for affordances; the virtual expansion of the world beyond the play space deepens the affective potential of the experience and, importantly, allows the small actions of play to be situated within a much wider context. The opening level of *Halo* may essentially just comprise of repetitively engaging Covenant forces within featureless identical corridors, but this small action is understood in the context of a desperate escape from a starship in the midst of an intergalactic war and the landing on an alien artifact by the doomed crew. Significance is thus attached to the looping sequences of action. A similar tactic is used in *Deus Ex*, where the initial conditions of repelling a terrorist attack deepens the small actions of sneaking and shooting. This virtual expansion of world beyond the accessible subsets of environments and actions that make up gameplay is not limited to opening environments and sequences: *Quake 4* extensively uses this device, reinforcing the message that the player is a just a cog in a vast military campaign, albeit an increasingly important one. This is made explicitly clear when Kane, helplessly undergoing Stroggification, is actually rescued by his NPC squad. Expanding the context for play functions as a significance management device, giving meaning to gameplay. *Doom 3* is an interesting example of where this process breaks down. After early levels are significantly populated with narrative devices, the mid-phases of the game have no sense of context, rendering the action taken by the

player both repetitive and, perhaps more importantly, relatively meaningless. The environment ceases to function in terms of its ludic reality, and gameplay is stripped of depth.

Halo, in contrast, is dramatically short on non-critical multi-state objects, but what it does has, in spades, is scale. Whereas *Doom 3*'s environments have little diversity; not just in terms of symbolic content, but variation in perspective, size, lighting and colour, *Halo* drifts between very large and relatively small spaces throughout the experience. By including vehicles in the gameplay, these large spaces are available to explore in a manner of different ways and, crucially, according to different temporal and spatial perspectives. The scale of *Halo*'s environments also enables the local action to be situated in a much wider context, virtually expanding the diegesis beyond actual play. In other words, *Doom 3* is reduced to empty corridors and dysfunctional technologies. There is no space for action outside the immediate, and when there is a goal-related reference to exterior activities (to stop a rescue mission from arriving at the base and being slaughtered), it is only cursorily introduced and never expanded upon. Not only do Master Chief's actions, by contrast, appear to affect a much wider world, but he is forced to respond to actions carried out by others elsewhere. He is not, for example, responsible for the release of the Flood, though he is for the initiation of the Halo weapon. For this to occur, not only is environmental diversity required to infer the virtual construction of a substantial, meaningful and causal wider world, but the environments themselves need to contain the potential for this expansion to take place. In other words, although self-containment is a powerful tool, it is relatively unrealistic. Given the imported schema of human and technological capabilities, virtual expansion heads off what might be described as the "call for help" reflex, by positioning non-ludic structures and devices in place to divert attention from, or otherwise manage, obvious choices for action not contained within the limited affordance set of the player. *F.E.A.R.*, albeit a little clumsily, uses the device of the player being out of radio contact early on, setting up a lack of ability on the avatar's part of initiating communication (other games force a distance between player and avatar as a means of controlling the same thing, as discussed in Section 8.2).

Section 6.7. Environment Characteristics: Scale of environments

In Section 4.3, Lakoff & Johnson's primary metaphor theory was introduced, and it is interesting to return to it in the context of *Halo*'s Forerunner ruins. The essence of their theory is that the majority of cognitive architecture – at least, conscious understanding of experience – is constructed from a limited number of base understandings, or primary metaphors drawn from kinaesthetic, embodied experience. Thus, time, an abstract experiential property, is conceptualised through the embodied filter of space. In other words, understanding of time comes from the understanding of a conscious entity's body changing in relation to an environment. It can

be extrapolated from this that scale infers time: it simply takes a longer period of time to cross a large space than a small one and this may extend to visual understanding of static architectures. That is not to say that a small camp, jerry-built from abandoned shells and temporary material, of the type found repeatedly in *S.T.A.L.K.E.R.* feels temporary and swiftly thrown-up as a result primarily of its scale (the materials and visual appearance also contribute). However, there is a simple underlying understanding to an appreciation of architecture: large, complex structures take more time (and resources) to construct. A lone Stalker may be able to cobble together a temporary shelter in a few hours, but it takes an extensive period of time, planning and workforce to build a Mars Bars, a Detention Centre or a Halo. Thus, the fact that the human and Covenant agents of Halo are dwarfed by the structures they are fighting in expands the importance of ludic action whilst suggesting it is tiny in comparison to the extended universe of the Forerunner's concerns. The sheer scale sets the Forerunner apart from humans and Covenants: they are titans. This is allied to the recognizably megalithic flavour of the constructions; both the size and feel of the architecture belongs to an earlier epoch. This stands in direct contrast to *System Shock 2*, *F.E.A.R.*, *Half Life* or *Condemned*'s small-scale, very human, banalities such as coffee machines, offices and living rooms.

There is an even more direct impact of scale upon play. Time to think, literally. Small spaces shorten reaction times and increase tension, as the field in which activity can occur is reduced. Thus, in games such as *Doom 3* or *Condemned*, anything occurring that is likely to impact upon the avatar is going to happen fast and up close. *Doom 3* does not give the player the chance of considering their options as a result of seeing a threat at a distance. Low light levels are, of course, used to reduce this field, what might be described as the *tactical option zone* even further. By contrast, *Crysis*, *S.T.A.L.K.E.R.*, *Far Cry*, plus the Halo and *Deus Ex* series both include a greater amount of outdoor space, increasing the tactical option zone, enabling a greater time to be taken when appraising a situation and slowing down play. In fact, most titles in the analysis keep the affective experience of play interesting by manipulating this scale. By increasing and decreasing the tactical option zone, primarily by controlling it with the scale of environments on offer, in turn usually mediated by the architecture presented, the game retains a core set of gameplay activities and affordances whilst layering an entirely alternate experiential dynamic across the top.

Far Cry remains perhaps the master of this, shifting backwards and forwards between substantial open spaces (taking full advantage of the engine's 1.5km draw distance) and tiny, cramped corridors. The setting of a tropical peninsula thus capitalises on the draw by enabling the tactical option zone to extend beyond the scope of the ludically available space. In the Boat level, the player clears an island at a time, developing their approach through long-distance observation from one to another. Embedded within the islands are a number of hostile camps

(Steam and Treehouse are others levels which makes extensive use of this), so small scale, low response time sequences are dropped into slower, more tactical sequences. In this way, the temporal manipulation of approach to play is dynamically and more subtly adjusted than *Halo*'s 'it's either inside or it's outside' design, or *F.E.A.R.* or *Doom 3*'s more or less unscaled environments.

Doom 3 is an interesting case in considering the impact of scale on gameplay. It features only a few exterior sequences, when any sense of large scale is imposed on the game but, tellingly, these are both very short, and placed under additional temporal pressure. The player, when outside, is on an oxygen countdown and must not only engage with enemies, but is forced to keep moving quickly from one air canister to the next, all the time seeking out the airlock to get back inside again. In itself, this sets up an interesting dynamic. The relief of being outside tiny, dark tunnels is undercut almost immediately, potentially ramping the panic reflex up further yet it does mean that the game risks failing to capitalise on the opportunity to adjust gameplay parameters and provide a break from the narrow affective and behavioural corridor it demands elsewhere. *Quake 4*, although in principal as well as look very similar to *Doom 3*, makes much better use of the purely external bridging sequences: Canyon, Aqueducts and Construction Zone. Not only does it switch to vehicles, changing the pace and power of the interactions the player has, but it allows a draw distance to be faked. *Quake 4* has only a limited capacity for self-selected strategy and long distance engagement (or observation) but it achieves a sense of gameplay diversity by increasing the scale of everything it presents: the avatar (to a tank); the hostile agents (to Heavy Hover Tanks, Convoy's and Harvesters); and the world itself (now running through giant causeways and through buildings in a matter of seconds, rather than lasting whole levels). It should be noted that this is illusory. Unlike *Far Cry*, the actual speed of play remains more or less constant. To an extent, this is also the case with the *Halo* series (with perhaps the New Mombassa tunnels sequence of *Halo 2* offering a definite dynamic pace adjustment), and *Half Life 2*'s canals and coastal sequences. *Fall of Man* has a small tank sequence early in the game that allows substantial ground to be covered and does not increase the scale – or diversity – of Chimeran threats, but there is little architectural difference between this environment and the surrounding ruined cities the game takes place in.

On the subject of the affective outcome of small scale environments, *System Shock 2* maintains a slow paced, configurative play style, even though its environmental design is of a scale that has more in common with *Doom 3* or *Condemned*. As with these titles, there is often little time to see agents approaching and the game is shot through with a survival horror slant that rests on the sudden adrenaline rushes of combat and shock tactics. However, the temptation to run and gun here is tempered by the surprisingly unreplicated gameplay device of degrading weaponry (which only reappears in *S.T.A.L.K.E.R.*, some eight years later) and highly limited stocks of ammunition. There is indeed a fair amount of running in *System Shock 2*, but it is frequently in the opposite

direction. What is worth noting is that hemming an avatar in reduces both their capacity to utilise a wide spread of affordances and the cognitive time to consider the options. A game which, at least in its first half, actually disadvantages combat and forces sudden, instinctive response is one that is likely to increase tension, as it forces a contradiction between the ideal play style and that enabled by the system. By contrast, *S.T.A.L.K.E.R.*'s early Sections comprise of large, open environments. The player has to fill their time whilst moving around the landscape, which is a risky strategy as it may fail to evoke a contemplation of the extensive and heavily invested diegesis and result in lowered attention instead. This may be countered by the frequent near-invisibility of many of the anomalies, meaning that attention paid to the environment has a distinct focus.

So, on one hand, scale can have an ongoing active impact upon play behaviour and affective outcome, whilst on the other, the more explicit, spectacular use of sudden scale shifts may be used to shock the player out of low cognitive engagement with the game. *Prey* utilises this device in a manner that has more in common with *Tomb Raider*'s (Core Design 1996) vast camera swoops and pulls than many other FPS games. This second use of scale underpins Bryce & Rutter's argument that FPS games should be considered systems of spectacle, rather than narrative (2002).

Understanding the impact of scale upon play starts to define a series of functional conditions for the types of architecture found in FPS games. A setting which enables localisation with the capacity for extended virtual diegesis, and the ability to anchor rapid and seamless transition between large and small spaces is more effective than a uniformly sized sequence of environments, even if they contain reasonable scope for diversity and validity. This is inevitably easier to manage if one is prepared to accept heterodiegetic breaks in the action: episodic structures such as *Return to Castle Wolfenstein*, *Fall of Man* or *Deus Ex*. Including some homodiegetic bridging sequences, or basing entire levels within the narrative construct of the journey (*Halo*, *Far Cry*, *Quake 4* and *Prey*) keeps the action moving more seamlessly. *Half Life*, of course, is a single journey sequence across the Black Mesa, and its sequel only utilises two breaks in the journey (these being dealt with using the homodiegetic device of teleportation *Portals*). Even a game as more or less single scaled as *Condemned* opens out considerably in its final Apple Orchard Processing Centre sequences. Finally, this section has principally considered the transition from exterior to interior spaces as the means for shifting temporal and affective gameplay, but should also note that this device works in reverse. *Deus Ex*, for example, opens a relatively small scaled office and lab complex into a vast subterranean chamber in its Versalife Office complex / Nanotechnology plant levels. It should also be noted that large scaled environments are in no way indicative of non-linear activity, nor do they necessarily allow a high degree of exploratory freedom. *Fall of Man*'s city environments are technically large scale, in terms of their draw distance, but the degree of movement is no more than a traditional interior shooter like *F.E.A.R.* or *Doom 3*.

Here, ecologically valid features: barbed wire, sandbags, burnt-out cars and trenches, constrain the player to a highly linear corridor of action. Thus, once more, the importance of a setting that enables a direct mapping of ecological validity and ludic functionality can be seen.

In contrast, *Far Cry* superficially enables a much higher degree of non-linearity, although the limits to this are rapidly apparent when put to the test. Much is made of the island archipelago format and the ability to travel from space to space via boat, car or hang glider, and this island hopping forms the basis of the 'boat' level. However, stray beyond the confines of the allowed space and attack helicopters appear from nowhere, forcing either a return to the play space or a reload. The fact that this method of limiting exploration has a higher degree of ecological or narrative validity than, say, *Half Life 2*'s man-eating eels or the G-Man's unconvincing ability to terminate Freeman instantly, is reflected in the fact that *Far Cry* is often described as highly non-linear when in actuality what it enables is a slightly greater degree of tactical freedom and, in a few levels, a choice of two or three approaches to an environmental / ludic bottleneck - a gameplay device that is hardly new or radical. Non-linearity within an environment is, not unsurprisingly, expanded in the most recent games in the survey, with *Crysis* and *S.T.A.L.K.E.R.* both offering sandbox environments with embedded goal structures. It is significant, however, that both revert to smaller scale, more linear environments at their points of high significance.

Section 6.8. Environment Characteristics: Diegetic Scale

The general scales of the environment sets and diegeses can be broadly demarcated into five sets: LOCAL, CITY, COUNTRY, GLOBAL and MASSIVE.

LOCAL scales indicate a defined master environment that is more or less traversed in its entirety during the game. In other words, it is the extreme of localisation: there may be an inferred reality outside play, but it is both inaccessible and, more importantly, either invisible or inconsequential. *System Shock 2* is a good example of this: all the action takes place upon the Von Braun or Rickenbacker and there is literally nowhere else to go as they are floating in the middle of deep space, after all. Likewise, aside from the Hell sequences, *Doom 3* is highly local, taking place at locations throughout the UAC's Mars Base. *Resurrection of Evil* is much the same although, as might be expected from an expansion pack, somewhat smaller. Although it may be inferred from both that this base is both bigger than what is experienced or even part of a wider environment, neither are particularly focused upon by the game. *Half Life*'s Black Mesa straddles this category and the next. Granted, Freeman does not leave the complex for the majority of the game, but the sense of scale is far greater: the exterior sequences of Surface Tension locate Black Mesa in a recognisable geographical context, and the initial theme of escape certainly

suggests there is somewhere to escape to (as opposed to *Doom 3*, where an exterior sequences are explicitly tied to a rapidly diminishing oxygen level and, therefore, chance of survival).

None of these games rely heavily on cutscenes, as might be expected, but interestingly, all of them utilise a radical break: the border worlds (*Half Life*), Hell (*Doom 3*), the body of the Many / cyberspace (*System Shock 2*). What is interesting is that in *Half Life's* case at least, it is not as if the game has been devoid of real narrative or environmental diversity until this stage. As discussed in Section 6.5, the radical break, like an affordance-parameter shifting vehicle sequence, enables a virtual re-invention of the affective experience without actually having to change anything in terms of the system's delivery mechanisms, as well as signaling explicitly to the player that the game is close to completion. It should also be noted that radical shifts are not found such as these in titles with generally larger scale, though there is nothing precluding this. Other, larger scaled, titles do utilise new environments in their final Sections: *Half Life 2* uses the Citadel; *Condemned's* Apple Orchard; *Cthulhu's* Devil's Reef or *Deus Ex's* Area 51 complex. However, although these sequences are something of a break from what has gone before, in all cases they are a logical extension of the diegesis. The Citadel has been seen from the very beginning of *Half Life 2* and it is established from this point on that it is likely to be the ultimate destination of the journey. Apple Orchard's exterior spaces are qualitatively different from the otherwise purely urban environments of *Condemned*, but it clearly belongs to the same pseudo-contemporary reality, and Page's labs may have a hub and spoke layout which shifts noticeably away from the linear later levels of *Deus Ex*, but it is nevertheless just another instance of the cyberpunk labs already encountered in Hong Kong or beneath Liberty Island. True radical breaks seem a product of the local²³. It should also be noted that none of the locally defined titles contain explicit bridging sequences, in the manner of *Halo 2's* New Mombasa tunnels, or *Quake 4's* aqueducts. *Doom 3*, *Resurrection of Evil*, *Portal* and *Half Life* are explicitly linear, with little re-use of environments, whereas *Deadly Shadows* and *System Shock 2* enable and encourage repeat visits to environment – and it should be noted that in terms of gameplay style, the former are traditional run and gun shooters, whereas the latter both belong to the RPG crossover subgenre. In terms of the plot / environment relationship then, in *Doom 3*, *Portal* and *Half Life*, the emphasis is on escape; whereas in *System Shock 2* and *Deadly Shadows* it is on investigation. The latter requires environments structured in such a way that they enable repetitive exploration that, in turn, has an impact upon the type of play that is encouraged.

To put this another way, a linear shooter does not require exploration as it is impossible to progress along the line without critical items. RPG crossovers that have an emphasis on configuration, or adaptability in play-styles,

²³ *Cthulhu* is a kind of exception to this, as it has both a number of sequences set within the Yithian city, and does shift location out to Devil's Reef via the Urania. However, the Yithian sequences are interspersed throughout the game, so it is not quite the radical break seen in these localised titles.

require a more flexible approach to time, to give these options consideration. A hub and spoke model means that the player can pace their own exploration or level of engagement, placing a greater degree of control over both the complexity of the experience and the learning curve within the player's control. *System Shock 2*'s division of the environment into decks means that there are clear boundaries of progression, linked by an always accessible central lift system. In terms of play, it means that a player short on health and/or ammunition can retreat to a lower deck to visit the facilities there with less risk than pushing on into unknown territories. From a system perspective, it may also be noted that RPG crossovers are much more complex in terms of their information load and an economy of environment may be seen as a deliberate tactic in freeing up room for thinking.

Whilst the structures in the games in this set can be easily divided into linear and something resembling hub and spoke, what is more important to note is that the plot line and environments fit together to define a particularly advantageous style of gameplay. Linear structure, localised environments, a game defined in its entirety as a bridge sequence, support the pace of the game by justifying the push along. On the other hand, slower, more configurative play is enabled by less linear, more open and non-episodic environments and ambiguity-driven plots.

Finally, some patterns in the genre can be noted once this scale is placed next to other factors (Appendix A). Games with local diegetic scales all use bridging structures: there are no distributed games in this group (as may be expected). With the exception of *Half Life*, all link episodes directly to environments; and there are a substantial number of fantastical settings. The significance of distribution of reality types will be dealt with shortly. There does not appear to be any particular pattern with relation to directionality or environment set numbers.

The next group is named CITY, although this does not exclusively mean an urban space, but a rough sense of scale. The game takes place in a diegesis too large to traverse during the course of the game, but the multiple locations presented are all within a relative proximity. *F.E.A.R.*, *Bioshock* and *Condemned*'s locations are within a drive, bathysphere or helicopter ride of each other; *Far Cry*'s island chain is isolated within the Pacific and presumably can comfortably occupy a definable grid co-ordinate or two. *Undying*'s hub-and-spoke design introduces environments orbiting the central mansion. Equally, once the initial, introductory Cult mansion sequence of *Cthulhu* is removed, the majority of the actual game itself all falls within shouting (or swimming) distance of Innsmouth. In this group of games some cutscenes are evident: *F.E.A.R.*'s protagonist is dropped from location to location by helicopter, and Agent Thomas gets around the city by car or public transport in *Condemned*. However, these travel cuts are minimal. Interestingly, however, none of the titles really have anything

approaching a bridging level either: *Condemned* features a very short episode on route to the library, including a sequence where Thomas rides a wheeled rubbish bin down an alley, but there is nothing on the scale of *Quake 4* or *Crysis*. *Far Cry* is the exception to this which, although using cutscenes that transport Carver to new island groups within the chain²⁴ integrates vehicles into a large number of levels, although there is really only one level (Swamp) where the use of a vehicle is compulsory. Thus, although the total diegesis is not on the scale of *Fall of Man*'s alternate England, let alone Stroggos or the Halo ringworlds, it is pushing at the upper edge of the boundaries of this group.

Cthulhu is ostensibly an RPG crossover title, although not on the scale of *Deus Ex* or *System Shock 2*. *Cthulhu* is a deeply non-standard FPS title in itself, as it uses huge amounts of cutscenes and narrative information surplus to the game's action. Technically, *Innsmouth* has a fair degree of non-linearity, though the game only supports a highly linear sequence of action in order to progress. In a study described by Pinchbeck (2007), this was noted by several participants and is a very good example of ludodiegesis breaking down: both the pace and the environment suggest a highly exploratory play style, but the non-linear environment actually only contains a linear stream of events. In other words, the player is encouraged to explore a town that has little to offer in terms of exploration, and whose critical progression devices often seem arbitrarily distributed. As already noted, *Far Cry* appears superficially non-linear, but in actuality this has more to do with a choice of tactics rather than any real non-linearity in the environment. *F.E.A.R.* and *Condemned*, both run and gun (or in the latter case, run and whack) shooters are highly linear and highly episodic. Each environment is presented as fully enclosed, with a very small degree of interactivity, though with a visible attempt at ecological validity, and each relatively small in scale. Technically, *F.E.A.R.*'s largest environments: an office block, a warehouse, are substantial in scale, but the design never expends much effort in making this too imposing. Further, both share a common central plot theme: pursuit. Although there is some degree of crossover with the 'solve the mystery' device found in *System Shock 2*, *Deadly Shadows* or *Cthulhu*, in that the player is pushing deeper into the presented diegesis, rather than ostensibly trying to get out of it, what is fundamental is that even though the particularities and ambiguities of the plot are still open to explore, a nemesis figure is presented from the outset.

This establishes a temporal inconsistency that is missing from the RPG titles. The plot corroborates the play style by making time of the essence: *F.E.A.R.*'s Paxton Fettel must be stopped before he escape; *Condemned*'s Thomas is being hunted by the police. Although both package highly ambiguous conspiracy narratives into the game progression, the visible spine of the game is all about pushing forwards, at speed. According to the diegesis

²⁴ This establishes a key gameplay rule – if you can see it, you can use a boat to get to it, but if there is no island in sight, it is the limit of the play area.

presented, it would be out-of-character for the avatar to explore cautiously forwards: thus, the environmental constraints are shifted accordingly. Highly recognisable environments, once furnished with the appropriate degree of ecological validity, do not require scrutiny on too deep a level: *F.E.A.R.* provides convincing warehouses and offices; *Condemned* rotting department stores and schools, but beyond this, there is little to take note of. It is assumed that players will arrive at the game with a solid schematic understanding that a car park is likely to be found in the basement and a helicopter pad on the roof, and so on.

Finally, *S.T.A.L.K.E.R.*, really belongs in this set too. It takes place within a large ‘rural’ area, the contaminated Zone, but there is no travel outside this metalocation, even though it is grouped into a number of divided Sections. *S.T.A.L.K.E.R.*’s world has a number of features that set it apart. Firstly, it allows a relatively high degree of nonlinearity in terms of both travel and microgoals. This is supported by an open-plan environment. Players can meander from engagement to engagement or set a deliberated and individualised path of travel that takes them to a surprising number of environmental features such as equipment stashes and small scale goal/plot branches. Although there is a clear and linear spine of progression through the game, in this instance the ‘corridor of affect’ is actually quite spacious. Exploration is encouraged, and the world can be seen to contribute to this directly. For example, such a large open-plan environment runs the risk of being both monotonous and/or daunting for a player, so *S.T.A.L.K.E.R.* uses groups of derelict buildings to site the majority of its action in. Although a map is provided (as a homodiegetic device) players can also visually navigate using these landmarks – and an epistemological principle is established: if in doubt, head for a building as it is likely to contain something. This is supported by a Stalker camp and trading outpost in the first area which acts as a locus point, being the site of all the early mission briefings to enable orientation during the game’s introductory learning curves. *S.T.A.L.K.E.R.* also uses a large number of environmental anomalies: essentially static threats to break up the world. This adds an interesting level of complexity to getting around the world, as anomalies cannot be destroyed and, in the case of Springboards, Vortexes and Whirligigs, are given away by fairly subtle visual clues. In other words, it is hazardous in the extreme for a player to blunder around without looking: attention is required at all times by the environment. This has principally the same net effect as LeBlanc’s drama (1999). It focus attention specifically in one direction at the expense of the unwanted other: the relatively sparse and potentially tedious wasteland of the Zone.

In the City group, once again all the games are bridging, although there is a greater mix of separated environment / episodic and linked games, perhaps reflecting that the overall diegesis is not critical but is forming a backdrop. Unlike local games, where the position within the world is critical, in these games, progression is linked to a pathway through this world, not to the exhaustion of the world as a whole. As with local games, however, there is

no evident pattern of environment set numbers or directionality. It can be noted, however, that normal opening realities are found for the first time. Also, *Episode One*'s inclusion in this group should be mentioned, whose lack of scale really set it apart from both its predecessor and, interestingly, its sequel, also an episodic release and not a great deal longer in terms of playing time, but with a much larger diegetic scope (and an extensive bridging Section).

The next group extends to a single COUNTRY. *Fall of Man* presents nine separate locations around England, plus the Chimeran tower which, like the Combine citadel qualifies as a form of radical break although, as has been noted, the distinction is far less radical than a localised title (probably due to the capacity for environmental diversity that a larger diegetic scale offers). It features perhaps the shortest episodes of play in the genre. Only one section (Common Ground) in the Somerset set, can really be described as a bridge, the other vehicle-based Sections (in A Lone Survivor, Parting Ways, Giant Slayer and Ice and Iron) are extremely small. Between these, travel from location to location uses the filmic technique of tracing a red line across a map, a convention that further anchors the diegesis to a recognisable historical context. *Timeshift* includes several sequences (Road Trip, Better Late, Disputed Airspace) which facilitate travel from one significant location to another (and, of course, provide gameplay diversity with the quad bike and zeppelins). Arguably, *Half Life 2* (though not *Episode One*, which belongs in the City group) also falls more naturally into this category, as beyond it, there is a sudden jump suddenly to a global scale. Although there is a small degree of travel in *Half Life 2*, via the coastal road to Nova Prospekt, the game centres heavily around City 17. In keeping with the first title, however, and unlike *Fall of Man*, a high proportion of the game is concerned with travel, with much of the first half of the game vehicle-based (Chapter 4: Water Hazard and Chapters 8 & 9: Highway 17 and Sandtraps). In addition to this integrated vehicle use, chapters 3-6 are concerned with getting to Black Mesa East and chapters 8 & 9 with getting to Nova Prospekt. That is, five of the fourteen chapters are all about traveling to somewhere without actually reaching it. They are self-contained, but without ultimate location. By contrast, although one may technically describe F.E.A.R.'s Armachan office sequences as traveling from basement to roof and back, they are driven by a series of shifting goals that include engaging Paxton Fettel and finding Alice Wade. Highway 17, by contrast has a simple goal that remains unchanged: travel to Nova Prospekt. It is interesting to note that after the relatively poor reception for *Episode One*, which stuck within City 17's limits, *Episode Two* opened out the diegesis, primarily being concerned with the journey to White Forest. It could be argued that not only does this expand the visual diversity of the game, as the goal structures are really not different in terms of the actual activities the player undertakes, but it also reverts the game back towards the kind of inherent bridging activity, that is, a travel defined game, which is the central feature of the franchise.

Quake 4 also belongs in this category. As with *Quake II* (id Software 1997), the action revolves principally around locations within Stroggos City, which would potentially classify it in the prior category, but the scale of this is substantially greater than the cities of *F.E.A.R* or *Condemned*. This is perhaps a result primarily of several lengthy bridging sequences (the convoy, the tank and mech Sections, a tram-ride and the final assault via dropship). The virtual diegesis of the game's action is consistently expanded to a global scale, making it a highly visible case of this tactic in operation. For example, skyline views of large portions of Stroggos City are offered from the tops of the final Data Processing Towers levels and the earlier environments are not visible from this perspective. Clear and unambiguously distinct parts of the City are explored in discrete units interlinked by bridging levels (and later some immediate jumps), but the distance between these structures makes it more appropriate to consider the game as having a scale comparable to the diegesis established in *Fall of Man* or *Half Life 2*.

The environments presented by *Quake 4* also enable the action to be cited within part of a global conflict: something the priming notes make explicit. However, the assault on Stroggos City, of which Kane is part, is clearly marked as the most important part of the task force. Key strategic sites can thus be intuitively tackled as independent environment sets, drawing upon player expectation in terms of both genre and wider understandings of alien, but heavily humanised, civilisation. Again, it is not necessary to really see how the Strogg live, as this can be inferred as at least recognisably humanoid from the list of target locations: hangars, medical facilities, communications hubs and so on. The player's expectations are therefore co-opted to edit necessarily presented locations, and transformations of existing schematic environments help control the actual affordances and presented diegesis. Here is a good example of where the semantic constructions of the diegesis enable control over the affective experience: the early phases of the game take place in pitched battles in highly recognisable environments with no complex function (trenches, bunkers), and the extent to which the Strogg deviate from humanity is established by the time more diegetically complex areas such as medical facilities, or processing plants are reached. In essence, *Quake 4* charts a journey deeper and deeper into alienity, with the first Nexus levels offering a mini-climax of distance from the known. The re-invention of Kane as Strogg then opens up further deviation from the norm into a shifted perspective. The propulsion from one world to another is core to the liminoid phase, and although *Quake 4* does not offer a shift between worlds in its environment, Kane's transformation effectively positions him beyond the normal world and into an transformed reality (established as a transformed subjective reality in this case). Unlike *Doom 3*, *Condemned*, *F.E.A.R.* or *Half Life*, but like *Fall of Man*, *Hellgate* and *Half Life 2*, *Quake 4* opens into an already liminoid reality. The loss of this transition to liminoid is virtually replaced by a transformation of the hero in *Quake 4* and *Fall of Man*, with Kale being infected with the Chimera virus early on. This transformation will be returned to in Section 9.5, but its apparent necessity to FPS plots should be noted in terms of how it is delivered through the presented environments in

most games.

Even though its opening Section is set in another country (Iraq as opposed to the US), *Blacksite* really belongs in this group, as the majority of the game's action and plot occurs across Nevada, giving it a larger geographical area than, say, *S.T.A.L.K.E.R.* or *Hellgate*. It is not placed into the Global category as the Iraq Section is unique and once the game gets going, all the action is contained within Nevada, which is qualitatively different from the world-hopping of *Deus Ex* or *The Operative*. There are vehicle based bridging Sections in both Quarantine and Topside (including rail-shooter helicopter and free control car sequences) as well as discrete, geographically distinct environments ranging from downtown Rachel to the Military Complex.

Once again, in this group, there are no distributed structures, as even far-ranging games such as *Quake 4*, *Blacksite* and *Crysis* link their disparate environments together with a strong sense of bridging and minimal disruption to this traveling. *Crysis* also opts for in-game travel to cover large distances and join otherwise unlinked geographical area, supplementing general use of vehicles in games with two episodes designed for vehicle-play. Of these levels, *Assault* does give the player the option of completing the mission on foot (although it takes considerably longer and is comprised of lengthy Sections of covering ground, thus pushing the player towards obtaining a vehicle), whereas *Ascension* forces the player into a VTOL for its duration.

The next group take place across a GLOBAL setting, meaning they span various locations across an entire world. With the exception of *Unreal Tournament 3*, *Halo* and *Prey*, this globe is identifiably Earth, which may explain the high proportion of Extended and Normal initial reality types found in this group. Most significantly, not only is this group predominantly made up of distributed titles, but the majority of distributed titles are found in this group. This would seem to suggest that distribution is primarily a means of adding visual diversity to the diegesis, and if this is what is sought, then the widest possible total diegesis is advantageous. There also seems to be a likely correlation between the global diegetic scale and the plot structures of these games: essentially, all bridging structure games operate around the meta-goal of getting to a target location. Distributed games lack this target structuring, as there is no linear progression from environment set to environment set – in other words, the plot has to operate by itself to justify the transitions from location to location. That is not to say that the target location of a bridging game cannot move, as in the case of *F.E.A.R.* or *Blacksite*, or be attached to a moving target (Paxton Fettel and Somers respectively), but the environments which are traversed in a bridging game have an internal logic. There is no particular internal logic to the movement between Morocco-Hamburg-Plane-Berlin-Freighter-UK-US-Tropics-Space-Alps, as found in *The Operative*, it is purely plot that draws them together. However, it should be noted that in most of these games, within the distributed structure, there are groups of

bridging levels. Thus, in *Return to Castle Wolfenstein*, the first portion of the game runs from Blazkowicz' escape from the castle, into the village, through the dig site and the ruined church to the chapel. Equally, the last levels are essentially a straightforward target location bridge, from village to chateau to dam to forest to castle. Notably, both of these sequences are substantially longer than the interim episodes (*Weapons of Vengeance*, *Deadly Designs* and *Deathshead's Playground*). In other words, *Return to Castle Wolfenstein* may be distributed, but it is bookended with two extended bridging Sections. Equally, *Halo* includes two lengthy bridging Sections: the Assault on the Control Room and its reverse incarnation in Two Betrayals.

Of the distributed titles, it should be noted that three (*The Operative*, *No-one Lives Forever* and *Perfect Dark Zero*) are based on Bond-esque espionage (and in fact, both *Deus Ex* and *Invisible War* also feature espionage as a core theme). Interestingly, they are three of the four games in the analysis to feature an explicitly female avatar, *Portal* being the last, and the set also includes one of the two where the player can choose (*Invisible War*, the other being *Hellgate*). More to the point, this diegetic conceptualisation allows a distributed structure to operate easily; it is practically a de facto expectation of the genre. *Deus Ex* and its sequel really fall into this category too. Perhaps the defining point about the plot structure of these games is that they are investigative: the player is party to the uncovering of a plot, rather than the predominant escape or pursuit structures found in bridging titles. The exception to this is *Prey*, the only real bridging game in the set.

What defines the environments presented at this scale is the high visibility of difference between them. Although affordances remain constant, the visual and audio details of New York, Hong Kong and Paris (*Deus Ex*'s three main locations) are totally distinct. This masks an essentially similar level design and works to contribute to goal diversity. It may also contribute to the player's understanding of their position in the game, even without the overarching ludic position offered by a bridge's target location or NPC. Like the radical break, abrupt location shifts enable closure to be projected into the experience: they notify the player that a threshold has been crossed. *Deus Ex* smooths over the temporal breaks somewhat by using the homodiegetic devices of Jock the helicopter pilot, and *Invisible War* offers the choice of either Sid Black's jet or Ava Johnson's helicopter, with plot ramifications established as a result of the choice. *Return to Castle Wolfenstein* opts for standardised cutscenes between each geographical location that also propose a substantial temporal break (and use two running, non-ludic NPCs) and text-based loadscreens between intra-geographical levels. Interestingly, *Invisible War* also opts later in the game for the *Deus Ex* machina option of a teleporter to transfer the player between Trier and Antarctica (teleporters are discussed in Section 6.9).

It may also be worth noting that more fantastical realities are found in this group, and there is a clear division

between the sub-group of fantastical games (*Prey*, *Painkiller*, *Halo*, *Unreal Tournament 3*) and those with extended and transformed realities; noting as well, that there is little transformation of realities in this group (*Return to Castle Wolfenstein*, *No-One Lives Forever*, *The Operative*, *Perfect Dark Zero*, *Deus Ex* and *Invisible War*). Of the fantastical subgroups, it may be argued that in the case of both *Painkiller* and *Unreal Tournament 3*, the diegesis is shallow and unimportant, and it is interesting that the two titles in the analysis least concerned with a deeper diegetic experience (being predominantly ports of arcade or multiplayer shooters to a single-player game) are found in a set which, together with a distributed structure, offers a means of environmental diversity to be layered onto the action. So a split can be identified in the group, between those games which are diegetically shallow and use a global, distributed structure as a cheap means of increasing diversity and those which invest in the global diegesis, though retaining a distributed structure (*Deus Ex*, *Invisible War*, *Perfect Dark Zero*, *Halo*). Finally, *Prey*, the sole bridging game has an ostensibly global scale but, tellingly, has the least in the way of environmental diversity. Finally, like *Halo*, the other game in the set that runs closest to a bridging structure, it is the only title which separates episode titles explicitly from location.

The *Halo* series really belongs in its own group, although the first title does only take place on the eponymous installation, so technically belongs in the global group. The sequels, however, are certainly substantially different from other titles in the group, being explicitly MASSIVE in scale. All three together will be discussed together here, whilst recognising that *Halo* itself, probably straddles sets.

Halo, in line with its epic mythology radiating through plot, character and avatar, is set on a stellar level and it is interesting that whilst its ludic environments are noticeably more spacious and larger than most of its counterparts, both the level of environmental interactivity and diversity of player affordances are towards the bottom of the scale (the latter are discussed in Section 8.1). Most weapons have no second function and although there are eight types of projectile weapon in the game, only two can be carried at once, meaning the diversity of action offered by a large rotation of weapons is dispensed with. There are practically no free trigger objects in the game, switches being limited to the (very occasional) door or lift (most doors open automatically anyway). Add to this a meager number of agents (3 basic Covenant types plus Flood spores and relatively indistinguishable series of Flood – armed with the same weapons as other agents in the game) and *Halo* presents one of the most simplified FPS game in the survey. It is perhaps no accident then that this is bolstered with the most elaborate and mythic non-ludic elements.

The first game contains six environment sets, but utilises the establishment of the *Halo* as an artificial world whose geography and meteorological is apparently defined by the unfathomable yet tantalisingly

anthropomorphic Forerunner technologies it houses. Under these circumstances it can play freely with types of exterior environment: the survivors of the Pillar of Autumn land in a environment of rocky foothills, then fly to a more tropical island to find the map room. They descend into the Halo structure and the Master Chief emerges into a winter landscape. The Flood containment area is in a swamp, the Covenant vessel is on a shoreline not dissimilar to the first Halo area. In other words, provided Cortana drops a few hints about why it may be snowing, or at the least expresses surprise and, crucially, awe, about the spaces, there is no need for ecological validity of any form. Halo 2 expands the scale of the action by crossing vast regions of space: opening in orbit around Earth, descending for the New Mombassa levels, destroying an entire conurbation (even for an FPS game this is destruction on an unprecedeted scale) before zipping off to the other side of the galaxy to another Halo installation. In the interim, the Covenant homeworlds have been visited, and a Cloud Station where the Heretics are holed up (and rather inexplicably infected with the Flood). Not content with then running a number of on Halo levels: a coastal level, and two more highly recognisable from the first title, a Library and a wintry, if more volcanic, Control Room approach, a cutscene takes the player deep into the Halo structure and Gravemind, an archetypically ambiguous deity figure before pushing the Master Chief back up to the mother ship of the Covenant fleet. This kind of world-hopping is found nowhere else in the genre – with the possible and rather odd exception of *Painkiller*, which only makes the most cursory stab at consistency and diegesis anyway – and is, importantly coupled with extensive bridging sequences by vehicle and on foot. Indeed, from The Silent Cartographer onwards, most of *Halo's* action is based around the premise of getting somewhere, then somewhere else, then somewhere else, and so on. Partially this is needed to string together such large levels, but it also taps into the high degree of mythos in the plotline. The Master Chief, perhaps more than any other FPS avatar, is on a quest and in keeping with the grand scale of Halo, this is not about anything as trifling as escaping from a demon-infested base (*Doom 3*), putting an end to a mad scientists' biological weapons research (*Far Cry*), taking on a dictatorial secret society (*Deus Ex*) or even saving Earth (*Quake 4, Fall of Man*). The Halo weapon will destroy every living thing in the galaxy. Never let it be said that Bungie don't think big.

Unlike the ludic / diegetic environment ratio issue discussed earlier, what is interesting about Halo is the lack of expansion of the virtual environment in any great detail. Master Chief is sent to find Keyes three times in the game: once to rescue him, once to stop him, and once to kill him (ostensibly to recover his neural circuits, but the underlying reality of the mission is readily apparent from the outset). Aside from Keyes' separate activities, there is no mention of other points of interest elsewhere on Halo. Although it seems that troops from the Pillar of Autumn have somehow found their way into all kinds of internal structures, the only contacts outside the ludic space come from Keyes and Cortana, once she uploads into the Halo system. Rather than expanding the diegetic space laterally around the ludic one, Halo chooses to push temporally backwards. It is not the only game to do

this: *System Shock 2*'s audio logs and emails are designed to establish a virtual version of the presented environment prior to the initiation of the game, for example, but *Halo*, in a not dissimilar way to *Prey*, uses the scale, history and semi-anthropomorphic megaliths of the Forerunners to make the notion of ecological validity redundant. The Forerunner are unknowable, therefore there is no reason to question why a handful of doors require manual operation when the vast majority are happy to work presumably on motion sensors. It is acceptable to descend into a lift shaft from a tropical island and find a snowy canyon at the bottom of it. Importantly, once inside this ambiguous diegesis, the environments themselves are highly recognisable or, in the case of the Library and Flood chambers, highly generic. *Halo* and its sequels do not require detailed environments because the slack is taken up elsewhere; in the drama and in the depth and resonance of the plot.

So, in this final group, two or three games, depending on how *Halo* is classified, are found: all parts of the same franchise. The *Halo* games are solidly fantastical; technically fall into the distributed structure category but including lengthy bridging sections (particularly *Halo 2* and *Halo 3*); increase the significance of plot in relation to environment by distinguishing episodes from environment sets; are monodirectional with the exception of the re-use of one environment and have a relatively small number of environment sets. The findings of this section can be summarised as follows:

Scale	Games	Type	En/Ep relate	Reality Init	Reality Game	Direction	Env Sets
Local	Half Life	Bridge	Separated	Extended	Transformed	Mono	11
	Doom3	Bridge	Linked	Transformed	Fantastical	Mono	10
	System Shock	Bridge	Linked	Fantastical	Fantastical	Multi	10
	Deadly Shadows	Bridge	Linked	Fantastical	Fantastical		13
	Res. Evil	Bridge	Linked	Transformed	Fantastical	Mono	6
	Portal	Bridge	Linked	Extended	Extended	Mono	
City	FEAR	Bridge	Separated	Extended	Extended	Mono	5
	Condemned	Bridge	Linked	Extended	Extended	Mono	7
	Cthulhu	Bridge	Separated	Normal	Fantastical	Mono	9
	Far Cry	Bridge	Separated	Normal	Extended	Mono	8
	STALKER	Bridge	Linked	Transformed	Transformed	Multi	10
	Episode 1	Bridge	Separated	Transformed	Transformed	Mono	4
	Undying	Bridge	Linked	Extended	Fantastical	Re-used	
Country	Bioshock	Bridge	Linked	Normal	Transformed	Multi	11
	Fall of Man	Bridge	Linked	Transformed	Transformed	Mono	11
	Half Life 2	Bridge	Separated	Transformed	Transformed	Mono	8
	Episode 2	Bridge	Separated	Transformed	Transformed	Mono	6
	Hellgate	Bridge	Linked	Transformed	Transformed	Multi	
	Crysis	Bridge	Separated	Extended	Transformed	Mono	9
	Blacksite	Bridge	Separated	Extended	Transformed	Mono	8
Global	Timeshift	Bridge	Linked	Transformed	Transformed	Mono	10
	Quake 4	Bridge	Linked	Fantastical	Fantastical	Mono	9
	Deus Ex	Distributed	Linked	Transformed	Transformed	Re-used	10
	Invisible War	Distributed	Linked	Transformed	Transformed	Re-used	7
	NOLF	Distributed	Linked	Extended	Extended	Mono	9
	The Operative	Distributed	Linked	Extended	Extended	Mono	10
	PDZ	Distributed	Linked	Extended	Extended	Mono	6
Massive	Wolfenstein	Distributed	Linked	Normal	Transformed	Mono	9
	Halo	Distributed	Separated	Fantastical	Fantastical	Re-used	8
	Prey	Bridge	Separated	Normal	Fantastical	Mono	11
	UT	Distributed	Linked	Fantastical	Fantastical	Mono	n/25
	Painkiller	Distributed	Linked	Fantastical	Fantastical	Mono	
	Halo 2	Distributed	Separated	Fantastical	Fantastical	Mono	7
	Halo 3	Distributed	Separated	Fantastical	Fantastical	Mono	7

Fig 33. Comparison of Environment Characteristics (green highlighting is used to indicate smaller common groups)

From this, the following arguments can be made: bridging structures are highly advantageous in terms of player orientation and game flow. This tends to limit the scale of diegesis that can be utilised, thus the much larger worlds tend to opt for distributed structures. Fantastical reality types tend to be found at the extremes of the scale, with less transformation between reality types found in the centre. This may be due to a bridge requiring a more stable diegesis in order for the use of target location, such as *Half Life 2*'s citadel, to function (too much radical change would disrupt this process). However, there are no particularly evident patterns in terms of directionality, separation of episodes from environment sets, and numbers of environment sets used. What can be seen, however, is how the scale and conceptualisation of the diegesis can play a significant role in terms of gameplay. The next natural step is to consider the embedded objects and characteristics of these environments, as a means of both adding gameplay diversity and managing player expectation of how these worlds should behave.

Section 6.9. Environment Characteristics: Ecological Validity

Ecological validity refers to the extent to which an attempt is made to present a internally complex, logically functional world. In essence, ecological validity is the counterpoint to localization: whilst retaining a high degree of control over the amount of content presented, a world may expend visible effort in asserting the context of this localized ludic space.

For example, *System Shock 2* embeds a substantial amount of information within the game on audio logs. These range from material with a direct ludic significance (codes for locked doors) through non-essential but advantageous configurative aids (chemical inventories for researching found objects) through to non-ludically significant diegetic information. The latter can further be split into those which progress the non-ludic plot; that is, the ongoing story that situates the action within a wider, non-represented background (explaining what has happened prior to the game), and extraneous, atmosphere building devices. Many of these logs use a core set of persistent NPCs to increase the chance of an empathetic response from the player (see Section 7.2 for more on PNPCs).

Doom 3 also uses PDAs, although there is little plot within the emails and logs found. They tend to contain either directly useful information (primarily the code combinations to ammunition and medical lockers) or protonarrative information designed to either deepen the atmosphere or add light relief. The latter is made up of spoof spam, arguments between colleagues and complaints about their jobs. These banalities are nevertheless important in terms of ecological validity, as they enable the player to infer a complex missing world. The Mars Base may now be devoid of any living humans, but it was once full, evidenced by the fact that people fought and

lost their jobs, downloaded pornography and were caught by their bosses, tried to swap shifts and schemed against their colleagues. These very human little acts both juxtapose the superficiality and unnaturalness of the game's action, and give meaning to the soft drink machines and desks littering the administration spaces. This, in itself, counterpoints the sci-fi labs and anchors the more fantastic elements of the environment to a recognizable corporate culture. In essence, they act as an earth to the game's world; they help to create a diegesis which has a recognisably valid ecology.

Condemned is packed with detritus. The episodes set in Bart's Department Store are practically knee-deep in old manikins, broken display cases and rubble. Again, the validity of the world is suggested by the remains of what is no longer there, the pre-liminoid trappings, in a sense. The highlight of this environment is the ruined Christmas tree at the centre of the store, providing a link not just to a recognizable culture, but a very specific temporal marker. A time for the collapse of normality is set, which is a powerful diegetic device. However, it should be made clear that ecological validity does not necessarily relate to the number and diversity of environmental affordances presented by a game. *Condemned* has a high degree of ecological validity but relatively few interactive objects. The central gameplay rotates around the use of improvised weapons found in the environment, but these are limited in number, and beyond using them to break the odd glass cabinet, or prize open a safe or closet, little can actually be interacted with in the environment. Likewise, *F.E.A.R.*'s warehouse and offices are full of crates, papers, filing cabinets, radios, phones, chairs, computer terminals and packing cases, but none are capable of anything other than being destroyed or relocated. Somewhat counter-intuitively, *Doom 3* is more interactive than either. Perhaps the best way of considering ecological validity is to ask the simple question: what would one expect in this place, in a real-world equivalent? Thus, *F.E.A.R.* can be seen to aim for a high degree, whereas *Far Cry*'s tropical islands are noticeably lacking in animal life (aside from the occasional pig), and the office and lab complexes staffed by Krieger's scientists show little sign of human occupation, much less the complicated business of scientific research.

Although ecological validity relates, albeit orthogonally, to the number of affordances in an environment, it also relates to the degree of detail, or amount of information presented. Thus, in recognizing the difficulties of establishing an objective scale of validity when, in fact, it can only be assessed relative to the independent diegesis of the game (not to mention the advances in graphics and physics engines over the course of the analysis period), the question of expectation should be centralised when considering ecological validity. To put it another way, rather than any absolute or replicable scale or mix of embedded items being needed to infer validity, the overall, holistic set-up of the world and, simply, what one might expect to find in it forms the core of this investigation. In this, a recursive position may be inferred, where the requirements for ecological validity are based upon the

establishment of an effective diegesis, whose characteristics include a degree of ecological validity. This requires a little explanation.

The concept of ludodiegesis focuses upon the functional, epistemological aspects of in-game content, particularly those with a narrative focus, in creating a stable and effective diegesis that manages a player's experience and behaviour. Thus, there is a balancing act between the co-option of pre-existing schema in order to prompt psychological functions such as closure, or primary metaphors in the player (to farm out the information need from system to user), and careful control over expectations pulled through in the slipstream of this process. It is thus no surprise to find that the majority of the genre is based within transformed or extended realities. It must be recognizable in order to provoke schematic extrapolation; but it must be swiftly revealed to be abnormal in order for the system to exert control over this process. Why does the player in *F.E.A.R.* not reach for the nearest telephone for reinforcements? Partially because it is not in the gameplay (there are an increasing number of FPS games that alternate between strategic, squad-based play and lone action), occasionally because the useful trick of killing any potential allies off at the beginning of a level is utilized, but also because almost from the offset, *F.E.A.R.* is set in a world where reality is under serious question, if not revision. *F.E.A.R.* does not have to be realistic to be valid: the phones do not have to work and fire doors can jam for no apparent reason (and resist bullets, not to mention grenades admirably) because, inside the diegesis, the player is bombarded with the suggestion that this is simply not real. Monolith go on to develop this sense more subtly in *Condemned*, where hallucination and normality are blurred at frequent intervals. This includes a dramatic moment during the Metro City Library level, when a hostile agent is flash imposed over the form of Rosa, the persistent NPC. This is a brilliant manipulation of the hairline trigger reflex the game requires of the player elsewhere. In that split second, the player can believe it is hallucination, and risk being helpless, or believe it is reality, and risk killing a friend

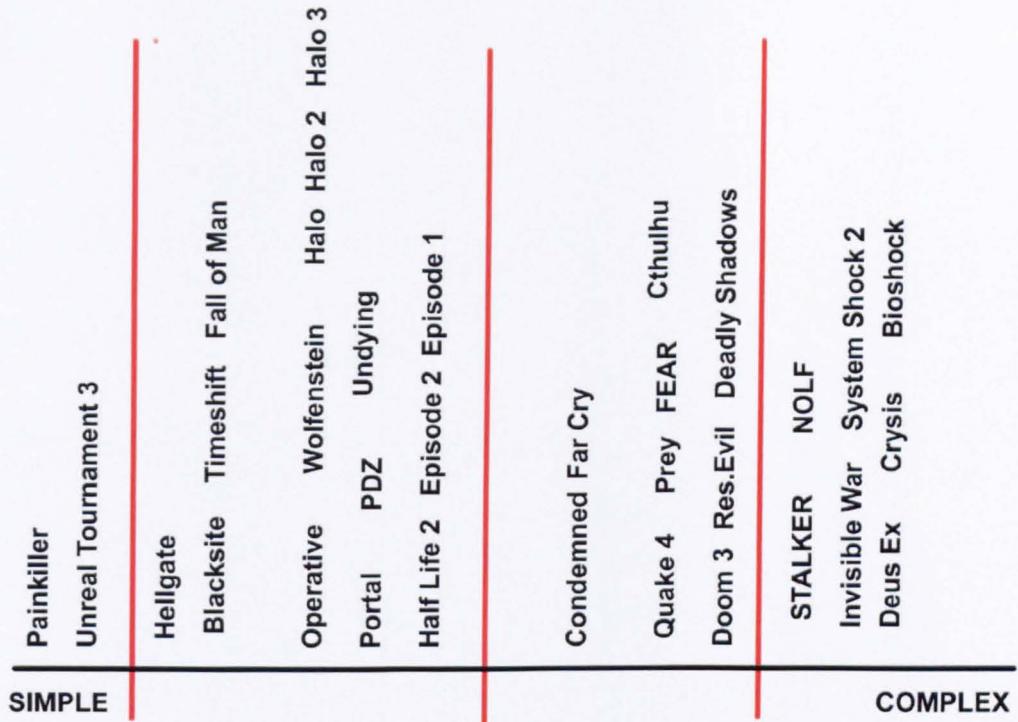


Fig 34. Degree of ecological validity across the genre (red lines indicated proposed boundaries of grouped titles)

So, although the relative environmental diversity and ecological validity of the titles covered in the analysis can be roughly mapped out, there is not much here that is surprising. The titles normally called RPG crossovers (*System Shock 2*, *Deus Ex*, *S.T.A.L.K.E.R.*, *Invisible War*) tend to contain a higher degree of ecological validity – they invest more in a complex diegesis, on an object-level. This may be attributed to the speed of play. Run and gun titles tend to push the player along rapidly, offering little interaction and not expending a great deal of energy in providing a world that is rich in supporting background detail because there may simply be less need, as has been argued. Nor is there any particular pattern to the number of environment sets; *Painkiller* contains the highest numbers of disparate environments, yet its sets are more or less entirely spurious. What can be drawn from this, however, is that neither a large number of environment sets or a high degree of ecological validity are particularly required for an effective diegesis. *Halo*, for example, lacks much in the way of corroborative detail, nor does it offer a great deal of environmental diversity, but it is still highly regarded as a strongly immersive game. Likewise, *Doom 3*, on paper, does contain both a substantial number of qualitatively distinct environments and a surprising degree of investment in the overall sense of ecological realism in them, yet this is not often noted. Indeed, it may be possible that unless supported by the gameplay, both factors are relatively minor. Finally, as noted, ecological

validity's primary objective is to control expectations and affordances. Thus it may well be determined by the principal of 'just enough'. The problems with real world ecology may also contribute to the significant number of fantastical or expanded reality settings in the genre, which again loops back to Turner's liminoid construct. Like *Halo*, *Fall of Man* swiftly moves beyond historical normality (York) to the Chimeran conversion centre (Grimsby), where although there remains 'just enough' real world ecological validity in the forms of the base architecture and some of the objects lying around, a simpler ecological set is layered over the top in the form of the Chimeran birthing machines and their alien, and inhumanly scaled, engineering. In every game covered by the analysis, there is at least an attempt to bring ecological validity within the liminoid, in other words, within control of the system.

Fall of Man's comparatively tiny episodes mean that its environments are sliced into small chunks that exist in less context than other larger scaled shooters. Whilst based upon recognisable historical reality in no uncertain terms (to the extent that the Church of England threatened to sue for the depiction of Manchester Cathedral in June 2007), the game rarely pays more than lip-service to its environments. There is a degree of mobility in scale: Cheddar Gorge and the Somerset levels are set in larger sites, but are carefully reduced in terms of actual play scale by geographic features and Chimeran devices. Likewise, the city levels utilise skylines to virtually expand the locations, but alternate between linear and hub-based action. There is a degree of effort expended to fill the locations with some debris and detritus, but little real expenditure is made in terms of ecological validity: desks and bars are always too high to jump onto; papers and folders strew the locations but are limited in diversity. Unlike *F.E.A.R.* or *Condemned*, there is no incentive to explore the environment or attempt interaction; indeed, the only means of doing so is either to shoot or attempt to slam the object with a rifle butt. Some Chimeran buttons can be pressed (with a heterodiegetic onscreen prompt) but all other technologies are opaque. Where physics is expended, it is in windows, which are punctured by gun-fire and shatter with a reasonable degree of realism. However, it is important to note that this is tied to *Fall of Man*'s gameplay: it contains weapons that can shoot around corners and through walls, so the strategy of positioning oneself in relation to combat, choosing appropriate weapons and, by extension, using the environment to gain advantage. Learning which parts of the environment are affected by fire and which are not (and how they are affected) thus becomes important to successful play.

Likewise, *Half Life 2* attaches the notion of ecological validity directly to gameplay, rather than taking the passive approach found in other shooters. Once the gravity gun is acquired in chapter 5 (Black Mesa East), the environment's supply of interactive objects becomes highly significant. Beyond the ubiquitous exploding barrels, every object in the environment takes on a significance as it can be used in both combat and exploration: breeze-

blocks, saw blades, crates and even wrecked cars. In other words, *Half Life 2* achieves a more direct mapping between ecological validity and affordances than any other game; *Condemned*, which centres around the use of found objects in combat is really the only other similar title. Thus, although *Half Life 2* does run into the very real problem of how to keep an avatar famed for his ability with a crowbar trapped by a simple locked door (see Fig 1), it tackles this issue by focusing attention away from what cannot be done towards what can.

Unlike *Quake 4* or *Doom 3*, which use the very simple homodiegetic device of lit door panels (red means locked, green means open), both *Fall of Man* (in which all doors cannot be opened) and *Half Life 2* instead train the player away from the obvious question made explicit in the satirical cartoon, *Concerned*. In the latter, some doors can be opened whilst others simply rattle and remain locked. This presents a potential issue for the diegesis, as it is an explicit realisation of the constraints of the reality. Obviously, there is a degree of player collaboration in not questioning these limitations, but in order for that to occur, there must exist a stable framework clearly communicating what is and what is not possible, and this must be applied consistently.

Games with few free trigger affordances such as *Quake 4* and *Fall of Man* use highly simplified homodiegetic additions to achieve this. If you can run at it and it responds to your co-location or shoot at it and it responds to your bullets, it's interactive; if it remains passive, it is inert. If it requires something more than co-location or bullet damage, then heterodiegetic markers are deployed: the words 'Interactive' or 'Use Switch' flash up onto the screen. In both games, this may be seen as something of a failure of imagination on the designers' part, as in both cases, it seems an easy enough solution to realise this as homodiegetic information.

Consider the use of switches in *Prey*: early in the game, Tommy acquires a severed hand from one of the Hunters and carries it with him. Whenever Tommy approaches a door that requires button activation, Tommy produces the hand, signaling to the player that interaction is required. With this simple device, the system can communicate to the player unambiguously what is required of them and in doing so, aids the epistemological process in terms of establishing where the limits of the system are. Granted, *Prey* also uses a rather unconvincing sound effect to let a player know when they have run at a locked door, but the hand device does at least move the communication about button activation within the diegesis. Elsewhere, where buttons exist that Tommy can activate without the hand, at the critical point of proximity he raises his hand to signal to the player they can interact.

What *Fall of Man* and *Half Life 2* share, along with most FPS games that make any attempt at ecological validity, is the device of drawing the player away from the constraints of the environment by mapping critical gameplay

onto those aspects of the environment which are interactive. In other words, *Half Life 2* makes much of the fact that crates and barrels can be stacked to gain access to windows and over walls: making this a critical activity early on. Subsequently, when faced with a locked door *and* some crates, the player will have no problem accepting the latter as the solution. The next time a locked door is presented without the crates, the framework is already in place for the limitation to be seamlessly integrated into the diegesis. Likewise, padlocks in *Half Life 2* can be shot off: this distinguishes the type of locking from an internal door lock, which cannot. Visible lock: can be interacted with; invisible lock: dead end.

Section 6.10. Teleporters and other special functions

It is worth considering the use of teleporters as a transition device, as despite being relatively easy to integrate into most extended, transformed settings and certainly into fantastical realities, teleporters are not that common in FPS titles and are generally reserved for specific usage rather than as generic travel devices. In *Invisible War*, only a single instantaneous teleport takes place. It is also found in *S.T.A.L.K.E.R.*, *System Shock 2*, *Prey*, *Halo*, *Doom 3*, and *Half Life*. In the last two franchises, portals sit at the core of the plot: in both, opening portals has led to a bridge to another dimension results in the initiation of the liminoid, or transformed world. In both, the player gains access to teleportation in the final quarters of the game, thus establishing it from early in the game as a form of target. In both games, of course, the player has already been beset by otherworldly agents teleporting into attack them from the outset, which contributes to this goal-setting. Gaining the power to also teleport raises the avatar to a level of power closer to the agents, symbolically precursing the final showdown. Gaining the ability to travel between worlds signals clearly and distinctly that a transformation has taken place within the interior landscape of the hero, as a microcosm of the liminoid world (Section 9.5).

Thus, Freeman encounters limited range teleportation in Lambda lab, his destination from early in the game, then battles through the pseudo-boss encounter of the central teleporter, to cross-over into the border worlds of Xen. At this point, the world is fundamentally altered; the radical shift described earlier, and the message is sent to the player that they are approaching the climax of the game. Equally, *Doom 3*'s teleport labs are the gateway to Hell, the final destination of the marine, who literally crosses the threshold into both another world and a supernatural incarnation of himself.

In both of these cases, the teleport-as-doorway can be considered as a critical controlled trigger, according to the taxonomy outlined in Section 2. In other words, they are functional in terms of the overall system and plot progression, but do not have a ludic function beyond this. This is also true of *Halo* and *Halo 2*, where the Master

Chief is transported by first 343 Guilty Spark and then Cortana as a means of covering geographical ground without resorting back to the lengthy bridging variations on Assault on the Control Room. As *Halo* has established scale as a fundamental environmental principle, it would break the diegesis to suddenly find the Flood chambers, Library and Truth & Reconciliation landing sites conveniently located within strolling distance; nor could the pacing of the game play support a long drive back through the environments (like all great game tricks, even Bungie couldn't pull off the backwards level more than once). Teleportation here is a functional, singular device to achieve a system goal.

System Shock 2, on the other hand, offers teleportation as an expansion to initial movement. One of the more advanced (Tier 5) psychic abilities available to players choosing the OSA progression pathway, Instantaneous Quantum Relocation allows the player to set markers in the environment and transport 'home' to these at any point. Teleportation does not, however, play any critical role in game progression. *Quake 4* uses teleporters late in the game, mainly to import the *Doom 3* style of agent spawning. Kane also gets access to a teleporter that enables travel between distinct levels in a similar way to *Halo*; at this point, the plot is heading towards a climax, so lengthy bridging sections would be problematic. In this way, the sense of travel and distance the game has already expended significant effort into (with its substantial number of early bridging levels) can be maintained without requiring the break in pace that these necessitate. As with most games, a clear funneling effect towards the conclusion of the game can be observed: signaling to the player that they are drawing towards a climax (*S.T.A.L.K.E.R.*'s final C-Consciousness level is a clear example of this, and fulfills a function as a form of radical break).

Teleporters thus, although potentially problematic in their bypassing of normal expectations of movement, are powerful devices for supporting episodic diversity without requiring cutscenes or bridges (they also ramp up the technological ante, pushing vigorously away from normality, thus signaling an increase in liminoidity or towards transformation). However, perhaps due to their disruption to the bridging that is so common and useful for FPS games, they remain an end-of-game device, signaling that a climax is approaching, as the normal bridging activity is truncated, speeding up the action. In fact, it is only really in *Unreal Tournament 3* where more-or-less free use of teleporters can be found as a gameplay device (the Relocator). Relocators may be used for navigation, such as reaching otherwise inaccessible locations, or tactical advantage (the Relocator destination device moves faster than a player can run).

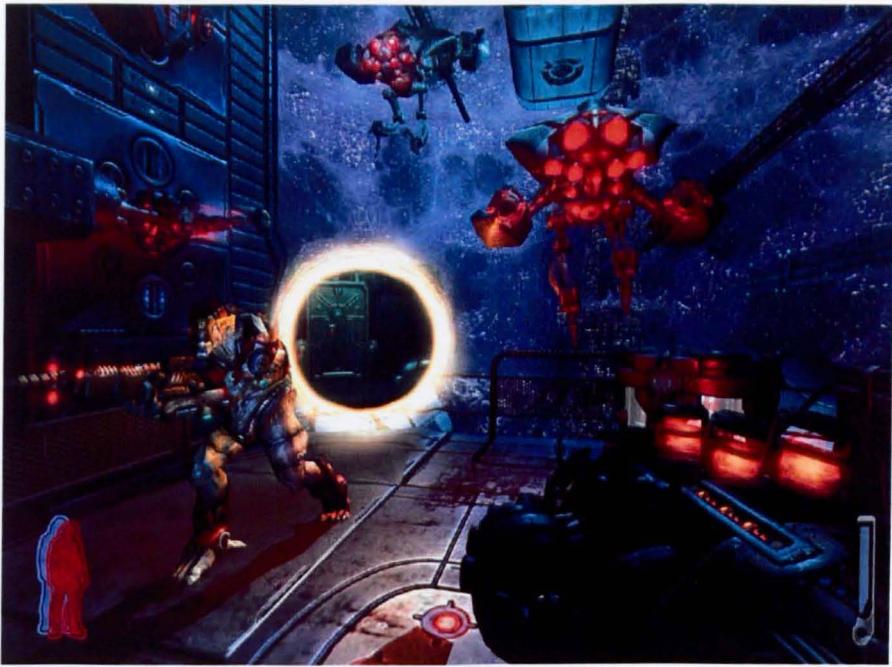


Fig 35. A portal in *Prey* linking two environments together. The other primary use of portals is to spawn agents, in essentially the same manner as *Doom 3*.

Finally, *Prey* also uses a form of running teleport device in the form of the portals scattered around the environment and it is worth discussing this, along with some other gameplay devices that attempt to divert attention away from what is basically a set of environments with little diversity or ecological validity. *Prey* is essentially a straightforward linear shooter with a number of integrated design tricks that expand the apparent affordances beyond the norm. With its capacity to shift between spirit and normal worlds (a running version of the hero's liminoid transformation noted above); gravity bending walkways, portals and a number of set-pieces that play extreme tricks with scale, *Prey* thus initially seems to move beyond the normal structural devices of an FPS. On closer inspection, however, really all that occurs is a shift in the available parameters. Entering spirit mode exposes bridges to normally unreachable parts of the environment and is locked to environmental affordances rather than being an ongoing attribute (and is unambiguously cued by a visual marker). In other words, it is more appropriate to view *Prey*'s spirit walking sequences as controlled triggers rather than a personal affordance. Likewise, the scale set-pieces, most notably, the transportation of the player onto the surface of a small asteroid in the episode "Downward Spiral", have no lasting or integrated shift in gameplay dynamics. The portals within the game, enabling transportation between environments with no geographical connection are again locked to the environment, but aside from the ability to play some interesting physics games (such as being able to shoot oneself in the back of the head), arguably break any sense of bridging the game tries to establish, in effect sacrificing orientation for scale. In other words, although *Prey* is essentially one long chase through the

Sphere for Jen, the portals make it hard to locate the disparate environments on the arc of the bridging structure – there is little ability to find a relationship between them. However, this does appear to be part of a wider adoption of disorientation as a diegetic technique (to provoke a sense of scale), albeit of questionable success.

Prey also makes much of its gravity shifting capabilities, which are distributed between environmental objects (walkways) and a carried-item (the Leech gun). The first of these are an interesting but straightforward means of re-inventing an environmental space, although unlike Halo, this recycling is limited to single spaces, rather than spanning extensive locations. Thus, they are once again really only classifiable as controlled trigger objects, as without utilising them, linear progression is barred and they serve no function in terms of dynamic gameplay (you turn them on and walk on them, or not).

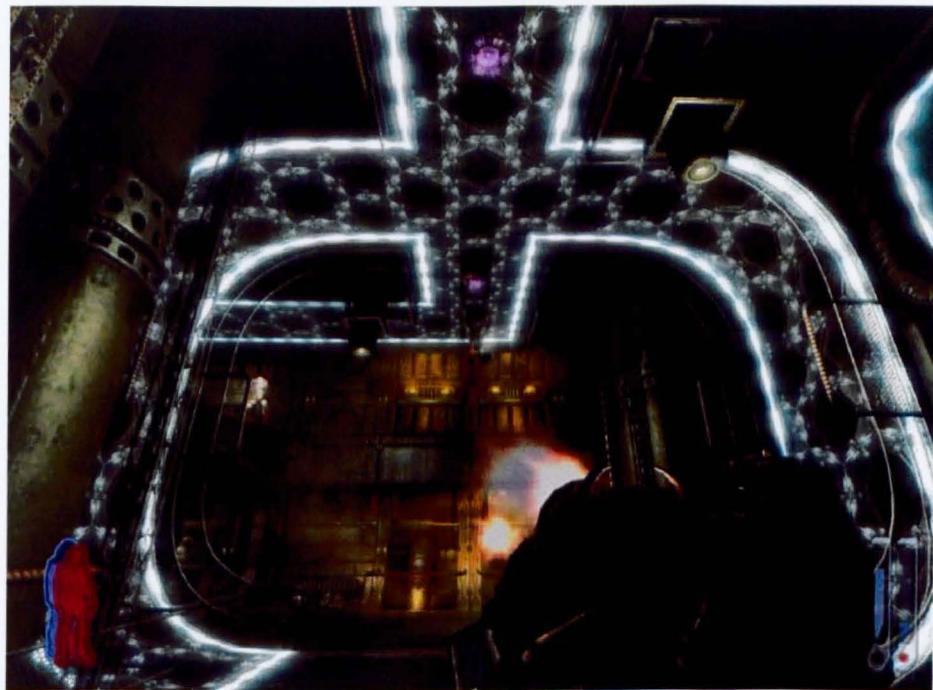


Fig 36. Gravity walkways in Prey

The Leech gun provides a superficially more interesting expansion to the avatar's affordances, as it allows the player to select from terminals located on floors, walls and ceiling to rotate the environment. However, whilst it does seem to fit more easily within an expansion of normal parameters applied to movement, it is once again limited only to those places where environmental objects enable it. In other words, like spirit walking, what is touted as the ability to walk on walls, is actually controlled trigger devices embedded in the environment but

encased in a purely diegetic coating which attempts to virtually relocate the action to a developed attribute of the player. By way of contrast, the much earlier *Alien vs. Predator* (Rebellion 1999) allowed the player, when controlling an Alien character, to run on walls or ceilings at will. This is true expansion of the normal parameters of the avatar, as it placed a strategic and ludic expansion of functionality in more direct control of the player. In other words, the player can take advantage of the parameters at any point, rather than them being attached to discrete points in the environment.

In terms of diegesis, *Prey's Sphere* makes extensive use of disorientation and a distinctively creative approach to ecological validity in order to cloak the degree of linearity of play. The spacecraft occupied by Mother and her agents is presented as vast: during ‘Downhill Spiral’ Tommy opens a viewport to the Earth seemingly encased by the Sphere. During Tommy’s pursuit of Jen up through the central transport structure, it is clear that the system is attempting to invoke a sense of planetary scale: the shuttle sequences have the player moving giant asteroids around within the interior spaces of the ship for example (Asteroid Mining). The interracial rebellion established as a subplot (Section 9.5) also enables a massive virtual expansion of the world to take place: in order for a mass uprising to occur with a number of tribes or even races involved, the environment must be suitably vast. With scripted sequences such as a commercial passenger jet crashing into the Sphere’s interior, and regular use of very large interior spaces – giant sized rooms and technologies – *Prey* constantly reinforces the message to the player that the world must be vast, in order to contain such a high frequency of vast accessible spaces. In other words, the system is taking advantage of the natural extension of distal attribution to virtually expand the diegesis way beyond the tunnel of environments that are presented. This is a frequent trick of FPS worlds, but whereas it is usually used to create a distinction between interior and exterior spaces, projecting the inference of more world out there, increasing context, *Prey* brings the whole thing inside a unitary structure to boosts its overall size and complexity. This has a knock-on effect of reducing the need for any form of ecological validity.

System Shock 2, for example, takes place on a remotely defined starship, and utilises imported schema as orientating structures accordingly: objects found on the Engineering deck are likely to be distinct from those found on the Bridge, for example. However, given the relative freedom of exploration or, rather, the ratio of ludic environment to diegetic environment, *System Shock 2* is forced to present a substantial number of non-ludic objects in order to retain a seamless diegesis. If, for example, the player has a more or less free run of the recreation deck, then the deck must provide recognisable or expected recreational facilities. And so it does: bars, clubs, shopping malls, a casino and a cinema. The problem then becomes that the recreation deck facilities suggest a far larger crew than can be drawn from the scale of the medical facilities or engineering Sections. The latter is tiny in comparison, and has to resort to distinctly fuzzy technologies to avoid highly complex

representation of the types of devices one would infer from the complexity of the technology and its attached expectations elsewhere on the ship. The result is a discontinuous diegesis. This is not to say that it has a substantial de-railing effect upon the experience of play, but it would be simple to design out by simply altering the ludic/diegetic environmental ratio in the latter's favour. *Prey*, on the other hand, posits such a vast alien structure that it would simply be absurd for Tommy to just-so-happen to wander through all the critical points in a way that would render them comprehensible. This scale also has the effect of dehumanising the technology, further decreasing the need for the diegesis to bother with comprehensibility at all, and that includes motive. Thus, a conceptualisation of environment can be seen to operate significantly in terms of the other symbolic design constraints.

Finally, *Portal* must be considered, which stands alone in the analysis for several reasons, not least of which being the fact that it is the only game in the analysis that does not rest upon the primary act of removing objects from an environment, although the player is still expected to deal with machinegun turrets for a section of the game. Rather, *Portal* is based around the only instance of free use of teleportation, or instantaneous transportation of objects around the environment (including the avatar). In this instance, although the environment does constrain the use of portals, it is the only case of teleportation being an affordance attached to the avatar, rather than defined by the environment. *Portal* thus has a quite radically different core gameplay mechanism than normal first-person games, revolving around the successful positioning of the *Portals*; in effect, ensuring that a multiple trigger object which can be positioned by the player aligns correctly with a controlled trigger object defined by the environment in order to move forwards.

Section 6.11. Summary

The worlds of FPS games are vivid illustrations of the use of story as a gameplay device. Wrapping complex diegeses around a core of simple affordances are clear indications of this function. Bridging structures, the dominant structural form of the genre, enable strong orientation on both local and global scale, telling the player where they are and where they are headed, both geographically and in terms of plot resolution. In order for both bridging and distributed structures to function effectively and engagingly, certain types of diegesis are demanded. These are fundamentally tied to the types and scales of realities presented, and their transformations, which usually occur in the opening sections of the games. Thus, localisation is a common device, separating the game world away from normal reality, whilst enabling our understanding of how normality works in order to reduce the need for concentrating on the non-significant actions of gameplay (doors, lifts, telephones and so on). The fact that patterns between reality types, structures and diegetic scale can also be tracked points to a deep

relationship between types of worlds and the underlying structures they enable and assist. Specific devices, such as the radical break (and mid-point break) serve a gameplay function in terms of adapting play and offering diversity and, like localisation, are supported by diegetic wrappings. Finally, it has also been noted how there may be direct links between gameplay style – how the player is encouraged to approach the affordances available to them, and diegetic markers, in terms of both architecture, scale and ecological validity. In all of this a formal narrative in the classic sense is not required, but evidence emerges of how protonarrative elements in the form of the environmental context, or diegesis, of the game, are not simply an overlay, but an interwoven set of devices to support and manipulate the trading of affordances that constitutes gameplay.

Section Seven: Agents

Section 7.1. Agents and Intentionality

Agents will be considered from two perspectives. Firstly, what may be described as the general population of the diegesis will be examined. This is followed by individuals; the often persistent characters that serve specific roles in the games' stories. Before this, however, a rounded definition of how the term 'agent' is being used in this analysis should be offered.

One way of defining an agent in a game is an object with an artificial intelligence system attached to it that manages its actions. In the model adopted in the first half of this thesis, this could be defined as an object which contains independent, dynamic (contextually driven) control over the application of its gameplay affordances. Essentially, this division is not dissimilar to that made between controlled and free trigger objects. However, an additional factor is added in that this form of free trigger object is not reliant upon the player for the application of its affordances. Artificial Intelligence thus enables a free trigger object (remembering that objects are still bound by their contextual relationships to other objects) to dynamically adjust and apply its affordances without direct input, in response to its context.

Note that this definition does not, in any way, denote any characteristics that may be seen as anthropomorphic in nature, and when looking at objects with a degree of dynamic, contextual control over their affordances, there is an inevitable scale that begins with simple, controlled contextual response, like a landmine, to a complex humanoid NPCs like Alyx Vance. For example, in *Half Life 2*, there is an artificial intelligence system attached to the heat-seeking rockets Freeman can pick up. They will dynamically adjust their affordances – Change Own Location, specifically – in response to new contextual information that does not rely upon direct player input. Thus, if artificial intelligence is used to define an agent, a line must be drawn between objects with attached AI

(such as the missile), and those more commonly classed as an agent (such as a zombie), or define all instances of AI-objects as agents, clearly not a satisfactory solution.

Besides which, this thesis is primarily interested in the diegetic qualities of agents, using the term here in a way that is deliberately suggestive of character, as a separate class of object, to demonstrate how these operate as gameplay functions. Agency itself is used to describe how an object may act, in effect, its affordance relationships, and thus 'agent' is a perfect term for those objects with the capacity to partially control their own agency. This bypasses the question of the complexity of the internal state system, according to which model, a situation may occur where the complex heat-seeking weaponry of later games may actually be more of an agent than a monster in an older, simpler game, and focuses upon the activities of the object in the world as the root of the definition. Moreover, it is recognised that game AI is usually fairly rudimentary, with Adams & Rollings even going so far as to say, "Most current video games do not, in fact, contain much real AI" (2007:21).

However, what really counts is the player's interpretation of this activity. When considering intelligence in games, alongside the state systems, the focus should be upon the adoption of the Intentional Stance by the player, via a series of design tricks (Butcher & Griesemer 2002). The fundamentally important issue is not necessarily AI but rather the attribution of agency to action: the interpretation of agents as intelligent by the player. Indeed, recent research has focused upon naturalness rather than ability (Horswill & Zubek 1999, Freed et al 2000). Gorman & Humphreys, for example, argue that "approaches based on the analysis and *imitation* of human play may produce superior agents, in terms of both performance and believability" (2006:1).

Thus, essentially, when the term agent is used, it denotes an object towards which one can adopt the intentional stance (Dennett 1991: 76-77). This means that the object in question is assumed or believed to be capable of acting intentionally – i.e., with *desires*. A degree of anthropomorphism is at work: adopting the intentional stance towards an object means attributing a mind that is recognisable in its rational peculiarities. In other words, it means that assumptions are made about its functions and the types of beliefs it may have, in order to base predictions upon. Dennett's Intentional Stance does not, critically, require the object of its gaze to actually be in any way Intentional in itself. Rather, it is down to the observer: "we must *treat* the noise-emitter *as an agent*, indeed a rational agent, who harbours beliefs and desires and other mental states that exhibit Intentionality" (1991: 76, italics mine).

Artificial intelligence in games fundamentally rests upon the successful co-option of the intentional stance in players, and it is not at all necessary that agents in games are anything more than rudimentarily intelligent. The

reason for basing a definition of agents upon intentionality rather than intelligence is vital, as it positions any understanding of agents from the perspective of their relationship to the player, rather than on account of any inbuilt capabilities. That is to say, the focus is on *represented intelligence*. In effect, the question at the core of this discussion should perhaps be what is it that the appearance of intelligence, or compatibility with the intentional stance, contributes to the epistemological and functional process of play.

The more general conception of intentionality and the specifics of the game populations can be bridged with some examples. In Section 2.4, it was argued that a simple contextual manipulation of affordances may lead to the inference of anthropomorphic qualities. The proto-intelligent response of Doom's monsters is a good illustration of this. The AI attached to these objects is really very simple, but one design trick that assists the process of anthropomorphisation is that, upon being struck by a projectile from another class of agents, imps will turn and attack the offending perpetrator. Whilst this really is a rudimentary degree of intelligence, no more sophisticated than a 'hit wall, turn back' response, it enables a bootstrapped intentionality that far outweighs its actual depth. Why did the imp turn on the zombie? Because it was hurt and responded in anger. It is already known that imps can be damaged by the avatar's actions, now the player knows that they are *generally* susceptible to negative state changes in the world. This expands their diegetic form, by allowing inference to occur. As with a reaction to an Intentional object in the real world, an internal state can be projected onto a contextual action. The player is free to speculate beyond the boundaries of a moving object, as they can relate -in an embodied manner – to the potential distal and anthropomorphised characteristics of the Imp. Critically, it does not require cognition, or any form of evident higher order deliberation, but it is recognisably instinctive and causal. The imp attacked the zombie because the zombie shot the imp.

Thus, the player has learned something, in this moment, not just about the vulnerabilities of the agent, but about the types of predictive models they can use when engaging with it; and, of course, there are other responses that could be experienced other than 'revenge'. The 'panic' of the Covenant Grunts when their Elite leader is downed not only establishes a strategically advantageous mode of play for the player (thus increasing the chances of this behaviour occurring), but enables a greater inference about the hierarchies and reactions throughout Halo's world. Coming across two unaccompanied Grunts in a new space may naturally lead the player to start wondering where the Elite is, which, in turn, may see an adaptation in play behaviour. Again, a simple, proto-intelligent behaviour on the part of the Grunts enables them to be empathetically bootstrapped into intentional agents – they are cowards, with all the associated cultural baggage that goes with the phrase – which, without any further investment needed by the system, has a direct epistemological effect upon play, and deepens the presented diegesis. Hunters are often found apart from other classes: they are solitary. Of course, they are fundamentally not

solitary, they have been positioned in the diegetic space apart from other units, but even this purely functional location has the capacity to trigger an intentional, anthropomorphic response. This is a hugely powerful ludic device.

What, then, can be discovered about the general populations of FPS games and does ludodiegetics tell us anything new about them? There are some simple and self-evident surveys and distinctions that can be made for starters, beginning with the number of different agent classes: the diversity of the population, and how this splits into sets. It is appropriate to adopt anthropomorphic terminology at this point and also consider the sets as factions. This kind of division, between representation and affiliation, functions to enhance the diegetic intentionality presented. Following this is a consideration of the distribution of the population through the world, followed by an appraisal of the types of actions attached to each of these objects, and an attempt to follow through the intentional stance by identifying the beliefs and goals of these agents, wherever possible. Indeed, it may be possible to trace the degree of clarity and explicitness of these characteristics, and offer examples of where a greater degree of ambiguity is presented, or a greater amount of player inference is required (if at all). These will be combined by a foray into the information load attached to each member of the general population, that is, what ludic and non-ludic information is explicitly presented by the agent (*Innsmouth*'s citizens wear their polluted genes on their sleeves; *Half Life 2*'s zombies demand victim as well as aggressor status by screaming 'Help me!' as they approach, etc). This is closely related to character depth, and will be concluded with a discussion of temporal span and projected history.

Section 8.2 General Populations

When considering the population diversity of a game world, an immediate number of sets of games can be noted, in terms of the subtlety of the divisions between agents. In other words, there is a clear and unambiguous gap between one type of agent in *Doom 3* and another – an Imp is fundamentally recognisable as different to a Pinkie, and to an ArchVile, and a Zombie, and a Revenant and so on. The same holds true for *Quake*, *System Shock 2*, *Half Life*, *Halo*, *Painkiller*, *Fall of Man*, *Prey*, *Cthulhu* and *Undying*. In other games, although some distinct sets of agents that are qualitatively different can be found, there are a greater number of similar agents within the largest set, with little immediate difference between them, or with an agent type's core characteristics being recycled in different factions. So, for example, the basic troop or civilian model in *Deus Ex* can be re-packaged as part of the NSF, UNATCO, MJ12, Versalife or the Chinese Army. *Far Cry* has 13 sub-types within Mercenary, but there is little differentiation between them, at least not on the scale of the division between sub-types in the Trigen set (Locusts, Trigen Monkeys, Spectre and Big Boys are immediately and fundamentally

distinguishable). In other words, the Mercs in *Far Cry* may have different parameters in terms of accuracy, speed and, via the weapons and armour they carry, capacity to inflict and absorb damage, but the set of human opponents is far narrower conceptually than the Chimera set in *Fall of Man*. *Condemned* is perhaps the most extreme instantiation of this: its cast of assorted junkies, psychos and criminals splits into two definable sets; normals (with two sub-types: standard normal and big normal – the latter being principally defined by size and use of larger weapons), and *weirds*²⁵ (living manikins, crawlers and ninjas). This more subtle sub-type division makes it more difficult to ascertain the total number of identifiably different agents within such worlds, so the following position has been adopted: where differentiations between agents is problematic, these sub-types are categorised as a single agent type, assuming that the diegesis is not attempting to make a division unambiguous. Thus, in *Far Cry*, the Merc set will be defined as having a single sub-type: the Merc. *S.T.A.L.K.E.R.*'s three sets, *human*, *animal* and *supernatural* have one, five and five sub-types, even though five distinct factions can be identified in the human set. *Doom 3*, on the other hand, has only one faction (Hell) and two sets (Hell and Zombies)²⁶. The first has thirteen unambiguous sub-types, and the latter three (melee zombie, zombie marine, zombie commando). Within the melee zombie sub-type there are a range of micro-types (fat zombie, headless zombie, burning zombie, etc); these are considered to be aspects of single agent format²⁷.

Thus, an important distinction between set and faction is being made which will enable some of the subtle differences between populations in FPS worlds to be drawn out. A set is a broad category of agents that has an unambiguous and substantial separating characteristic from other sets. *Half Life* has two sets: Xen creatures and Humans. Rather than trying to draw up a list of must-have criteria for definition of these, or establish a formal prototype, what is critically incompatible between an agent and the broad distinction in the given set in terms of placing them is considered (a Bullsquid, being a two-legged, green, tailed, acid-spitting, tentacle-faced beast, clearly is not human, and thus belongs in the Xen set, for example). Even when the set division is more subtle, such as the distinction between *Deus Ex*'s normal humans and bioengineered humans, the latter have distinct characteristics which easily separate them from the former (normal humans do not explode when killed, for

25 It should be noted that in some games, sets have clear names assigned within the diegesis: Halo has Covenant, Flood, Forerunner and Human for example. In others, where names have been assigned by the author, the name is italicised. The existence of named sets, in itself, should communicate something about the diegesis.

26 Technically, there is a third set and second faction, Human. However, all the humans are dead by the time the game really starts, and from the initiation of the action, human contact is limited to a few isolated instances. It makes more sense to thus consider them within the individuals aspect of this investigation into agents, rather than as members of the general population.

27 Technically speaking, there are three basic zombie agents in Doom – normal, fat and Bernies, with a selection of different skins wrapped around them, but the affordances and characteristics are so similar we can class them together

example, or yield bio-implants if searched). Factions, on the other hand, are clear sets of allegiances that group agents along slightly different lines. A faction enables an agent-type to occupy more than one position in the game. For example, *S.T.A.L.K.E.R.*'s human agents (set = Human) can be found in the factions of Duty, Freedom, Bandit, Loner, Military and Monolith: the factional division separates out what are essentially the same agents.

Thus, factions can add complexity and depth to the agent population without requiring an expansion of agent types. Similarly, they are highly useful for adding complexity where an increase in agent numbers may damage ecological validity. *Deus Ex* may be futuristic, but it attempts to create a recognisably corporate normality; having too many non-human agents would place a strain upon this diegesis (it could be argued that it already struggles with Greasers and Karkians, although, perhaps due to its co-option of existing conspiracy themes and schema, not with Greys). The large number of competing factions in the game, however, allow for a huge diversity of human troop agents simply by affiliation (and a few adjustments to visual appearance). By contrast, Quake has many, many agent types, but only two factions: human and Strogg. This distinction establishes a totally different approach to play: in the latter, the prompt is that if it's not a Marine, it should be shot at. In the former, there are implications for both action (is this the right human to be shooting at) and prediction (if I shoot the NSF agent, the UNATCO troops will side with me, but this may affect my ability to get inside the Mole People's tunnels). In other words, by using factions within a population, the game system is suggesting that higher orders of intentionality are at work, and at stake. The Strogg have limited intentionality: it is enough to *believe* that they *want* to kill anything human, including the player. On the other hand, the NSF may *want* to kill UNATCO troops, but this is actually because they *believe* UNATCO troops to be supporting a regime *responsible* for the spread of a lethal virus. Indeed, *Deus Ex* forces a confrontation between the initial political and moral stance of the player and the plot's development when it is revealed that the player has been betrayed. *Invisible War* goes even further by not settling on an unambiguous nemesis like Page and MJ12; all the factions are problematic and the player can side and switch until late in the game. Thus, the ramifications of their actions can be inferred through simple reactions of factional agents, increasing the order of intentionality the player has to invest in the game which, in turn requires a different, more cognitively engaged style of play with implications for attentional resources and attached significance.

A table of sets, factions and total number of distinct agent sub-types across the genre can be drawn up as follows:

Title	Sets	Factions	Agent Types
Half Life	2 (Xen, Human)	3 (Xen, HECU, Black Mesa Staff)	13
The Operative	1 (Human, Animal)	2 (H.A.R.M. Agents and assorted goons)	5
NOLF	2 (Humans, Robots, SuperSoldiers)	3 (HARM, Police, Super Soldiers)	8
Undying	2 (<i>Humans, Supernatural</i>)	5 (Trsanti, Monks, Primitives, Supernaturals, Mansion Staff)	19
Deadly Shadows	3 (<i>Nonhuman, Human, Supernatural</i>)	7 (Keeper, Pagan, Hammerite, Undead, Kurshock, Hag, <i>Body</i> ²⁸)	11
System Shock 2	3 (Annelid, Cyborg, Robot)	2 (The Many, S.H.O.D.A.N.)	13
Deus Ex	4 (<i>Human, Robot, Nonhuman, BioEngineered</i>)	4 (NSF/Silhouette, Illuminati, MJ12, <i>Body</i>)	10
Invisible War	4 (<i>Human, Robot, Non-human, BioEngineered</i>)	6 (Order, WTO, Templar, Omar, ApostleCorp, <i>Body</i> ²⁹)	11
Halo	4 (Human, Covenant, Flood, Forerunner)	4 (Human, Covenant, Flood, Forerunner)	9
Halo 2	4 (Human, Covenant, Flood, Forerunner)	5 (Human, Covenant, Heretics, Flood, Forerunner)	14
Doom 3	2 (<i>Zombies, Hellspawn</i>)	1 (Hell)	15
Res. Evil	2 (<i>Zombies, Hellspawn</i>)	1 (Hell)	17
Painkiller	1 (<i>Hellspawn</i>)	1 (Hell)	26
Half Life 2	3 (Human, Combine, Xen)	3 (Human, Combine, Xen)	15 ³⁰
HL2 Ep 1	3 (Human, Combine, Xen)	3 (Human, Combine, Xen)	16
F.E.A.R.	4 (Replica, Human, Robot, Supernatural)	2 (Replica / Armachan, FEAR unit)	8
Condemned	2 (<i>Normals, Weirds</i>)	1 (The Hate)	5
S.T.A.L.K.E.R.	3 (Human, Animal, Supernaturals)	8 (Loners, Army, Duty, Freedom, Monolith, Military, Bandits, Mutants)	11
Fall of Man	3 (Human, Chimera, Chimera Vehicles)	2 (Human, Chimera)	17
Far Cry	2 (Human, Trigen)	2 (Merc, Trigen)	5
Prey	2 (<i>Sphere, Supernatural</i>)	2 (<i>Sphere, The Hidden</i>)	13
Quake 4	2 (Human, Strogg)	2 (Human, Strogg)	18

28 In the case of titles such as *Deus Ex*, where factions shift considerably throughout the games as a result of the unfolding conspiracy, the large number of sub-intrigues make a total faction count spiral. In view of this, the faction "Body" has been introduced, standing as a catch-all classification for small factions that, whilst identifiable, remain temporary or relatively unimportant to the game.

30 If the three types of headcrab and associated zombies are distinguished between, this rises to 19

29 It transpires late in the game that both the Order and WTO are part of the same faction, Illuminati. However, given that both neither faction knows about this, and that they spend most of the game in opposition to each other, it seems reasonable to classify them as different factions.

Call of Cthulhu	2 (Human, Mythos)	3 (Human, Dagon, Yithians)	10
Wolfenstein	3 (Human, Undead, X-Labs)	2 (Human, Undead)	11
Halo 3	3 (Human/Elite, Covenant, Flood)	3 (Human/Elite, Covenant, Flood)	10
Crysis	2 (Human, Alien)	3 (Korean, US, Alien)	4
Perfect Dark Zero	2 (Human, Robots)	3 (dataDyne, Carrington, Civilians)	9
Unreal Tournament 3	4 (Human, Robot, Kraal, Necris)	4 (Liandri, Axon, Phayder, Izanagi)	4 (no real major distinction between types)
Portal	1 (Turrets)	1 (Test Machines)	1
Hellgate	5 (Spectral, Beast, Human, Necro, Demon)	2 (Hell, Human)	Huge variation using colour, name and size
Half Life 2: Episode 2	3 (Human, Combine, Xen)	3 (Rebels -incl Vortigaunts, Combine, Antlion)	18
Blacksite	3 (Human, Reborn, Xeno)	2 (US, Reborn/Xeno)	8
Bioshock	3 (Splicers, Big Daddies, Security Bots)	3 (Splicers, Big Daddies, Bots)	7
Timeshift	2 (Humans, Time Troops, Robots)	2 (Krone's forces, Occupant forces)	5

Fig 37. Population diversity: sets, factions and total agent types

From this, factions and total numbers of agent types can be plotted against each other to provide another illustration of the genre (see Fig 38 overleaf).

There are a number of immediate patterns in this model. Towards the bottom of the factions axis, often with only one represented faction in the game, are highly linear shooters with little in the way of narrative complexity. Indeed, with the exception of *System Shock 2* (which is both narratively and ludically complex), all of the games with a low Faction count are linear, run and gun shooters. In fact, with the exception of *Deus Ex*, all of the games in the analysis which are geared towards interactive or branching narratives and highly flexible gameplay approaches are found at the top end of the faction axis. The two exceptions to this patterning should be considered. Firstly, *Undying*. Although there are a substantial number of represented factions in this game, they occupy entirely distinct points in diegetic space/time. Unlike, say, the Merc and Trigens of *Far Cry*, the Tsraanti, Monks and Sil Lith never occupy the same world. They are oceans (and centuries) apart.

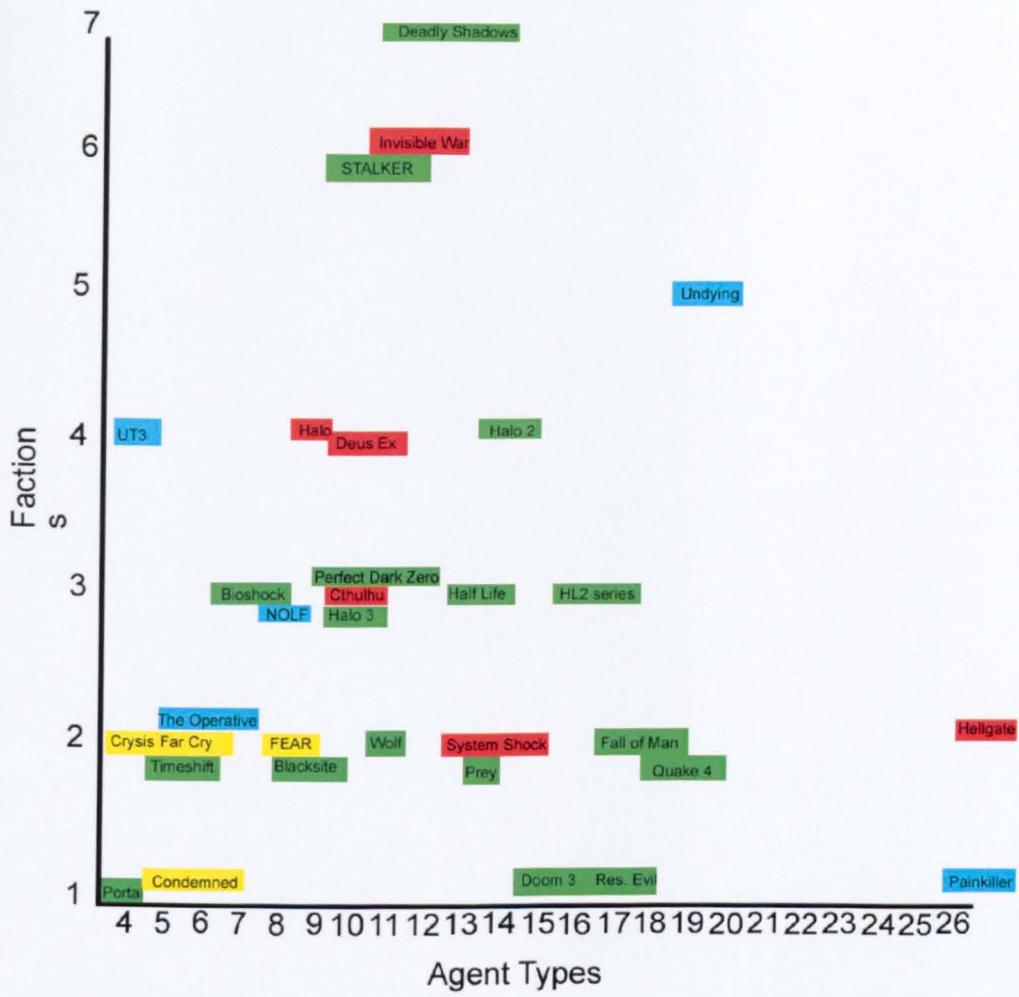


Fig 38. Factions and total agent types (red titles are RPG crossovers, green titles are more linear games, blue denotes heavily themed games; yellow are ‘grounded’ titles – see below for more detail)

Indeed, *Undying*, like *No-one Lives Forever* and *Painkiller*, is what might be described as a themed game in terms of population. That is, agent types are anchored to specific levels and are not represented outside these. Antlions in *Half Life 2* are another example of theming, although *Episode One* does introduce them into City 17, thus breaching the established boundaries of the first game. Elsewhere, most of the agent types found in *Half Life 2* can be found in most of the levels, with more dangerous agents finding staggered introduction throughout the game. This is a common device, with introductory agents reducing in number towards the later portions of the game (*Doom 3*, *Quake 4* and *System Shock 2* are prime examples of this). *Painkiller* is perhaps the ultimate themed population, not altogether surprising given its relative lack of narrative continuity and development of a coherent reality. So although there are technically a larger number of politically, or rather intentionally, definable factions in *Undying*, there is little actual tension between these groups. In other words, although a distinction may be

made between the Trsanti and the Cro-Mags, in actuality they are essentially the same agents serving the same function, without any interaction. This is radically different to the Hammerites and Pagans (*Deadly Shadows*); the Flood and Covenant (*Halo* series); the Mercs and Trigens (*Far Cry*); or S.H.O.D.A.N.S.'s cyborgs and The Many (*System Shock 2*). Indeed, highly themed games are actually quite likely to have a substantial number of unrelated factions.

The other slightly surprising position is *Deus Ex*. This may be a victim of attempting to straighten out the rather tangled web of factions in the game, and to represent the fact that they have somewhat dynamic borders. The four factions are defined as NSF/Silhouette (the anti-secret society 'terrorist' organisations), the Illuminati (including the Vanderburg lab staff and, initially, Tracer Tong), Majestic 12 (including UNATCO and FEMA) and the background body of population. Bringing UNATCO under the MJ12 banner is appropriate given that the plot exposes the control of the former by the latter, but it does fail to differentiate between the superficially different agendas of the two, or the fact that the player only discovers the links after substantial progression into the game. Equally, although the Vanderburg labs are included within the Illuminati, they are actually a break-away part of MJ12. Finally, within the body population, there is a huge number of microfactions that the umbrella term does not perhaps do justice to. Likewise, in *System Shock 2*, the emails and audio logs expose not just the running battle between The Many and the doomed crews of the Rickenbacker and Von Braun, but the political machinations and all-too human factionalism that The Many and S.H.O.D.A.N. exploit.

This is not say 'complex narratives require higher numbers of factions', as *Halo* and *Cthulhu* both have relatively small faction counts, but it certainly suggests that a larger number of factions are important if the player is going to have more choice in terms of their gameplay approach. In other words, factions allow for a virtual expansion of player-controlled play. Rather than having to track complex reactions to the player's activities within a limited group of agents, factions allow broad-stroke reactions to be delivered across a wider range. This is a similar set-up to Selfridge's Pandemonium, or Minsky's Society of Mind in that what matters is the overall effect of many simple process taken as a whole. Thus, rather than packing many demons into few agents, which increases the system complexity dramatically, as evidenced by AI driven interactive dramas like *Façade* (Mateas & Stern 1999-2005), it is easier both in terms of system capacity and design, to include a larger number of stupid agents. Let us use an example to make this really explicit. The Knights Templar and Illuminati are fundamentally opposed in *Invisible War*, and JC Denton's ApostleCorp are opposed to both. In the second 'Cairo Acrology' episode towards the end of the game, the player enters a hangar controlled by the Templar. The player has the choice of giving them blood (co-operation) or refusing. In the latter case, they must fight the Templar, but gain respect from the Illuminati. In the former, they gain the allegiance of the Templar but lose this with the

Illuminati. Whatever the outcome, the player then finds Paul Denton's body in suspended animation. Denton can be revived or killed. Reviving angers both Templar and Illuminati, but serves the agenda of ApostleCorp; killing him does the opposite.

This is all very straightforward, a standard branching structure, but what is important to note is that the response to the player's actions need not be subtle. Because the political decisions are depersonalised, the level of required representation of intentionality is reduced. When the player tells the Templar to "Go to Hell" and they immediately attack, all the supporting affect and intentionality can be inferred by their actions; each individual Templar's reaction is unnecessary as they operate en masse. By contrast, individual, persistent NPCs require a more complex representational structure as their reactions to ludic activity is localised. Each of the Templars is highly stupid and has a tiny behavioural response set: Alex agrees to give blood, do not attack; Alex refuses to give blood, attack immediately. But the combined mass of Templars enables a virtual, more complex affective response to be insinuated by the system. Likewise, any individual Pagan or Hammerite 'knows' the relative position of Garrett along their allegiance bar (an integer determining a parameter itself determining possible states which manipulate the ASSESS and SELECT affordances), but the overall effect is of a group of individuals responding to the shifting tactics of the player. The system is responding apparently intelligently to the player, but the requirements of each individual agent are reduced, as the shift is illustrated by the avatar's relative position to factions, rather than personalised reaction.

So factions, in other words, may provide an ethical framework for activity. A singular faction of agents, as found in *Doom 3* or *Painkiller*, leaves no room for consideration of approach. Inter-factional conflict, such as that found in *Halo* or *Far Cry* increases projected intentionality without the system having to do much additional work: the relationship between the Mercs and the Trigens can be inferred without any difficulty and the intentionality inferred from this suggests the factions can be tactically exploited, thus increasing gameplay options. Trigens will attack Mercs as well as the player, and Mercs see Trigens as every bit as much of a threat, so the groups can be maneuvered into a position where they will attack one another, allowing Jack Carver to slip past unnoticed. Exactly the same is true of the Flood and the Covenant in *Halo*, and essentially all *Deus Ex* or *Deadly Shadows* do is formalise this. Note that the actual behaviours of the Mercs and Trigens remains highly limited, but the simple factional conflict response allows a greater degree of intentionality to be inferred: I believe that the Mercs are concerned about the threat of the Trigens, who want to kill them, therefore, they will engage the Trigen unless I represent a greater threat to them.

In terms of the total numbers of classes presented; three groups can be identified. The RPG cross-over titles are

grouped together, all with 10 or 11 agent classes. By and large, more linear shooters tend to have a larger number of agents, and it may even be suggested that there is a tendency to find that as diegetic stability reduces in importance, the titles head towards the bottom right of the chart: they increase the number of agent types whilst decreasing the number of factions. In other words, as the story tends to simplify, larger numbers of agent classes can be found. This may be interpreted in two ways: firstly, it could be argued that new agent classes are being offered as challenge/reward system, thus diegetic progression is less necessary as a reward system, or, alternatively, that if diegetic progression (i.e. plot) takes up a more important and complex role in the delivery of the affective experience, less agent types are needed overall, as attention is focused elsewhere.

Either interpretation leaves the question of the isolated group in the bottom left: *Crysis*, *Far Cry*, *Condemned*, *Timeshift*, *Portal* and *F.E.A.R.* *Portal* is a highly unusual FPS game as has already been noted, as it is essentially a puzzle-game that utilising a first-person perspective, and thus has a very low agent count. *Timeshift* is unusually low in its agent numbers but is quite radically different from *Condemned*. *Crysis* and *Far Cry* and *F.E.A.R.* in its fantastical setting. In terms of the relationship to the world, looking back at the conditions of the presented diegesis (see Fig 22), all four titles run close to the past/future axis in terms of historical settings, equally, all four are relatively close to the ‘realistic’ part of the scale. Importantly, the other titles in similar positions quickly deviate away from their initial conditions – such as *Prey* – whilst this group stick with limited environmental progression (*Crysis* deviates the furthest of the three). In other words, *F.E.A.R.* remains within warehouses and office blocks, *Far Cry* does not leave the island archipelagos, *Timeshift* makes no further transformations upon its alternate reality and although *Condemned* does have something vaguely resembling a radical break it is not on the scale of *Half Life* or *Doom 3*. This positions the games in an alternate reality that does not stray too far from what is expected (taking the caveat that psychic cloned super-soldiers, criminal activity being an infection spawned by a demon ninja, and genetically modified killer apes do fall outside this range). All of these do, however, occupy symbolic positions easily drawn from normal life: genetic modification and biological warfare are highly recognisable contemporary issues, and the question of urban violence is perennially discussed. In other words, they are somewhat less fantastical – perhaps it would be more appropriate to consider them less embellished *metaphorically* – than the Chimera virus or an invasion force taking advantage of a teleportation experiment. They might be described, loosely, as ‘grounded’ titles.

Finally, the fourth group are the games situated on the right hand of the chart. What links *The Operative*, *No One Lives Forever*, *Undying* and, to an extent, the more contemporary *Painkiller*, is that they are all *themed*. Although in all cases there is a running plot, levels are absolutely grouped, with little spill in terms of environmental detail or agent class. That is to say, the sets observable in both world and agents are strictly

delineated. Whereas, for example, MJ12 Commandos and Troops can be found in New York, Paris, Hong Kong and the US labs of *Deus Ex* (which otherwise may appear themed, with its distinct global set characteristics); the Thugs from the *No-One Lives Forever* chapter Misfortune in Morocco will not be found in Berlin or anywhere else. Likewise, the Trsanti and Cro-Mags remain completely distinct in *Undying*. *Painkiller* pushes this to the extreme, with a frequently obscure link between agents and environments (if it exists at all) and is totally themed in terms of population. Zombie Ninjas in the Opera House and Amputees in the Asylum, but both remain within their episodes. Interestingly, *Painkiller* and *Undying* both have extremely high agent class counts, adding further support to the idea that there is a balance made between visual and progressive reward systems (*Undying*, to be fair, attempts a high degree of progressive reward, but the story in no way impinges or even appears to link across to the action making it easy to play through the game without engaging in it at all). *No-One Lives Forever* has a lower agent class count as might be expected from a (broadly speaking) non-fantastical game, in the same way that *Return to Castle Wolfenstein*'s range of Nazi soldiers are actually quite distinct, if all human. That is, the Black Guard paratroopers are non-trivially distinct from the Venom Troopers, Madame Blavatsky's coven and the rank and file soldiers. However, *Return to Castle Wolfenstein* falls outside the definition of a themed game as the agents are persistently introduced in the manner of *Quake 4*, *Half Life* and *Doom 3*, rather than being absolutely fixed to episodes.

Just by identifying trends within numbers of sets, factions and total number of agent classes, distinct groups of games within the genre can be noted. Low faction counts reduce the need to cognitively engage with the content, or the actions undertaken – they imply a much more passive relationship between ludic activity and the diegesis. High numbers of factions usually means that the player's actions have an impact and help reinforce a more careful, thoughtful approach to the game. This then may be exploited in terms of level design, goal approaches and reward systems, not to mention the virtual diversification of affective and narrative output on multiple playthroughs. High numbers of agent classes tend to be found in more linear games, where there is, perhaps, a greater link between Bryce & Rutter's spectacle and the reward system, which is to say there is a smaller conceptual and temporal distance between reward and action. New agents are their own reward, as well as challenge. It should also be noted, that the most fantastical games are found within this group: *Quake 4*, *Doom 3*, *Painkiller*, *Fall of Man*, etc. In such settings, designers have a much freer hand in terms of agent design, allowing for high visual diversity, as they are not constrained by a diegesis anchored to normal reality.

Whilst on the subject of theming, it is pertinent to consider the distribution of agents throughout the diegeses they occupy. *Painkiller*, on the one hand, uses a microepisodic breakdown of environments: enter an area, clear the area, find the checkpoint marker, move to a new area. In each area, very large numbers of multiple agent

classes are spawned simultaneously (and there may be multiple spawns before each sub-environment is cleared). Gameplay thus has more in common with a multiplayer deathmatch and *Painkiller* makes no real effort to connect this action with any persistent storyline or progression. On the other hand, *Doom 3*'s agents are very thinly distributed, usually appearing either as lone agents or in small, occasionally mixed groups. *Doom 3*'s environments are smaller and more clearly linear than *Painkiller*, with a relatively low degree of agent/ecology validity, though the agents are linked to a persistent storyline and, whilst not falling directly into line with its progression, are at least attached nominally to it. It is worth making this cross-reference explicit, whilst remembering that correlation does not imply causality (a rather more holistic, complex temporal ordering is probably at the root). *Doom 3* is based around fast-response, low tactics gameplay, with minimal interaction and high tension. Large numbers of agents require a degree of tactics in order to successfully engage with: a player must quite simply track more demons at any given time in *Painkiller* than in *Doom 3*. This requires space: not only for the representations of the agent, but room to think and plan and make tactical actions. It does not seem to be a contentious statement to say that *Doom 3* is not a tactical game. Smaller environments (both physically and as a result of lighting levels) limit the numbers of agents it is possible to fit into a given space and this, in turn, reinforces a play style. Beyond which demon to target first, forced later in the game by the spawning agent Arch-Vile, there is not much thinking needed, and quite literally not much space or time to do even that in. *Doom 3* therefore requires a semantic mould for its agents that fit the available space, which rules out any particular social dynamic; there are not enough agents around at any given time to see this. Thus, the player is not presented with any particularly complex suggestions of agency upon which to build anything other than a rudimentary intentional stance. This, once again, reinforces the play style. Unlike *Prey*, where the player can make the strategic decision not to shoot at any of the unarmed mutants because they will attack if disturbed; everything in *Doom 3* can be assumed to be hostile. *Prey* establishes an additional level of intentionality within the play space: complex motive. Left alone, mutants will ignore Tommy (they have other, *better* things to do – unless Tommy interferes with their doing so), whereas Hunters are actively trying to kill him. A decision is therefore available to the player, which is a hugely simplified version of the central gameplay mechanisms of *Deus Ex*.

As a further contrast, consider the relatively complicated social dynamics of *Halo* and *Halo 2*. The relationships between Elites and Grunts has already been noted, as has the fact that both titles contain extended sequences of inter-agent conflict (Marines versus Covenant and Covenant versus Flood³¹). These complexities require space to function visibly. There is no point in Grunts fleeing when their Elites are killed if there is nowhere for them to run too. Equally, in order for the player to appreciate the inter-agent conflicts, they have to have space to breathe, pause and observe. This demands larger environments. Agent diversity and environmental conditions in *Halo* are

³¹ Plus, later (and in *Halo 3*), Elites versus Brutes

thus mutually reinforcing: large, open environments get a population interesting enough to break up the space; populations get a big enough world to be interesting in. Tellingly, the squad-based sections of *Quake 4* tend to be more open plan; lone activity takes place in smaller, more linear spaces.

Intentionality requires space to operate, then, and this can be achieved by reducing the population density or increasing the environment size. The former disenables social dynamics (or the illusion of dynamics, as a few good tricks can prompt intentionality, like closure, in the player), the latter reduces tension. However, as has already been seen, a conflict between expected and delivered intentionality is likely to cause problems. Once again, the presented diegesis can be used to manage the issue of how much intentionality should be inferred from the world. In other words, the semantic or symbolic nature of the presented agents can be used to affect the expectations of behaviour attached to an agent. The innate adoption of the intentional stance by the player can be co-opted to bootstrap the illusion of agency beyond the cues presented by the system. Likewise, poor conceptualisation can lead to the formation of expectations outside the capability of the system to deliver. The ensuing breakdown in agency, or conflict between expectations of intentionality and presented cue – is perhaps a far bigger issue for game AI than ‘realistic’ behaviour. In a way, an analogy can be drawn to McCloud’s discussion of iconic visualisation and empathy in comic book character visualisation (1993: 42-44). Just as comic artists understand that it is the iconic attributes of a character that will create empathy, rather than high levels of realism, which has roots in both the understanding of media/consumer relations going back as far as Plato, and in Jung’s archetypes – so a few key iconic attributes can elevate even simple agents to a higher degree of intentionality than highly complex ‘realistic’ behaviour. When using a term like iconic or archetypal, cliché, of the kind derided by Freeman (2004) is of course neither advocated nor expected.

The amount and type of information carried and transmitted by each agent will be returned to in due course; for the moment it can be assumed that each agent, like each symbol, contains a certain amount of information which may be transmitted explicitly, i.e., through action, language or visualisation; or implicitly, i.e., through association, implication or by co-option of imported schema. From this some broad observations can be drawn about how the relationship between agents (including the population distribution) and environments may serve to enhance or detract from their ability to function as intentional objects supporting a wider diegesis. This reintroduces the notion of ecological validity. In the case of agents, this is less to do with the fit of agent to environment because the hostile agents presented in an FPS world are highly likely to be established as either invaders or trespassers into the realms of the normal reality, but more about the way in which they engage with the world and the action contained within the temporal frame of the game.

This can be illustrated this in terms of both successful implementation and a breakdown of validity by considering the way in which the two major agent sets of *Far Cry* interact with water. Firstly, there is a general rule: Trigens can't swim³²: a Trigen will drown if it enters even relatively shallow water. This is applied consistently and the knowledge can be applied strategically by the player. More to the point, it co-opts a general folk theory about apes to support itself: gorillas are never seen swimming. The fact that this lack of ability can be seen in the Trigen's behaviour increases the virtual attribute set of the agent by extrapolation and inference. They will not tend to run into water, but may be tricked (in strategic terms, they tend to attack by leaping at Jack, so a quick duck can become a potent weapon). With only the information that Trigens can't swim and Trigens don't normally enter the water, the intentional stance can be adopted towards them: from Trigens don't enter the water because they can't swim is easily reduced to the anthropomorphic *Trigens are afraid of water*. This, given a lack of experience of swimming gorillas, makes ecological sense.

On the other hand, people can swim, so it would be strange (i.e. have lower ecological validity) to find an entire Mercenary army of non-swimmers. Thus, Mercs will happily enter the water and wade, or swim. Here, however, a good example of a breakdown of ecological validity that derails the entire sense of intentionality can be identified. On entering the water, Mercs have a bad habit of staying put, treading water until encouraged to leave or being picked off by the player. Indeed, whole groups can be enticed into the water at once (see Fig 39 below) by a few well aimed shots or even tossed rocks to get their attention). This creates a kind of odd pool party, complete with eight to ten professional killers treading water together indefinitely whilst hurling abuse at an unseen adversary. Primarily, it begs the questions: "what on earth are they doing?" swiftly followed by "why don't they get out?". Unlike the apparent reluctance of the Trigens to enter the water, the Mercs seem to love paddling so much they see no reason to get back onto dry land; despite the fact they cannot use their weapons whilst swimming and are fully aware, as evidenced by their barks, that an armed and dangerous enemy is in the vicinity (at least within earshot). Two things can be drawn from this: firstly, a breakdown of intentionality caused by a conflict of very simple behaviour: the Mercs have shifted state into a combat mode yet they have rendered themselves defenseless and are not seeking a resolution to this problem. The second is inference based on ecological validity: no-one would put themselves in this position, and the pool party effect doesn't fit any imported schema for human behaviour within this ecological context.

³²In what follows, Ape Trigens subclass, is being dealt with, rather than the humanoid Locusts, Spectres or Big Boys.



Fig 39. A Far Cry 'pool party'

Compare this to the kinds of overheard conversations between Mercs triggered by the player aiming the binoculars at them from a safe distance.

Merc One: We're twenty feet from the equator here, genius. It's Micronesia, for crying out loud

Merc Two: Sure, but if it's not the heat it's the bugs. I hate bugs

There are three things to note about this. Firstly, it does not involve any intelligence to be attached to the agents in any way; it is simply a triggered audio file. Secondly, it is not essential; the player can complete the entire game without experiencing this conversation or any other conversation like it. No actual information of any significance to play is delivered by it; unlike if one of the Mercs had said "...and I spent six hours guarding that goddamn grenade store in the locked hut by the beach... You know the one with the brass key we keep hidden under the bucket in the pig shed". What it does do is expand the potential for the Intentional Stance to be adopted towards the Mercs: the player is given information that allows this to happen by telling them that the Mercs *know* where in the world they are (and thus also reaffirms they are in the world); one *dislikes* the heat (he has thoughts about the world) but not as much as he *hates* bugs (he has thoughts about many things). The player

is also given a status relationship between the two, as the derogatory “genius” comment suggests they are hearing a conversation between two equals (they have a social life outside the game). Finally, the conversational tone, its informal banter, sets up a relationship that has a temporal span: it can be projected that these agents know one another and have done for some time (they have an implied diegetic history outside the action of the game).

What is essentially happening is that the Intentional complexity is being virtually increased by a triggered audio file. This extends the process noted with the original Doom’s inter-agent conflict in personalising two agents. The player is given specific information that can be used to derive extended Intentionality. As soon as the Mercs become aware of the player, they will revert to depersonalised combat behaviour but, however fleetingly, they have been individualised. This has been accomplished by supporting a relatively simple, shallow deployment of information that works because it is ecologically valid: two bored men stand around complaining about their lot. The very banality of the conversation gives it a depth; it is eminently recognisable, and it humanises what are for all other intents and purposes, simple agents. Likewise, a Covenant Grunt in *Halo* will scream and run away when its Elite is killed, but it won’t ever try and beg for its life. But the panic and cowardice that is displayed is enough to help the player elevate the simple bot to a more complex level of Intentionality.

It is not just a case of avoiding water or cliff edges, but how an agent or class of agents uses the environment. Just the simple act of ducking for cover enables the player to draw the inference from an agent that it is environmentally aware; that it has a degree of self-knowledge. If it can distinguish between a normal barrel (a good place to take cover) and an exploding barrel (a bad place to take cover), this is increased dramatically. Few players of my generation can forget the first experience of *Half Life* of being flushed out by the Marine squads. Caught off balance by a system’s AI doing something outside one’s expectations of its possibilities, but sitting squarely within the type of ecological validity to be expected from highly trained military units, there was a palpable sense of being out-smarted by the agents. Of course, the actual AI and actions taken are far less complicated and dynamic than the real world, but it does demonstrate that it is perfectly possible, with the co-option of the intentional stance and an appropriate level of ecological validity, to create that illusion.

The way in which *Fall of Man*’s Steelhead Chimeras use their Augur rifles is another good example of this. One of the game’s several special function weapons, the Augur will target enemies and hit them through walls, and Steelheads will use this rather than engage the player directly. In system terms, this actually decreases the complexity of the task of line-of sight aiming, as the Steelhead just orientates to the player’s position regardless of what is between the two points. From an affective point of view, it offers a boost to intentionality once again: the Steelheads *know* where Kale is hiding and will flush him out into the open by targeting him through a wall. They

know their capabilities in relation to the environment. Ecological validity can therefore be assessed along two related axes: the agent's perceptual awareness of their environment and the agent's semantic understanding of their capabilities relative to the environment. A Trigen is not only 'aware' of water; it 'understands' it should not enter water. A Steelhead is aware of Kale and understands that even though it cannot see him, it can still hit him. A Merc is both aware of, understands the purpose of and, in a third level, can exploit, an alarm box on a tent pole. A Trigen is perceptually aware of the pole, in terms of collision detection, but has no demonstrable capacity to understand that the alarm box will summon more Mercs let alone the capacity to therefore set it off. This can be understood by returning to the notion of affordances. For a Trigen, the alarm box affords nothing more than a constraint to movement, whereas for a Merc, it affords a means of calling reinforcements. Note that both of these are entirely ecologically valid according to the likely expectations of imported schema. Thus, it would be as ecologically invalid for a Trigen to pick up a phone and call for help as it would be for a Merc not to use an alarm (indeed, alarms are a fairly ubiquitous device for ramping up intentionality in FPS games). The point is that the semantic characterisation of the agent has a profound influence upon the expectations of its behavioural set and that, in turn, can be used to manage the actual state system required in order to implement it. To put this another way, *Doom 3*'s assorted demons and zombies are profoundly stupid, in that they rarely take advantage of the environment (some zombie marines will take cover, but generally the mode of attack is limited to charging the player with all guns blazing), but at least their lack of complex interaction with the environment can be validated by their semantic attributes. Like a Trigen, it would be strange to see an Imp using a coffee dispenser. As a result of their non-ludic characteristics, a vastly simplified affordance relationship with the environment can be established that retains the all important ecological validity. Contrast this with *Condemned*'s basic agent set of derelicts and sociopaths. Although deranged, they display a striking ability to utilise parts of the environment as makeshift weapons: pipes, pieces of timber, shop window dummy limbs, etc. However, given their evident ability to draw these affordances from their home environments, there is an 'unnatural' cut-off from other obvious affordances they could therefore draw. Given the chaotic mess of broken furniture, doors, boxes and other rubbish in *Condemned* environments, the agents never do utilise this in any obvious way. They will duck for cover and occasionally lie in wait, but they never really make any effort to hide. They also cannot be seen engaging with the environment in any way at any point – bums do not rummage through bins, junkies are never seen engaged in any drug-related activity. They will attack each other given half the chance but this is no more advanced than the original *Doom 3*'s inter-agent hostilities. Given that Thomas is intruding into what appear to be the home environments of particularly animalistic, predatory, paranoid and downright insane criminals, and given the relative ubiquity of the mine or laser tripwire elsewhere in the genre, there is a surprising lack of traps or ambushes in the game. Not to mention no visible sign at any point of exactly what the crazies are doing hanging around in the sewage system in the first place. For all its lack of progression or depth, *Doom 3* at least bypasses

this problem by dumping complete aliens, with a distinctly less than human lack of interest in either their surroundings or actions short of dismembering the player, into the diegesis.

Halo's marines and Covenant share the characteristics of being marooned on an alien and ineffable world, and the Flood, the only vaguely native inhabitants have no interest in the surrounding technologies (although they do a mean line in hotwiring Covenant battlecruisers). It is not simply a case of building complex fixed-state AI systems, but rather of ensuring the state systems in place yield ecological validity, and one of the most powerful means of doing this is adjusting the far cheaper (in systems terms) diegetic properties of the agent in question. In other words: humans have recognisable behaviours and require recognisable facilities. Non-humans have a greater degree of freedom in terms of expectation management: they can be anthropomorphised to allow the import of schema, but their very inhumanity avoids expectations of more complex or subtle behaviours.

It is telling that only three of the games covered in this analysis attempt to show 'neutrals', that is, humans getting along with their daily routines in normal spaces – *No-One Lives Forever*, *Deadly Shadows* and *Deus Ex*. Of these, *No-One Lives Forever* is deliberately comic: these are not naturalistic characters and that allows them to be highly reduced and focused in terms of response and set behaviours. Both the *Deus Ex* games and *Deadly Shadows* present possibly the most under-populated cities in media history. In every other title, the initial conditions quickly give way to a liminoid phase, or the game opens within a liminoid environment, thus allowing the behaviours of humans, where they are presented, to be specialised. The crew and Marines of the Pillar of Autumn are in battle from the outset, as are the troops battling across the surface of Stroggos. It would thus not be ecologically valid to find them shopping for vegetables or cleaning their cars. Everyone in *Condemned* is either psychotic or has sensibly avoided the areas Thomas finds himself in. Even easier than this to manage are demonic or alien populations: the majority of the encountered population in the majority of the games covered fall into this category, and the system can assume a far greater degree of control over the expectations of validity inherent in such populations.

Thus, what may be thought of as epiphenomenal characteristics of in-game agents actually may exert a more subtle and deeper influence upon play than may be initially apparent. That is to say, in the characterisation of game populations, what may actually be occurring is a legitimisation of the necessarily reduced set of behaviours available within the ludic and system constraints. Intentionality occupies a position between expectations managed through semantic characterisation on one hand, and ecological validity as evidenced by appropriate affordance relationships on the other.

The latter part of this equation can be considered from another perspective. In order to adopt the intentional stance, evidence of behaviour that lends itself to prediction must be available. In other words, random action does not support the intentional stance. Putting aside the question of the validity of the performed actions, consider what can be drawn from the action set of an agent in terms of beliefs and goals, the fundamental supports of intentionality. This can be achieved by starting with a hugely simplified behavioural set: for example, the Barnacle from *Half Life*. Barnacles do not move, they do not actively seek out prey, but if anything hits their tentacle, they will draw it up to their body (attached to the ceiling) and dutifully attempt to consume it. They do not make any distinction between organic and inorganic matter, thus a player can deal with them strategically and easily. In terms of intentionality, the Barnacle is an extremely simple organism: it does not move; it cannot distinguish between food (organic matter), non-food (inorganic matter) and potentially lethal non-food (and exploding barrel). However, recognisable characteristics can be drawn from its presented behavioural set.

Firstly, it is a predator, it consumes things. It does not consume non-organic matter, evidenced by its rejection of such catches when they reach the mouth. It is indiscriminate however at the point of entrapment, therefore, it can be assumed to have little environmental awareness. It appears to believe that anything that hits its tentacle is potentially food and should therefore be drawn into the mouth, although its visible beliefs stop there. Critically, these beliefs are predictable. Barnacles always believe that any object hitting them is potentially food, thus will always draw it towards the mouth. Because this behaviour is predictable, belief and intentionality can be inferred and even though the behavioural set is tiny, it still enables a working organism to be constructed from the available evidence. The fundamental relationship between belief and predictability is thus an immensely powerful tool for agent design. The successful establishment of a belief system leads naturally to predictions about how that belief system will behave. In other words, there is a dynamic cycle operating between observed behaviour and (schematic) predictions and reinforcements in terms of intentionality and this can be co-opted by a ludodiegesis to bolster the behaviour of its agents with imposed expectation and justification on the part of the player. In real terms, this means that the affordance set can be kept under control without sacrificing ecological validity.

This is related to the information load attached to each agent, that is, what is known about them. Of the Stroggs as a general population, for example, alongside the observed behaviours and affordances – they can move independently around an environment, take some advantage of its features, engage with offensive and defensive behaviour, use simple strategies in these contexts, will always attack humans but not other Stroggs, etc – the player is given some explicit priming information and also develops their understanding of the population as the game progresses. Assuming no prior knowledge, the following information about Stroggs (in general) can be learned from *Quake 4's* manual:

In the mid-21st century, a barbaric alien race called the Stroggs launched a massive invasion on Earth. While the invasion was originally believed to be an attempt to strip the planet of its natural resources, humans soon discovered that the Stroggs are only after one thing: the human remains of those they kill. Through a horrific process, the limbs and flesh of the fallen are fused with metal and machinery to create the monstrosities that are the alien Stroggs...

...one surviving marine broke through and was able to destroy The Big Gun and ultimately defeat the Strogg leader, the Makron... The Stroggs proved to be extremely resilient and as the war continued to rage, the Stroggs regrouped and constructed a new and more powerful Makron... (pg. 3)

So, *Quake 4* opens with the understanding that the Stroggs will be hostile, have humanoid qualities but are not human (thus may be loosely expected to move etc in a human fashion, but with the caveat that they will differ in critical ways, so this difference should not be considered as invalidity). They are further dehumanised by their act of cannibalising body parts (dehumanisation being part of the process Atkins (2003) notes may help the seamless integration of a mass slaughter into the game action), are given motive (the cannibalisation of body parts), a technological level (capable of crossing space to attack Earth, thus high) which is grounded in an industrialist context (setting expectations of the types of architecture and objects the player may experience) and have a social hierarchy (the Stroggs had to re-group and build a new Makron, therefore they are vulnerable to the assassination of a leader, establishing both a goal and the inference that it is possible to take down this entire race with the destruction of an isolated object).



Fig 40. A Strogg marine: just human enough to use perceptual and schematic closure to boost animation, AI and intentionality?

Further, aspects of this information are reinforced in the opening meetings with the Strogg. Visually, their humanoid appearance is confirmed, but their inhuman qualities are reinforced by visual detail and speech. Their behaviour is certainly hostile and their motives, at least the immediate goal of killing all humans, support the premise. It may sound banal, but this sort of reinforcement is hugely important to developing a convincing diegesis. As the game develops, Kane burrows deeper into the Strogg environment, fleshing out but never compromising these initial conditions: aside from his Stroggification, which demonstrates the process of human-Strogg conversion, he visits the purification plant, where failed converts are dumped. In itself, the fact that Stroggification can go wrong fulfills two purposes: on the one hand, it allows the temporary introduction of a new set of agents (Zombies) with visibly different affordance parameters to keep the game interesting; on the other, the fact that Stroggification is not an exact science adds a kind of flavour-through-failure to the population. Making a mistake is an extremely human quality after all – analogous to the “unnecessary” but “aesthetic” actions Gorman & Humphrys (2006) describe training bots in Unreal Tournament to carry out, as part of process of humanising their play. There are, of course, cheaper ways of carrying this process out, such as seeing Barney getting locked out during the opening of *Half Life*, or the vending machine obsessed security

guards found by Adrian Shepherd elsewhere in the expansion game *Half Life: Opposing Force* (Gearbox Software 1999).

This process also applies to friendlies, that is factions and agents in the general population who are not trying to negatively affect the avatar's state and may even be 'assisting' them. Combat-capable agents fighting alongside the player are found in the franchises of *Halo* and its sequels, the *Half Life* series, *Quake 4*, *S.T.A.L.K.E.R.*, *Blacksite* and *Fall of Man*. In addition to this, there are several games that 'fake' friendly agents, or feature them in extremely small, zoned instances: *Return to Castle Wolfenstein*, *Cthulhu* and *Prey* (the original *Half Life* really belongs in this group too). It's not really any surprise to note these are all recent games (*Halo* being the oldest) as it requires AI capable of handling this type of play convincingly. However, only *Quake 4* uses mass-named avatars. This may be due to the fact that *Quake 4* supports the normal selection of persistent NPCs with a whole squad, and then additional squads and squad members repeatedly met during the game³³. Each agent is specifically named, and the name is displayed alongside the agent when they are within the primary visual field of reference (which can be diegetically explained by Kane's HUD). This is a significant decision, as it contributes next to nothing to ludic activity of the game, aside from the occasional command to "find Sgt/Corporal/Private/Lt X". It therefore begs the question of what purpose it does serve and the answer may be simple and obvious: it humanises the agent population.

Adding a name increases the information load attached to each agent, which is in addition to the ludic information, or affordances, already attached to them; it has the effect of increasing their significance. Whereas *Halo*'s marines, or *Deadly Shadow*'s night watch do come equipped with a range of accents and semi-formed personalities, *Quake 4*'s soldiers dispense with overly noticeable characters and opt for an extremely simple means of insisting a degree of individuality for themselves. They are literally different people. A (small) range of custom skins support this, as do a range of voice actors and a few well deployed audio triggers that pad out the relationships between friendly agents, rather than between the agent and the player. For instance, the player learns in the opening levels that Rhodes has placed a bet that Kane will not survive the crash and Ramirez is annoyed to see Kane as it means he owes Rhodes money. These features are extremely cheap in system terms, but they contribute a not insignificant depth to play.

Games frequently extend the ludodiegetic space virtually beyond the confines of the domain of play, and this virtual extension is not limited to the environment, but is more frequently found attached to agents and

³³Doom 3 also uses this device, but the non-hostile encounters are so few and far between they should really be considered special cases, rather than a general approach to population

operating along the temporal dimension. This is nothing as crude and shallow as *Undying*'s time-traveling exploits (not to mention *Timeshift* or *Painkiller*), but more subtle devices that project the sense that without the player's actions, or avatar's presence, agents would continue going about their business. In other words, (virtual) persistency.

Of all of the games in the study, *System Shock 2* uses a split temporal sequence to increase the ludodiegetic depth most explicitly, and attaches this to a large number of virtual agents (*Bioshock* also makes much of this technique). Importantly, however, *System Shock 2*, *Bioshock* and *Doom 3* (another utiliser of the email technique), the agents are never experienced directly. Only in a very small number of scripted sequences does the player see any surviving members of the Von Braun or Rickenbacker. Instead, email and audio logs are collected as the player explores, which contain both significant (catalytic) and extraneous (cardinal) information, following Barthes' terminology. It can be deduced from the use of logs that contain both types of information that the designers wish to draw the player to the latter, as the inclusion of the former forces them to engage with this device. The cardinal devices can be sub-divided into "advantageous cardinal information" and "insignificant, or atmospheric, cardinal information". Advantageous cardinals include things such as codes for lockers, or locations of supplies, but it is the atmospheric cardinals that are responsible for establishing the dual-temporal narrative that gives *System Shock 2* its still diegetic flavor. Plot, and a substantial number of sub-plots, are attached to reports spread throughout the ships' populations, telling the story of what happened prior to the initiation of ludic activity. Alongside the solution of the game's core conflict (including micro-goals) therefore, is a non-interactive, ludically extraneous process of piecing together a removed narrative occupying a temporal location outside the player's ability to actively engage with. Nor is this limited to the discovery of the Annelids and the subsequent power struggle within the ships; of particular note is the love affair between Siddons and Suarez which is developed throughout the game. This is a deeply humanising device, framing the high-concept science fiction and FPS action of the game within a cultural schema operating outside the schematic expectations of the genre. The importing of this alien but recognisable narrative structure thus deepens the game's emotional range without placing any particular demand upon either the system or the ludic activity. The fact that an audio log can be triggered and then played in the background whilst action progresses may add a potential flexibility to the individual affective arc the player will undertake. By attaching this affect expansion to a virtual narrative, *System Shock 2* reduces the need for system complexity, in terms of attentional and other immediately necessary cognitive resources, as well as in terms of need for AI, visualisation, interactivity and so on. *Bioshock* works in a very similar way, even though its AI is much advanced. *Doom 3* uses the device at a much simpler level, using humorous messages and the highly recognisable (and once again, highly human) bombardment of Mars Base employees with email spam, to break tension and widen the affective range of the game. As with environments,

these are economical and effective tactics for enabling an inference to take place that opens out the diegesis to a more complex and interesting affective relationship. Little more is required than Siddons and Suarcz's desire to be with one another, and their struggles to find one another to infer personality, humanity and most critically, history on board the Von Braun. In a way, this operates within Kermode's notion of forced closure, the impossibility of not creating links and building virtual architectures to support even vaguely narrative fragments.

Anthropomorphising these fragments by attaching them to agents enables the player to draw upon their own cultural archetypes and schema to ease the process; empathising with the story, giving it fuel to further generate affective experiences. As with *Quake 4*'s references to "what happened in Austin", the player is not expected to, and it is not particularly important whether they actually do, believe in or develop any actual historical diegesis in any depth, but what has happened, however briefly, is that a much wider world has been inferred. This once again adds legitimacy to the shortfalls and constraints of the presented world. In the case of *System Shock 2*, the daily grind and human activities one might expect to find in such a recognisably human space are indeed supplied, only in a temporal line inaccessible to the player.

System Shock 2's characters that occupy the expanded temporal frame bridge the divide between general populations and persistent NPCs. However, before discussing how the conceptualisations of key characters in FPS games can be understood in terms of the significant functional effect they may have upon player behaviour and affect, it is worth summarising the agent properties that have been established. In this initial investigation into the general agent populations of FPS worlds, it is hoped that the following arguments have been made convincingly.

Agents carry a huge responsibility in terms of the effectiveness of the diegesis and the ability to actively manipulate player behaviour. General populations can be qualitatively analysed by thinking in terms of sets, classes and factions; FPS populations can be broken down easily into 2-4 sets, with actual agent classes ranging from 5-26 in number. It appears a link can be made between the number of classes and the types of reward systems on offer (high number of classes are linked to linear, run-and-gun shooters with little diegetic interactivity, less complex narratives and little ethical/player-controlled dimension to play and visa versa) and from this, an impact upon play-styles. This last point is reinforced by the notion of factions, where high numbers of factions simply require more cognitive resources to track, thus lending themselves to a different approach to play. Likewise, further evidence of these trends can be seen when considering population distribution. Tight, closed spaces such as *Doom 3* and *Condemned* offer little space for the demonstration of strategic behaviour on the part of agents and the same is true for the possible choice of actions facing the player. There is thus a dynamic

relationship between environment, agents and player behaviour: Halo has the space to effectively enable social behaviour and this also enables a more strategic approach which, in turn, requires space to carry out and, literally, space to think. *Doom 3*, which is predominantly a reflex-based game, requires smaller environments, which means a less dense population, which means social behaviour is never on the cards, which means less to exploit (and be rewarded for) in terms of strategic play, and so on.

The conceptualisation of the population has a huge role to play in supporting this; it has been argued the key factor is 'ecological validity'. In order for agents to be in any way effective, they have to fit the diegesis, but, perhaps more interestingly, the conceptualisation of agents can be used as a tool for managing the diegesis being created. Through a relatively simple process of understanding behaviour and affordances in relation to expectations brought in by imported schema, and the automatic adoption of the intentional stance when faced by predictable behaviour that is environmentally valid, designers can both prime and actively manipulate the expectations of the player in relation to the population. Mercs *should* trigger alarms to get help because they are 'intelligent' people; Stroggs may be stupid, but this is alright, because they are little more than crudely reanimated cyborg corpses; Grunts are cowards, not technicians or philosophers. Simple evidence of predictable, iconic behaviour is enough to trigger the intentional stance, through a process not dissimilar to narrative closure, and an information load that gives just enough to enable this process, but no more, will cover the remaining cracks. Anthropomorphisation is critical although inhumanity is constantly reinforced through visual appearance or conceptualisation to cap expectations of more complex social behaviours.

Establishing a virtual digetic history, or mapping out more complex expected behaviour to an inaccessible temporal span is a powerful tool for inferring a greater depth to agents without any need to manage this within the ludic space. If the question of whether subjective reality is inherently narrative remains, there is little doubt that significance is normally attached to the human, or humanoid, and the importance of agents within a diegesis, particularly in terms of managing affective state and predictive expectations cannot be underestimated. Thus, when Grunts run away, it makes the Covenant that much more acceptable as a virtual enemy. Doing so when faced with a one man killing machine who has cut swathes through their ranks and just wiped out their champion is an action it is easy to empathise with. And with that simple masterstroke, it no longer matters where the Grunts sleep on their staggeringly empty battleship, or who brings them their food, or letters from home, or any of the other things that might be expected of a reasonably intelligent creature. Empathy is prompted and intentionality attached because an ecologically valid act is recognised, and this is inextricably interwoven with a functional suggestion about the approach to play designed to make a player take note of. Believable, intentional agents are, to an extent, predictable. Predictability can thus be exploited, by both players and a clever designer.

Section 6.3 Persistent NPCs

With the possible exception of *Half Life*, all the games included in the study contain at least one running character external to the player, featured in either cutscenes or in-play, who play a significant role in story or gameplay³⁴. In this section, these persistent non-player characters (PNPC) will be explored, illustrating how powerful they can be as ludodiegetic devices. This will begin by offering a taxonomy of PNPCs; a simple head-count together with names, degree of embodiment or visualisation and indication of regularity and persistence. This sets the framework for an investigation into whether individual instances can be grouped into clear types and functions, and what these contribute to both the game world and gameplay. Indeed, this section will go on to look at the ludic characteristics of the PNPCs, their role in play and their capacity for independent action in the world. This will be followed by an examination of their non-ludic properties: depth of character information, temporal span and location and personality, which suggests a final argument for the dynamic ways in which not just the actions or speech, but also the background characterisations of PNPCs can have a direct influence upon affect and behaviour. The PNPCs' relationships to the avatar, other agents, world and plot; with particular focus upon status, social networks, tacit knowledge, prediction / control and transformation, will be discussed.

Before doing so, a PNPC should be defined. The idea of a non-player character implies that the agent in question has some form of individuality, that they are recognisable as a separate character from the background population. Clearly, *Painkiller's* hordes of demons are not characters in any sense, they have no individuality. Further, each of *Halo*'s marines is one of six archetypes with no individuality attached to them. A similar principle is applied to *Quake 4*'s marines who, despite being individually named, have no other distinguishing individual features. A non-player character, therefore, is an agent with individual features. This, obviously, requires a greater amount of system resources than a generic agent, and it is therefore not surprising to find other games, such as *S.T.A.L.K.E.R.* and *Deus Ex* using the same model as *Quake 4* and attaching an individual name, and small amount of bespoke speech to a percentage of the general population as a means of virtually increasing the inference of individuality that can be drawn from the experience. However, the superficiality of these attachments should be noted.

Persistent NPCs, on the other hand, are those individuals presented in the diegesis who appear repeatedly or have a definable role in the world and plot. They are, to an extent, defined by diegetic significance rather than

³⁴It could be argued that the G-Man, whilst not impacting in any ludic sense – he is only seen a few times, briefly, and does not contribute actively to any events or plot until the very end of the game, nevertheless contributes a great deal to the background conspiracy motifs of the world of Black Mesa.

representation, as PNPCs like Halo's Cortana do not actually appear in the game as agent – that is, objects with dynamic and context-constrained independent control over their affordance relationships. When discussing PNPCs, therefore, it is a diegetic quality which distinguishes them: they are significant in the reality of the game, most normally due to a repeating significance in the story. Thus, although *Doom 3* and *Resurrection of Evil* include occasional meetings with trapped scientists, who are named and do have bespoke dialogue, they do not repeat, and have no diegetic significance outside the sequence they occupy. They are NPCs, but not persistent. Equally, although the medics and traders who occupy *Hellgate*'s key stations are persistent, and do have individual names, representations and a small amount of introductory dialogue, they have no significance outside the very limited affordance relationship they offer, such as making one controlled parameter shift (money) in order to make another controlled parameter shift (add a new weapon, so create a new state).

S.T.A.L.K.E.R.'s substantially non-linear game environment contains a large number of agents, controlled by the ALife engine, which enables them to conduct ongoing 'lifecycles' outside interaction with, or even visibility of, the player. This engine enables a more dynamic factionality to take place in the Zone between Duty, Freedom, Monolith, the Stalkers and the military. However, whilst this means it is entirely possible for the player to constantly return to and talk to Nimble or Bes, they play no additional role in the developing game after delivering their informational payload (and swiftly run out of new things to say). This is to be contrasted with the traders Sidorovich, Barkeep or Sakharov or even less important but repeat goal PNPCs like Kruglov. Likewise, although the player can return to and continue to receive quests from the large numbers of NPCs in *Hellgate*, only a few are active in the plot or development of the game. The same goes for the general population of *Quake 4*; just because all soldiers are named, and may even be re-encountered, it does not make them significant to either plot or gameplay in anyway like the same manner as Voss and the rest of Rhino Squad.

Title	Name / Number	Embodiment	Regularity / Persistence
Half Life	1 (G-Man)	Visual, in-play, non-dynamic	Irregular, more frequent at beginning, but reappears at end
The Operative	5 (Bruno, Goodman, Wagner, Armstrong, Volkov)	Mainly cutscenes + boss encounters	Throughout, used as narrative drivers in cutscenes
No-one Lives Forever	7 (Volkov, Mime King, Director, Armstrong, Schenker, Isako, Barnes+Hawkins)	Mainly cutscenes with some in-game representation (as boss encounters)	Throughout
Undying	5 (Bethany, Aaron, Jeremiah, Ambrose, Lizbeth + Keisinger)	Visual, mainly cutscenes and boss encounters (Bethany, Jeremiah, Ambrose, Otto); Lizbeth+Aaron appear in game, lots of journal representation	Themed to area/goal – Aaron makes multiple appearances, Jeremiah in frequently at start of game as cutscene character.

Deadly Shadows	3 (Artemus, Gamall/Hag, Orland)	Cutscenes.	Throughout
System Shock 2	7 (SHODAN, Many, Polito, Delacroix, Korenchkin, Diego, Preformataine)	Journals, or represented by corpses. Predominantly non-embodied with occasional cutscene	SHODAM persistent and regular. Others more dispersed, but persistent with some theming.
Deus Ex	13 (Manderley, Navarre, Hermann, Simons, Page, Jock, Doctor+tech alex, Paul, Tracer Tong, Everett, Dowd, Daedalus/Helios/Icarus)	Visual, in-play plus extensive radio. Dynamic, with some combat function (Simons, Navarre, Hermann).	Varies. Most persist through majority of games with goal-linked adversaries phasing out.
Invisible War	16 (Billie, JC Denton, Paul Denton, Tracer Tong, Leila Nassif, Chad Dumier, Donna Morgan, Leo, Klara, DuClaire, Samas, Sid Black, Ava Johnson, NG Resonance, Lin-May Chen)	Visual, in-play plus radio. Most dynamic, with sub-goal and attitudinal shifts possible.	Some theming, but mostly highly persistent.
Halo	3 (Cortana, Keyes, Guilty Spark)	Cutscenes or radio	Highly persistent and regular (Cortana esp)
Halo 2	7 (Keyes, Johnson, Cortana, Tartarus, Prophets (Truth, Regret), Oracle/Guilty Spark)	Cutscenes or radio. Only rare occurrences of in-play, dynamic representation	Highly persistent and regular (Cortana) Others all relatively high levels of persistence
Doom 3	4 (Betruger, Kelly, Swann, Campbell)	Cutscenes + occasional radio	Sporadic, but recurring
Res. Evil	1 (O'Neill)	Cutscenes, occasional radio	Highly sporadic
Painkiller	3 (Eve, Sammael, Asmodeus)	Cutscenes	Highly sporadic but regular + persistent
Half Life 2	9 (Vance, Alyx, Kleiner, Calhoun, Gman, Mossman, Breen, Dog) + Gregori	Visual, radio, in play (Dog, Calhoun, Alyx)	Spaced out at first, then highly regular (Alyx). Occur throughout (except Gregori + Dog)
HL2 Ep 1	4 (Kleiner, Vance, Alyx, Calhoun)	Visual, in-play, dynamic (Alyx + Calhoun)	Throughout
F.E.A.R.	9 (Fettel, Alice Wade, Harlan Wade, Norton Mapes, Alma, Betters, Jankowski, Sun-Kwon, Aristide)	Visual, in-play, dynamic, goal liked. Aristide + H. Wade cutscenes, messages Alma – cutscenes- ish	Regular, persistent
Condemned	4 (Rosa, Serial Killer X(Leland), Van Horn, Farrell)	Rosa – in game, dynamic (once) + extensive radio Van Horn, Leland – cutscenes (Leland x1 combat sequence) Farrell, radio only	Regular, persistent
S.T.A.L.K.E.R.	1/4 (Doc + Traders: Sidorovich, Barkeep, Sakharov)	Visual, in-play, non-dynamic. Doc by cutscene only	Location based- down to player to control total contact.
Fall of Man	2 (Parker, Cartwright)	Parker – 1 in-game, rest voice-over	Parker = highly persistent and regular

		Cartwright: 2 in-game, dynamic sequences	Cartwright = episodic
Far Cry	4 (Val, Doyle, Krieger, Crowe)	Doyle – mainly radio. Small cutscene + ingame presence Krieger+Val+Crowe – mainly cutscene, isolated in-game, dynamic representation	Doyle – persistent and regular Others- less persistent, episodic
Prey	5 (Jen, Enisi, Elhuit, Mother, Talon)	Visual, in-game, non-dynamic (apart from Talon)	Fairly regular, persistent
Quake 4	8 (Voss, Rhodes, Strauss, Anderson, Cortez, Bidwell, Morris, Sledge)	Visual, in-game, dynamic	Regular, persistent but diminishing!
Call of Cthulhu	6 (Rebecca, Mackey, Burnham, Ruth, Hoover, Marsh)	Visual, in-game, mostly cutscene but some dynamic	Each limited to 2-3 levels, environmentally bound.
Return to Castle Wolfenstein	3 (Unnamed OSA executives, Deathhead)	Cutscenes only	Regular, throughout
Crysis	5 (Prophet, Jester, Helena, Major Strickland, Admiral Morrison)	In-game visual+radio, dynamic.	Regular, throughout. Prophet used for full mission.
Perfect Dark Zero	6 (Jack Dark, Chandra, Mai Hem, Zhang Li, Jonathan Steinberg, Daniel Carrington)	Mostly radio and cutscene, with some in-game dynamic + boss encounters	Jack dies early, Chandra removed after betrayal, Carringtons replace Darks as major PNPCs
Half Life 2 Episode 2	5 (Alyx, Vance, Kleiner, Magnusson, Dog, G-Man)	In-game, dynamic	Alyx throughout, others loaded to end of game
UT3	5 (Jester, Othello, Bishop, Malcolm, Akasha)	In-game, dynamic, plus cutscenes	Throughout for most, Akasha is final boss
Hellgate	7 (Emmara, Murmur, Lann, Altair, Arphaum, Ser Sing, Rourke)	In-game, occasionally dynamic but normally as goal-objects/givers only	Mainly towards end of game and confined to core quests.
Halo 3	8 (Cortana, Keyes, Johnson, Gravemind, Arbiter, Guilty Spark, Truth)	In-game, visual + radio, dynamic	Throughout – Keyes, Johnson + Truth killed part way through
Portal	1 (GlaDOS)	Mainly radio contact, final visualisation as boss	Throughout
Bioshock	3/9 (Atlas/Fontaine, Ryan, Tennenbaum, plus assorted minor characters: Suchong, Jolene, McDonagh, Langford, Steinman, Cohen)	Mainly audio – Ryan in cutscene, Fontaine as boss dynamically.	Main characters throughout, minor characters tend to be localised.
Blacksite	4 (Somers, Grayson, Ambrose, Weis)	In-game, dynamic	Throughout
Timeshift	4 (Krone, Cooke, Foster, Tucker)	Cutscenes – only Cooke is represented in game, but not dynamically	Sporadic

Fig 41. PNPCs by game, representation and recurrence.

PNPCs are defined by diegetic significance, so it should be expected they will play a major role in driving the plot forwards; a key means of diegetically wrapping or adding diversity to the simple ludic framework of FPS play (Section 2.6). It is telling that even *Painkiller*, possibly the least narrative (or narratively cohesive) game in the analysis still makes use of three PNPCs, even if these only exist in inter-episode cutscenes. Indeed, in a strange parallel to Juul's argument that a game version of a film distorts the narrative beyond any genuine comparison, *Painkiller* feels rather like a film has been overlaid with a game with plot, character development, empathetic/affective architecture written over the action. According to the cutscenes, the repetitive action the player undertakes unlocks more diegetic information to the avatar than the player is aware of; the cutscenes carry on as if the player were privy to this 'lost' information. In other words, the PNPCs of *Painkiller*, through cutscenes, deliver a plot that is entirely absent from gameplay. This is an extreme instance, however, and in most games in the genre it can be suggested that PNPCs represent possibly the most powerful and easy to control tool for managing affect and atmospherics in any developing or narrative sense. *Painkiller* is significant because although its PNPs are diegetically significant, they have no gameplay function – they are not ludically significant.

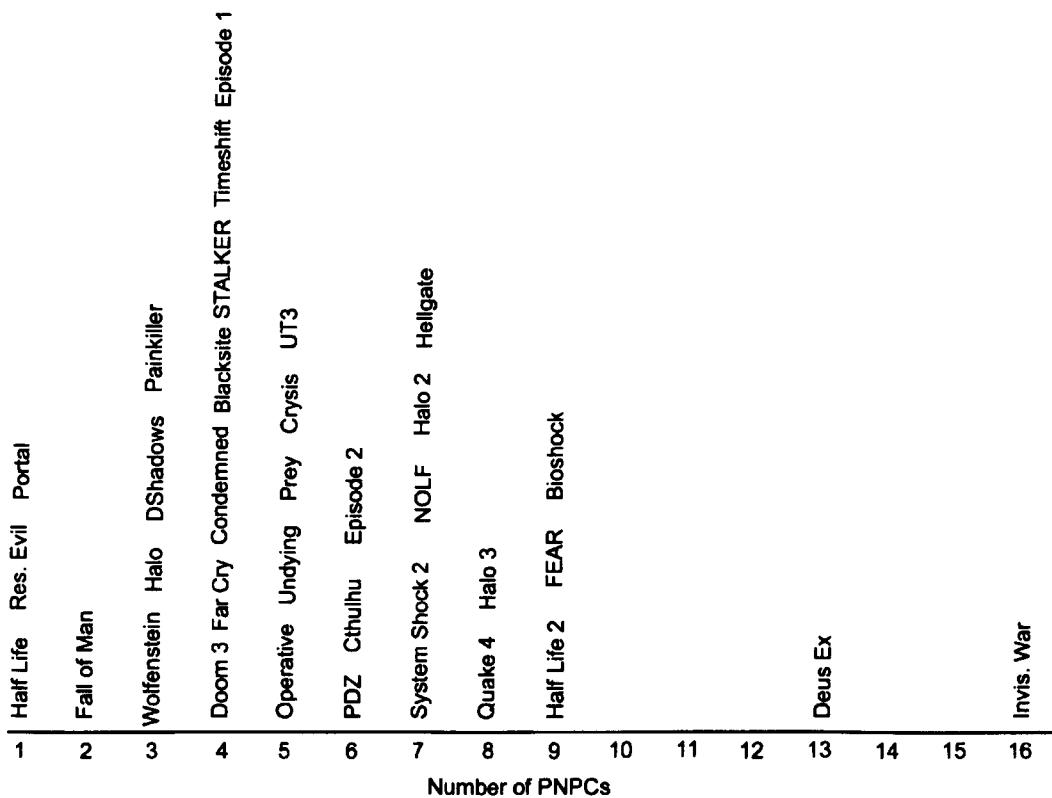


Fig 42. Number of PNPCs per game across the genre

Game	Total PNPCs	Ally	Oppose	Ally to Oppose	Oppose to Ally	Ambiguous	Unrelated
Half Life	1						1
System Shock 2	7		1	1			5
Deus Ex	13	8	2	(3)			
The Operative	5	1	3	1			
Wolfenstein	3	2	1				
Undying	5		4	1			
Halo	3	2		1			
NOLF	7	2	4	2			
Doom 3	4		1	1			2
Far Cry	4	1	2	1			
Invisible War	16			n	n		1
Half Life 2	9	6	1		1		1
Quake 4	8	7		1			
Halo 2	7	3	5				1
Deadly Shadows	3	1	1				1
Painkiller	3	2		1			
Res. Evil	1	1					
PDZ	6	3	2	1			
F.E.A.R.	9	3	2	(3)			1
Condemned	4	2	2				
Cthulhu	6	5	1				
Prey	5	3	1	1			
Episode 1	4	4					
STALKER	4	4					
Crysis	5	5					
Blacksite	4	3		1			
Episode 2	6	5					1
Fall of Man	2	2					
Bioshock	3/9	1	1	1			6
UT3	5	3	1	1			
Halo 3	8	4	2	1			
Portal	1		1				
Hellgate	7	7					
Timeshift	4	3	1				

Fig 43. PNPC relationships to the avatar

Aside from simply offering a count of the number of PNPCs per game (Fig 42), which shows that there tend to be somewhere between 3 and 9 PNPCs in each title, the most obvious distinction that can be made between types of PNPC is their position relative to the avatar. This has the added benefit of exposing a further two groups: those whose motive shifts from one position to the other, or is exposed as a result plot development. This enables a reinvention of relationships that reinvigorates the story by immediately drawing focus back along the entirety of the arc, exposing focalisation and voice and manipulating existing closure (this is examined in Section 9.5 in more detail).

The most regularly used type of PNPC is the ally, occurring in all but five of the titles in the analysis. Following this is the opposing PNPC, as might be expected. It is interesting, however, that more allies than enemies in the PNPCs are found, which suggests that PNPCs have a function that is more epistemological than challenge-based. That is, it is clearly not necessary to have a running nemesis figure, or even to always conceptualise end-game boss encounters as characters within the game. Thus, in *Quake 4*, Kane ultimately faces the Makron, but the Makron is never presented elsewhere in the game as a character. Likewise, the Nihilanth in *Half Life* is not a running, developed figure in the game's story; Lucifer has no part to play in what little there is in the way of story in *Painkiller*; and Betruger is reinvented in *Resurrection of Evil* as the Maledict, but does not feature in any meaningful way in the story until the boss battle at the end. At the other end of the scale, *Half Life 2* presents Breen as a nemesis figure, but does not use him in a boss showdown at the end of the game. Interestingly, the same is true for Betruger in *Doom 3* and Krone in *Timeshift*. Nor is *Condemned*'s nemesis figure, Serial Killer X, the boss battle at the end of the game. *Far Cry* does use its nemesis, Krieger, as a boss, but interestingly then follows this up with a 'non-boss' battle with the ally-turned enemy Doyle to end the game. *Undying*'s family members, together with Keisinger, are used as bosses during gameplay, but the final battle is saved for the *Undying* King, once again, not a featured PNPC. So not only do nemesis figures not appear to be the primary use of the PNPC in FPS games, but where game do use oppositional PNPCs, they are only occasionally deployed as bosses. This, together with the overwhelming deployment of allies, should lead to a consideration of an alternative key role for PNPCs in gameplay.

Firstly though, the other three major classes of PNPC need to be considered, starting with the relative lack of opposition to ally characters. The Deus Ex series break this pattern somewhat, probably due to the fact that its PNPCs are specifically designed to operate with a more flexible allegiance system. The first title has more fixed allied and oppositional PNPCs: it is impossible to be allied to Simons or Page, and the game will not progress without Everett as an ally. This leads to some breakdowns in functionality: it is possible to have a running gun battle with Everett in his laboratory, but he is improbably impervious to bullets and suffers immediate amnesia

about the situation as soon as Denton moves to the next environment. However, with some of the more minor PNPCs, or for temporary sequences within the game and the occasional major PNPCs it is possible to shift allegiance and establish a play-defined relationship. This is expanded in *Invisible War*, making it difficult to describe a comprehensive network of PNPC relationships. It must be absolutely noted, however, that this is hardwired into the core of game design and is significantly more complex to handle, perhaps an explanation for its rarity.

Aside from the *Deus Ex* titles, only one game in the study has a PNPC shift from opposition to ally during gameplay, Judith Mossman in *Half Life 2*. Armstrong shifts from enemy to ally between *The Operative* and *No-One Lives Forever*, but this can be excluded from in-game representation for obvious reasons.

The reason for this paucity is suggested by the central schematic dynamic of FPS play. As has been argued, the underpinning structural dynamic of the genre is the simplification of the ludic space, as opposed to ongoing or additive configuration, such as is found in MMOs or puzzle-games. Simply put, allies require more complex structures to function, both in terms of systemic capacity and affordances. In other words, they present more of a challenge for both system and player, in terms of input-output relationships. When an enemy becomes an ally, they require more complex interaction. When a traitor is revealed, the means of interacting with them reduces to the standard method of dealing with enemy agents in the general population. When Doyle is exposed as the real nemesis in *Far Cry*, the question of how Jack will interact with him the next time they meet becomes as simple as it is with the other nemeses, Crowe and Krieger. Not only is this easier to handle as far as system complexity goes, it also simplifies the field of response for the player, particularly given the semantic structure of the game, story, affordances and avatar they are slotting into. Jack's response to Doyle's betrayal is as straightforward as it is justified by all other aspects of the game's content. On the other hand, Mossman becomes a more complex character through her re-affiliation with the rebels: she has already been exposed as a traitor earlier in the game, now she switches again, leaving her trustworthiness totally open to question³⁵. This potentially makes the experience more complex, as further interactions would be subject to doubt: should her information be trusted, what should the player do if, in that subjective instant, they decide she is leading them into a trap - should they immediately treat her as every other hostile agent, by attempting to remove her from play? This presents a problem for the system, evidenced in the breakdown of diegesis of Everett's amnesia. Thus, Mossman has to be removed from dynamic play as a result of the increase in complexity – in fact, it occurs at the very end of the game and she plays no further part. This is not entirely dissimilar to the branch involving Jock's death in *Deus Ex*:

352 So, technically, Mossman belongs in a class all of her own – Ally to Opposition to Ally. Given the lack of other PNPCs in this category, it seems unnecessary to complicate classes further however.

in the Paris episodes, if the player follows a non-core exploratory route, they uncover a bomb on Jock's helicopter. Should they not do this, the bomb explodes and kills Jock, but only after he has served his last function, transporting Denton to Area 51. This is a powerfully emotive diegetic occurrence, but it occurs outside any potential ludic impact.

It can be suggested that a similar issue of complexity is behind the relative lack of ambiguous or unrelated PNPCs found in the genre, which can be broadly separated into two types. In *System Shock 2*, there are a substantial number of unrelated PNPCs developed over the course of the pre-game narrative, as deployed through the audio logs³⁶. These characters are fully non-interactive and have no dynamic impact upon gameplay, though they are occasionally used to deliver ludically significant information. Similarly, in *Doom 3*, Swann and Campbell really have very little to do with the player, being used to establish a parallel story to add depth to the narrative spine being developed by the player's actions. *F.E.A.R.*'s unfolding conspiracy operates somewhere between the two, oscillating between past and current events but with little direct link to play or the avatar. By contrast, the G-Man is hugely implicated in the ongoing narrative of *Half Life 2* (though less in the original), but it is perhaps telling that he only bookends the proceedings, and makes fleeting appearances in the beginning and at the very end of the first title. Other ambiguous, as opposed to unrelated characters, such as the reappearance of 343 Guilty Spark in *Halo 2*, are reduced to very minor roles and arguably should thus not really be counted as PNPCs at all. The lack of ambiguous PNPCs stands in striking contrast to the high degree of usage of ambiguity as a plot device in FPS games in general. This is returned to in more detail in Section 9.5, but the discrepancy should once again highlight the fact that defining character in such games is primarily a decision predicated upon system constraints and an economical, functional approach. PNPCs tend to serve a gameplay purpose, and those classes of PNPC that increase the general load on the system, in terms of both computational power and experience/affect management, are extremely rare. This leads back towards the question of the function of PNPCs, now underpinned by a better sense of what types are likely to be found in the genre.

36 It should be noted that *System Shock 2* contains audio logs from both PNPCs and other characters who do not have any particular diegetic significance.

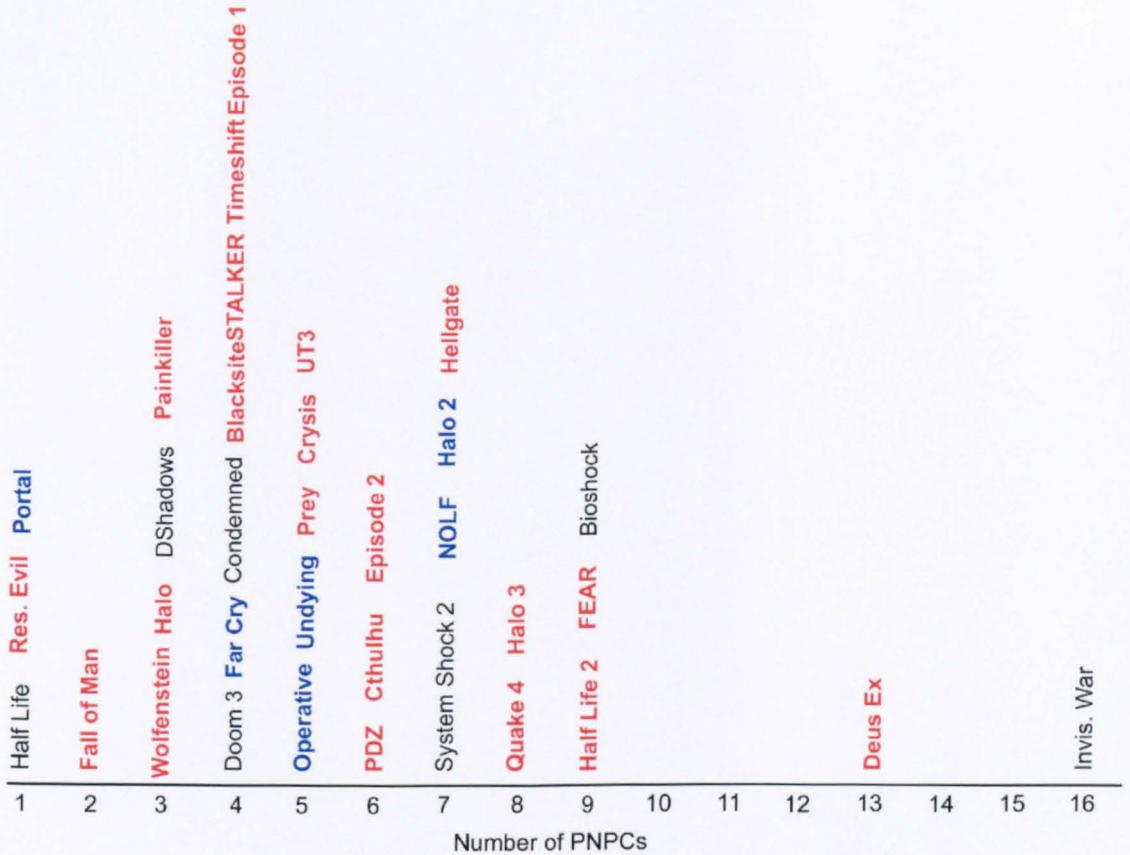


Fig 44. PNPC dominant type against total number per game – red indicates dominant use of Ally, blue indicates dominant use of Oppose, and black indicates either balanced or unrelated PNPCs

Prior to this, two things should be noted. The first is that there appears to be no pattern between the dominant types of PNPC and the overall number of PNPCs in each game (Fig 44). In other words, the most common use of PNPCs in a given game (such as allies in *Cthulhu*, enemies in *Far Cry*, balance as in *Condemned* or dominant use of unrelated PNPCs as in *System Shock 2*) does not appear to relate to the numbers used. Secondly, there is no discernible pattern between type of PNPC and date of release (Fig 45). This means that the issue of advances in game AI as a driver behind PNPC type can be dispensed with as there is no apparent move from the dominance of one type of PNPC use in the early period of the analysis (1998-2002, in red) and the games released in the last year of the analysis (2007, in blue)

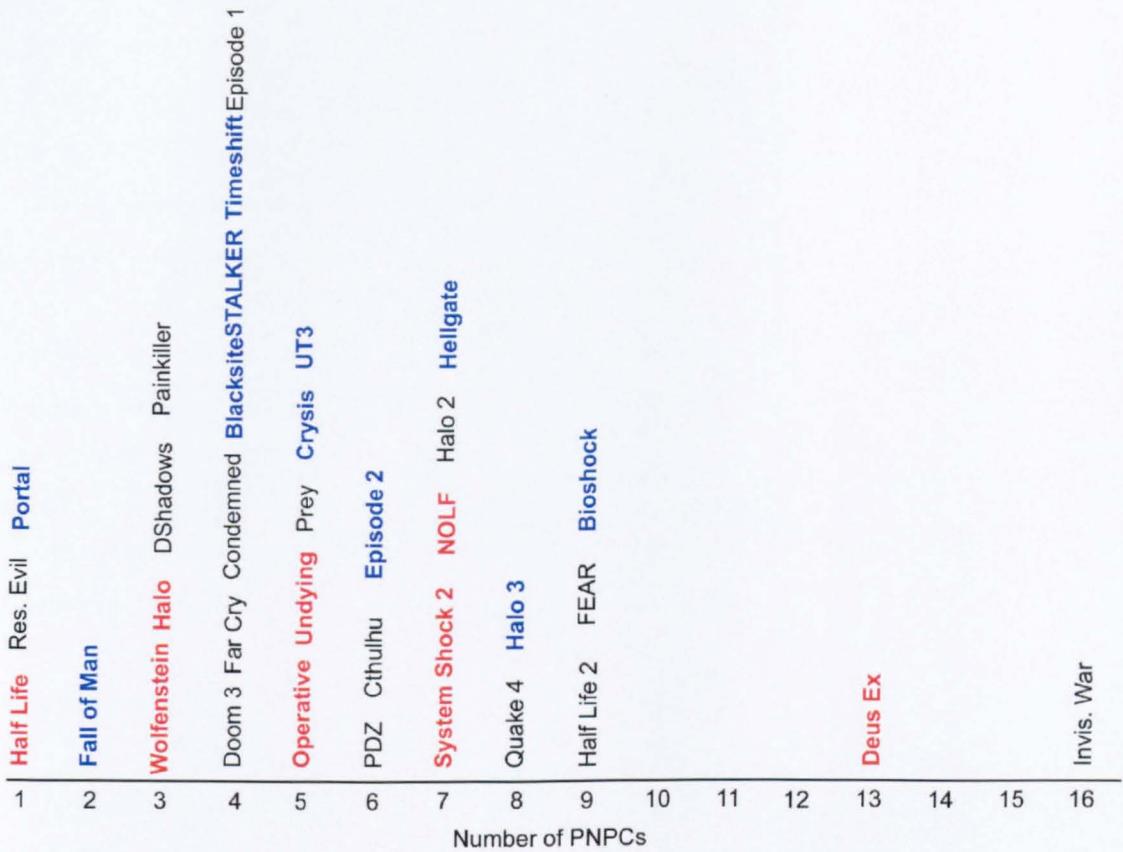


Fig 45. PNPC type, by date

With this in mind, the distinctions made at the beginning of this section can be returned to, splitting the functional properties of PNPC into two forms: direct and indirect. Analyzing what it is that the PNPCs actually do is a reasonable place to start. The criteria are as follows. Firstly, it is noted whether the PNPCs are primarily represented in cutscenes or in-game. The latter is then split into audio and visual representation, as the focus is on the dominant mode of representation at this point. For example, although Anderson (*Quake 4*) does appear in two short cutscenes (aboard the Hannibal, and during his death), he is predominantly represented in-game, visually, as is the rest of Rhino Squad. Doyle (*Far Cry*), on the other hand, appears only briefly in cutscenes and as an in-game visual representation, so is determined to be predominantly represented as an in-game audio object. Finally, although Armstrong (*No-One Lives Forever*) makes a brief boss appearance, he is predominantly represented in cutscenes. This distinction enables a determination to be made of the relative systems cost of the PNPC: a dynamic, visually represented PNPC with the capacity to independently interact with the world (Alyx Vance, *Half Life 2*) is substantially more costly than a static cutscene character, even when these cutscenes are

extremely short and integrated more fully into play (*Alma*, *F.E.A.R.*). In-game representations can be developed further by cataloging the relative dynamism and affordance capabilities of PNPCs: their ability to function independent of the player's input; to conduct themselves in combat; whether (when appropriate), they engage the player in combat; and whether they are explicitly tied to a goal. By cross-referencing the last two factors, it is possible to identify boss encounters and distinguish these from persistently independent PNPCs. The list of independently operating PNPCs is much reduced, confined to a small number of games: the *Half Life* series, *Quake 4*, *F.E.A.R.*, *Condemned*, *Far Cry* and *Prey*. Of these, *Prey* is represented by Talon, who is little more than a gameplay device and has no real 'character' as such and *F.E.A.R.* by Jankowski and Sun-Kwon, whose input into the game is minimal. The same goes for *Far Cry*'s Val, who only plays an active role in the Factory level of the game. In terms of true persistence, that is, active participation and representation throughout a significant proportion of the game, the list of in-game, visually represented, independently active PNPCs can be limited to *Half Life 2*, *Condemned* and *Quake 4*: it is only in these titles the most developed character objects in the classification are found.

The overwhelming majority of PNPCs are represented primarily through either audio or cutscenes. This should immediately highlight their limitation in terms of active, dynamic influence upon gameplay. When the kinds of information PNPCs have attached to them are examined, relating this in particular to the relationship between critical trigger object attachment and critical information load, it is clear that although there are plenty of occasions where there is an attachment of a PNPC to a critical trigger object, only rarely does not engaging with the information a PNPC is giving directly obstruct the player's capacity to progress in the game. In other words, finding Jen is Tommy's constant long-term goal for the majority of *Prey*, but he (or the player) is never actually reliant upon her for this to occur. Likewise, when this goal shifts and progression is fundamentally predicated upon killing Jen, this information is not exclusively attached to her as a PNPC; she does not deliver the information required to progress. Nor are PNPCs often found delivering ludic information, that is, information directly pertaining to gameplay.

An example is probably the best way of defining this criteria. On first meeting Kane in *Quake 4*, Medic Anderson says: "If you find a medic, they'll heal you up". This would not be dissimilar to say, Sgt Kelly, telling *Doom 3*'s marine that their guns require ammunition. In fact, only a small number of occasions are found when PNPCs give direct information about gameplay function: in *Deus Ex*'s training Sections, Alex is used for this purpose; and Alyx is directly tied to the gravity gun training Section of *Half Life 2*. *System Shock 2* uses its PNPC characters to occasionally give non-critical information that is perhaps better thought of as ludic rather than diegetic in nature (Myers' audio log, for example, records that "I rewired the security station to 83273. I don't trust any of those

bastards....") and *Doom 3* uses a similar tactic, albeit with non-persistent NPCs; but apart from these examples, there is little ludic instruction to be found. So, although every PNPC contributes in some way towards the story and diegesis of its game, there are actually relatively few examples where any PNPC, regardless of its representation, is critical to ludic structure or progression. This does not, however, mean that direct interface can be dispensed with just yet.

Just because it is possible to ignore almost every PNPC in a game and still progress does not mean by extension that it is easy or desirable to do so, and it should not be surprising to find a fairly ubiquitous use of PNPCs as goal-communication and manipulation devices. Every game, with the by-now half-expected exception of *Painkiller*, uses at least one character to explain what the avatar is expected to be doing next, and a significant number also use PNPCs to adjust the goal and objective structures during episodes or levels. That PNPCs are used to do this is highly significant and offers another argument for the movement of ludic structures and instructions to within the presented diegesis. Importantly, it should be noted that this is not merely a case of technological capability, as there does not appear to be a simple correlation between the fall-off in use of inter-episode loadscreen information and date of release.

System Shock 2 does not use a single heterodiegetic goal communication device, or overlaid system level prompt. It is possible to complete the game with the sound off, without picking up any significant number of audio logs, but it does not reinforce location, goal and key plot as text in level load screens, like *F.E.A.R* or *Return to Castle Wolfenstein*. Nor does using loadscreens necessarily lead to this reinforcement: they are absent in *Far Cry*, *Quake*, *Prey*, *Invisible War* and *Doom 3*, which instead offer snippets of generalized information about the world. The last two criteria, therefore, refer to isolated and distinguishable moments when the PNPC tells the player what is expected of their avatar, rather than supplying absolute information about how to progress, and to those moments where, during an episode of play, the goal or objective is shifted, or a suggestion about an alternate approach to play is made ("I'd go quietly from here on in. You don't want them calling for reinforcements, etc"). In other words, they are directly homodiegetic and do not necessarily have to have a heterodiegetic counterpart function. To put this another way, it is entirely possible for Doyle to send Carver across an island to attack a mercenary camp, then to secure a radio mast, then to unlock a blast door and finally to a jetty to steal a boat without the player ever having to do anything other than move forwards, removing objects from play and triggering every object that can be triggered through a process of un-diegetic elimination. The essential structural dynamic of FPS play, to simplify the environment, is all that is necessary, it is the function of homodiegetic goal structures to enable an inference of complexity to be overlaid.

In essence, these are points on a line between direct and indirect, and goals spread across a portion of this line; not as direct as dynamic independence, but not as indirect as manipulating affect. The most direct form of goal communication is the explicit instruction: go here and do that. In this case, what is being communicated is an epistemological schema that simplifies the core ludic activity by attaching significant markers to the ongoing action. A player can randomly run around the Armachan offices, firing blindly at Replica troops and attempting to activate any object that looks interactive, but it is much simpler and easier to know that the Point Man is trying to restart a server, because it primes the player to be on the look out for rooms full of big banks of computers (*F.E.A.R.*). It is feasible to simply exhaust the available possibilities of the Zone, but the experience is unlikely to be rewarding. If the player follows Sidorivich's lead, however, orientation is made easier as significance is anchored to landmarks and events within the world (*S.T.A.L.K.E.R.*). Likewise, when Goodman warns Cate not to set off alarms in *No-One Lives Forever*, it is rapidly made apparent why this is a good idea, in terms of likelihood of surviving the experience, although it is important to note that for more gung-ho players, this also clearly indicates how to start a great big fight³⁷. In these three cases, the latter relatively less direct than the former, the game is attempting to co-opt the player into a certain mode of play, both attentional and behavioural. A suggestion is made: "Look out for these points of significance; act in this way over that".

By rewarding the player who operates within the diegesis by making play both implicitly and explicitly easier and rewarding, the game is establishing a very particular relationship. Attention paid to the diegesis, rather than to the system, pays off. In return, the system increases its control over attention and behaviour and, by extension, affect. If the player engages with Doyle as a character, rather than an object, then Doyle's betrayal means more, which increases the chances of it expanding on the normal affective scope, in which case the game succeeds in delivering an experience within a greater predetermined range. If a player fails to engage with Doyle as a character, the betrayal is relatively meaningless: it just tacks another (ludic) level onto the game. But it is uncontentious to argue that even in a game such as *Far Cry*, whose emotional and political range is simplistic to say the least, there is an attempt to expand the affective journey of the player. As Haze's (Free Radical 2008) scriptwriter Yescombe has commented

If you shoot someone in a game, what do you feel? Triumph. And how much further could this be removed from reality? You look at soldiers who return from battle having shot one guy and they're traumatized. Yet we'll shoot 100 people and feel triumph: what about guilt, responsibility, even remorse? (2007: 63 – Edge 176).

37 And in some cases, it is a critical failure trigger

Thus, even though *Far Cry* is no any way approaching anything other than a glorification of mass slaughter, there is an attempt to create an affective state other than tension, adrenaline or triumphalism. A betrayal is a complex thing, potentially inducing a feeling of shock, anger, self-doubt and a little panic. Doyle's actions, and the fact they force a reconsideration of the plot to this stage, thus plays with the closure that may have already been put into place, demonstrating that developer Crytek sought a degree of maturity in their plot that may otherwise be almost comically absent³⁸. In order to increase the chances of this more complex payoff happening, the player needs to engage with Doyle as a character rather than an object, and a very good way of increasing the chances of this happening is to ramp up Doyle's significance: make the player want to engage with what he is saying, because a great deal of what he is saying is useful.

The use of PNPCs as goal-givers can be discussed in terms that refer directly to the act of play. Even though in ludic terms they can be seen as technically superfluous, but their function runs deeper and more experientially than that. Games often co-opt the player into attaching significance to the PNPC, rewarding them for doing so, and as a result, open up the potential for more complex affective experiences. Anderson's death in *Quake 4* is another good example of this: he is fundamentally useful in play, as he is able to restore health. This functional capacity increases his significance, as it's worth keeping track of where he is (as a representative of the general medic class). This is then reinforced by his being part of the squad that rescue Kane from full-Stroggification: Kane owes him his life. Three minutes later he is murdered while Kane stands helpless and, tellingly, from here on in, the player has access to Strogg medical terminals to heal up. But Anderson's death is only meaningful if he is meaningful first, and to be meaningful, he must be significant. By contrast, it's questionable whether Jankowski's death in *F.E.A.R.* has any emotional punch whatsoever, but attention is specifically drawn to it by the ongoing and ambiguous appearance of his ghost in the preceding levels. He starts the game as a boring, standard FPS goon, but is transformed into something substantially more interesting and ambivalent, thus screaming for significance, and this attention seeking behaviour directly invites and rewards the player for entering into the diegesis of *F.E.A.R.* In other words, happily surrendering a degree of interpretative control over to the system³⁹.

Somewhere below the direct goal-giving functionality of PNPCs on the direct-indirect scale is virtual expansion

38 The fact that until this point, the villain of the piece is a mad German scientist operating out of a hollowed-out volcano in the south Pacific is always worth remembering.

39 Ghosts can be also be found operating according to similar principles in *Undying* and *System Shock 2*. Of course, it should be noted that one of the primary characteristics of a ghost is it cannot be interacted with: the player has no power to affect it. It thus serves as a reminder of the player's relative lack of control over the environment, which may have important affective ramifications. In a very real sense, it reminds a player, whose primary objective is mastery over the ludic space, that they are relatively powerless.

of affordances once again. Tech Strauss in *Quake 4* is frequently used as a means of enabling Kane to be associated with actions outside the affordances of the game, thus offering a solution to the affordance/ecology discontinuity. This is, in essence, a principle more or less analogous to localization. The climax of *Quake 4*'s first half involves an attempt to hack into the Nexus Hub, a complicated activity that falls outside the affordances the player can utilise. However, not only does this diegetic overlay increase the diversity of *Quake 4*'s actions, it is a diegetically supportive military solution to the situation (the marines are massively outnumbered and are attempting to disrupt the means by which the Strogg are co-ordinated). Thus, rather than the inelegant situation of the player destroying a complicated and large computer system by shooting at it, Tech Strauss is used as a device to hack into and disrupt the Hub, unlock doors that could not otherwise be opened (thus separating the play area off into smaller environments), and so on.



Fig 46. Tech Strauss as a means of distributing complex activity

Cortana operates in a similar way in the Halo series, but as a disembodied AI, she is handily capable of being plugged into any available computer system to undertake complex actions not realistically solvable by the Master Chief's arsenal of weaponry. Rosa, also disembodied for the majority of *Condemned* does the complicated things

like analyzing evidence and making plot connections for Thomas: he can operate comfortably within his small affordance set because the actual police work is farmed out to a remote PNPC. Strauss is more frequently dynamically present as an agent in *Quake 4*, but the function is the same; as is Alyx Vance in *Half Life 2* (without her general purpose ‘sonic screwdriver’, Gordon Freeman’s ability with a firearm would be pretty useless). Even when direct activity in the game is not distributed, plot progression is nearly always pushed out in the direction of a PNPC or two; it’s a highly effective and non-intrusive way of increasing both the likelihood that a player will engage with the diegesis and ensuring they understand why events are occurring, again aiding the attachment of significance, and general orientation. As noted above, it is rare that the PNPC is critical to success (usually in the form of the need to protect the PNPC whilst they carry out their distributed function), but engaging with the PNPC is ludically advantageous in that it provides clear explanation as to what is expected or about to occur.

Betters in *F.E.A.R.*; Enisi and Elhuit in *Prey*; Jeremiah in *Undying*; Parker in *Fall of Man*; even Eve and Sammael in *Painkiller* fulfill this function. As with localization, it detracts attention from the repetition inherent in gameplay by wrapping virtual extensions around the core ludic activity. This activity is a great deal more direct than simple contextual support; it has a deliberate and non-ambient deployment in gameplay. Whether this is explicitly extending the context of the player’s actions through association with the actions of a PNPC, or the wrapping of extended associative action around these actions through PNPC contribution (“by doing that, you’ve actually achieved this...” or “now you’ve blown up the radio, they won’t be able to do X”), what is actually happening is the use of a device to divert attention in a particular manner, to adjust the mapping of significance within the ludodiegetic space.

Further, the fact that not only is action distributed, but also thought, should not be ignored. Cortana, Strauss and Parker quite literally do the thinking for the Master Chief, Kane and Kale. The avatar’s role is to supply the embodiment, not the mind. In a not insignificant number of cases, PNPCs determine where to go next and what to do next, and this is as much the case with nemeses like S.H.O.D.A.N. as it is with allies like Tracer Tong. This should probably be understood as an epistemological process: the system is repeatedly reinforcing the message that the player does not have to think about the why or the how: it will be supplied. There is a form of training going on, where the player is encouraged to surrender a level of problem-solving to the system, quite specifically surrendering power to the game to make decisions for them. It could be argued that it is non-accidental that PNPCs – the highest point of anthropomorphisation of the system; the points where there is the easiest opportunity to adopt the intentional stance – are the crux of this process.

Finally, the most indirect functions of PNPCs should be considered. The notion of contextual support, has

already been mentioned, and continuity should be added to this in order to understand how PNPCs fulfill a vital role in ensuring that the players actions are, in Zahorik & Jenison's terms, "successfully supported" by the environment. This extends beyond the actual input-output issue of ensuring that affordances do what they are supposed and expected to, but that there is a semantic, schematic justification by extension of the occurrences presented by the game. When context is described, in effect, the idea of the 'atmosphere' of a game is being essentially recast in terms that are ludological. A quick return to Barthes at this point may demonstrate why this is advantageous.

As discussed in Section 3.3, Barthes splits narrative units into functions (actions) and indices (which might perhaps be describe as diegetic anchors). The latter are then subdivided into indices and informants. Indices cover such aspects as emotion, mood or atmosphere, and informants act as temporal locators. These can be used to correspond to context and continuity respectively. When an agent, particularly a PNPC acts or responds to the environment and situation, it has the capacity to support and justify both the avatars' and players' responses. In other words, Alyx's opinion of Judith is a mirror of Freeman's and, by extension, the suggested response of the player. PNPCs, through their implied affective relationship with the player (as opposed to simple, location or situation based relationships existent with more general population agents), illustrate the system's expectations of the players' reaction, by reflecting the avatar's. Especially, but not exclusively, in games where the avatar's input is minimal, such as *Doom 3*, *Half Life*, *F.E.A.R.* or *System Shock 2*, PNPCs allow an avatar to be carved out by proxy, and assist in the formation of a response system that supports the ludic activity. Not only that, but this prompts and supports an affective relationship with the environment. Just in case the player has stopped finding the action and plot of *F.E.A.R.* spooky and weird, Betters is usually on hand to reiterate that this is just how they should be finding it. And, critically, this atmosphere is important not just for affective outcome, but because it has the capacity to influence player behaviour. *F.E.A.R.*'s indices corroborate the gameplay microstructure: bursts of highly intense action punctuated by periods of lone, isolated and tense exploration. The game is less effective if a player rushes through the levels without any consideration of what is around the next corner. In order to try and create the appropriate play-style, the game advantages a particular type of play-activity (by including sneak attacks and head shots, and the ability to utilise the environment strategically), but it also uses every available tactic to support this semantically. Alma, Fettel and Jankowski, being supernatural and incorporeal, can appear at any point, meaning that the player's expectations of the environment are quite literally invaded and subverted by two direct nemesis figures and one of ambiguous relationship to the avatar. When Betters radios in to expresses his disbelief and lack of understanding in regard to the situation, it sends out a clear signal to the player: it's OK not to understand, it's not supposed to fit expectations of reality, even in the game world presented. By responding to the world in a way that fits the world, PNPCs broadcast the appropriate response to the player.

This is, of course, alongside the more obvious use of PNPCs to directly transmit information about the avatar to the player: telling them who they are, so to speak. This technique occurs frequently in Quake 4, where marines aboard the Hannibal provide background information about both Kane's being a new addition to Rhino Squad, and of his previous exploits.

Key NPCs frequently have, at the least, ambiguous motives, even when direct betrayal is not on the agenda. The player's relationship with S.H.O.D.A.N. is not as simple as straightforward enmity, they are reliant upon each other to a degree. Even though S.H.O.D.A.N. is the villain of the piece, the avatar is repeatedly forced to co-operate in order to survive; the Many being the most immediate problem. It is made clear that Carver never really trusts Doyle, even though he is the major point of contact; *Deus Ex* is awash with ulterior motives and half-truths; Betters may be a straightforward boss but he is surrounded on all sides by Wade, Mapes, Aristide, the ghost of Jankowski; and even the initial characterisation of Fettel as nemesis is gradually undermined by the unfolding plot. Voss goes from father figure to unwilling boss-agent; Jen undergoes a similar transformation. On the subject of *Prey*, Mother's relationship with Tommy, from first awareness to deliberate grooming as a replacement is a classic example of the ambiguity at the centre of key PNPC relationships. Even Cortana has a flash of rampancy when she first connects with Halo and by *Halo 3* is intimating a far greater and more ambiguous role in the overall plot, suggesting in the opening voice over that she has been watching (controlling) the Master Chief since he was first bolted together⁴⁰. Those core PNPCs without the intimation of a deeper purpose are rare: Alyx Vance, Parker in *Fall of Man*, Rosa in *Condemned* are notable exceptions.

Ambiguity is very closely linked to closure, and thus may serve a double-function here. On one hand, it buys a narrative flexibility that does not require an explicit plot twist as a betrayal. In other words, it holds off player's ability to form closure; deliberately coding a non-ludic tension into the proceedings that does not require representation in play. Secondly, it once again virtually expands the diegesis beyond play, by referring out to situations, timelines, relationships and sequences of action that pre-exist the game itself. By hijacking closure, ambiguity forces a breach into the presented diegesis, derailing a tidy and limiting summation of the world, thus increasing its inferred complexity. It is perhaps telling that no single game in the study is fully self-enclosed in narrative terms, every single one of them requires a link out to an unrepresented world in order to create a context for the action, and it is significant and interesting that this is normally conducted through a relationship with a PNPC.

Indeed, Barthes' concept of informants directly corresponds to continuity which, along with context, forms direct

⁴⁰ Her captivity also seems to manifest other psychological breakdowns of personality, so the player is repeatedly fed the inference that what will remain of Cortana when she is found is very much an unknown quantity.

support. PNPCs, by their definition, span periods of diegetic time and ludic time. As Juul (2003, 2006) and Nitsche (2007) have noted, the relationship between play time and event time (or diegetic time) can be very complex, yet players demonstrate no obvious problem with integrating this. Consider *S.T.A.L.K.E.R.* as an example. On one level, there is the real time actually taken to play the game. This must be separated from the temporal sequence enacted when actually doing things in the world. The Zone works on an internal time-clock of about 1 minute per 5 real seconds meaning a 24hour rotation of diegetic time for two hours of play time. However, the microtemporal sequences are not accelerated: the game does not run in permanent bullet-time. On top of this, play time can be suspended or re-engaged at an earlier point. Finally, cutscenes such as the one seen at the end of the X-18 lab sequence show events presumably prior to the start of ludic activity but without explicit temporal referencing. *Cthulhu*'s diegetic time sequence is massively disrupted: the opening cutscene takes place six years before the first level of play, the cutscene following the first level jumps forwards six years again, but prior to the opening cutscene, and the rest of the game operates in this interim time (with occasional flashbacks to the missing six years but through Yithian time). There are also instances gaps of time between levels.

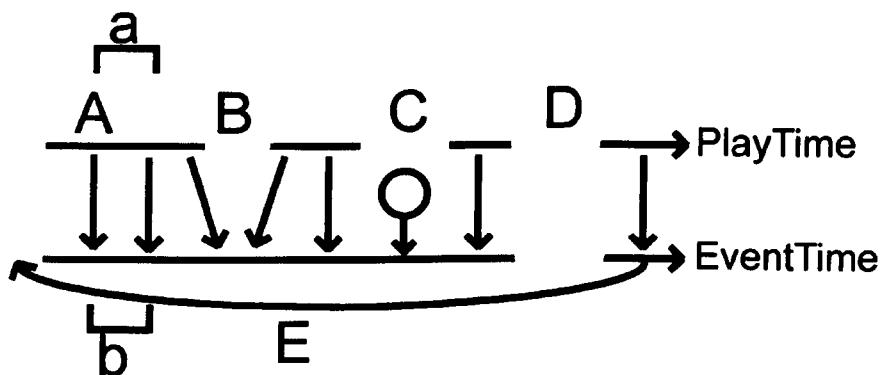


Fig 47. Juul's model of relationships between play time and event time (2005)

PNPCs are powerful tools in assisting the management of this complex relationship as they offer a point of reference that is semi-fixed in terms of relationship to the avatar. They offer clues as to the temporal location of what is occurring. This may be as explicit as the following dialogue from *Half Life 2*:

Kleiner: My dear, I had given up hope of ever seeing you again.

Alyx: I was thinking the same. I think the teleporter exploded just as we made it out.

Kleiner: Indeed it did. And the repercussions were felt far and wide. But that was over a week ago.

Alyx: What do you mean? Gordon and I were just there a minute ago.

Kleiner: Fascinating. We seem to have developed a slow teleport. This suggests an entirely new line of investigation.

Alyx: A week? Then what have we missed?

Kleiner: A great deal my dear. The blow you struck at Nova Prospekt was taken as a signal to start the uprising.

However, it can be more subtle, such as the ongoing reconstruction of events about the Rickenbacker in *System Shock 2*. Because PNPCs have a defined and persistent character, they offer stability in this complex array of time sequences.

System Shock 2's use of PNPCs to establish an entirely alternate timeline to the game's actual action should be considered in more detail, as it clearly demonstrates the further, indirect, function of PNPCs to virtually expand the diegesis, in the manner of localisation. It has already been noted that marines refer to Kane's history prior to the commencement of *Quake 4*; in *System Shock 2*, the found audio logs create a prior story which supplies much of the game's affective charge. Simply put, by anchoring non-interactive affective plot to PNPCs existing outside the temporal span of play itself, *System Shock 2* can expand its range and the inferred complexity of its world beyond the available dimensions of its gameplay and affordances. Rather than trying to co-opt or coerce the player, via the avatar and its relationships with PNPCs in the manner of *Half Life 2*, *Quake 4*, *Far Cry* or even *Fall of Man*, *System Shock 2* keeps all the affective complexities safely locked into an already decided narrative line.

Two potential effects of this can be identified. Firstly, it allows the game to deliver a plot that is underpinned by a sense of predetermined fatalism: the characters are doomed and it is a question of slowly uncovering the details of how they died. This enables *System Shock 2* to introduce a rare plot element into the mix: failure, or determinism. Normally, FPS games are deterministic only to the extent that avatars will either die (temporarily, of course), or succeed. *System Shock 2* introduces an alternate layer – there is nothing that can be done to save the characters that the player is encouraged to develop an affective relationship with, they are already dead. Secondly, it enables the game to deliver a narrative that is far richer in terms of political, factional and personal motivations than found in any of its more recent counterparts (with the exception of *Bioshock*, something of a spiritual successor), as the representation of the characters is extremely cheap, and does not have any real impact on gameplay. Thus, the virtual extension of time into a prior linear plot enables a virtual expansion of diegetic and affective complexity, without ever compromising constraints or their relative visibility. Once again, it can be argued that this is made possible primarily through the vastly improved call to intentionality that PNPCs, with all their very human characteristics provokes.

Indeed, it may be noted that many of our PNPCs refer to existence outside the temporal span of gameplay.

Cortana states “If I still had fingers, they’d be crossed”. Not only does the intriguing ambiguity of such a statement, running as it does contrary to populist conceptualisations of artificial intelligences, immediately deepen the player’s sense of a wider world, but it attaches a prior existence to the game and to the character. *Halo* furthers this by intimating at several occasions that Cortana and Master Chief’s relationship is not initiated by the outset of the game’s action, that the two share a past (something made explicit by Cortana’s claim to have ‘chosen’ the Master Chief at the start of *Halo 3*). *Undying* is full of references to the past, even prior to its explicit time-traveling; *Half Life*’s central plot is all about uncovering the truth of what went before as is *Doom 3*, not to mention *Cthulhu*; *Halo* wallows in its space opera historicity. In almost exactly the same way that localization places the complex parts of the world that are required to back-up the inference of complexity needed to deepen the affective punch safely away from the action, so temporal expansion enables a bypass of the need to develop relationships with PNPCs and the action, because it has already taken place. In this, note again that a critical and often overlooked distinction is being made between player and avatar, and arguing that it is more or less irrelevant whether or not the player feels they have a relationship with Cortana, provided they accept that the Master Chief does. This is all that is necessary for their ludic relationship to function.

Cortana and Master Chief’s relationship has another aspect to it that deserves attention as it serves as a good example of another common non-ludic characteristic of PNPCs that may have an indirect affect upon player behaviour. It has been suggested that PNPCs are frequently used to co-opt the player to handing over control of problem-solving behaviour to the system: getting them used to being told what to do by a representative of the game in the form of a PNPC. It is not surprising then, that large numbers of key PNPCs are higher status than the avatar in one form or another. In *Halo*, Master Chief’s status as mythic hero is constantly referred to, yet he is lower in status than all the PNPCs in the game, deferring to Keyes, 343 Guilty Spark and Cortana, who, interestingly, assumes godlike power when she is plugged into the *Halo* systems. Kane follows orders from Voss, Bidwell and Morris, then, as the squad system falls apart, from the not-accidentally arrogant and brilliant Strauss. Gordon Freeman is referred to as a saviour and leader, but always takes a secondary position of power when Alyx, Eli or Isaac Kleiner are in the vicinity. There are very good reasons for this: firstly leaders require more options in terms of interactivity. If the player is to control someone who gives orders, rather than takes them, the system has to take on board the degree of supported choice in these orders and this potentially exacerbates into affordance/ecology discontinuity. However, by placing the avatar below the core PNPC in status, this level of authority can be carefully put to one side whilst not compromising the transformation into redeemer, hero, savior, destroyer or whatever the avatar is required to undergo to mask the arc of parameter increases. What is really interesting, however, is that these high status PNPCs are not often present: many PNPCs are represented by audio when they are dynamically represented in play. Not only does a lack of visual representation solve some

technical problems, avoid the uncanny valley, and increase association and empathy, it also means that a PNPC running a background high-status relationship to the avatar does not in anyway conflict with the player's mastery of the ludic space. In other words, the player's represented ludic skills are not outpaced by any PNPCs. Chandra is instrumental in the completion of Joanna Dark's early missions, but she does not compete for the attention of represented action. It might be suggested that this makes the prospect of handing power over elsewhere more palatable, as attention is focused upon immediate gratification. Cortana and Strauss may really save the world, but its Kane and the Master Chief who are wielding the Big Fucking Gun with such power and skill. In effect, the PNPC handles the 'complex thinking' whilst the player lines up the vanishing point with objects, an act which is computationally simpler but culturally more 'heroic' as in real life it has an associated risk. Moreover, as with ambiguity of motive, disembodied PNPCs have the capacity, within the diegesis, to invade the ludic space at any point, increasing tension and exerting an influence upon play style.

PNPCs, especially those who fulfill this central, epistemologically functional role therefore have some core non-ludic characteristics that are easy to identify. They are smart, they are high status, they know or understand more about what is going on than the player, their motives are not generally obvious or apparent and they are located somewhere else. Thus, it should not be surprising to find a generic set of personalities, attributes and abilities in the PNPCs of this genre, and this extends beyond the dominant politics or demographics of the genre. That is not to dispute the generally poor representation of women (or men, for that matter); the mad German scientists, or the massively endowed space marines, but to note that beyond the superficialities, there are clear functional frameworks for PNPCs to fit into, in order to achieve distinctly ludic, epistemological goals. Consciously or not, designers are carving out a set of archetypes that are rooted in the demands of the media experience, rather than simply importing archetypes from existing media.

Section 7.4. Summary

The diegetic properties of agents in FPS games, like worlds, are not simply decorative or epiphenomenal. They represent a rich protonarrative network used to manipulate gameplay and support action and affordances. From a basic summary of the numbers of types of agents and how these split down into factions, the type of gameplay being aimed for in the experience can be reverse-engineered. It is no accident that there tends to be an inverse relationship between numbers of distinct agent types and number of factions, and that a high/low relationship tends to be found in what are popularly called run-and-gun shooters whereas a low/high relationship tends to be found in slower, more configurative games. Factions not only force a consideration of potential repercussions of actions on the player, but they are powerful tools for virtually expanding the intentionality of a system without

relying upon complex AI. Equally, the diegetic characteristics of the agents and limited 'cheap tricks' to boost ecological validity contributes to this increase in intentionality, itself a major factor in how the player approaches the agents, in terms of expectation and likely action.

PNPCs are more obviously linked to plot and gameplay, as they are objects with explicitly enhanced significance, but this in itself is supported by diegetic and protonarrative characteristics. From the form of representation, such as the lack of dynamic, integrated occurrence in play and prioritising of audio contact, to the status relationship with the avatar, PNPCs are geared towards a deliberate gameplay function and this is absolutely supported by who they are and how they are represented. The farming out of actions needed to support a more ecologically valid diegesis to PNPCs is a hugely powerful device in drawing attention away from the limits of the affordance set, as is their function as orientation devices, reducing the need for the player to worry about where to go and what to do. These are essentially gameplay functions, and it is the protonarrative construction of PNPCs which enable it to occur seamlessly and homodiegetically.

Section Eight: Avatars

Section 8.1. Functional Capabilities

Fine's tripartite system of player experience culminates in the level where "the players not only manipulate characters; they are characters." (1983: 186). More recently, in his critique of the construct of immersion, Calleja nevertheless states of FPS games, "The lack of an intervening avatar can produce deeper involvement than third person manipulation because it anchors the player more directly in the world" (2007: 85). Klevjer sees the player of the FPS as "asked to *perform* the routines of a super-human, lethal machine" (2003: 5, italics mine). However, what needs to be considered are the functional capabilities of avatars - what they can actually do; the degree of configuration or, to borrow Kromand's distinction, *openness* (2007), they enable; and how they transform as play progresses – and how this relates to their representation. This second analysis raises the question of intervention and proximity to the player, as well as the avatar's relation to the wider world and plot. This assists in the construction of a framework of the diegetic qualities of avatars in FPS games, through first establishing what their functional qualities are. In this way, it will be once again demonstrated that the line between function and protonarrative aspects of this most important of gameplay devices is distinctly blurred, if it exists at all.

The affordances of avatars break down into a natural series of categories: moving in the world; interacting with the world; combat; capacity for the player to configure the avatar's capabilities; and special functions. Assessing

each of these will allow a series of scales of complexity to be proposed that will, in turn, enable an illustration of commonalities and specific approaches to the avatar as a gameplay device across the genre. The most simple will initiate this: being and moving in the world.

All games enable 360 degree looking as well as movement along the four key axes. In addition to this, about a quarter separate out strafing from sideways turns by separate key mapping. In the remainder, strafing is assumed, with the mouse (or analogue stick) controlling direction when used in conjunction with forward movement. From the latter, it may be deduced that an economy of input is desired, lending support to the notion of unbroken, un-complex activity. Jumping is also fairly ubiquitous, appearing in all but 2 games (*Perfect Dark Zero* and *Condemned*). Equally, the vast majority of games support crouching (exceptions are *Painkiller*, *Condemned* and *Hellgate*). *S.T.A.L.K.E.R.*, *Far Cry* and *Crysis* also bolt on an additional stance, the prone position. This is, in itself, illustrates the expectations of the designers upon the player. When the creep option (which decreases movement but also decreases the perceptability of the avatar by other agents in the environment), which is found in five additional games (*Deadly Shadows*, *Undying*, *Cthulhu*, *System Shock 2*, *No-One Lives Forever*), is considered, a class of FPS games where an instruction about the approach to play the player should take is embedded directly into the avatar's capabilities becomes apparent. Similarly, *Timeshift*'s special functions to slow, pause and reverse action are a clear indication that not only are these functions likely to be critical at points in the game, the fact they can be generically used suggests that they should be used frequently. The sheer fact of the 'creep', 'prone' or 'crawl' functions broadcasts the advantages of creeping, crawling or lying prone to the player. In other words, these are not games where charging in, all guns blazing, is likely to be a ubiquitously successful strategy. Indeed, it is that very last word, strategy, that is implicated. In other games, rather than a 'walk' function, a 'run' function exists: in *Doom 3*, the *Half Life* franchise, and *Quake 4*. Stealth here is clearly not a major part of gameplay, but the signal is sent to the player that they are likely to have to think and move fast in this game. An alternate type of gameplay may be inferred. Finally, those games which include movement adjustment in both directions (again *S.T.A.L.K.E.R.*, *Crysis*, *Far Cry*, *Deus Ex* – all prompt higher engagement with the avatar's activities in the world and allow more choice to be made in play approach).

This complexity prompts a different form of engagement with the game's action. The same goes for peek-round-corners, which is found in *S.T.A.L.K.E.R.*, *Far Cry*, *Deadly Shadows*, *No-one Lives Forever*, *Cthulhu*, *System Shock 2*, *F.E.A.R.*, *Deus Ex* and *Return to Castle Wolfenstein*. This list also contains all the games which have either sneak or prone options. Additionally, *F.E.A.R.* utilises the bullet-time special function to increase strategic play, which only leaves *Return to Castle Wolfenstein* as an odd inclusion.

Game	Separate turn	Jump	Crouch	Walk/Sneak	Run/Sprint	Peek	Additional /
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	and strafe (not mouse)			as key mapping	as key mapping	around corners	Special
Half Life							
System Shock 2							
Deus Ex							
The Operative							
Wolfenstein							
Undying							
Halo							
NOLF							
Doom 3							
Far Cry							
Invisible Wat							
Half Life 2							
Quake 4							
Halo 2							
Deadly Shadows							
Painkiller							
Res. Evil							
Perfect Dark Zero							Dive
F.E.A.R.							
Condemned							
Cthulhu							
Prey							Spirit Walk
Episode One							
S.T.A.L.K.E.R.							
Crysis							
Blacksite							
Episode Two							
Fall of Man							
Bioshock							
UT3							
Halo 3							
Portal							
Hellgate							
Timeshift							Timeshift

Fig 48. Movement and exploratory affordances (red indicates a dual level of application, such as crawl and prone)

Fig 48 summarises the findings. This can be used to propose three conclusions: firstly, that there are indeed a set of ubiquitous affordances in the genre that are almost always present: 360 look, movement in four horizontal, cardinal directions, jumping and crouching. Two, that additional functionality in the form of either toggled running or walking increases the player's options for movement types, suggesting a more complex approach to gameplay may be taken. Thirdly, that the subset of games which enable creep, peak and bi-directional speed adjustment begin to steer play in a specific direction: by the inclusion of these additional, optional, adjustments to the parameters of moving in what is, above all else, a medium of economy, the player is being explicitly prompted that their usage is likely to be advantageous. Even at this most simple level, player behaviour is being manipulated and adjusted. Thus a simple scale of movement is proposed, from simplicity to complexity in terms of gameplay movement afforded by the avatar. At the simplest, games such as *Perfect Dark Zero* offer fewer player controlled movement actions than *Half Life*, which offers fewer than *Crysis*.

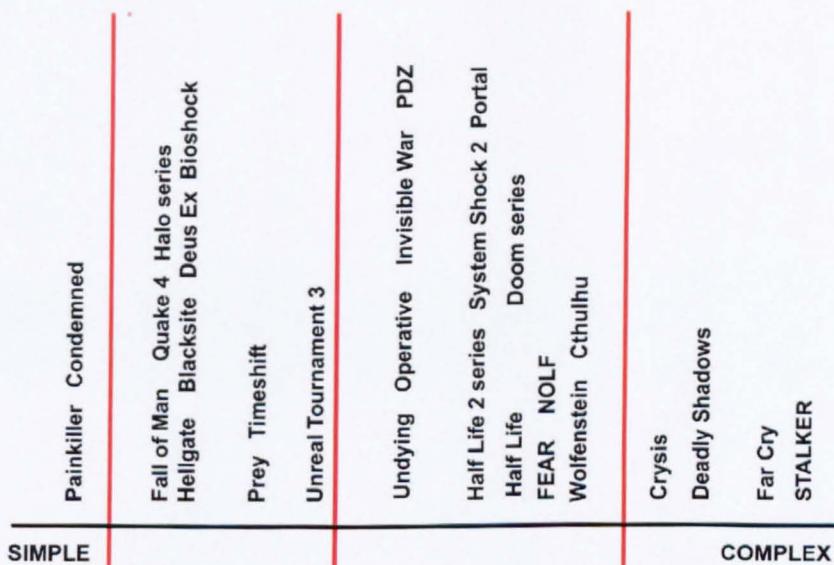


Fig 49. Relative complexity of exploratory affordances (red lines indicate natural groupings)

All avatars interact with their diegeses beyond combat, but the degree of this complexity of this invites consideration of player behaviour. For example, *Quake 4* does not include a generic interact option, instead, interaction is limited to specific critical devices embedded in the environment which are signaled by the heterodiegetic superimposition of the word 'Interactive' and the change from a cross-hair to a cursor. The same goes for *Doom 3* and *Resurrection of Evil*. *Painkiller* likewise does not enable any generic interaction with the

world other than combat. In these games, power-ups are obtained by simply co-locating the avatar with them, which distinguishes them from games such as *Hellgate*, *S.T.A.L.K.E.R.* or *Bioshock*, where the player is required to explicitly select the item for collection or manipulation via an additional key input. Likewise, in the Half Life franchise, a separate button is mapped to interaction, or use. The addition of a generic action button is also found in *Perfect Dark Zero*, *Return to Castle Wolfenstein* and *Condemned* but this forms a middle point between the two, as here interaction is context-dependent and clearly signaled by heterodiegetic devices (superimposed signals, as with *Quake 4*). Those titles which require players to consider if aspects of the environment can be interacted and those which do not can be separated, as this defines an explicit means of controlling the nature of player perceptual and activity based behaviour. For example, *Half Life 2*'s gravity gun is a physics manipulator, it can move objects around in the space. This works intuitively because the player of the Half Life franchise is already used to the concept that the world can be adapted and interacted with in this way. Being able to generically interact with many objects in the environment (including stacking crates, using health terminals and throwing cans of coke at police officers) is part of gameplay. This approach is explicitly prioritised by the opening sequence in *Half Life 2*: in order to progress the game, the player must stack boxes and hurl soft drinks at Civil Protection officers. This precedent is set before combat is introduced: it has informed the player that shooting is not the only solution to a problem. By contrast, the introduction and use of the grabber in *Resurrection of Evil* is less comfortable, as it sits within a game franchise where generic interaction has not been previously supported and the environment simply does not contain a great number of appropriate objects – there is simply little reason to use it during gameplay.

Context specific interaction with integrated input	Context specific interaction with interaction key input (explicit signaling)	Context specific interaction without explicit signaling but interaction key	Generic interaction with interaction key input
Doom 3	PDZ	Prey	Deadly Shadows
Quake 4	Condemned	Cthulhu	Portal
Undying	FEAR	System Shock 2	Half Life series
Painkiller	The Operative	Halo series	Deus Ex Invisible War
Fall of Man	Wolfenstein	S.T.A.L.K.E.R. Bioshock	NOLF
UT3	Crysis	Hellgate	Portal
	Far Cry		Resurrection of Evil
	Blacksite		
	Timeshift		

Fig 50. Types of avatar / environment interactivity

Additionally, some other general interactions with the environment afforded to the avatar should be considered. Most FPS games now include a flashlight function (all but *Cthulhu*, *Deadly Shadows*, *The Operative*, *Perfect Dark Zero*, *System Shock 2*). Flashlights are effective devices for layering additional complexity into a given

environment, by limiting the degree of enabled perception. They also contribute to an increase in tension by reducing the draw distance of the avatar and thus reaction time of the player. *Doom 3*, of course, relies heavily upon reduced visibility to both cover the shortfalls in environmental diversity and make the player constantly reactive to the action, rather than strategically planning for it.

The other major parameter shifting affordance relative to perception is the zoom function, which occurs in all but *Condemned*, *Painkiller*, *The Operative*, *Undying*, *System Shock 2*, *Cthulhu*, *Portal* and *Bioshock*. Of these, *Portal*, once again, is constructed around very different core gameplay which is not predicated on the vanishing point. *Cthulhu* and *System Shock 2* use neither flashlight nor zoom. *Deadly Shadows* makes the use of darkness a key gameplay mechanism – darkness is an advantage rather than disadvantage - so the lack of flashlight is not surprising. Thus, with the exception of *Bioshock*, although all games which do not use zoom or flash belong in the context specific interaction categories, which may be taken as evidence of simpler gameplay, it should be noted that in fact, the vast majority of FPS games, also fall within these groups. It may be argued, however, that lacking a flashlight and zoom function, *Cthulhu* is a simpler game in terms of the capacity of the avatar to interact with the environment than, which includes both. It should also be noted that zoom can be either attached to a specific weapon, attached to a specific item (binoculars, for example) or enabled as a general affordance. Games with zoom split as follows:

No zoom function (or aim only)	Zoom function is generic only (weapon has aim only)	Zoom function is attached to weapon only	Zoom function is generic and attached to weapon	Zoom function is attached to specific item and weapon
System Shock 2 2	Deadly Shadows	Quake 4	Half Life series	Far Cry
Condemned	Bioshock	The Operative	Hellgate (as a skill choice)	S.T.A.L.K.E.R. Crysis
Undying		PDZ	Wolfenstein	Deus Ex
Painkiller		F.E.A.R.	No-one Lives Forever	Invisible War
Doom 3 series		Prey	Quake 4	
Cthulhu		Blacksite	Halo series	
		UT3	Fall of Man	
		Timeshift		

Fig 51 Zoom configurations

Likewise, use of flashlights can be broken down as follows:

No flashlight function	Flashlight functions as independent affordance	Flashlight functions as item (i.e. must be equipped weapon rather than a weapon)	Flashlight is attached to a
Deadly Shadows	Far Cry	Doom 3 series	Quake 4
Undying	S.T.A.L.K.E.R.	Deus Ex	Invisible War
Cthulhu	Half Life series		Perfect Dark Zero
System Shock 2 2	Fall of Man		
Painkiller	Halo series		
Blacksite	Painkiller		
Bioshock	Condemned		
UT3	The Operative		
Portal	NOLF		
Hellgate	Prey		
Timeshift	F.E.A.R.		
	Wolfenstein		
	Crysis		

Fig 52. Flashlight configurations

These can be used to propose another scale of complexity, where games that explicitly signal context dependent interaction and do not require additional key inputs are placed at one end, and games with generic, un signalled interactivity at the other. In the latter, the ability of the avatar to search and more freely use the environment during gameplay lends itself towards more complex gameplay, as it enables a greater degree of player-controlled configuration to take place. Games such as *Quake 4* and *Doom 3* offer no real ways of choosing how to interact with the environment other than which weapon to shoot at it with. Flashlights and scopes add detail to this, as their use; and more specifically, their existence as either special functions of items, or items themselves that must be configured – also indicates more complex gameplay. However, it should be noted that this scale illustrates only the complexity of interactivity available to the avatar – it is not an indication of the interactive complexity of the environment. Thus, although *F.E.A.R.* is positioned towards the simple end of the scale, its environment allows for a far greater degree of, albeit superficial, interactivity than *Deus Ex*, in terms of knocking things off shelves, breaking windows and so on.

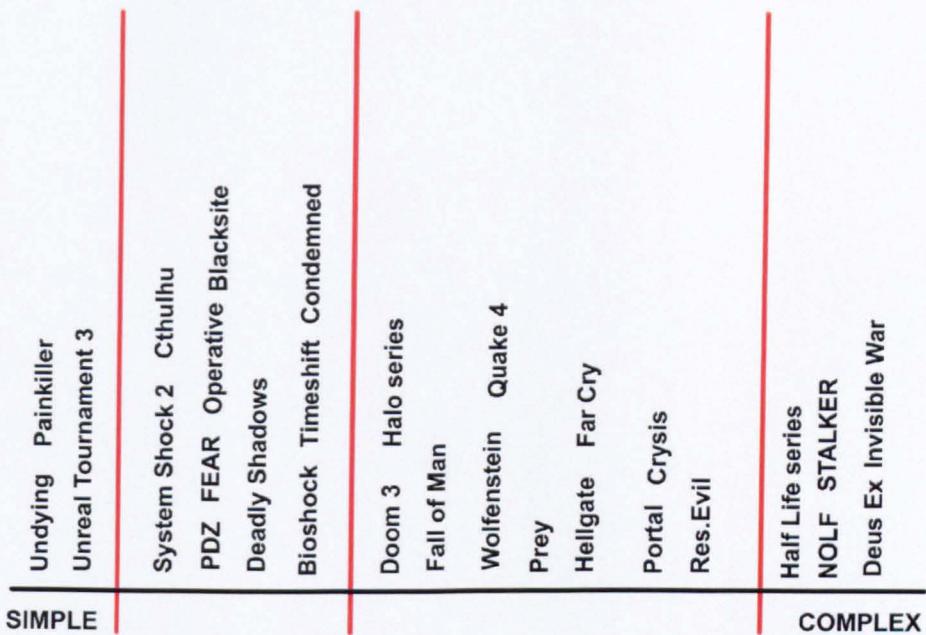


Fig 53. Relative complexity of interaction affordances

With the exception of *Portal*, FPS games rotate around the central issue of combat. Thus, it is not surprising that all games include a primary fire, and over half an alt-fire mode for each weapon, including the ability to zoom look, generally as an alt-fire for a particular weapon. All but *Hellgate* use a depreciating ammunition supply with specific key-mapping for reload (which draws attention to an additional tactical consideration in the game – when to reload – it is something else to literally think about). This is coupled with multiple weapon use: all games enable free selection of weapons for combat, and swapping between weapons takes a small, but important amount of time. Further, a significant number of games only allow a limited number of weapons to be carried at once – another cue for tactical planning. Players must thus assess their choice on the basis of likely threat, which prompts a higher level of engagement with both the presented environment and the arc of the ludic activity at this point. It increases their likelihood to engage with presented cues which, following LeBlanc (1999), can be understood as signals that both offer advance warning of approaching play, and manipulate tension through feedback. For example, the presence of large caches of missile launcher ammunition is an indicator that the launcher will be required, in itself a potential precursory signal to a boss encounter. These kinds of signals directly affect the affective journey of play. On top of this, *Deus Ex* and *System Shock 2* directly tie the ability to use classes of weapons to skill choices, which give the player a wider strategic arc and the potential to adapt gameplay to

their preferences. *Hellgate* operates similarly, with both the ability to enhance stats and add skills, and constraints attached to certain weapons making them accessible only to certain classes, or to those with pre-requisite skill levels. Finally, in both *System Shock 2* and *S.T.A.L.K.E.R.*, weapons themselves deprecate in quality, resulting in more jamming – a potentially dangerous obstacle in combat – and the need to trade-in, or repair. In all three cases, by attaching very simple parameters to in-game items, the subjective complexity of the experience is greatly enhanced.

Most commonly, games opt for alt-fire mechanisms, choices of ammunition or minor upgrades to offer a degree of choice to combat. Half the games studied included an alt-fire option and a further ten enable weapon properties, such as ammunition used, or rate of fire to be manipulated in real-time. This leaves only five games with neither, and this list includes *Portal* for the reasons already discussed, the *Doom* series, *Undying*, *Blacksite* and *Cthulhu*. Most of the games that enable property-shifts in real-time also have some form of inventory function where additional changes can be made to weapons. This ranges from *Crysis*' four attachment types independent of fire-rate, to *S.T.A.L.K.E.R.* and *Hellgate*'s inventory-based modification activities. Additionally, *Bioshock*, *Hellgate*, *Invisible War* and *Deus Ex* enable permanent weapon upgrades, a nod towards a progressive structure where favorite weapons can develop alongside the avatar. *Quake 4* also upgrades its weapons (once each per game), but this is not configured by the player and operates as a result of proximity to controlled trigger objects in the form of key NPCs. A limited number of games have additional key-mapping to grenades and/or melee (eleven and eight respectively), whereas most integrate these within gameplay as alt-fire modes, specific weapons or proximity triggers. Interestingly, separate grenade mappings are not to be found in highly configurative games. A separate mapping suggests that grenade use is less about selecting an appropriate tool for the job prior to combat, than with developing reflex actions without breaking the flow of play (or expecting the player to make fast decisions during this flow). The same goes for melee. In both cases, the player is expected to develop the skills of using the control system quickly and fluidly, according to the situation, rather than more cautiously or strategically. In other words, this suggests that once in combat, the games are drawing the player towards a higher concentration on a small number of co-ordinated acts, in terms of principal input. Strategy operates prior to combat actually occurring: in terms of selection of weapons and the positioning and approach of the avatar. Regardless of the complexity of these, actual combat itself is clearly streamlined. The use of alt-fire functions to expand the complexity of firing options whilst retaining a highly focused use of key mappings supports this idea.

Game	Altfire	Switch Properties	Configurable	Permanent updates	Deprecation	Separate Grenade	Separate Melee
Half Life							
System Shock 2							
Deus Ex							
The Operative							
Wolfenstein							
Undying							
Halo							
NOLF							
Doom 3							
Far Cry							
Invisible Wat							
Half Life 2							
Quake 4				Automatic			
Halo 2							
Deadly Shadows							
Painkiller							
Res. Evil							
PDZ							
F.E.A.R.							
Condemned							
Cthulhu							
Prey							
Episode One							
S.T.A.L.K.E.R.							
Crysis							
Blacksite							
Episode Two							
Fall of Man							
Bioshock							
UT3							
Halo 3							
Portal							
Hellgate							
Timeshift							

Fig 54. Complexity of combat options

The number of available weapons and their distribution through the diegesis also needs reviewing. Games such as *Half Life 2*, *Quake 4*, *Bioshock*, *Return to Castle Wolfenstein* and *Prey* are clearly progressive. The further the player gets through the world, the greater firepower they have access to through picking up new weapons which, of course, balances out the increase in toughness of the agents they are facing. These can be distinguished from more configurative games such as *Crysis* or *Halo*, where the player has early access to most of the weaponry available and the focus is upon the strategic selection of the appropriate, limited, mix at any given point. This rough divide signals two very different approaches to game play. In the former, less attention is required to depletion of ammunition, for example, as the game world can be assumed to be upgrading players if ammo for pistols starts to run short. This requires simply less attention, which can be read as either focusing attention elsewhere, or reducing the cognitive engagement with that aspect of the experience (for a more visceral ride).



Fig 55. Number of weapons across the genre

There are certain things to be noted about this. The first is that there is a recognisable pattern of distribution, with most games opting for between seven and fifteen weapons. Notably, all of what are commonly referred to as run and gun shooters fall within this pattern, with the exceptions of *Halo 3* and *Perfect Dark Zero*. *Condemned* and *Hellgate* both have extremely high weapon counts, but include a large number of variations on single weapons (*Hellgate* in particular has slightly different visualisations for a large number of classes, plus equivalent weaponry for different character types, increasing the number of named weapons dramatically whilst being a game that requires very little in the way of combat skill or strategy). All of the games with a weapon count above

sixteen limit the number of weapons either by fixing a finite limit to the total that can be carried (*Condemned* has one; *Halo 3* has two, three if dual wielded) or by space in an inventory. This means that it is *Return to Castle Wolfenstein* which offers the player the largest selection of available weapons at any given point during play.

Above this, once again the major issue is tactical configuration of the avatar's capabilities prior to combat; in other words, selecting the states which define how the avatar may affect other objects prior to engagement. Inventory limits are imposed in six titles, and other these all but *System Shock 2* have over sixteen weapons (and it should be noted that *System Shock 2*'s psi-amp was only counted once, although opting for a psionic class means it is a focus for several directly offensive abilities, which could be seen as additional weapons). Finite limits to weapons are evenly distributed amongst the genre, although it should be noted that three of the five games which opt for this are all part of the Halo series.

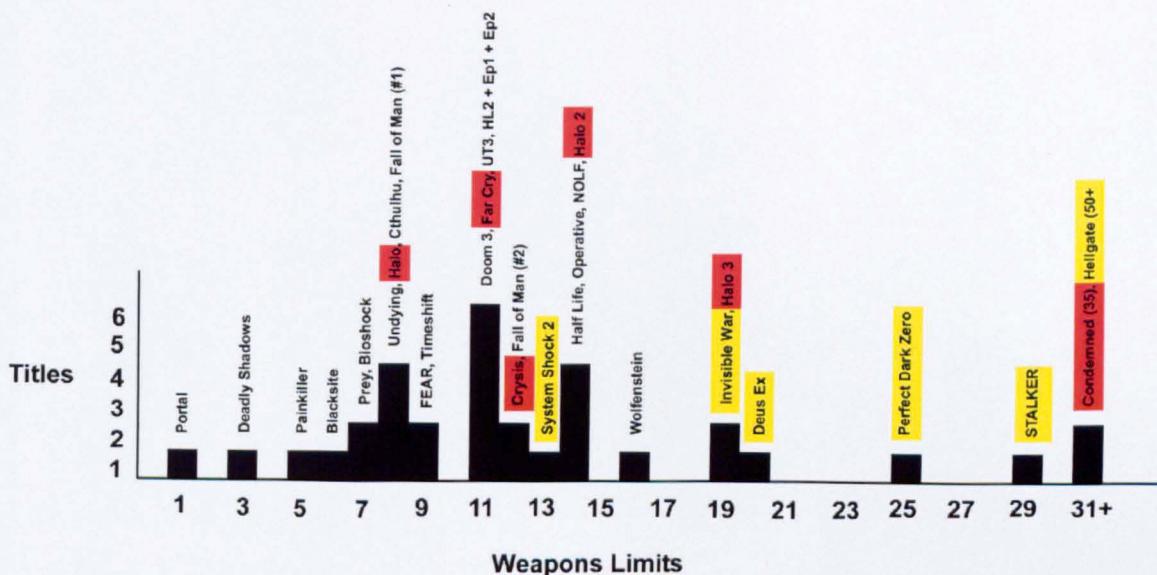


Fig 56. Limited weapons by inventory (yellow) and finite limit (red)

From this table, it seems apparent that many games with high numbers of weapons also use inventories, which limit the total number that can be carried. Games that offer fewer weapons normally do so without a limitation on this number. Once again, games can be positioned on a scale of complexity, taking into consideration the factors relating to combat. Cross-referencing this to numbers of weapons does not offer an particular pattern, but it is clear, however, that games which limit weapon counts by inventory generally correlate with those that offer a

more complex degree of combat interactions. Once again, there is a clear type of avatar-usage emerging here, with the usual suspects to be found at the top and bottom of the scale.

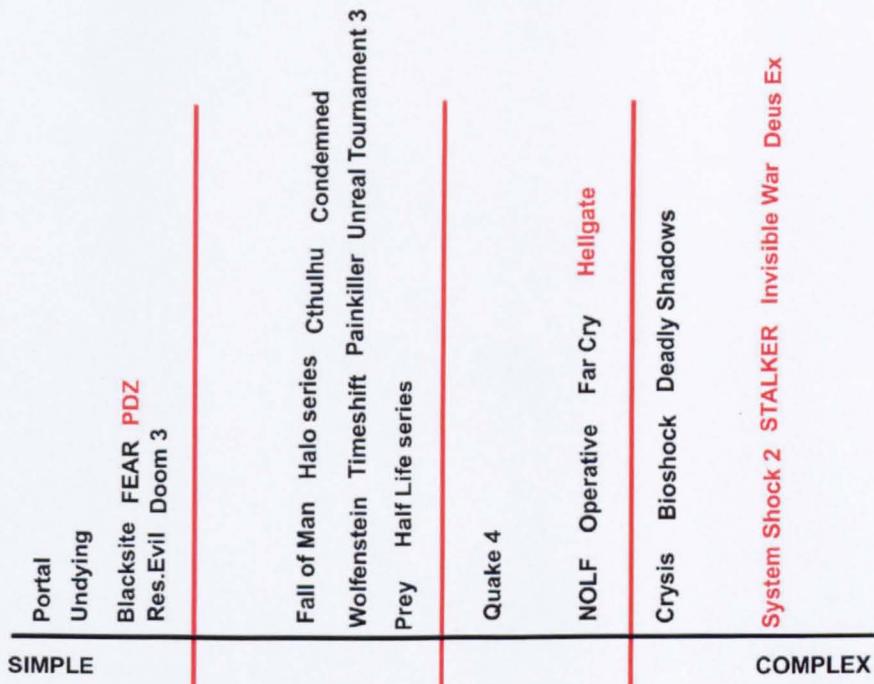


Fig 57. Combat complexity across the genre (red indicates inventory limitation on weapon count).

Next, those aspects of gameplay which do not involve combat or exploration should be turned to; those which, in other words, are direct indications of a general configurability of the avatar and its relation to gameplay. These can be easily divided into games which have no action-stopping configurability; those which have no configurability but have action-stopping additional information screens; those which have action-integrated configurability, and those which have full inventory systems. Of these, there are three immediate functions that can be identified as having a core effect upon gameplay (alongside weapon configuration): health, mapping and additional information screens.

No breakout screens	Additional information screens	Action-integrated configurability	Inventory system
Half Life series	Doom series	Condemned	S.T.A.L.K.E.R.
Halo series	Fall of Man	Crysis	Deadly Shadows
Painkiller		Perfect Dark Zero	The Operative
Far Cry		F.E.A.R.	No-one Lives Forever Undying
Prey		Timeshift	Cthulhu
Quake 4			System Shock 2
Wolfenstein			Deus Ex
Unreal Tournament 3 Blacksite			Invisible War
Portal			Hellgate

Fig 58. Additional information and configurability available to avatar

Only five games contain a map function: *Bioshock*, *S.T.A.L.K.E.R.*, *Deadly Shadows*, *System Shock 2* and *Hellgate*. Lack of a map function exerts an influence upon both design and player behaviour. Firstly, players becoming lost in environments and unable to ascertain where to go or what to do next is, self-evidently, a bad thing (this is to be distinguished from exploration which, even in a sandbox game is operating under the constraint that the player must feel as if their activity has a *purpose*). Thus, designers must either make environments simple to navigate or provide alternative means of keeping the player moving along the right track. This tends to lead towards either simplified, linear environments or persistent NPCs who can be used for orientation and goal. In fact, both are common. Secondly, the lack of a map function sends out the more or less explicit message to players that this is indeed the case, and they will not have to concern themselves with working out where things are or where they have to go next; that play will take a more or less linear and simple form, with clear instructions on how to proceed. It is no accident that when those games that have bi-directional links between environments, as opposed to monodirectional links that effectively remove the preceding environment once the threshold to the subsequent one has been crossed, are considered the same list of games are found.

Twelve games include no orientation function whatsoever and as might be expected these are all monodirectional, highly linear environments (with the exception of *Cthulhu*'s Innsmouth levels). The reader is referred back to Section 6.3 to note a direct mapping between multidirectional diegetic structures and the full map affordance. Here a direct link through from gameplay requirement to representation affordance can be traced: a multidirectional game requires greater ability to orientate on the part of the player, hence a full map affordance is required. This in turn requires integration into the representational functional affordance set of the avatar. What is interesting is that three of these titles also provides an overlaid mini-map as well as the action stopping full map function. Additionally, *Crysis*, *Unreal Tournament 3* and *Timeshift* provide mini-map functions. In the case of *Unreal Tournament 3*, this is only applied in certain circumstances (Warfare levels) even though it may be seen as

equally useful in other gameplay levels where the core dynamic is the relocation of an item to a specific location, such as Capture the Flag.

Game	Motion Tracker	Minimap (as MT + environment)	Compass	Directional arrow	Full Map	Occasional maps as discrete object
Half Life						
System Shock 2 2						
Deus Ex						
The Operative						
Wolfenstein						
Undying						
Halo						
NOLF						
Doom 3						
Far Cry						
Invisible Wat						
Half Life 2						
Quake 4						
Halo 2						
Deadly Shadows						
Painkiller						
Res. Evil						
Perfect Dark Zero						
F.E.A.R.						
Condemned						
Cthulhu						
Prey						
Episode One						
S.T.A.L.K.E.R.						
Crysis						
Blacksite						
Episode Two						
Fall of Man						
Bioshock						
UT3						
Halo 3						
Portal						
Hellgate						
Timeshift						

Fig 59. Map functions

Compasses are infrequently used, with directional, goal-orientated arrows being a more common device. These, of course, have the advantage of not requiring further cross-referencing: they reduce the attentional resources required for orientation, without necessitating attention to be paid to where the player should be headed next. They are found in eight games (although three of these are the Halo series) and only combined in one, *Bioshock*. It is perhaps surprising that so many games offer no orientation devices at all: eighteen in all. In these cases, the environments must be navigable by players without help, in other words, they are likely to be linear. Just as additional movement parameters signal to a player that their use is likely to be advantageous, so the presence of an orientation device is a clear signal about the type of player behaviour required in the game space. In a game without any orientation device, linearity and clarity is implicitly suggested; a game like *S.T.A.L.K.E.R.* or *Bioshock* tells its player that they will be required to consider their movement around the world in more detail (though in *Bioshock* this is mediated by the potential use of the golden arrow, suggesting that it is also possible to take a less careful approach to the game). Likewise, the presence of a motion tracker, whereby the player can see all agents in the area is a clear indication that doing so is a very good idea, and indeed, it is a device found in the Halo series, which places a great deal of importance on the strategic dimension of its agent's social intelligence (discussed in Section 8.2) and *Crysis* and *Far Cry*, which operate around large sandbox environments and very dangerous combat.

The second of the specific functions, health kits, take a number of discrete forms. Firstly, there are single use objects embedded in the environment which increase health by a fixed amount when the avatar co-locates, if health is below maximum (the standard health kit). Secondly, there are fixed objects which increase health when triggered but remain in place as multiple trigger objects until their total health count is depreciated (like *Doom 3* and *Half Life*'s wall-mounted stations). Thirdly, there are health kits which can be retained in the inventory and used where necessary for games using inventory systems (such as *S.T.A.L.K.E.R.* and *Cthulhu*). Finally, some games use a dual counter for armour and health, each with a depreciating value, where the former adjust the effects on the latter when taking damage. *Blacksite*, *Timeshift*, *Fall of Man* and the Halo series operate a system whereby health regain is linked to time; *Fall of Man* sets four more permanent markers but allows recovery up to the current marker and Halo rebuilds armour but includes a small permanently depreciated health bar beneath this that requires rare single-use trigger objects in the environment to replenish.

Game	HK	MHK	Rechgr	Armour	Regens	Inv	Notes
Half Life							
System Shock 2 2							
Deus Ex							Regeneration as augmentation
The Operative							Bandages stop bleeding
Wolfenstein							Carried wine recharges health
Undying							Shield spell is temporary armour
Halo							No armour pick-ups (doesn't affect damage)
NOLF							
Doom 3							
Far Cry							
Invisible War							Plus regeneration as biomod
Half Life 2							
Quake 4							
Halo 2							
Deadly Shadows							
Painkiller							
Res. Evil							
Perfect Dark Zero					Some		
F.E.A.R.						Only Med	
Condemned							
Cthulhu							Healing not instantaneous + interruptible. Damage shows in avatar
Prey							
Episode One							Damage mediated through armour and artifacts
S.T.A.L.K.E.R.							Suit armour use is strategic
Crysis							
Blacksite							
Episode Two							Grubs act as mult. health
Fall of Man							
Bioshock							Health benefits adjustable
UT3							
Halo 3							
Portal							No health – dead or alive
Hellgate							High level of armour configurability
Timeshift							

Fig 60. Summary of health and armour functions.

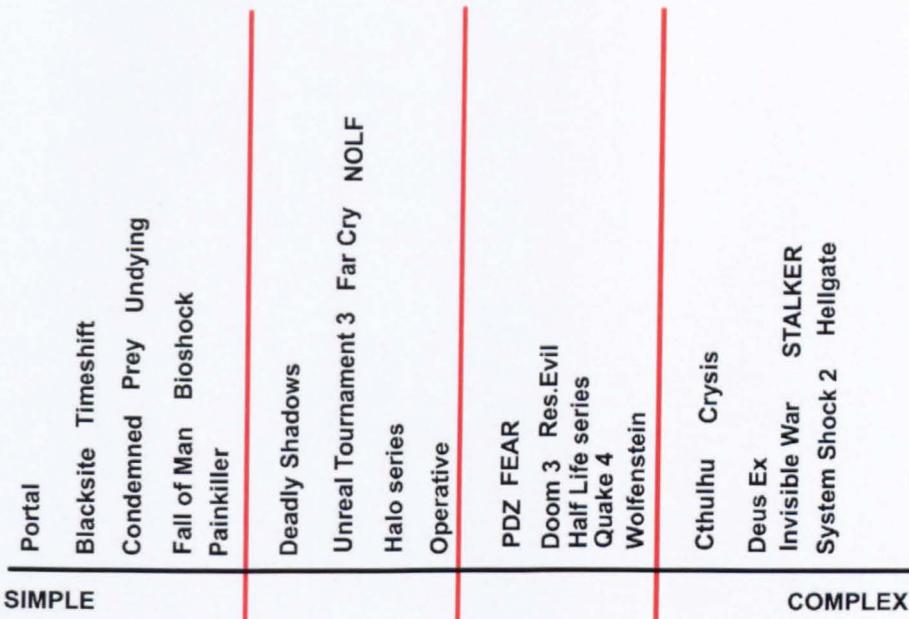


Fig 61. Scale of health and armour complexity

This can also be plotted along the standard complexity scale. Thus, at one extreme, titles such as *Portal*, *Blacksite* and *Timeshift* are found, where keeping track of damage done to the avatar is more or less taken care of automatically. *Portal* does not really deal with damage, as such, at all. Both *Blacksite* and *Timeshift* use automatic regeneration, so it is simply a case of temporarily withdrawing from combat while recharge occurs. This is quite different from *Halo* and *Fall of Man*, where regeneration is mediated by a permanent health loss, making attention to levels of damage more important. The majority of games use armour as a mediating parameter in health depletion, adding another class of single and multiple use triggers into the environment. This is another case of a virtual increase in complexity with relatively simple cost, even when dealing with configurable armour, as found in *Hellgate* and *S.T.A.L.K.E.R.* These are, at root, simply state changes to a mediating parameter, as discussed in the first part of this thesis. Mixing different types of armour and health triggers, however, increases the necessity for attention paid to the environment. Distributing these triggers both makes the player remember where they are, and provides feedback about the position of the avatar relative to both overall episodic content and potential microcontent. Just as with large numbers of high capacity ammunition turning up, health kits are often used as a sign they will be needed. Finally, using an inventory to deliver health means the player has to actively carry out the action, using a separate input or by breaking out of the action altogether. This has an

impact upon the speed of play, and the approach to combat, as healing ceases to be either automatic or just a case of locating the avatar correctly. It should therefore be no surprise that *Deus Ex*, Cthulhu, and Hellgate are found at one end of this scale, and Blacksite, Fall of Man and Painkiller at the other.

Inventories relate to the degree of action-integrated configurability. No inventory system means although the game enables cycling through weapons (in effect, opting for state changes to the CHANGE OBJECT/AGENT PARAMETERS affordance) and may include additional actions such as applying a health kit or using an item, the latter have specific key mappings. By contrast, a simple inventory, such as *Crysis*' nanosuit menu, or *Perfect Dark Zero*'s gadget menu break the action by having the player cycle through a small set of options. This is once again easily distinguished from full inventory systems like *Cthulhu* or *Invisible War*, where the action is broken and an entirely separate interface is used to locate, configure and utilise objects that have been collected from the environment. These carried objects can be seen as new state changes mediating the available actions of the avatar within the environment. Thus, games with inventory systems, especially those like *Deus Ex* and S.T.A.L.K.E.R. that allow configuration of items held in the inventory can be described as more complex than those without them. This, in itself, may explain a great deal about the expected behaviour of the player.

No inventory system	Simple inventory	Full inventory
Half Life series	Deadly Shadows	S.T.A.L.K.E.R.
Halo series	Perfect Dark Zero	System Shock 2
Painkiller	Crysis	Deus Ex
Far Cry	Bioshock	Invisible War
Unreal Tournament 3	The Operative	Hellgate
Condemned	Wolfenstein	Cthulhu
Portal	No-one Lives Forever	
Blacksite	Undying	
Timeshift		
Prey		
FEAR		
Doom 3 series		
Fall of Man		
Quake 4		

Fig 62. Inventory systems across the genre

These can be combined with the Health & Armour complexity scale to yield a fourth, overall scale of the relative configurability complexity of the avatar, as the former illustrates a relative indication of a core configuration activity (that is, adjusting a rolling parameter of the avatar's capacity to absorb negative parameter shifts from the environment).

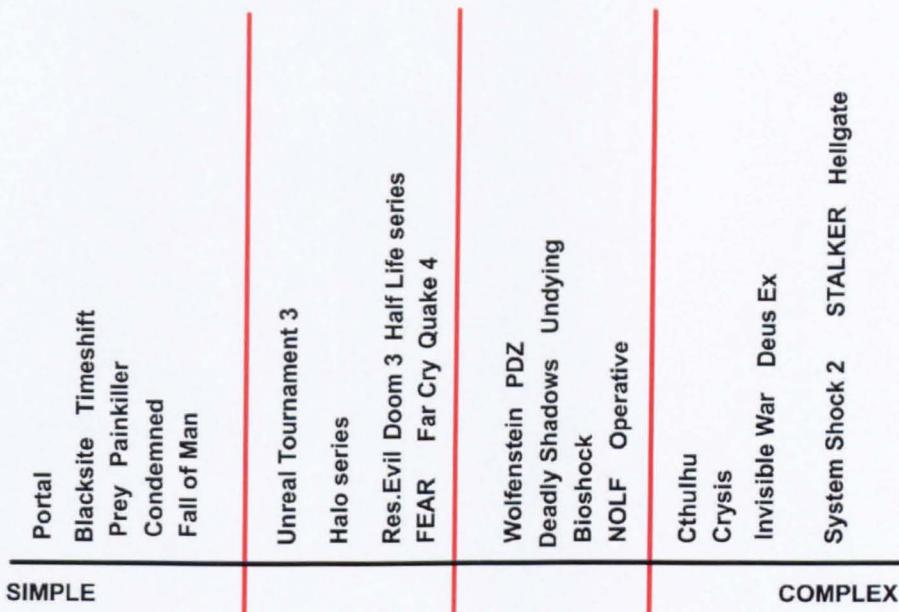
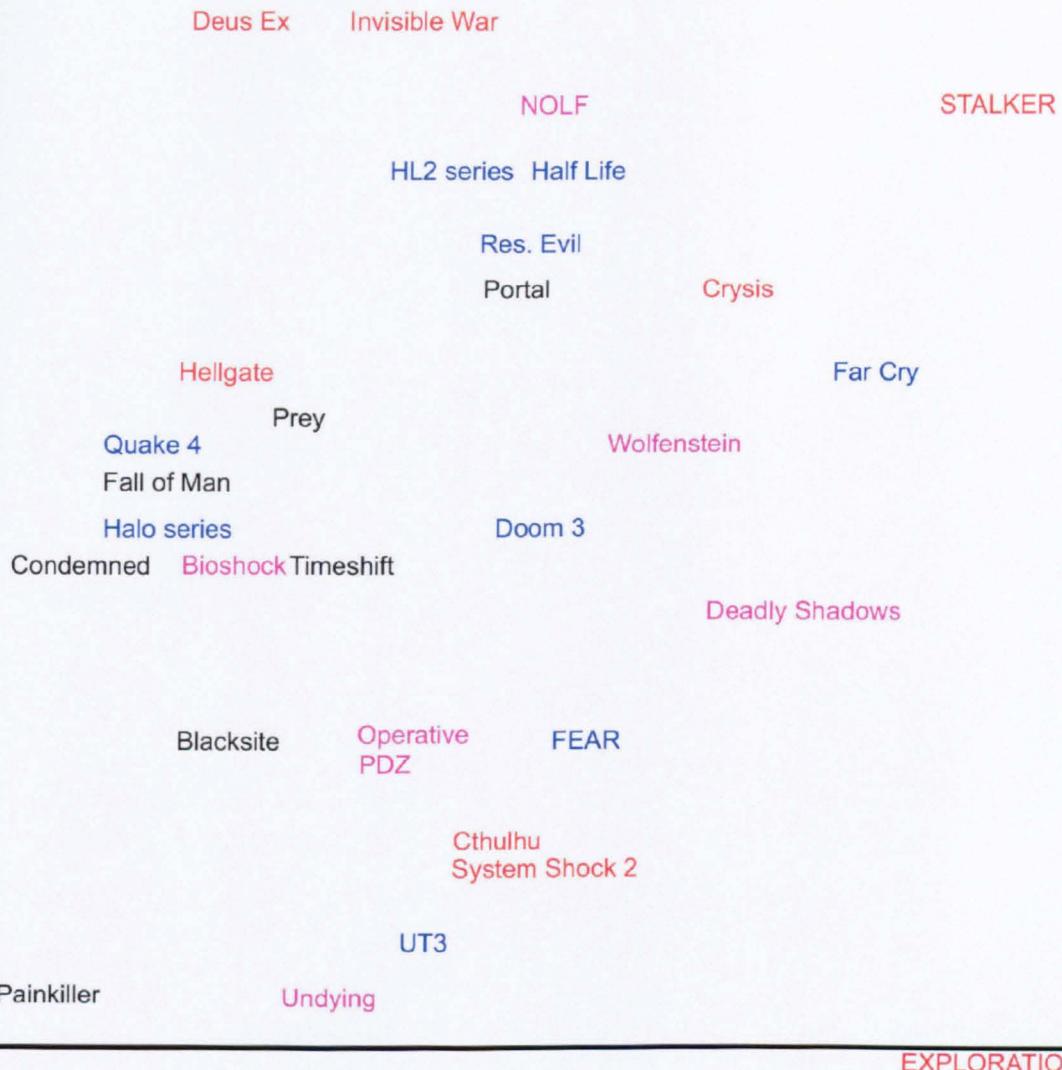


Fig 63. Configuration complexity (including health & armour complexity)

Finally, the four scales: exploration, interaction, combat and configurability can be cross-referenced to look for patterns of avatar functionality across the genre. This gives an overall illustration of the genre's avatars that can then be used to inform the discussion of representational strategies.

Figs 63-65 show a result of combining the four scales. What is immediately apparent is that it is difficult to plot a smooth combined line from simplicity to complexity. Only in the combination of combat and configuration does anything resembling a pattern emerge, but this is fragmented. Further, once complexity of interactivity is added, the pattern breaks down further.

In terms of interaction, exploration and configuration (Fig 63), there is no apparent pattern, only the suggestion of a correlation between configurative complexity and exploratory complexity, and some evidence of a partial correlation between interactive complexity and configurative complexity. No strong correlation is apparent however.



EXPLORATION

Fig 64. Combination of interaction, exploration and configuration scales. Red indicates a high position on the configuration scale, purple the next group of complexity, blue the low complexity group and black the lowest.

Fig 64 shows a combination of interactive, exploratory and combat complexity and, once again, there is no particular pattern evident. There is more of a suggestion of pattern when combat and configuration are compared, with a trend towards a correlation between the two factors, although this is undermined by the addition of the interaction scale (Fig 65).

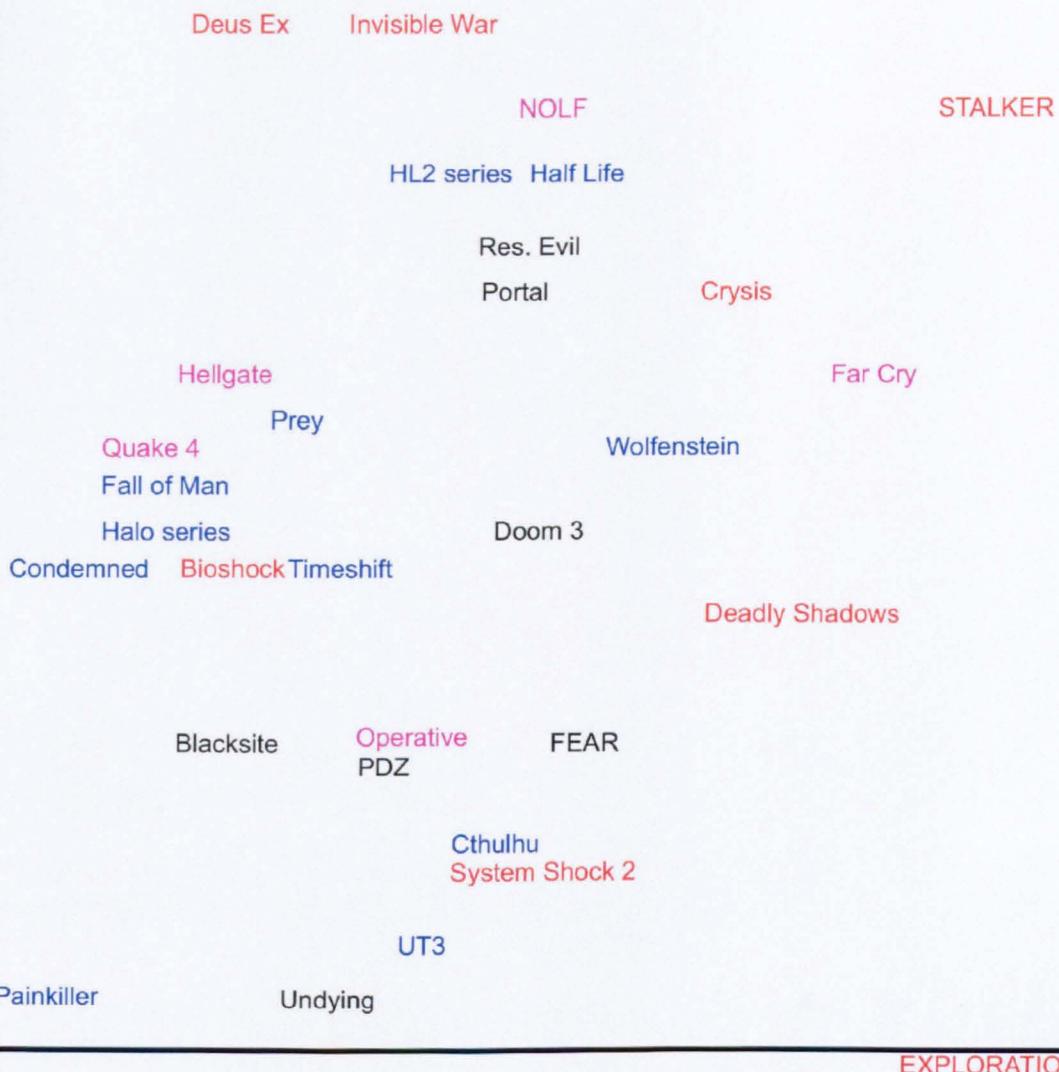
**EXPLORATION**

Fig 65. Combination of interaction, exploration and combat scales. Red indicates a high position on the combat scale, purple the next group of complexity, blue the low complexity group and black the lowest. Although some titles score highly on all scales, for the majority of titles, there is no clear pattern.

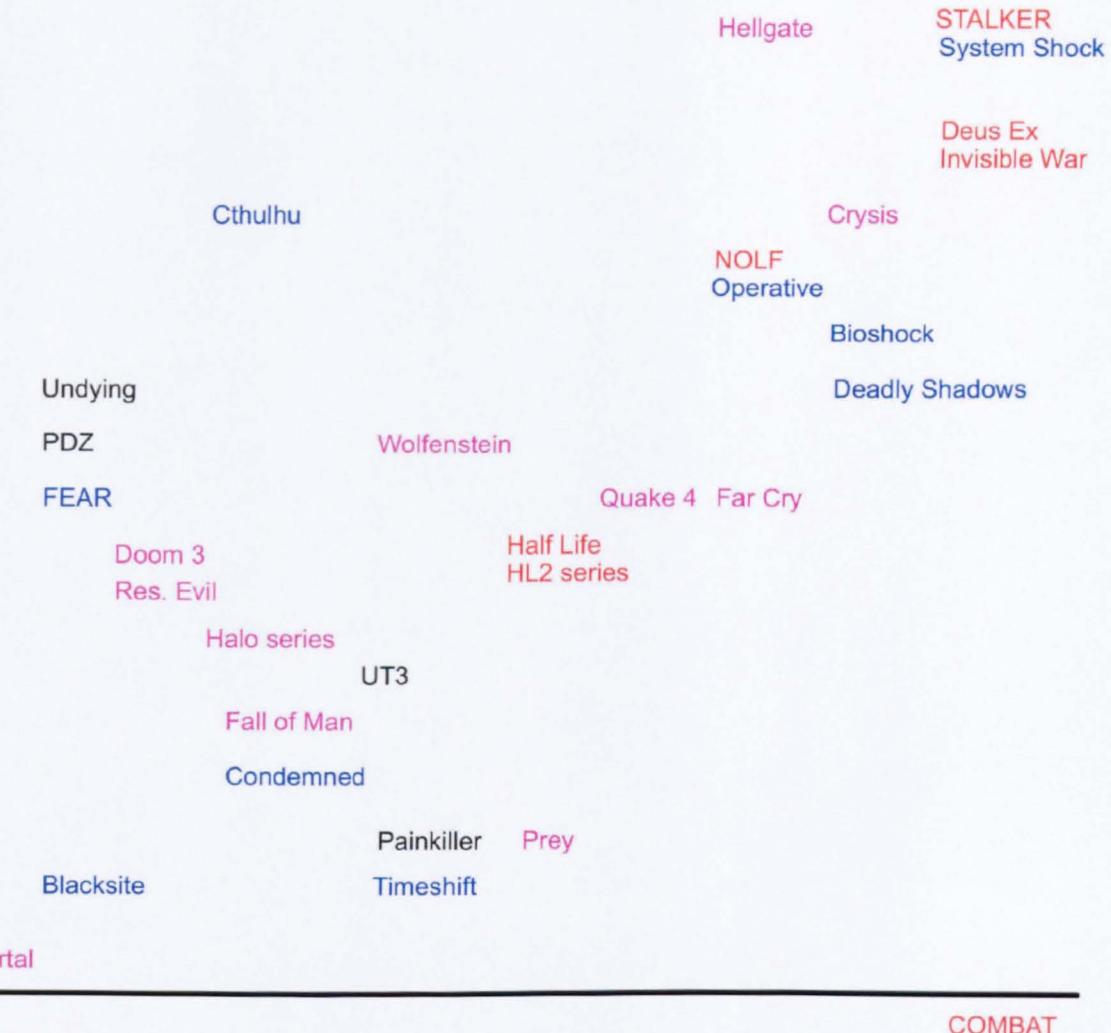


Fig 66. Combination of combat, configuration and interaction scales. Red indicates a high position on the interaction scale, magenta the next group of complexity, blue the low complexity group and black the lowest. There is more of a suggestion of a pattern between combat and correlation apparent.

What this shows is that there is not a smooth gradation of complexity across the genre. Specifically, this suggests that any division of the genre should not be carried out in relation to the functional capabilities of avatars. In other words, although some titles (*S.T.A.L.K.E.R.*, *Crysis* and the *Deus Ex* series) are clearly more complex titles than others (*Blacksite*, *Painkiller* and *Condemned*, for example), the populist divisions into Run&Gun, RPG-crossover and so on, cannot be made in this fashion. Given the diversity of experience on offer across the genre, this offers a further suggestion of the role that diegetic wrapping may play. Once again, there is no clear separation of underlying ludic structure between titles across the genre: complexity appears not be grouped, and

distributes across the titles in different areas of play. In other words, taken as a genre, FPS games tend to even out in terms of complexity, applying this complexity to different supported actions the avatar is capable of undertaking.

Section 8.2. Representational strategies

The structural capabilities of avatars can now be compared to their representational strategies or diegetic properties. The first thing to note is that twenty of the thirty-four avatars (*Halo 2* splits between two avatars – the Master Chief and the Arbiter) are represented as animated characters in cutscenes⁴¹. Of these, fifteen speak. The six games that are left include three from the *Half Life* franchise, leaving only *F.E.A.R.*, *Return to Castle Wolfenstein* and *System Shock 2*. The fact that virtually all FPS games represent the character in cutscenes should lead to the consideration of unrepresented avatars as exceptional cases, and explore the reasons behind this separately, whilst beginning to interrogate why the significant trend is found to be the opposite (Fig 67). Equally, in terms of the avatar as having an identifiable identity other than the player, it should be noted that it is only in *Doom 3*, *Resurrection of Evil* and *F.E.A.R.* that the protagonist remains unnamed (and in the latter, the avatar is referred to as the ‘Point Man’, suggesting a singular identity rather than *Doom 3*’s more generic ‘marine’). Even though *System Shock 2*’s avatar is amnesiac and is only visually represented in the very last cutscene (they also have only one word of dialogue in this cutscene), they are referred to in a cutscene as Soldier G654434-2. Indeed, a simple chart of representation can be drawn to illustrate which games explicitly use representational strategies to make the gap between player and avatar clear.

⁴¹B.J. Blazkowicz does appear briefly in *Wolfenstein*’s closing cutscene, but until that point has only been seen briefly in a photograph in the opening cutscene, so he has not been included in this count.

Game	Name	C/S	Hands	Body	S/ Mirror	S/ Death	Vocalises	Monologue	Talks to	Talked to	Talked about
Half Life											
System Shock 2	2										
Deus Ex											
The Operative											
Wolfenstein											
Undying											
Halo											
NOLF											
Doom 3											
Far Cry											
Invisible War											
Half Life 2											
Quake 4											
Halo 2											
Deadly Shadows											
Painkiller											
Res. Evil											
Perfect Dark Zero											
F.E.A.R.											
Condemned							FACE				
Cthulhu											
Prey											
Episode One											
S.T.A.L.K.E.R.											
Crysis											
Blacksite											
Episode Two											
Fall of Man											
Bioshock											
UT3											
Halo 3											
Portal											
Hellgate											
Timeshift											

Fig 67. Avatar representational strategies

A word of explanation is required for some of the categories, and running through the list should clarify them. Nearly all the avatars are named and all but five are represented visually in cutscenes and, not altogether surprisingly, the hands (usually holding weapons) are ubiquitous in their visualization. However, only a handful of games ever show the limbs or body of the character when performing actions. Another nine show either the body of the character or a full visual representation on death. Finally, another ten enable the player to see their avatar in mirrors. Combining these columns, less than half of the games (nine in total) never show any more of their avatars than are visually represented in cutscenes (including, significantly, the five games that do not use cutscenes at all).

In terms of audio representation, like hands, footsteps are ubiquitous, and in more contemporary games, these are tied to specific gameplay, as strategy and sneaking become formulaic devices. Ten games have the avatar vocalize and another seven contain some form of monologue, in other words, the avatar speaks either to themselves in the form of either diaries or commentary on the unfolding action and plot. Combining these, thirteen out of the thirty-four games tie audio representations, other than footsteps, directly to the avatar during play. In terms of dialogue, fifteen games have their avatars speak, including both cutscene and in-game dialogue, to other characters. When this is added to the audio representations, the total rises to eighteen (just over half the games in the analysis). Additionally, most avatars are directly spoken to during the game, in either cutscenes or during ludic activity, although this is qualitatively different, and it could be argued that this may be directed at the player, rather than avatar (and, indeed, in the case of audio directly or indirectly instructing the player how to play the game or achieve goals, there is a degree of truth in this). But, overall, between visual and audio representations, it seems apparent that the avatar is very deliberately made clear and distinct in some form or another and that systems, rather than directly identifying avatars with players, make efforts to establish avatars as independent characters, thus highlighting the difference between them and the player. Further, it appears that this is successful: a recent empirical study examining recall of FPS play notes that the overwhelming majority of subjects shared a very distinct conceptual separation between player and avatar. Only two subjects in the entire study referred to the action in the first person. Further, the majority used the second when discussing plot, character and environment: “you go into the basement”, “you are this marine” (Pinchbeck 2007). This offers a contrary perspective to traditional applications of presence questionnaires to games, in which it has been claimed that players both maximize their presence-inducing strategies (Nunez & Blake 2005) and the impact of story upon presence (Schneider et al 2004). In the latter study, it is assumed that games do everything they can to aid the player both develop a sense of diegetic presence and relocate their attention within this.

This is a highly problematic notion, as importing schema wholesale would rapidly lead to a breakdown of input-

output relationships, not least because it is simply not realistic to map embodiment from player to avatar. So, it is not actually be too surprising to find an investment in the avatar as independent and different to the play occurring in first-person games, as this fundamentally assists the negotiation of the affordance/expectation discontinuity. In other words, it is not relevant whether or not a player can imagine mapping an action from the real world into City 17, as long as Gordon Freeman's actions are fitting and managed within the diegesis. Avatars operate somewhere between puppets and masks, in performance terms, and their characteristics may function as not quite orientation devices, but metaphoric user manuals.

From the initial survey of representations, it can be safely claimed that the vast majority of avatars are indeed established as characters existing in the diegesis: that is, the player is forced to confront them as independent from the player, or that they are not representing the player directly. Even Gordon Freeman, one of the most unrepresented avatars of them all, with practically no visual representation, is referred to by name repeatedly during all the *Half Life* games. Indeed, it seems safe to argue that avatars operate as push as much as pull devices as far as drawing the player in is concerned. That is not to say that players do not heavily engage with their avatars; the formation of a strong, identifiable character actually may assist an empathic relationship with the avatar, thus enabling the player to get close to the diegetic action, so to speak, without having to be there themselves.

The character of the avatar may help explain the limitations of the affordances available to them but justifying these skills or preoccupations. For example, the job or career of the avatar prior to the start of the game can be noted and, related to this, the amount of pre-game history supplied alongside any clues as to the avatar's personality. Somewhat unsurprisingly, in seventeen games, the avatar is explicitly military in background. In a further seven, the avatar is a police officer, agent or investigator, again a pseudo-military background. There is a subtle suggestion of a difference in motive, approach and likely relationship with plot embedded here, and when looking at the list of games this is the case for (*Perfect Dark Zero*, *Deus Ex*, *Invisible War*, *Cthulhu*, *Condemned*, *The Operative* and *No-One Lives Forever*) it is entirely possible to see this reflected in the type of gameplay presented (all of them utilize a substantial number of gadgets or non-combat items). The remaining games opt for a mix of backgrounds: Gordon Freeman is initially a scientist, although he could arguably be described as a soldier for the *Half Life 2* series (which brings the count up to twenty games), as is *Timeshift*'s unnamed protagonist (though it does transpire he is actually more of a secret agent as the game develops), Garrett is a thief, Strelak is a stalker (somewhere between mercenary, explorer and thief), Jack Carter a boat captain, Tommy a mechanic, *Bioshock*'s Jack is genetically engineered assassin (although the player knows nothing about him at the start of play), Chell a 'test subject' and *Painkiller*'s Daniel Garner is dead. Once again, the fact that this

information is given about the avatar suggests both an independence of character from the player, and a contextual frame for their actions.

Conspiracy is a frequent theme in FPS games, which is not too surprising as it gives endless opportunities for plot, and gameplay, reinvention (see Section 9.5 for further discussion). Thus, there is a common occurrence of mystery or an unknown but implied deeper significance to the avatar's past in several titles: *Half Life* series, *S.T.A.L.K.E.R.*, *Condemned*, *Far Cry*, *Cthulhu*, *F.E.A.R.*, *Bioshock* and *Timeshift*. This is frequently attached to amnesia, which is explicitly referenced in all of these except *Condemned* and *Far Cry* (it also is a feature of *System Shock 2*). Amnesia has the advantage of leveling the knowledge base between player and avatar, as it effectively reduces the temporal span of the latter to the opening of play. As such it is a powerful device for controlling any expectations of prior knowledge, the "why didn't they just?" factor. Other titles go out of their way to introduce a history outside the game by explicitly referencing prior activities and relationships. *Quake 4*'s Rhino Squad repeatedly refer to Kane's activities and "what happened in Austin"; whilst in the opening of *Halo 3*, Cortana's voice-over states that she "watched as you became the soldier we needed you to be". *Painkiller* shows us the car crash that kills Garner. It could be argued that the very existence of a mysterious or unknown past establishes that a prior time to the game exists for the avatar, thus also forcing an extension of the character of the avatar along the temporal dimension outside the framework of the game. This is another representational tactic, creating a distinction between the player and the avatar. Prior history can be found in half the games in the analysis.

Regardless of a prior history, the majority of avatars are outsiders. This is clearly an important part of supporting the lengthy periods of lone action they will undertake. The exact nature of this 'outsiderness', or 'otherness' varies. The Master Chief, one of the more social avatars is, nevertheless, the last of his kind, a cyborg soldier who is not altogether human, Freeman is a new employee, Hale ceases to be "one of the troops" when he is infected with the Chimera virus, likewise with Kane's Stroggification. This otherness occasionally extends to include a team, normally the PNPC allies of the avatar, as with *Unreal Tournament 3*, *Crysis* and *Blacksite*, but in these cases, the team itself remains apart from the normal population. This is a diegetic device, and it enables knowledge about the world to be reduced, just as normal reality gives way swiftly to a strange land, so the hero is often a stranger in it from the outset.

This compounds the suspension of normal reality. So, the marine in *Doom 3* has just arrived at the base, not knowing where anything is, or knowing anyone. This is technically unnecessary given that the base is swiftly transformed, but what it does do is bypass any question that the marine might either know his way around, or have any knowledge about the activities of the base. Likewise, in *Undying*, although Patrick Galloway does have

separate knowledge to the player and some knowledge of Jeremiah, he has no experience of the estate.

Thus, the explorations of the avatar and player are brought into line with one another. Although a degree of knowledge about the world is found in a significant number of games, it should be noted that this is normally generalised knowledge, rather than being local or situational. Thus, both JC and Alex Denton are new recruits and although the latter makes reference to her foster parents in Chicago, and a limited grasp of the roles of The Order, WTO and Tarsus, she is nevertheless new to Seattle and, more specifically, the function of the Tarsus Academy. Likewise, JC Denton is just starting with UNATCO and thus reliant upon PNPCs like his brother Paul for local knowledge. Generalised knowledge about the world may be inferred for other avatars (presumably that most of them were not bred in a vat, *Bioshock* being an obvious exception) but it is not explicit. Further, the break from normal reality that occurs at the beginning of the majority of the games undercuts this knowledge as things move away from normality. It may be argued that only in a small number of titles (*Hellgate*, *Perfect Dark Zero*, *The Operative* and *No-One Lives Forever*) aside from sequels, does the world remain as it is presumed at the opening.

Much less common than the expectation of, or reference to, knowledge of the world are instances where the avatar explicitly knows more than the player. *Fall of Man* is a good example of this – alongside the fact that the plot is revealed retrospectively, Hale clearly knows more than the player. Through his infection, he 'sees' the Chimeran plot and their weakness. This is, without doubt, a *deus ex machina* of quite epic proportions, which in itself may point to the relative lack of this device in the genre. *S.T.A.L.K.E.R.* infers a discrepancy between Strelok's knowledge and the players, but this is mediated by amnesia – in effect, Strelok does not actually know all that he knows, and the player parallels his uncovering of his past and memory. *Undying* hints at a secret in Galloway's past, which links into the Keisinger subplot, that demonstrates a clear division between player and avatar knowledge, but this has negligible impact on the development of the game. Likewise, Garrett has established relationships with many of the characters in *Deadly Shadows* and a strong knowledge of the city itself, which does somewhat beg the question of how he has managed to miss so many substantial and critical buildings, lairs and subterranean citadels in his busy career as a serial interloper. Finally, Reaper has established relationships with *Unreal Tournament 3*'s PNPCs and a strong understanding of the wider conflicts the diegesis is concerned with.

The transformation and development of the avatar will be returned to in Section 9.5, but the avatar's centrality in terms of the plot of the game should be touched upon, before summarising the representational strategies discussed and relating them to the functional capabilities of avatars across the genre. A distinction can be made

between those games where the plot is centred around the avatar's actions, and where the avatar acts upon a plot that is in motion regardless of them; in other words, whether plot revolves around the avatar, or whether they assume a centralised position predominantly through their actions in the game. Some examples may clarify this. In *Half Life*, Gordon Freeman is peripheral to the core plot until relatively late in the game. Putting aside the retrospective implications of the G-Man's final monologue, Freeman has nothing to do with the resonance cascade, or the fact that the scientists at Black Mesa have been exploring Xen. Freeman starts to become centralised as he fights back against the troops and, particularly, launches the satellite to close the rift. At this point, other characters begin to notice him, and following the withdrawal of the special forces, having failed to stop either him or the alien invaders, he becomes the focus of the plot's attention, as the one person capable of stopping the invasion. Compare this to *Half Life 2*, which is all about Freeman, from the opening sequences: Freeman comes to the attention of Breen, who recognises him as a major threat, then pawn, and the game focuses around the action of this hero figure driving sequences of causality forwards. In other words, the major action of *Half Life*'s early phases would occur whether or not Freeman was there or not – as presumably someone else would trigger the cascade. The Freeman of *Half Life 2*, by contrast, initiates the plot by his re-appearance.

The avatar's role in driving the plot forwards may seem rather conjectural: without the avatar relaying the player's actions, after all, it is mildly irrelevant what may or may not have happened in a diegesis, but is nevertheless important if a game system is to be understood as an object existing independent of play, that is, with predetermined relationships and networks of affordances and protonarratives embedded in it. Thus, the diegetic trajectory can and should be separated from ludic activity. What is more, there is a steady pattern in the relationship between the avatar and the plot trajectory which is an important part of manipulating the player's expectations and behaviour. In order to make this case, the representational strategies detailed so far should be summarised into a series of functional effects.

Firstly, avatars always exist as distinct characters. The player is kept slightly removed from seeing themselves as the prime instigator in the game's actions. It was suggested that the player-avatar relationship is more akin to puppetry than acting in this regard. The diegetic characteristics of the avatar act as a channel for the allowed behaviour, in a manner that is certainly suggestive of the performative filter Scheiffelin argues for in the context of liminoid activity (Section 6.1). Thus, a substantial number of military and pseudo-military backgrounds are found, supporting both a reduced range of skills and likely behaviours in these circumstances. The fact that the vast majority of avatars are outsiders and have limited or no local / situational knowledge reduces the need for social interactions, focusing play on the supported actions and diverting attention from alternate strategies (particularly socially orientated ones) for completing goals and carrying out actions. At the same time, there are

frequent references to history prior to the commencement of the game, once again establishing a separate character for the avatar without requiring any real knowledge of the presented diegesis specific to the games actions. Amnesia and conspiracy build upon this basic model, where an inaccessible history is created whilst expectations of local knowledge are reduced. This is analogous to the idea of localisation discussed in Section 6.6, where the diegesis is virtually expanded whilst keeping the actually accessible diegesis at a controlled size, which again has clear links to the idea of games as liminoid spaces. The relationship between avatar and plot thus becomes clear. Most avatars begin the game with a low level of knowledge about the world, which is enabled by their not being party to the major initiating events (which would, otherwise, require a reasonable knowledge). As they move towards the centre of the plot, their knowledge increases, but this normally takes the form of a greater understanding of their role in the near-ubiquitous conspiracy. This is a focusing device and it means that only a small fraction of increased knowledge about the diegesis needs to be delivered.

Again, some examples may help. The S.H.O.D.A.N. plot, together with G654434-2's amnesia , means that the actual target actions and explorations of the player are focused upon the resolution of a pre-existing, controlled and focused set of goals. What they begin to know about the diegesis they exist in tightly orbits the issue of the relationship between S.H.O.D.A.N. and the Many. This also relates to the notion of PNPCs acting as foci for exporting for knowledge and action outside the tightly defined affordance set. Likewise, in *Far Cry*, Carver's knowledge about the islands and Krieger's operations expands but within the parameters defined and controlled through Doyle and Val. Indeed, the point at which Carver personally dictates the sequence of events (shutting off the power which ultimately lets the Trigens' rebellion begin in earnest) and starts to move to a position of plot driver, as opposed to plot responder, the plot focuses specifically around the nuclear destruction of Krieger's plants, and hence exploration of any kind is strictly off the menu. *F.E.A.R.* ceases to be a search for Fettel with inferences of a deeper, more personal conspiracy, and becomes much more focused upon the identity of the Point Man and his relationship to Alma, but this runs alongside the plot speeding up and focusing – and finds its apex in the final lab levels, where local knowledge can expand safely within the highly controlled boundaries of a localised break.

Prey, of course, keeps any knowledge about the Sphere carefully under wraps, but allows Tommy's knowledge to expand by introducing the rebellion, Jen's plight and the Keeper figure, whilst keeping Mother back until the final plot-twists. As he becomes more central to the plot; in other words, when the player becomes more aware of Mother tracking his movements, he gains some degree of geographical understanding of the Sphere (although 'head to the top' is hardly extensive), but this is tightly interwoven with the plot's insistence that finding Jen is a race against time, again another focusing device.

Alongside this process is a transformation of the avatar, reinforcing or reinventing their outsider status and altering their knowledge of the world even as it should be generally increasing. Thus, a range of strategies can be inferred that, as with localisation and ecological validity, act as filtration systems to control and manage player expectations and behaviour. This is not to suggest that players are somehow held against their will by the system, or are incapable of seeing the constraints. On a pragmatic level, even if this were actually possible, the fidelity and complexity of the media in question certainly falls well short of it being an actuality. However, it creates a template for activity that, if subscribed to, enables a greater degree of homodiegetic engagement (avoiding the connotations of the problematic term 'immersion') to take place.

Section 8.3. Summary

By analysing the functional capabilities of the avatar, a better position is created from which to evaluate the impact of avatar affordances upon gameplay. Whilst this can be used to understand how different supported actions not only enable, but steer players towards particular types of behaviour in games, it is also noteworthy that there is not a clear gradation of complexity in avatar actions. To put this another way, those games which traditionally have been described as RPG crossovers also contain high degrees of combat configuration, and whilst others are generally less complex, there is no clear separation of a class of run & gun shooters. What can be drawn from this, however, is further evidence that the diegetic properties of avatars have a role to play in creating diversity in the genre. The process of examining functional capabilities also provides a background for examining these diegetic properties; with an understanding of how affordances not only constrain but prompt behaviour, how the diegetic properties further support this process can be turned to.

As avatars function as a point of engagement between the player and the system, they constitute a reduced behavioural set, a filter to channel normal behaviour into the limited affordances of the system. The kinds of representational strategies found across the genre are geared towards making this happen, from managing the avatar's level of knowledge about the immediate environment to inferred psychologies and responses based upon past history, career and, frequently, amnesia or similar breakdowns of understanding between themselves and their worlds. What is perhaps most telling is that the suggestion of a player 'being' a character, or FPS games being characterised by the 'lack' of an 'intervening avatar' are clearly flawed. The complex web of protonarrative, homodiegetic characteristics establish the avatar as a performative filtration system for behaviour and expectation: in essence, for gameplay.

Section 9.1. The Ludodiegetic definition of Plot

Plot is the predetermined development of a protonarrative network, as described in Section 3.4. This bypasses the issues raised by Juul (2003) in his discussion of the problem of attempting to map narrative from one media form to another, by dispensing with the idea of the action of a game containing a narrative in the classic sense. Instead it hosts a network of protonarrative objects likely to lead to one interpretation. In other words, the 'plot' of *Doom 3* as including lengthy sequences of action that do not adjust the predetermined development of the protonarrative network can be bypassed:

The marine enters a room filled with blood and body parts. Six imps materialise in the room and he blasts them to pieces with his shotgun. He then enters another room filled with blood and body parts, where another two imps and a pinkie appear. He dispatches these and enters another room...

Even if this account were expanded to do justice to the environmental details of Mars (not to mention well-written), the plot, in the classic sense, of *Doom 3* is immensely repetitive and stunted. Partially, this is because the fundamental difference between a game and a traditional narrative form is that the inner life of a game takes place not in the system, but 'in' the player, thus the depth normally found in a closed media system is simply not necessary to the same degree. This is compounded by the necessarily repetitive nature of games, as the improvement of the player's skills is fundamental to the enjoyment of most games, and certainly all FPS games.

Plot is therefore the development of the protonarrative network as determined in advance by the system designers. This is clearly similar to Forster's description of plot as the connecting structure of events (1927: 93), and has the advantage of distinguishing between absolute determinations and the entire set of events available in the game. Emergence is not considered as part of this. Regardless of the arguments about whether emergent narrative actually exists in any real terms, it is conceptually a product of the player's actions. Thus, although it is influenced and constrained by plot, it is fundamentally different. In the case of *Doom 3*, the betrayal of the marine by Sergeant Kelly can be understood absolutely as a plot device as it is the predetermined development of a protonarrative relationship between objects, in this case, the relationship between Kelly and all other objects relative to the action of *Doom 3*. There is no emergence here whatsoever. A player would have to interpret this predetermined development to the point of transgression to evade the clearly desired shift in relationships. To be prosaic, it is not really feasible for the player to decide Kelly is simply misunderstood, or has metaphorically

joined Hell for personal or political reasons, it simply is what it is. As stated in Section 3.4, plot fixes relationships to absolute points, over a predetermined temporal framework. Plot, in games, occurs in the same way, in the same spatiotemporal location, each time the game is played, and is thus explicitly separated from player activity.

As such, it should serve a distinct gameplay function, and the most obvious is helping manipulate the player's experience to deliver an experience within a predetermined affective and interpretative range. However, there may also be gameplay functions at a more immediate level, offering context and justification for actions and events, and virtually expanding these, by wrapping diegetic complexity around repetitive occurrences to add depth to the experience.

This Section therefore deals with these fixed protonarrative relationships and their effect upon gameplay. In other words, what will be investigated here are the plots found in FPS games and what function their structures and devices have: in essence, how they constrain and enable. In this way, a better understanding may be built of why the plots of FPS games should take the form they do than by pre-existing models from other media. However, discussing these models and their limitations when applied to FPS games is a logical place to start.

Section 9.2. Conformity of FPS plots to generic plot models

Two common models are often used to illustrate plot development. Firstly, Freytag's triangle (Fig 67).

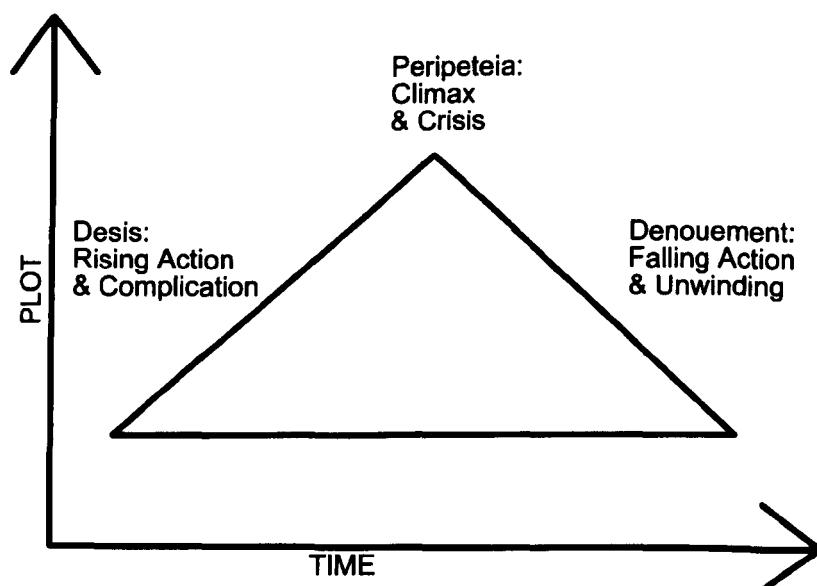


Fig 68. Freytag's Triangle: whilst not a definitive or fixed structure, it nevertheless forms a basis of most conventional linear

Essentially, Freytag's model operates around a central climax (using the term central with care, as the crisis point is often offset towards the end of the drama, creating a 'lopsided' triangle). The early part of the plot 'rises' towards the crisis, the latter 'falls' from crisis to resolution. This is emphatically not to imply a drop in tension or action, rather that events build to a point, and then are carried by the momentum of what has happened.

Laurel (1991: 82-85), in her discussion of the triangle, notes that discrete events can even be given a value in terms of significance, and whether they contribute to rising action (asking a question) or falling (answering a question). In this way a more complex chart can be constructed that better reflects the intricacies of a plot. Arguing that rising and falling segments of plot more often resemble a jagged edge than a smooth line, Laurel nevertheless offers a simplified, but more useful, modern version of Freytag's model thus:

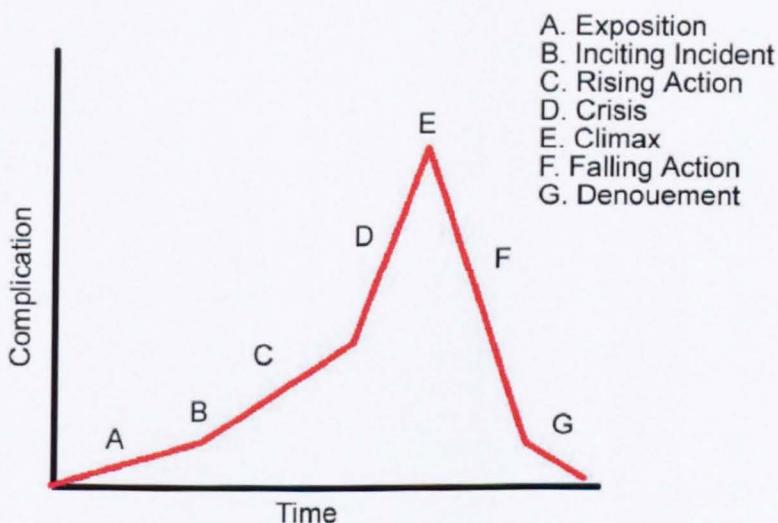


Fig 69. Laurel's updated version of Freytag's triangle

It should be noted, of course, that this model is purely structural: it does not offer any guidance or constraints on the nature of the action during these seven critical phases. This sets it apart from the more contentious application of the Hero's Journey (Campbell 1949), which claims to identify archetypical events or relationships at points along what is self-evidently a Freytag triangle.

Volger (1998) argues explicitly that much contemporary media plots fall naturally along the path that Campbell

laid out, even going so far as to attribute the proportion of a screenplay that should be attached to each⁴². Whether or not Volger's extrapolation does indeed follow in Hollywood movies (his primary medium) is irrelevant here, however the explicitness of his mapping of content to structure is extremely useful as a means of beginning to illustrate plot shapes in the FPS genre.

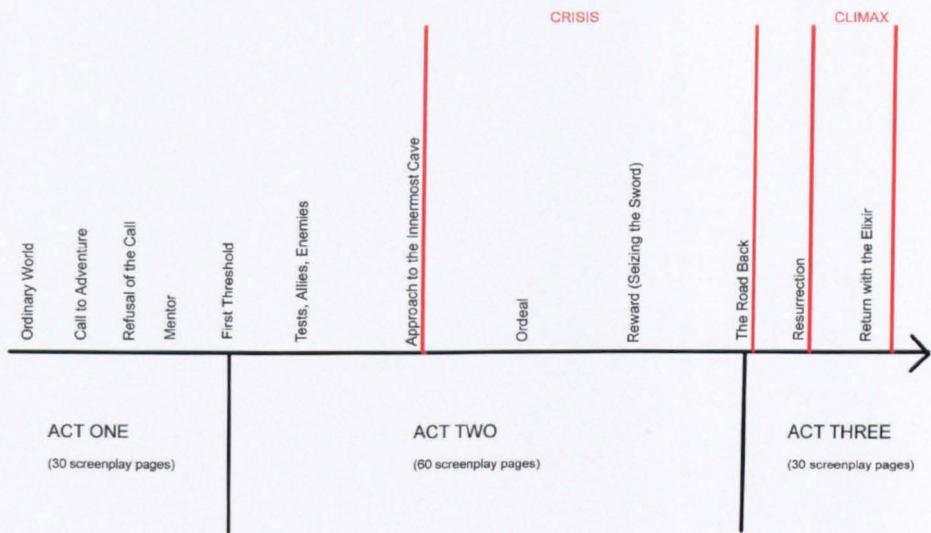


Fig 70. Volger's screenplay mapping of the Hero's Journey (1998: 8) – red lines indicate the boundaries of the crisis and climax sequences

What Volger's mapping also makes explicit is that the falling action is by no means a drop in tension or activity; indeed, it builds towards the final climax. What it is characterised by, however, is being a result of the crisis point, rather than the events leading to it. If FPS games follow the Hero's Journey as described by Volger, the following events should occur, within a temporal structure that is recognisable, over the course of the plot:

The game opens with an apparently ordinary individual in a stable reality. Something occurs to disrupt this reality, and the Hero is summoned in some way to take action. Initially, they refuse to act, or act in a manner that does not aid resolution; but they overcome this refusal and embark upon a quest. A mentor figure appears to guide them, often contributing to the overthrowing of the refusal, and this mentor frequently has special or

⁴²Although, Volger does state that the actual points can be moved around considerably, which does lead to the question of whether there really is a model at all under such circumstances. However, the model is used here as a useful tool rather than a definitive – or even definite – structure, and this debate does not need to be entered into.

supernatural powers or knowledge. Near to the beginning of the quest, they cross an identifiable threshold, often marked with a definable guardian, their journey begins to deviate from the real to the heroic, or supernatural realm. The quest itself follows, with a cast of villains and allies, building to another identifiable threshold, a major challenge that the Hero may either fail, or conquer to be presented with a vision of the ultimate goal. What follows is characterised as an ordeal: there must be danger and a confrontation of the Hero's own weaknesses. Ultimately, they conquer this and are rewarded with a powerful object, be this metaphoric or actual. They then head back towards normality, which can be read as meaning they begin to reform, transform or return to the real world, along the way transforming themselves psychologically, emotionally, spiritually or supernaturally (the resurrection). Finally, they return, often altered, to an often altered world. Moreover, the events leading to the first threshold tend to occupy the first 25% of the overall plot; the quest, ordeal and seizing of the sword the next 50%, and the resurrection and road back the final quarter.

The first question is therefore simple – how many FPS games conform to this model?

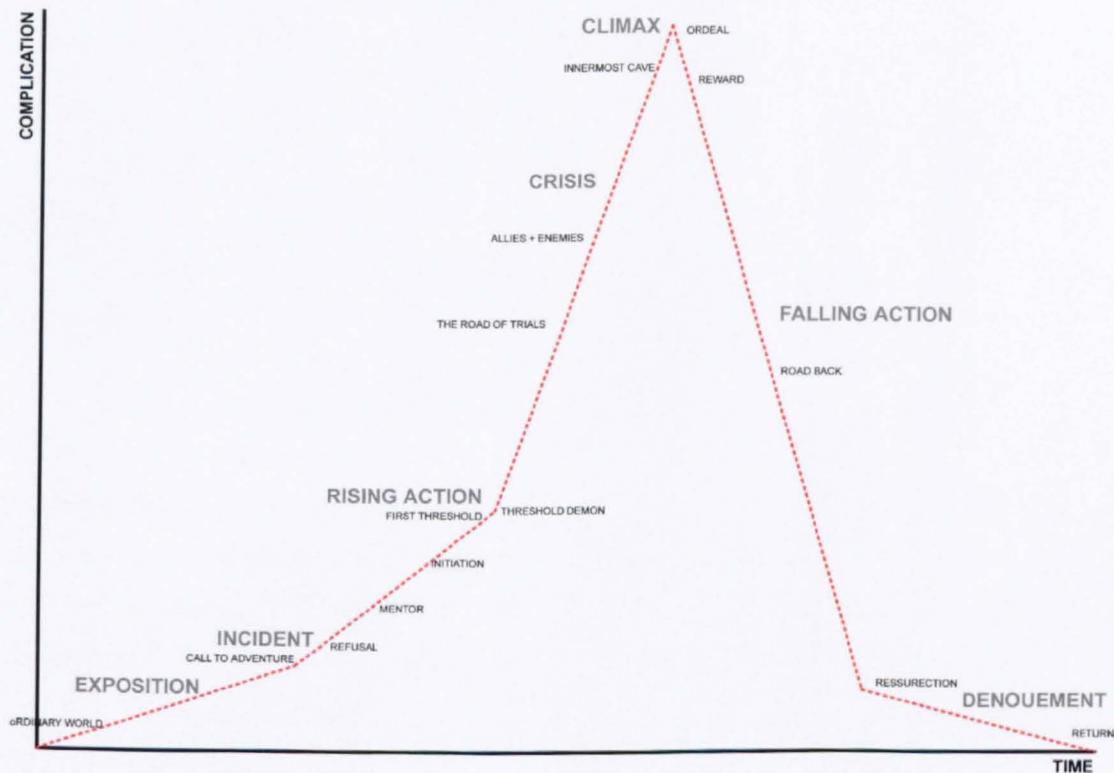


Fig 71. Generic plot model, from Laurel and Volger (Laurel's basic structure plus segments in red/grey, Volger's events in black)

Before tackling this, it should first be noted that Laurel and Volger place the crisis and climax at different points along their models. For Laurel, the climax is an event, prompting the falling action and the crisis is the rising action preceding this. Thus, rising action according to Laurel's model occurs during the period leading to the First Threshold, in other words, her Road of Trials is the crisis. Volger instead uses crisis as the period following the approach to the innermost cave, during Laurel's falling action. Both locate the denouement in the same part of the journey, but Volger uses the term climax instead. Nevertheless, Volger argues that the exact shape of the plot may change, but most of the characteristic features of the Hero's Journey can be expected along the way. As Laurel's model provides a more distinct separation of rising and falling action, the two can be combined (they are not mutually exclusive) to yield a more definite structure to map FPS plots onto (Fig 70).

Roughly Conforms	Conforms but significant deviation	Does not conform
Doom 3	Half Life	Deus Ex
Halo	Halo 2	HL2 Episode 1
No-one Lives Forever	Invisible War	HL2 Episode 2
Wolfenstein	Deadly Shadows	S.T.A.L.K.E.R.
Far Cry	Resurrection of Evil	Fall of Man
Half Life 2	F.E.A.R.	Portal
Quake 4	Condemned	Hellgate
Painkiller	Cthulhu	System Shock 2
Perfect Dark Zero	Unreal Tournament 3	
Prey	Undying	
Crysis		
Blacksite		
Bioshock		
Halo 3		
The Operative		

Fig 72. Conformity to the basic plot structure across the genre

By charting the core plot of each game along the model, their conformity can be noted alongside any general patterns or omissions (Appendix B). The genre seems to split between those games that appear to conform to the model, such as *Crysis* and *Perfect Dark Zero*; those that appear not to conform to the model in any significant way, or require it to be so flexible that it loses power as a model, such as *Deus Ex*, *Portal* and *S.T.A.L.K.E.R.*; and an equal third which appear to conform to the model but have at least one significant deviation or questionable conformity. In this latter group titles such as *F.E.A.R.*, are found, which really lacks any central crisis point, which tends to give it a structure of more or less constant rising action. Indeed, if there is a pivot, it would probably be the death of Fettel and the switch in nemesis from Fettel to Alma, however, this occurs so late in the game the resulting shape of the model is heavily distorted. In many other ways though, *F.E.A.R.*'s shape and components

do resemble the model. *Condemned* is another title that seems to lack a strong pivotal crisis point. On the other hand, *Deadly Shadows* has this moment in Garrett's betrayal and the turning of the Keepers, but loses shape in the denouement: after falling action sequences and funneling during the Shaledale and Museum levels, the final episode is quite defocused, involving traveling around an extensive area placing objects in specific locations. Although the plot is linear at this point, the actual gameplay defuses its drive, reducing the sense of final climax. All of these can and should be distinguished from *Portal*, which is focused far more on the character development of GlaDoS and her relationship with Chell than much of a plot in the traditional sense; or *Fall of Man*'s deeply truncated, episodic bursts of story. Finally, the episodic games *Episode One* and *Episode Two* need consideration, which do not, unsurprisingly, fall along the plot model, perhaps as they represent stages along a wider path (Eli Vance's death at the end of Episode 2, for example, makes a perfect crisis point for a series, although the simultaneous introduction of the Borealis suggests that the action will be rising even further. Certainly, the introduction of the notion that the Combine's homeworld is reachable begins to sow the seed for some form of radical break finale, and the closing of the superportal means that certain aspects of the original plotline can be signed off). When describing these plots as conformist or not, in this instance the basic shape of the model ('Laurel aspect') is referred to. Archetypical plot events (the 'Volger aspect') are returned to in Section 9.3, but for the moment, two examples are offered to support this division into broadly conformist and non-conformist games.

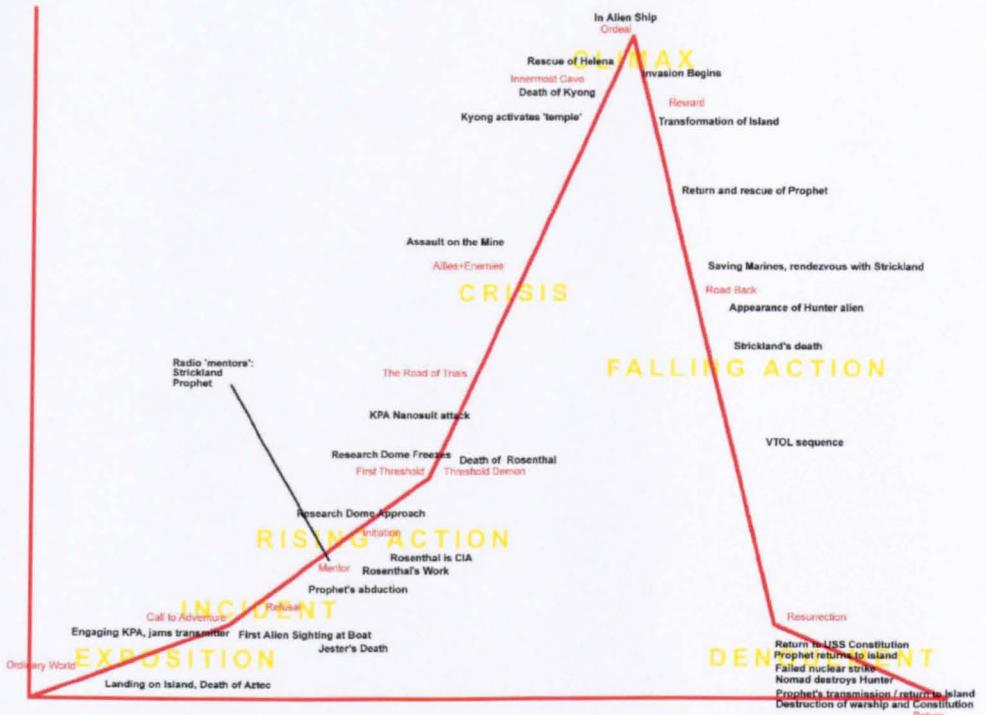


Fig 73. Crysis plot model (conforms well to generic model)

As an example of a conformist plot model, *Crysis* has most of the expected markers and in roughly corresponding locations. A normal world, with the intrigue of Aztec's death, proceeds for a time, before the first sighting of an alien and Jester's death (The Lusca's Call) initiates the major plot line. Strickland and Prophet have been established as radio contact 'mentors', although they function at a much lower level than clearer 'mentor' figures such as Cortana (see Section 9.3). Prophet is then suddenly removed, increasing the plot tension. Nomad learns about the Rosenthals and fights through to the Research Dome. The death of Dr. Rosenthal and the freezing of the Dome marks a shift in plot intensity as the rising action phase is entered, with a clear geographical objective: the mountain and the mines. The alien that freezes the Dome could be described as a threshold demon, as even though the player does not fight it, as it is a precursor of the climactic freezing of the island. However, it is perhaps telling that shortly after this, the player does encounter the KPA Nanosuit troopers, which has some of the hallmarks of a boss battle. The assault on the mine is more or less straightforward rising action, leading to another threshold demon (Kyong) who initiates the climax. As this occurs, there is a plot release in that Helena Rosenthal is rescued. The player then enters an explicit innermost cave (the alien ship) and on exiting, is not only now aware of the invasion, with the KPA having been replaced as an enemy, but is confronted by a radically altered landscape following the freeze ray. The falling action, essentially a long escape sequence, is provided with some intrigue in the form of Prophet's return and the death of Strickland, but ultimately breaks with the VTOL

sequence and the radical shift to the USS Constitution, where the final climactic battles take place. What is apparent in *Crysis* is that although the landscape of the falling action is transformed, it is nevertheless recognisable, leaving the potential for a radical break to signal the denouement is approaching.

Contrast this to *System Shock 2*, which is deeply non-conformist. Unless one considers the 'training sequences', which do not really include any gameplay, the game begins in crisis, bypassing the normal world. A call to action is immediate, as is the presence of a mentor, in Polito. The entire opening sequence of the model is jettisoned. Additionally, the majority of plot developments in the game occur retrospectively, creating a parallel temporal stream of events to the player's actions. This includes the distress signal, infections, discovery of the AI and eventual civil war, but the plot line of this is offset to the temporal development of protonarrative networks in the game itself. So, although there is rising action in the attempt to reach Polito, which does lead to a climax point in the discovery that it has been S.H.O.D.A.N. all along, one would be hard pressed to describe Hydroponics as an innermost cave, or that there is any particularly distinct ordeal occurring. In the falling action sequence, there is also a major deviation: the player completes four levels (Operations, Recreation and two aboard the Rickenbacker) ultimately attempting to transfer S.H.O.D.A.N. to the Rickenbacker, then there is the first of two radical breaks, as the player heads into the Body of the Many. This is not the denouement however, as this occurs when the player realises S.H.O.D.A.N.'s plot and enters cyberspace to defeat her.

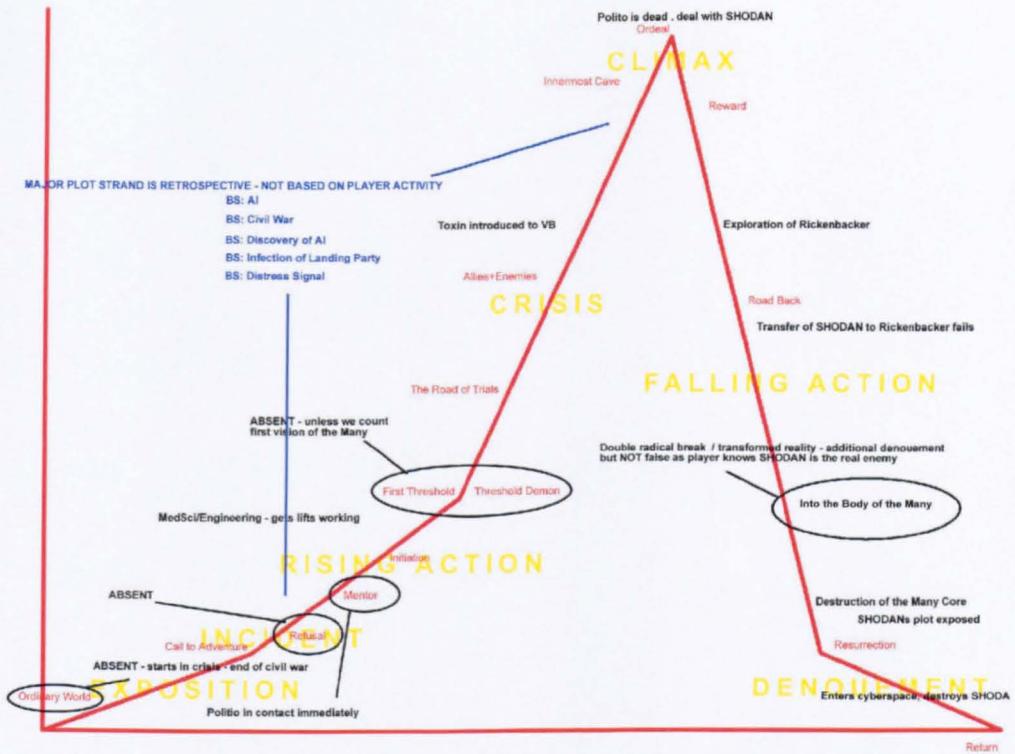


Fig 74. System Shock 2 plot model (many instances where plot does not conform to generic model – blue indicates retrospective backstory)

This creates a kind of double denouement structure, where a secondary climax point is bolted onto the game. However, unlike, for example, the fairly generic Hollywood horror trick of the bad-guy-not-really-being-dead-after-all, or the sudden shift of nemesis from one character to another (found in *Far Cry*'s handling of Doyle's betrayal), the player knows all along that S.H.O.D.A.N. will have to be dealt with and, as the Many represent a distributed general force of evil and S.H.O.D.A.N. is a single figure, she will probably represent the final conflict. This makes dealing with the Body of the Many sequence problematic as it is both explicitly different to the rest of the game, and there is already a significant block of falling action between the climax point and it occurring. Thus, *System Shock 2* does not really conform to the plot model.

That most titles conform, or mostly conform, to the 'Laurel aspect' of model should be expected, when it is considered what the bare bones of the model actually are (something happens, there is deal of action trying to work out what is happening, a major event occurs that suggests how the situation may be resolved, the action builds to a climax). However, it is nevertheless interesting to see which games do not conform in any particular way to the model. Leaving aside the episodes of *Half Life*, there are four games frequently described as RPG-

crossovers: *S.T.A.L.K.E.R.*, *System Shock 2*, *Deus Ex* and *Hellgate*, plus *Portal* (which is qualitatively different from every other game in the analysis as its core gameplay is fundamentally not based upon removing objects from the environment) and *Fall of Man*, perhaps due to its 'recollected' plot (i.e. the whole thing is narrated by Parker, after the action has occurred, in essence creating the most explicitly episodic game in the genre).

Furthermore, at this point only the 'Laurel aspect' of the model has really been considered, that is, its more generic structural aspects. Already, there are a significant number of titles deviating from normal plot structuring. Thus, the more detailed set of archetypical events (the Volger aspect) should be returned to, to see whether FPS games adhere to this side of the model.

Section 9.3. Presence and absence of major plot components.

The first marker is the ordinary world, which returns to the discussion of initial reality of Section 6.1. *Prey*, *Far Cry*, *Bioshock*, *Return to Castle Wolfenstein* and *Cthulhu* all explicitly open in a normal reality; an ordinary world. On top of this, although the realities presented are extended or transformed, *F.E.A.R.*, *Condemned*, *Deadly Shadows*, *Undying*, *Half Life*, *Blacksite*, *The Operative*, *No-One Lives Forever*, *Crysis*, *Perfect Dark Zero*, *Doom 3*, *Deus Ex* and *Unreal Tournament 3* all open with stable worlds, which are changed by the instigation of the plot: the *Call to Adventure*. However, a substantial number of games: *Painkiller*, *Fall of Man*, *Portal*, the *Halo* series, the *Half Life 2* series, *System Shock 2*, *S.T.A.L.K.E.R.*, *Hellgate*, *Resurrection of Evil*, *Quake 4* and *Invisible War* all begin in crisis, that is, with the call to adventure already begun. There is no particular distribution of this across the conformist/non-conformist divide, indicating that the ordinary world is in no way a requirement of generic plot structure, but an option that is local and specific to the game's actions. Thus, even within the conformist group, a third of the titles begin in a manner which deviates from the normal model.

It goes without saying that the Call to Adventure is generic, but the following marker is a clear demonstration of where games separate from traditional narratives. *The Refusal of the Call* is completely absent from FPS plots. On one hand, this can be seen as a banal statement as a refusal to play is a purely heterodiegetic option (turning off the game). As Frome (2007) has noted, there may be limits to the types of emotional and affective experiences applicable to games as a medium – frustration and despair being obvious examples – and, likewise, a game which does not encourage its players to continue is skating on extremely thin ice. Having said that, there is no particular structural reason why an avatar should not attempt to escape the Call to Adventure, only to be sucked into it, like it or not. It could even be argued that for Gordon Freeman or *Doom 3*'s marine, as with other games that use Escape as a key plot driver (see Section 9.5), this is the case, although in all of these instances, even where the

avatar is clearly represented as a character separate and distinct from the player, there is no evidence of hesitation or recalcitrance. Indeed, as noted in Section 8.2, avatar characters are generally set-up to offer a framework of justification for behavioural responses to the situation which supports the allowed actions of the game. Volger does note that some heroes do indeed swing into action without refusal (1998:110-111) but also argues that this is usually done in the context of the refusal being farmed out to other characters in the narrative. Once again, there is no evidence of this occurring in FPS games. Thus, a significant marker in the Hero's Journey is completely missing.

There is a ubiquitous usage of PNPCs across the genre and, on the surface, these seem to correspond to the figure of the *Mentor* normally found at the next stage of plot development. Campbell explicitly describes this "protective figure" as one offering "supernatural aid" (1949: 69), in other words, extending the capabilities of the hero in line with the supernatural forces they must overcome. In contrast, whilst FPS games are certainly packed with supernatural forces, by and large, the means used to overcome them are rather more prosaic. The avatar only has supernatural powers in a few games – *Undying* (spells), *Prey* (spirit walking), *Fall of Man* (Hale is part-Chimera), *Quake 4* (Kane is stroggified, but not until later in the plot), *Bioshock* (plasmids), *System Shock 2* (psionics) and, to an extent, *F.E.A.R.* (heightened reflexes) and *Condemned* (Thomas' un-ludic psychic abilities). The biomods of *Deus Ex* and its sequel may be included in this list, although other characters also possess them, so they are more common than the notion of Supernatural Aid suggests. What is important to note, however, is that only in *Bioshock* are these directly tied to a Mentor figure: Atlas demands that Jack begins to use plasmids (which is forced by the game as the player cannot progress without them).

This is not to say that PNPCs are not vital assistants, but the notion of supernatural aid should be reconsidered, away from the idea of discrete items or abilities towards an ability to see the world more widely than the avatar or the player can. As noted (Section 7.3), the PNPC often serves a distinct gameplay function by mapping out actions beyond the limitations of the player. In this way, Strauss or Alyx Vance could potentially be described as having 'supernatural powers' in that they can carry out actions no-one else in the world can, although this prosaic inclusivity does stretch things a little problematically. More to the point, what most PNPCs do is tell the player where to go and what to do. In this way, they could be seen as 'seer' figures, who have an understanding of what is occurring beyond the normal, but supported by homodiegetic characterisation. Certainly, *Prey*'s Enisi fulfills this definition perfectly, and represents one of the few instances where a distinct supernatural power (spirit walking) is bestowed upon the avatar. More often, however, there are figures like Cortana, Doyle and S.H.O.D.A.N., who assist in steering the player, or get them to undertake actions on their behalf, but do not actively assist them in terms of gameplay. Indeed, beyond this list, it is a struggle to find PNPC mentors at all.

Either games feature multiple PNPCs who operate in the background, rather than as plot drivers (such as *S.T.A.L.K.E.R.*'s traders, *Crysis*' Strickland and Prophet, or *Hellgate*'s many supporting characters), or PNPCs vying for the avatar's loyalty (*Deus Ex*, *Deadly Shadows*), or PNPCs who comment and orientate but are not actively helping the avatar, or bestowing gifts upon them (*Fall of Man*, *Portal*, *Resurrection of Evil*). PNPCs predominantly exist as gameplay functions, not as plot instigators. This may be due to the focus of the games upon the actions of the avatar; the sense of building importance in the resolution of the plot which is central to the reward and feedback systems at the heart of gameplay. The player is rarely, if ever, reliant upon somebody else.

This is not to underplay the importance of the PNPC which is so vital in so many ways to a rich and functional diegesis, but to question whether they are really mentors, in the classic sense. An example may help. *Bioshock*'s Atlas is very clearly, very explicitly a mentor figure. He introduces Jack to rapture, helps him cross the first threshold, gives him his first supernatural powers and sets up the conceptual environment for this transformed world, including Ryan as the nemesis and cause for the breakdown in normality (the fact that this is a lie, and that Atlas is a facade for Fontaine is not relevant here). These actions and contributions to the plot fit the construct of Mentor extremely well – there is a distinct status relationship, Atlas appears to guide and help Jack as he attempts to reach Ryan's office – the symbolic centre, or innermost cave of Rapture. However, the fact that Atlas fits the construct of Mentor so well only causes us to look critically at other 'mentor' figures and question whether this is an appropriate term. For example, Strickland in *Crysis*, although in fairly constant contact, being older and more high status and being in possession of information beyond the avatar, is too irregular a contributor to the diegesis to really fit the bill. He doesn't really actively help beyond giving directions to the next mission, doesn't have any understanding that goes beyond the normal and does not give the avatar any special knowledge or powers. Likewise, although Tech Strauss is a critically important PNPC in *Quake 4* and is high status, issues instructions and actively carries out actions the player cannot, he is not privileged in terms of his knowledge about the situation to any super-normal degree, is also very sporadic in appearance and, crucially, appears at the wrong place in the plot model. Rosa in *Condemned* does have privileged information and actively helps Thomas, but this is highly prosaic and does not constitute a preparation for activity: she is as in the dark about the transformation of the reality of the game as Thomas is, perhaps even more so. Equally, Van Horn does have a knowledge of the underlying reality (that Serial Killer X is his nephew) but he does not assist Thomas in any meaningful way.

As Volger puts it, "Heroes typically don't just accept the advice and gifts of their Mentor and then charge into the adventure. Often their final commitment is brought about through some external force which changes the course or intensity of the story. This is equivalent to the famous 'plot point' or 'turning point' of the commercial three-

act movie structure” (1998:128). Putting the lack of Mentors to one side for the moment, and keeping in mind the fact that for some FPS games the world begins in crisis, this is the most major point of the early part of the structure following the initial call to adventure. *The First Threshold*, where the normal world is fundamentally altered and action proper begins. This presents something of a problem too, as it is difficult to separate this out from the Call to Adventure, unless the latter is significantly downplayed. For example, *Doom 3* opens with the ordinary world and the Call to Adventure would seem to come in the form of the invasion from Hell. If however, this point is taken to be the First Threshold, marking the significant departure from the real, then the only available plot marker for the Call to Adventure is Kelly’s orders to report to the Old Comms Building in the first place, which is less a clear call than a banal order. If, however, the invasion is the Call to Adventure, then it is difficult to find a clear First Threshold, as the alteration of the world is more or less instantaneous (through progressive, as might be expected). Likewise, if the opening of the Yithian portal at the end of *Cthulhu*’s Prologue is read as the Call, then the Threshold event should be the Attack of the Fishmen, although the world has been clearly transformed from normal long before this. The alternative reading is one where the *Portal* opening is a Threshold event, leaving the Call atrophied to the (pre-game) summoning of Jack Walters’ summoning to the house by the police.

Some games do offer a clearer Call / Threshold distinction: *Return to Castle Wolfenstein* makes the escape from the Castle and travel to the Dig Site the Call event, with a Threshold occurring with the first introduction of the undead in the Catacombs. This is unusual however, and leads to a consideration that, whilst recognising a plot model that resembles Laurel/Volger’s, assert that where the Call would normally be located, this is frequently the First Threshold (which is nonetheless distinct from a subsequent plot event that changes the gear of action, setting it on a clear path of rising action towards the climax). Certainly this is the case in non-conformist games, and in those which begin in crisis. For example, *Quake 4* begins in crisis, in the invasion of Stroggos, and the early Sections in the Air Defence Complex are clearly post-Call. There is however, a significant, explicit shift in action with the rendezvous with the MCC Hannibal and initiation of Operation Advantage, which ends in the clear climax and pivotal point of the Nexus Hub, Makron and Strogification sequences. Thus, this is kept as the plot point, and the Call slides forwards to the opening of the game. In *F.E.A.R.*, two significant points are positioned close to one another: the first vision of Alma and death of the SFOD-D Team at her hands and, just prior to that, the Point Man being knocked out by Fettel and the intimation that he is implicated in the conspiracy. At the end of this Section (First Encounter) there is also the first intimation that Jankowski is dead, and the Point Man is caught in what should be a lethal explosion. In this case, the latter seems an appropriate Threshold event, as it implies the Point Man is beyond normality, both in terms of seeing the dead, and surviving what should kill him. This means that there is a second, earlier plot point, roughly in the Call to Adventure spot,

although this has, of course already been issued. Finally, *Fall of Man* also begins in crisis and does not particularly conform to the plot model, but has two clear plot points in the opening Sections. The first is Hale's infection with the Chimeran virus, although this could be seen as the Call, as it fundamentally alters his relationship to the plot, from standard trooper to Hero, separated from the rest of humanity. The most obvious threshold is the transition from Spires to the conversion centre in Fates Worse Than Death. This frees up the later killing of the Angel by Hale as the climactic plot shift.

Threshold Guardians are as rare as mentors, even in those games which use Boss encounters (which are relatively few as it is). It should be noted that the guardian is an entirely distinct entity to the threshold itself, so although unambiguous threshold events can be found in games like *Prey* (Tommy's death and first visit to the spirit realm) or *Halo 3* (the arrival of the Flood), these are not accompanied by identifiable guardians as such. Contrast this with the first of the three Hunters that the player has to defeat in *Resurrection of Evil* and that marks the transition between the opening sequences of the dig site and entry to the Mars Labs proper, or the first battle with a Big Daddy shortly following the player's first encounter with a Little Sister in *Bioshock*'s medical pavilion. A threshold guardian, although not requiring a boss encounter as such, suggests a figure that in some ways blocks or complicates the hero's progression into the major part of the adventure. This figure is noticeably absent in the FPS genre, even though it is easy (if not always immediately obvious) to find thresholds. For example, the first encounter with a Spore Tower on the outskirts of Rachel in *Blacksite* could be classed as a guardian, but it is not clear what it means symbolically - just that a large, singular entity is blocking the way. The same goes for the Vagary encounter at the end of *Doom 3*'s Alpha Labs, and it could be argued that this boss really arrives way past the threshold, as does the Scarab in *Halo 2*, the Controller in *S.T.A.L.K.E.R.*'s Agroprom Research Institute tunnels, Killian's aircraft in *Perfect Dark Zero* or *Return to Castle Wolfenstein*'s Olaric. The very fact that boss encounters in FPS games simply do not meet the plot pattern of threshold guardian placement should be, in itself, enough to question the validity of all but a cursory application of the model. In other words, even when there is conformity to the basic Laurel aspect of the model, the use of Volger's archetypes as a means of understanding plot in the genre should certainly be questioned.

Thus it is argued that the model is stretched past any point of useful application to find a Threshold Guardian, Mentor or Refusal of the Call, and noted that the ordinary world is missing in a significant number of titles. Whilst Volger and Campbell's insistence that not all versions of the Hero's journey take the same shape is recognised, there seems to be a clear pattern emerging: most FPS plots do not use the Hero's Journey in any true sense, even when they conform roughly to the 'Laurel aspect' of a standard plot model.

Following the Threshold, the plot map simplifies into four major phases:

1. Rising action
2. Crisis, including Climax (Innermost Cave-Ordeal-Reward)
3. Falling action (The Road Back)
4. Denouement (Resurrection-Return).

The majority of action in games can easily be categorised into the first and third of these, so it is a case for looking for the specifics of the remaining two. According to the survey of FPS worlds in Section 6, some mapping may be expected between the climax and the mid-point transformation (or break) and the denouement and the radical break.

Game	Plot Climax	Synchronisation to major gameplay event?
Half Life	Xen portal is not accidental and must be closed	No
System Shock 2	Discovery that Polito 'is' S.H.O.D.A.N.	New level but no major event
Deus Ex	Meeting Everett in Paris	No
The Operative	H.A.R.M.'s message and demo of the bomb	No
Wolfenstein	Discovery of Super Soldier and Operation Resurrection plot	Boss fight + new weapon (affordance shift)
Undying	Keisinger's chapter – discovery of the Undying King	Boss fight+ env break
Halo	Release of the Flood – priming of the Halo weapon	New agent class + interfactional conflict
NOLF	Discovery of the Cyborg Soldier program	No
Doom 3	Recovery of the Soul Cube	Follows Boss fight in env break, plus new weapon
Far Cry	Rebellion of the Trigens	New interfactional conflict
Invisible War	Meeting Denton in Antarctica	Boss fight
Half Life 2	C17 rebellion start	New gameplay dynamic added
Quake 4	Kane is stroggified	Affordance shift
Halo 2	Master Chief and Arbiter meet Gravemind	No
Deadly Shadows	Garrett's betrayal	No
Painkiller	Death of Alastair, Lucifer is Asmodeus, Eve kidnapped	No
Res. Evil	Meeting with McNeil	No
Perfect Dark Zero	Death of Jack / Graal conspiracy uncovered	No
F.E.A.R.	Realisation that Fettel is trying to 'free' Alma	No

Condemned	Thomas first encounters The Hate	Boss fight
Cthulhu	Feds in the asylum / attack on the refinery	Shoggoth sequence
Prey	Discovery of Elhuit & the Hidden	No
Episode One	No climax point	N/A
S.T.A.L.K.E.R.	Disabling of the Miracle Machine in X-16 / Meeting with Doc ⁴³	No
Crysis	Nomad enters the alien ship	Major env break and temporary affordance shift
Blacksite	Somer's betrayal and attack on the base	No
Episode Two	Encounter with Advisor / Arrival at White Forest	No
Fall of Man	Hale realises how to stop the Chimera	No
Bioshock	Death of Andrew Ryan	No
UT3	The Necris Invasion	No
Halo 3	Traveling to the Ark	No
Portal	Chell escapes test chambers	No
Hellgate	Maxim's failed assault on the Hellgate	No
Timeshift	Sabotage of Krone's Facility	No

Fig 75. Climax points and synchronicity to gameplay transitions

The *Climax* or mid-point transformation should act as the pivot on which the plot turns, and it can be expected to be marked with some form of intensified event. The Hero's Journey model variously describes this as an innermost cave, followed by some form of ordeal, or test, and some form of reward (Volger explicitly calls this the “Seizing of the Sword”). All of these three sub-units are highly suggestive of types of gameplay objects that might be expected in an FPS games: a transformed or distinct environment, a boss encounter or puzzle that separates from ongoing action, and some form of upgrade or transformation of the avatar. The other critical aspect of the crisis is that the plot should move from rising to falling action, in other words, from the crisis, the end should be conceptually visible to the player, and many of the questions arising from the call to adventure answered.

Not surprisingly, given that this is the most generic part of the model, the climax point is more or less ubiquitous across the genre. Exceptions, that is games without a clear climax point, are *Episode One* and *Episode Two* (which is to be expected, as they form part of a larger narrative; however it is noteworthy that *Episode Two* certainly has something more closely resembling a plot) and *Resurrection of Evil*, another expansion (although, again, the meeting with McNeil may be seen as something of a plot climax, as it does trigger falling action, but it is just not particularly visible in terms of gameplay). Aside from these, most games do feature a recognisable transition from

⁴³ If the C-Consciousness subplot is followed, the latter really is the pivotal point of the plot. However, if it is not, then the miracle machine is the point at which action begins to fall.

rising to falling action (Fig 74), although these are not always as centralised as the model suggests. Further, these plot climaxes are not always synchronous with gameplay climaxes or transformations, and further to that, multiple gameplay climaxes can often be found (such as boss battles, or forced transformation of the avatars affordance set – often by losing all weapons).

What Fig 75 does make clear is that there is a distinct separation between plot climaxes and gameplay climaxes in a significant number of titles, and in this, the definition of plot developed earlier should be remembered: as the predetermination of relationships between protonarrative objects. Therefore, in these asynchronous titles, there is a separation between the plot in the classic sense of causal sequences and plot in these terms, as a functional device. In *Half Life*, for example, the revelation that the resonance cascade was no accident and that the portal is deliberately being kept open (inferring that an invasion is under way) is asynchronous with any major gameplay events, in fact, it follows a level after the major gameplay mid-point climax, Residue Processing, which opens with the player dealing with a major affordance shift (no weapons). This is very different from the synchronicity of *Doom 3*, where the plot climax (the player obtaining the Soul Cube and the means to stop the invasion) is linked to an environment break (Hell), a boss battle (the Guardian) and an affordance shift (the new powers the Soul Cube bestows). Implications of synchronicity and episodic structuring are dealt with in the next Section, but in the meantime, a similar process can be applied to the final major transitional point in the model, the denouement.

Game	Denouement Threshold	Synchronisation to major gameplay event?
Half Life	Freeman travels to Xen	Radical Break + Affordance shift
System Shock 2	Body of the Many	Radical Break
Deus Ex	Travel to Area 51	No
The Operative	Travel to Alpine levels	No
Wolfenstein	Discovery of Super Soldier and Operation Resurrection plot	No (but follows environment break – Low Earth Orbit)
Undying	Travel to Eternal Autumn	No
Halo	Return to Pillar of Autumn	No
NOLF	End of Volcano level	2 Boss fights in Volcano, Radical Break, new gameplay (killer darts for cyborg soldiers)
Doom 3	Enter Dig Site	Radical Break
Far Cry	Helicopter drop at volcano	Affordance shift (no weapons) – lava is new environmental feature (if not radical)
Invisible War	Return to Liberty Island	Major multifactional conflict, env break

		(known environment)
Half Life 2	Freeman enters the Citadel	Radical Break, Affordance Shift
Quake 4	Kane enters Nexus Core	Follows Boss fight (Tower Guardian)
Halo 2	Chief teleports onto Forerunner ship	No
Deadly Shadows	City 'run' to place artifacts	No
Painkiller	Garnett enters Hell	Radical Break + Agent Change
Res. Evil	Return to Hell	Radical Break
Perfect Dark Zero	Jo travels to Africa	No
F.E.A.R.	Death of Fettel, Wade, Alma	Agent Change + 'timed' sequence
Condemned	Apple Orchard	Radical Break
Cthulhu	Mother Hydra's temple	Follows Boss fight (Polyps), Radical Break
Prey	Mother kills the Keepers	No
Episode One	Station sequence	Follows escort sequence, but not really
S.T.A.L.K.E.R.	Chernobyl CPP / C-Conc	CNPP – Radical Break C-Con – Gameplay shift (teleporters)
Crysis	Aboard the USS Constitution	Radical Break + Affordance Shifts
Blacksite	Peirce enters wrecked labs	Radical Break, Gameplay shift
Episode Two	Strider attack on White Forest	Gameplay shift
Fall of Man	Hale enters Chimeran tower	No
Bioshock	Jack is transformed into a Big Daddy	Affordance Shift + Gameplay Shift
UT3	Arrival at the Necris homeworld	No
Halo 3	Death of Johnson & 343 Guilty Spark	Gameplay shift
Portal	Chell finds GlaDOS mainframe	Gameplay shift (timed sequence)
Hellgate	Breach of the Hellgate	Multiple Boss fights
Timeshift	Pursuit of the Sentinel	No

Fig 76. Transition to denouement phases

The falling action leading to the *Denouement*, as with the rising action, comprises the major gameplay of the third quarter of the model, although this is not to say it cannot contain micro-climaxes and plot development (it is rarely a smooth downhill run to the plot's climax, after all). What should be expected, however, is a more or less explicit transition into the final phase, the *Denouement* itself.

Indeed, this appears to be the case, for the most part, with few games opting not to signal in some explicit way that the game has entered a final phase. There is a great deal more synchronicity here than with the mid-point climax point is suggestive that there is a direct gameplay function of a strong denouement transition that is

simply not as important for a mid-point shift (once again, refer to section 9.4 for a discussion of synchronicity). Returning to the consideration of plot structure, in Section 4.3, it was noted how narrative and story structure can be seen as particular forms of schema; generalised architectures for stereotypic situations. Thus, a story is a potent device for organising expectation. If something resembles a story enough to trigger the story schema, subsequent interpretation of events will be processed through this filter: with all the expectations of causality and closure this implies. Certainly, this is a core reason to use plot in games: it enables a better grip, by the player, on what is happening and a means to understand the action. This is perhaps why, even in a game like *Painkiller*, a plot, rudimentary as it is, nevertheless is evident. It is a very cheap means of adding 'why' to the world. However, caution should be exercised before extending the ubiquity of models such as the Hero's Journey, even in its most watered-down form wholeheartedly to the genre, as it is very evident from even a cursory survey of the medium that key constructs are so frequently missing from the plot structures that it calls into question the validity of doing so at any level. That is not to discount Volger's insistence that not every film is a Hero's Journey which, by extension, could equally state that not every game is a Hero's Journey, but to note that it is really inappropriate to consider any FPS game to be one. Further, what does seem apparent, is that even more generalised models, such as that proposed by Laurel, are by no means ubiquitous and that plot in FPS games may be formed from its functional role in gameplay, more than adherence to traditional models.

However, what does emerge is a tight synchronisation between two important plot events: the threshold between a normal and liminoid diegesis (whether the ordinary world is represented in-game or not) and the use of a synchronised gameplay/plot transition to signal the opening of the denouement. In the latter, there are clues that plot is not simply about linking the action, or providing some epiphenomenal entertainment for those looking for more than just ludic challenge.

Section 9.4. Synchronicity and types of plot object

In Section 6.4, the relationships between episode and environment across the genre were summarised, noting that in the majority of cases, the two are, at the least, broadly synchronous. It was suggested that even in branching structures, discrete environments break play into manageable chunks, primarily by enabling a clear indication of the player's relative position to a given goal. This pads out the space between overall goal arc and microgoal activity (between saving Jen and shooting another Hunter; between uncovering the mystery of the Covenant curse and finding some explosives to open the Monastery, etc). The use of PNPCs to export more complex diegetic actions (Section 6.3) have also been identified, thus virtually expanding the action of the game without requiring extension to the basic affordance and ludic structure.

For some games, plot operates as an explicit reward system: *Undying* and *System Shock 2*, for example, contain large amounts of information about sub-plots that do not affect the action of the game at all (in both cases, this information is located outside the temporal span of play and thus the player cannot affect anything with their actions). The inclusion of diegetic material outside the framework of play bypasses the normal problems of interaction and narrative already discussed (Section 4) and is fundamentally disposable: in both cases, the player is free to *not* engage with this material. Inclusion of such material therefore can be seen as extraneous to the core game action, which begs the question of why it is there. There are two obvious answers; firstly, that engaging with the material makes a positive contribution to the experience of playing the game, and secondly, that the material can be used as a reward to players for progressing, just like new classes of agents are a reward system in shooters like *Quake 4* and *Doom 3*. They may also add diversity to the affective tone of the experience: *Doom 3*'s PDAs are often humorous, deliberately lightening the mood. By contrast, *Bioshock* and *System Shock 2*'s logs are unremittingly bleak, directly supporting the ongoing affective diegesis of lost hope and humanity that constitutes Rapture. Although most of the material in these devices is ultimately disposable, it is telling that players are drawn to them by the inclusion of advantageous homodiegetic information within this framework: codes for ammo caches or other stashes of useful items. In the case of *System Shock 2*, critical information is also sometimes included in logs, without which progression is not possible. This increases the logs' significance and the chances of players engaging with them in general, as they may always potentially contain fundamentally important information.

Aside from the titles that include plotlines set apart from the game's action (i.e., occurring in the past, as with *Bioshock* and *System Shock 2*), the ongoing application of plot to game is one of focalisation in terms of both interpretation and even action. Fixing relationships between objects at predefined moments in the game reduces the scope for thinking and playing outside the projected range. Thus, within a given environment, the plot structure can be used to direct attention and supported action. Inclusion of a visible plot structure co-opts story schema by creating an implicit condition that plot progression will equal game progression, therefore local closure of plot conditions will move the action forwards. The protonarrative units, including protonarrative actions leading to microgoal resolution are effectively linked into a wider network which reaches right up to the overall goal of game completion. Further, additional information at this interim level of plot can be attached to protonarrative objects to artificially boost their significance, and this information does not have to be ludically significant.

To exhaustively list the constant wrapping of plot around near-identical episodes of activity to give it some diversity would be extremely long-winded and of questionable worth, but it is worth reviewing an example to

show how this is not simply a case of bolting an entirely disposable structure onto the top for decoration but is often a much deeper, more complex network of effects. Consider *F.E.A.R.*, which has a low number of agent types, reasonably poor environmental diversity and equally limited ecological validity. The gameplay of *F.E.A.R.*, if written out linearly, would be positioned somewhere close to *Doom 3*'s on the literary spectrum; a near endless stream of shoot-outs with Replica forces interspersed with lone exploration of urban spaces. On one hand, *F.E.A.R.*'s gameplay is defined by the balance of these sequences, and the positioning of objects to add variety to the combat when it occurs. On the other however, much of *F.E.A.R.*'s experiential quality comes from the micro-cutscenes and audiovisual effects which constantly punctuate play.

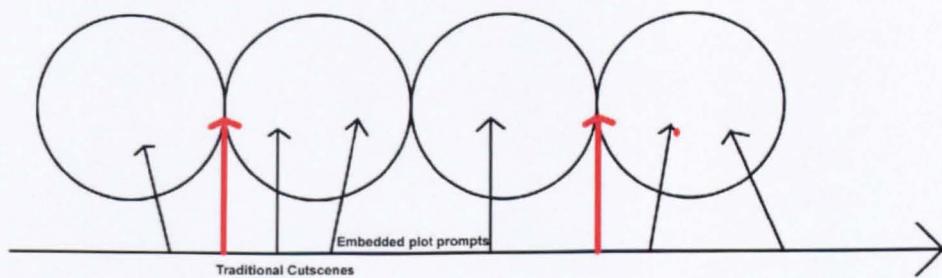


Fig 77. Types of plot progression devices

Fig 77 illustrates the two major ways in which plot is injected into games. The red arrows show the traditional, *unintegrated, synchronised* method of punctuating episodes of play with cutscenes (or other devices to progress plot, such as loadscreen information). However, most games, *F.E.A.R.* included, push past this model to one where plot progression is *integrated* and potentially *asynchronous* to play. Thus, between *F.E.A.R.*'s intervals, there are cutscenes which set-up the new environment; also during loadscreens mission goals and plot information supports the ongoing action. The integrated plot, however, is where the real affective manipulation happens, as it destabilises the local knowledge of the player, proposing a deeper plotline that is unobtainable. The episodes of action are therefore linked to a secondary diegetic structure, one that is set deliberately apart from the action of play (in this case using two distinctions, firstly, that what is being seen is not necessarily temporally synchronous, and secondly, that the reality of what is being seeing is entirely ambiguous) and one that has a continuity regardless of the player's actions.

This last statement needs qualifying. Clearly, there is a link to the actions of the player in that they trigger the plot progressions and these are often linked in some way to what they are doing. However, it is important to note that the player has no control over plot progression points and frequently, poor understanding in the early stages of the game of their full meaning. This second point highlights a means by which closure can be extended across

a longer game experience. Local knowledge (of the environment) can increase, thus delivering the reward of closure, whilst the removed, ongoing plot extends and manipulates broader diegetic knowledge, deferring closure. Integrated plot progression is therefore a far more powerful tool than unintegrated plot, as it loads the actions of the ludic space with increased significance, linking ongoing action more deeply to microgoal structures. In other words, a game without integrated plot lacks long-term closure, making each episode of play more self-contained and reliant upon itself and its ludic actions to retain interest. Put simply, plot, by reducing the player's level of knowledge and manipulating their ability to explain and predict, offers a greater support system to play by attaching meaning, significance and the deferral of closure to the action. Finally, integrated plot progression adds depth and colour to play over and above the player's actions: it is a means by which the system can appear responsive without actually needing to track any actions in depth, and repetitive sequences of action can be broken up with diversified spikes of intrigue.

If a gameplay event is defined as being a transition in the ongoing action over and above the normal business of exploration, interaction and combat (although, of course, it may be triggered by any of these events, it is just that only a subset of such events may be significant in terms of a transition) then it is clear that an unintegrated plot device cannot logically be asynchronous, as it by definition, it breaks gameplay. A *synchronous, unintegrated device* automatically creates a threshold, a division in a period of gameplay, thus it should not be surprising that the vast majority of cutscenes occur at gameplay boundaries, signally the beginning or end of an episode or environment set. This does not automatically mean they are significant to gameplay; they may not, as in the case of *Painkiller*'s cutscenes, impart any gameplay information, such as a goal. The small cutscenes which occasionally interrupt *F.E.A.R.* do not communicate gameplay information either. By contrast, integrated devices may be either synchronous or asynchronous. Doyle supplying a new goal via radio once an objective is completed in *Far Cry*, for example, is an integrated, synchronous device. These can be divided into those with gameplay significance and those without: a new goal is an example of the former, a comment on what has just occurred is an example of the latter. An integrated, asynchronous device will thus rarely contain gameplay significance, as it is not responding to a specific event. *Asynchronous, integrated devices*, such as one of Alma's appearances, or the fuzzing of the Point Man's radio from an unknown source, or a vision of Jankowski's ghost are, like Barthes' indices, primarily affective: they have no direct bearing on the action, or closure, but are designed to act upon the player's experience. However, these devices certainly *do* have an effect on gameplay. The player of *F.E.A.R.*, through these devices is being steered towards a certain type of emotional state, which may manifest in a certain type of behaviour. At its most simple, this kind of device artificially breaks the flow of play, jolting the player out of the action for a moment. This has a direct impact upon the way the player can play the game. However, *synchronous, integrated devices* are commonly used to adjust goals as play progresses: these are devices that do not

break the flow of gameplay but bear directly upon it. The best examples are radio contacts from PNPCs, such as Doyle, S.H.O.D.A.N., Cortana or Atlas; thus, such communications may be either synchronous or asynchronous in nature. The latter however, have more in common with Barthes' functions as they manipulate relationships between protonarrative objects, and specifically steer the player towards certain actions (as opposed to unintegrated devices which work more subtly upon behavioural or affective responses).

Synchronous, Unintegrated	Asynchronous, Integrated
Coincides with gameplay event Halts ongoing action	Does not coincide with gameplay event Does not halt ongoing action
General description: This device coincides with a gameplay event, such as the beginning or end of a level, introduction or defeat of a boss, etc. Gameplay is suspended whilst the device is played. This device may or may not have gameplay significance.	General description: This device does not coincide with a gameplay event and occurs during normal action. Gameplay continues and no new gameplay information, such as a goal, is communicated. This device rarely has gameplay significance.
Example from F.E.A.R.: Cutscene following Fettel ambushing the Point Man during Inception (no gameplay significance)	Example from F.E.A.R.: Visions of Jankowski's ghost
Example from Halo 3: Johnson's death (gameplay significant: introduces new episode and environment)	Example from Halo 3: Cortana's voice-over
Example from Bioshock: Final cutscene (gameplay significant: signals end of play)	Example from Bioshock: Radio message from Atlas, Ryan, Fontaine, Tannenbaum, etc
Synchronous, Integrated	Asynchronous, Unintegrated
Coincides with gameplay event Does not halt ongoing action	Does not coincide with gameplay event Halts ongoing action
General description: This device coincides with a gameplay event, such as the completion of a goal, introduction or defeat of a boss, etc. Gameplay continues but new information directly affecting gameplay, such as a new goal, is added.	General description: This event is logically defunct.
Example from F.E.A.R.: First sighting of Norman Mapes in Armachan offices	
Example from Halo 2: Master Chief's circuits are re-aligned after his crash-landing	
Example from Bioshock: The 'death' of Atlas' family aboard the submarine	

Fig 78. Taxonomy of plot object types and examples

Breaking down plot objects in this way, prior to any consideration of the actual plots themselves neatly illustrates the range of applications of plot as a gameplay function. Any halt in action automatically punctuates play, forcing a break of activity; thus, synchronous, unintegrated plot devices, whether they contain explicit gameplay information or not, structurally affect play. They act as an implicit signal of change and, even if skipped immediately, create a division between action before and action after. This is a direct intervention into player behaviour; it literally forces the player to take at least a momentary break. This forced transition is therefore a powerful device in terms of synchronisation to breaks in the delivery of the game: if a new set of environments must be loaded, a cutscene justifies the pause, as it signals that a transition is occurring. Forcing a break in the action also means the player is not distracted by ongoing activity, making this a useful way of imparting new information, such as goal. Equally, breaking the action allows plot to be expanded or contracted without potential conflict from the player's activities, the reason perhaps why it is a common device in older games following a more traditional string-of-pearls model.

Integrated objects maintain the diegesis however, and allow diegetic expansion of the ludic space, by altering the interpretable properties of what is represented. They can be used to directly adjust player behaviour, in the form of new goals, or by defining new ways of approaching the situation. They can also be used, as with the case of asynchronous, integrated objects, to manipulate mood, adding complexity to the situation without requiring the player to act upon the information that is provided. This expands the complexity of the situation without requiring explicit engagement or new affordances. The majority of the games in the analysis use a combination of both integrated and unintegrated objects, and thus can take advantage of a diverse toolkit for shaping gameplay. Thus, regardless of the actual content of the plot objects, it can be argued that they can be used to manipulate affect and player behaviour; establish microgoals and goals; break the flow of play and force the player's concentration to shift; divert attention from a necessary system break by synchronising this with a natural transitional event within the diegesis; control the level of longterm knowledge of the diegesis, forestalling closure whilst enabling closure to occur on a local level (rewarding the player); act as an explicit reward, and explicitly adjust gameplay with linked embedded devices. On a structural level therefore, plot is more than simply the temporal sequencing of events in the play space. By approaching it in this manner, the full potential of plot as a gameplay device begins to become clear.

Section 9.5. Motivation and plot drivers

With this better understanding of the local effect of plot objects (those objects defining a specific shift in protonarrative object relationships), the stories, in the holistic, populist sense of the word, of FPS games can be

returned to. Frequently derided for rudimentary, infantile stories, FPS games have always traditionally been a genre where story is seen as secondary to the repetitive action cycles of play; the “30 seconds of fun” as Bungie famously described it. What should already be evident from the analysis, however, is that once story is protonarrativised and the relationships sought between its components and gameplay, it becomes clear that a great deal of these have the characteristics they do because they strongly support a type of gameplay, and the ability to manipulate player affect and behaviour as the story progresses.

It is possible to reduce FPS plots down to a series of key events (Appendix C) interspersed with long sequences of repetitive action (the 30 seconds of fun). However, the plots can be reduced even further, to an absolutely stripped down list of the major factors in the shifting predetermined relationships between objects. Thus, the action of *Half Life 2* might be summarised as *Escape* from the train station, *Reaching Kleiner's lab*, *Reaching Black Mesa*, *Rendezvous* with Alyx, *Rescue* Eli from Nova Prospekt, *Reach* the Citadel, *a Rebellion*, *Destroy* the suppression field, *Infiltrate* the Citadel, *Destroy* the Portal. *Painkiller*'s set is much simpler: three General's must be *Killed*, followed by the *Rescue* of Eve from Hell (which is never actually resolved, instead the game ends following the death of Lucifer, itself a *Kill* event). A full breakdown of plots into these constituent parts can be found in Appendix C, and it is summarised below (Fig 79).

	No Travel	Static Target	Traveling /Ambiguous Target
Location Focus	Secure	Reach Extraction	Infiltrate Escape
Object Focus	Defend	Find [Operate] [Destroy] [Retrieve]	Deliver
Agent Focus	Protect	Locate [Rendezvous] [Rescue] [Kill]	Follow [Escort]

Fig 79. A summary of plot drivers.

The term driver is used to specifically note that these are events which drive predetermined shifts in the relationship mappings of objects in the protonarrative network; it should thus be remembered that these need not explicitly be gameplay goals. Rather, they represent the activities or events which underpin a significant change to these relationships. The first distinction that can be made is between the target of the driver. This can be based around a particular location in the game world, whether this is within an episode or environment set (such as the drive to reach the dig site within the village of Wolfenstein following a rendezvous with Kessler), or spanning

multiple episodes or environment sets (such as reaching Black Mesa in *Half Life 2*); an object or an agent⁴⁴. This establishes a division according to gameplay affordances.

The second division is along the lines of target location. In two of these, travel is required to complete the driver: the avatar has to either move away from or towards the target. This can be subdivided into those cases where the target is located in a known, or set, and static position, such as the Communications Dish to be destroyed in *Far Cry*'s Fortress level, or the retrieving of the X18 documents in *S.T.A.L.K.E.R.*; and those cases where the target is either ambiguously located (there is no predefined location point in a driver based around infiltration or exploration of a given area, such as is found in *No-One Lives Forever*) or whose location shifts. This last case particularly defines either the delivery of an object or the escorting of an agent (delivering Alice Wade to the extraction point in *F.E.A.R.*). Finally, some drivers have subclasses which propose subtle, but important distinctions in intent and focus. All action across the genre can be reduced to this basic set of drivers, in a similar manner to the reduction of gameplay to affordances carried out in Section 2. Reducing plot to a series of *drivers*, or key processes is extremely useful for three reasons. Firstly, it brings patterns and commonalities directly into the spotlight, secondly, it enables the indices to be placed to one side (the characteristics of the objects, have already been dealt with in the preceding three Sections), and concentrate directly on the functions and, thirdly and most importantly, it vividly illustrates the gameplay functions of these drivers. The set of drivers summarised in Fig 79 and drawn from the analysis of the genre found in Appendix C will now described.

This will begin with the location focus drivers: Secure, Reach (and its opposite Extraction), Infiltrate and (and Escape). SECURE is a simple and, for logical reasons, localised driver, that tasks the avatar with eliminating hostile agents within a given area for a certain amount of time, whether this is attached to simple temporal span, finite limits of agents, or defined by an action being carried out. There are limited examples of this in the genre, perhaps due to specific environmental requirements (an arena like area) and the fact that it is, by definition, comprised of low content repetition of the same activity. Secure is repeatedly used in *Fall of Man*: at the bus depot, the hangar and the bridge, and the object focus variant of the driver, Defend, is used for the Convoy, the Angel's tank and the bridge's demolition (in a separate episode). Finally, the agent variant, Protect is also uncommon, though the traveling object variant of this, Escort, is common. Secure is also found in *Timeshift* (following the first rendezvous with Cooke), *Unreal Tournament 3* (the extended of Act III is the repulsion of the Necris attack, even though the actual gameplay takes the form of repeats of either Destroy, Deliver or Kill), the defense of the human stronghold at the beginning of *Halo 3*, the repulsion of the Deep One attack on the Urania

⁴⁴ Noting as well, that these drivers may very well be nested, with either sub-plots or localised goal plots being situated within the framework of a larger, more persistent driver. Freeman has to rendezvous with Gregori within Ravenholme, which is being traveled through to rendezvous with Alyx.

in *Cthulhu*, and *Prey* (the final Spirit World sequence).

In the case of REACH, the driver is based upon the co-location of the avatar with a distinct environmental location, or landmark. Reach may be characterised as open-ended: it does not specify what will happen or what must be done upon reaching the landmark, and accordingly, it tends to be used in the beginning and middle of games, but rarely towards the conclusion. Equally, Reach is more common in games with bridging structures: the most obvious example being *Half Life*, where the underpinning driver for the majority of the game is simply to reach Lambda Lab, as it explicitly defines the core goals and action. INFILTRATE, by contrast, establishes an environment as a target, rather than a singular landmark, but rather than the reaching of this goal establishing a threshold onto the next driver, contains the instructions to explore the target once it is reached. It is thus highly related to Find and Locate (its object and agent variants) but can contain multiple nested versions of these, or simply be realised by the reaching of an undefined location, or one whose exact position or characteristics are unknown at the outset. Although the genre schema demand that new locations will be invariably hostile, Infiltrate particularly supports this as premise. Further, Infiltrate establishes the avatar as outsider, intruder upon a space, and this carries with it potential implications: that killing everything that moves is neither necessary or, indeed, advantageous. Thus, it frequently appears in more tactical FPS games, such as *Deadly Shadows*, *No-One Lives Forever*, *The Operative*, *Cthulhu* and *Deus Ex*, although it is also used in *Return to Castle Wolfenstein*, *Far Cry*, *Quake 4* and *Blacksite*, usually in combination with a Find or Locate driver, although this may not be clear at the outset. Thus, Garrett is sent to Retrieve the Jackal's Paw in *Deadly Shadows*, but prior to this, he needs to Infiltrate the Pagan Stronghold. Unlike X19 in *S.T.A.L.K.E.R.*, where the Operate mission to shut down the Brain Scorcher is a straightforward case of pushing on through the labs eliminating resistance, Garrett's driver carries a noticeable degree of investigation and exploration, not to mention the implications that avoiding conflict is a good idea. Thus, although nesting and partnership of Infiltrate, Find and Locate are common, the characteristics of the former suggest a separation is advantageous. Likewise, although the ultimate goal of *Timeshift*'s administration building episodes and environments may be the Operation of the server, the task of Infiltrating the complex is a substantial plot driver in itself.

It should be noted here that the defining feature of infiltrate is that the target location is thus not singular and there is an inference that further drivers will be instigated upon breaching the threshold of this target environment. This, alongside the implicated gameplay style, makes it distinct. What is interesting is that the more obvious and open variant of this – to simply explore or investigate an unknown or ambiguous location, is simply not found in the genre. Although Infiltrate differs in its ambiguity, it nevertheless has particular gameplay implication embedded in it. For this reason, although it may appear more specific than other drivers, this is a

direct result of the lack of a more open driver such as Explore in the genre.

Reach and Infiltrate both push the avatar into new locations, where traveling from origin to target is the dominant thrust. Both have counterparts, that correspond to the basic distinction of landmark versus exploratory space, in Extraction and Escape. EXTRACTION requires the avatar to reach a landmark, but the focus here is upon leaving an environment. Whilst it is not necessary for this environment to already be known or explored, it is nevertheless a frequent aspect. *Crysis*, for example, requires Nomad to reach an extraction point following the Research Dome, and whilst this does require some backtracking, it also adds on new environments. There is a self-evident advantage in the Extraction driver, as it enables the economic re-use of existing environments, justifying this with a purely diegetic device. Even when this is not the case, as with *Blacksite's* withdrawal from Rachel, Extraction carries two important implications; firstly, that upon completion, there will be some form of break in the flow of events, some form of at least localised closure, and secondly, that the relationship between avatar and hostile agents have changed: that the avatar cannot or should not push any deeper into the world at this point. In other words, it justifies a limitation to the presented environment, and allows for re-spawning and a change in agent behavioural state (the opposing forces are now fully aware of the avatar). ESCAPE, by contrast, does not define a landmark to be reached, but is characterised by the action being orientated around the need to leave an environment, usually under some pressure or threat. For example, *Fall of Man's* Grimsby sequences are characterised by Hale attempting to get out of the processing centre before being captured; the opening levels of *Bioshock* see Jack attempting to escape from Rapture, the post-Stroggification levels of *Quake 4* centre around Kane escaping from Stroggos city, and several important parts of *Cthulhu* also take this form (the escape from Innsmouth, the escape from the Shoggoth in the refinery and the escape from the Deep One's city). Escape as a driver implies a time condition: escape must be made before capture or destruction, and in terms of gameplay, this focuses activity around a central goal. Exploration and investigation are reduced by this plot driver; there is only benefit in these activities if they serve the underlying goal. Although Escape drivers do have definite exit points – such as Jack finding Atlas' submarine in *Bioshock*, or the Master Chief reaching the dropship in *Halo*, what distinguishes Escape from Extraction is the intensity of the action and a subtle shift in avatar-environment relationship: Extraction implies a controlled exit, Escape a scramble to get free. Nomad may fight through to the Extraction point following the Research Dome in *Crysis*, but he is attempting to Escape from the Alien vessel. Extraction infers continuation, new insight, followed by a return to the action. Escape makes no promises about what will follow.

In both cases, encountered agents are likely to be hostile, reducing the need for social contact, and a pressure to keep moving (focusing attention) can be applied, that reduces the need for complex affordances or high levels of

generic ecological validity. This is not to say that avatars cannot explore their environment, but the actions carried out are being drawn towards a type of predetermined range.

As may be clear from the above, not only are there closely linked variations of drivers across the relationships to environments, but across the focuses on location, object and agent. In particular, application of a basic set of driver characteristics to either an object or an agent creates extremely similar structures with nevertheless important, if subtle, distinctions. For example, the basic drivers for static targets of objects and agents, Find and Locate, share many of the same characteristics, but deviate from one another when their subclasses are considered. Thus, in what follows, it should be remembered that there is a great deal of interflow between driver types and further, that nesting is common.

The object focused equivalent of reach is FIND. The base driver requires the avatar to reach the location of a specific device, which carries implications that this device has more than one state attached to it. In other words, upon Finding the object, something must be done, and this requires active participation by the avatar. Thus, based upon the gameplay affordances existing in the genre, three basic subclasses of Find are evident. OPERATE describes a driver where, upon reaching the object, the avatar must interact with it, according to a predetermined, controlled trigger. This is the modern equivalent of the big red button: in *Doom 3*, the marine Operates the transmission to the Fleet, power to the monorail, the pump system, power to the Delta system, and so on, all by locating the appropriate object attached to the environment and using generic interaction. Likewise, Freeman launching the satellite, powering up the rail system and rebooting the Lambda reactor are all Operate driven. These drivers are unsurprisingly common and occur across the genre, from Invisible War to Portal, Bioshock to *System Shock 2*. DESTROY simplifies the process by replacing a controlled trigger with the requirement for the avatar to approach the object in the mode of normal gameplay, by shooting it until it explodes or shuts down, or whatever the equivalent is. The distinction is thus made upon affordances, rather than result: when Jo Dark sabotages dropships, anti-aircraft weapons, radars and security systems, she does so through an operation, rather than a gun. In *Deus Ex*, when Denton scuttles the tanker, he does so by simply blowing up a number of bulkheads; and Hale wipes out the Chimera by shooting at the central London reactor until it breaks. Clearly, Destroy has limited uses, in terms of a coherent complex diegesis, but it does reduce the need for a controlled trigger and frequently has a better fit to the characteristics of the avatar. As noted in Section 7.3, operations that are not convincingly afforded to the avatar, such as hacking computer mainframes, are often farmed out to PNPCs, utilising a combination of Escort and Protect drivers whilst they undertake the actions that may otherwise be the target of an Operate driver.

Interestingly, the object focused variant of Secure, DEFEND, is extremely rare. Defend means protecting a distinct object from hostile agents, and the only real examples of this can be found in Fall of Man. Indeed, in these cases, it may even be argued that these drivers are in reality no different to the Secure driver, as the objects in question are not vulnerable to the attacking agents. The lack of Defend drivers in the genre is interesting especially in the context of the relatively high incidence of Protect, its agent focused variant. This may be due to it simply being less interesting, having little focal power. There is also an equivalent in multiplayer games, where simply 'camping' in a secure position and taking control over the playing arena is frowned upon as bad sportsmanship. Whether the reasons are based upon player expectations or the inherent limitations of this driver, its relative lack in the genre suggests that drivers do have strong links into the forms of gameplay they enable or support.

Far more common is RETRIEVE, which requires the avatar to not only find, but to collect a specific object. This is ubiquitous in games that use an inventory system (*Deadly Shadows* in particular is composed of little other than one Retrieve after another) but also occurs in those where the acquisition of the object in question is really only virtual. For example, the Master Chief is sent to Retrieve Keyes' neural implants in *Halo*, but these objects are never represented in gameplay. The same goes for the race for the Index in *Halo 2*, or the many examples of secret data Cate Archer is sent to find in *No-One Lives Forever*. Not surprisingly, Retrieve represents the most common class of plot driver at a protonarrative or gameplay level, as finding new keys and keycards underpins a huge amount of actual avatar activities. Thus, in Appendix C, a distinction is made between this generic activity and specific missions to Retrieve items, to avoid the otherwise absurd situation of having to record core gameplay action; i.e., removing all agents from each location as a plot driver. In some circumstances, successful retrieval of an item carries with it a parameter shift, or even state change: as with *Doom 3*'s Soul Cube or *Return to Castle Wolfenstein*'s Snooper Rifle. Any use of Retrieve may affect the focus of attention on the environment, making an object increase in significance, which can also be used as a means of directing attention away from other items in less ecologically complex environments. Retrieval objects are those which stand out, pushing insignificant details backwards in attention and covering a lack of interactive objects in the environment. Certainly, the driver is likely to exert an influence upon player behaviour as they are actively looking for an object in a given environment. Retrieve almost always increases the complexity of the plot, as the question of what is to be done with an item once it is secured is raised. Interestingly, in the case of *The Operative*, *No-One Lives Forever* and *Deadly Shadows*, all games which make extensive use of Retrieve, the answer is not much, but in other cases, Retrieve is often paired with DELIVER, its variant of object focused driver with a traveling target.

Like Extraction, Deliver justifies the re-use of environments, as it specifically pushes the avatar to return the

found item to an agent or location. Although the delivery may be made to an, as-yet, undiscovered area, the fact that another driver exists with the potential to diegetically wrap returns through environments with a new emphasis is significant. Indeed, in the case of *S.T.A.L.K.E.R.*, the Barkeep acts as a hub of activity for the central portion of the game, always bringing the avatar back to a central location to receive the next driver of the main quest. As with Extraction, Deliver suggests a transitional point for the plot, something is completed in a way that is not present in simply finding the item in the first place.

This leaves the agent focused drivers: Protect, Locate (Rendezvous, Rescue and Kill) and Follow/Escort. As may be clear by now, these operate in basically similar ways to their counterparts focusing upon location and object, although there are some important diegetic implications that deserve distinct attention.

PROTECT requires no travel by either agent or avatar. In the cases of *Half Life*, *Far Cry*, *Quake 4* and *Fall of Man*, the agent must be shielded from attack whilst carrying out an activity (opening a portal, arming a bomb, hacking a computer, planting demolition charges), clear instances of the farming out of activities to NPCs discussed in Section 7.3. In the other two cases the agent is helpless (Alyx in *Episode Two* and Jeremiah in *Undying*). In all of these, the sequences are short; as with Secure and Defend, the lack of movement dictates this meaning they are diegetic wrappings for setpieces. In other words, they change the normal flow of action by keeping the avatar confined within an area for a period of time, altering their relationship with the environment tactically. This adds a new level of complexity for the duration of the plot driver, as this new relationship is levered onto an existing space, expanding its function. There is also a definite shift made to the relationship between avatar and agent in terms of power: the avatar becomes a protector, the agent dependent upon them for survival. This has a counterpart in Escort and, to a lesser extent, Rescue, although in the latter there is no immediate question of the agents dependence upon the avatar for survival.

In the case of ESCORT, the agent in question is moving through the environment, whether this is known (a return, or a version of Extraction/Escape) or unknown (which has resonances with Deliver or even Operate). In the first instance, it is another example of a diegetic justification for the re-use of an environment; in both, the significance of the environment is manipulated, as attention must be directed on both agent and potential attacks. In real terms, this may reduce the ability of the avatar to explore, as their successful progression rests upon an independently moving object. Thus, in *Crysis*, when Nomad escorts Prophet through the frozen jungle, he simply cannot stray too far from the unarmed PNPC, and is further constrained by only having a set amount of time to get Prophet to the next heat source. Likewise, when the Point Man attempts to Escort Alice Wade to the Armachan extraction point in *F.E.A.R.*, it would make no sense diegetically and is not rewarded (or even

supported, given the linear set-up of the environments) for him to leave her and explore other areas. Note that it is not in anyway critical to tie the failure to protect the agent to gameplay failure: in *S.T.A.L.K.E.R.*, failure to escort Kruglov successfully does disadvantage Strelak, but does not fundamentally impede the game's progression. As with Escape, the pressure to achieve a goal is often virtual. If the need to protect the agent is removed, the driver becomes FOLLOW. This retains some of the characteristics of escape, in that the attention of the player is specifically targeted upon an agent, and the avatar is expected to remain in relatively close proximity to them. The pressure of Escort is removed in that the implication here is that the agent both knows more than the avatar (once again picking up the notion of knowledge hierarchies introduced in Section 7.3) and can protect themselves from any hostile activity that may occur.

RENDEZVOUS and RESCUE are the agent focused variants of Find and Reach: in both, rather than the target being a landmark or object, it is a person. Neither require dynamic representation of the agent in question. However, moving between Rendezvous and Reach, for example, shifts the focus of the avatar's behaviour, adding diegetic complexity to a situation where the actual gameplay goal remains constant. In the case of Rescue, as with Escape, a diegetic intensity is suggested; that the agent in question is in peril and, as with Escort, is dependent upon the avatar for safety. Thus, a quite distinct motivation and avatar-agent relationship from Kill or Deliver is established, with the potential for a wholly different affective response to situations. This is not to say, of course, that all players will engage with it, merely that it is there for those who do, and creates a more diversified experience. As has already been noted, for Rescue to function effectively, it helps a great deal if the player cares about the agent in question, thus they are frequently PNPCs or figures who play an important role in the development of the game. The attempt to Rescue Jen is central to *Prey*, for example, and the second half of Half Life 2 revolves around the very extended and convoluted Rescue of Eli Vance. Jack Carter's investigation of the Burnham case become a (failed) rescue mission; once he has escaped from the Innsmouth citizens, he has to effectively return and collect two other agents. The use of the Innsmouth environments are thus extended, and it is interesting that the town's environment set and proportion of the overall game is large; the following levels in the Refinery, Frozen River, Mansion, Urania and Devil's Reef are both smaller and more linear by contrast, although Rescue also features heavily in both the Refinery and the Mansion.

Finally, the diegetic distillation of FPS gameplay is KILL, which is self-explanatory with the proviso that it does not always entail a final showdown or boss fight. The Point Man is hunting Paxton Fettel for the entire of *F.E.A.R.*; although Fettel's death is a profoundly downbeat affair. Thomas may fight Serial Killer X in *Condemned*, but Van Horn knocks him out before he can finish the job and there is a final radical break level before the actual concluding boss battle with The Hate, who has not featured as a plot driver at all in the game.

Twenty of the games in the analysis do end with a Kill driver, which may focus the plot to a singular point that enables a closure that has diegetic satisfaction. Of these, both *Deus Ex* and *Invisible War* are branching endings with only one option being an actual assassination. Further, *Portal*, *Timeshift*, *Fall of Man* and *Half Life 2* do include climatic battles, but these take the form of destroying objects, rather than agents. Equally, both *Doom 3* and *Resurrection of Evil* end with boss battles, but in both cases, the boss in question has never been a plot target (unlike Sergeant Kelly in *Doom 3*, who the marine is specifically hunting down). Although Kill is common across the genre, it is used sparingly in individual titles (with the exceptions of *Painkiller*, *Perfect Dark Zero* and *Undying* – and, taking on board the fact that it is essentially a plot wrapped around a series of multiplayer deathmatches, *Unreal Tournament 3*). This may be due to the fact that killing large numbers of agents forms the core gameplay of shooters, and diegetic plot drivers offer the opportunity to diversify the action around this core, rather than simply offer more of the same.

From this summary, several things can be noted. Firstly, that all diegetic wrappings of goals in FPS games can be categorised according to whether their focus is environment, object or agent. Secondly, that this can be further divided according the relationship between the avatar, focal object and environment: co-located with the avatar, static/predetermined and traveling/unknown. From here, a small number of plot drivers can be identified by examining the plots, goals and episodic structures of FPS games. It is argued that this enables a diversification of gameplay activity, but may also manipulate the affective and behavioural activities and responses of the player.

Further, there are a number of other functions present in these drivers. Kill and Destroy are fundamentally about simplifying the diegesis by removing an object from play. Retrieve, Deliver, Reach, Rendezvous and Rescue likewise close an event down by achieving a set goal; Defend, Protect and Secure simplify a local environment. All of these devices carry a degree of closure. Some Operate drivers also do this, but others, like Infiltrate and Follow increase the complexity, by taking the avatar further into an unknown environment or situation. This is not to say that all the closure drivers are final, many then instigate a new rise in action: the delivery of the X18 documents leads the Barkeep to the conclusion that X16 must be investigated as the recipient of the parts being developed in the former; the removal of the blockage in Hydroponics in *System Shock 2* enables access to a new area and the subsequent Rendezvous with Polito introduces the major plot hinge of S.H.O.D.A.N.'s discovery. However, a distinction can be made, in terms of expected completeness of the current activity, and alternating between these device types offers the player information about how gameplay is likely to evolve following the driver's resolution.

The other major thing to note is that all of these drivers are fundamentally concerned with the actions of the

avatar, constituting a metaset. Alongside these, there are some common devices which all dramatically increase plot complexity, tilt the action into a rising mode, and occur outside the avatar's control, even if they are in some way a result of their actions: in other words, this result is accidental or unforeseen. As noted at the beginning of this section, drivers are defined as a devices which force a predetermined shift in protonarrative relationships, thus it should not be surprising to find devices which serve this function without requiring avatar involvement.

AVATAR DRIVERS			NON-AVATAR DRIVERS	
	No Travel	Static Target	Traveling Target	DIEGETIC CATASTROPHE
Location Focus	Secure	Reach Extraction	Infiltrate Escape	Conspiracy Outbreak Rebellion Betrayal Revelation
Object Focus	Defend	Find [Operate] [Destroy] [Retrieve]	Deliver	
Agent Focus	Protect	Locate [Rendezvous] [Rescue] [Kill]	Follow [Escort]	

Fig 80. Classes of plot drivers, by avatar and non-avatar action

The first of these is CONSPIRACY. The vast majority of narratives have some form of conflict at heart, whether this be internal or external, personal or political, emotional or explicitly acted out. Closure, in a very real sense relies upon conflict, something to be closed. The Call to Adventure or initiation of the liminoid phase, the signpost that something *framed* as a narrative has begun, is isomorphic to some form of conflict-causing event taking place. Given the nature of FPS games, conflict other than the brutally explicit kind is hard to visualise and sculpt into an affective experience, possibly due to it competing for space with the intensely short temporal repetitions of gameplay. *Prey* attempts to deepen Tommy's character out by making him resistant to his Cherokee heritage, turning his back on the global crisis and concentrating only upon finding his girlfriend (of course, the two happily coincide in terms of resolution), only switching to a revenge motif and transforming him into a true hero after her death.

As should be clear from the discussions of the representational strategies applied to avatars, however, inner conflict is a hard notion to successfully implement, as the relationship between player and avatar is neither one of acting, nor simply empathising. Put simply, the more complex the inner structures, the higher the potential for a misinterpretation or conflict between how the player feels the avatar is feeling, and how the system feels the avatar is feeling. This is supported by a recent study, where players were asked to describe the personalities of the

avatars from two very different games they had been playing (*Resurrection of Evil* and *Cthulhu*) and found that they frequently defined the personality *according to their own style of playing* (Pinchbeck 2007). Given that this playing style is subject to manipulation by the systems set-up of affordances, co-option of schema and exactly the type of diegetic influence that has been discussed throughout this thesis. This is, to an extent, a result of the system itself; the *player-shaped hole* at the centre of every game, which effectively illustrates the prototypical affective experience within the predetermined range, is the best fit to purpose relationship between player and system. There is still a degree of subjective interpretation, with the projection of the avatar away from the player being part of this process. Thus, starting to describe fixed emotional structures in the inner landscape is highly problematic. However, just in case the pseudo-interiority of the avatar being constructed by the player does not fit this. *Prey* is an excellent example: the sub-climax when Tommy is forced to kill Jen is a noble, but deeply flawed, attempt to create a complex emotional experience. For this to work, it has to be assumed that the player will understand Tommy's inner conflict; that he loves Jen and cannot bring himself to kill her, but he knows she is in huge pain and will die anyway. The system forces the player's hand by blocking progression until Jen is actually killed, and then pushes Tommy's grief to the fore, making the Killing of Mother a revenge motive rather than being about saving the world, to a large extent. This is a very risky strategy: all it takes is for the player to simply not share any of Tommy's inner life (let's not forget the player has just spent 3-4 hours repetitively shooting anything that moves and may well be intellectually and emotionally able to grasp the situation without *Prey*'s 'use a sledgehammer to crack an egg' approach to emotioneering) and the structure begins to fail. Much more sophisticated is *Bioshock*'s central climax, the assassination of Andrew Ryan. Here control is taken away from the player whilst Ryan, in a postmodern metacomment on the FPS experience derides their avatar's lack of free will and points out that they at no point have they not been steered, manipulated and controlled into doing just what they have been expected to do. Critically, *Bioshock* at no point tells the player what Jack is *feeling* – it allows the penny to drop all by itself with the discovery. Likewise, JC Denton's 'moral' choices and those of Alex D in the sequel are manifested as exterior actions, not internal structures: these are left to the player to generate, if they want to.

However, Conspiracy operates as a bridge between internal and external conflict and establishes a model whereby plot complexity can be increased within a stable framework. Like amnesia, it reduces situational knowledge, signposts a closure system and the markers for progression along it, and allows an inference of a deeper interiority of agents in the diegesis (conspiracy, like factionalism requires a more complex Intentional Stance to be taken). It explicitly announces to the player that the avatar is a pawn, is being lied to, is part of something they do not grasp, and this establishes a framework for inner depth and emotional response without ever having to provide risky, explicitly represented structures for this to occur. Conspiracy, of course, is a profoundly political structure

in itself, and works extremely well with the violent conflict that acts as a backing for the ludic activity of removing agents from an environment.

Like conspiracy, OUTBREAK, is another means of opening out a plot in the genre without the avatar taking action. It involves a new conflict starting in the diegesis, where agents that have not previously been in opposition become so. Sometimes, as in *Far Cry*, the conflict and agents have been present to an extent already in the environment, but there is a clear moment when this conflict escalates, transforming the world. In other cases, like *No-One Lives Forever* or *Halo*, the Outbreak introduces a new class of agents or PNPCs. Outbreak is a powerful plot device because it is so fundamentally easy to map across to gameplay: without a single alteration in the system structure, an entirely new form of gameplay is layered onto the game. When the Flood are released in *Halo*, all that really changes is that rather than Human/Covenant inter-factional combat being the backdrop to the Master Chief's action (where one faction is actively trying to kill him), there is now Flood/Covenant inter-factional combat (where both factions are actively trying to kill him). The new Flood agents add some variety in terms of requiring or enabling slightly different approaches to combat but other than that, nothing changes, except of course, the transformation of the diegetic relationships and the shift into a falling action. An event has occurred which must be put right in order to achieve final closure: the Flood must be stopped.

Sometimes, as in the case of *Far Cry*, *Deus Ex*, *Half Life 2* series, *Halo 2* and *Prey*, the Outbreak can be thought of as a REBELLION, where a group challenges the dominant power structure. Interestingly, in these cases (with the exception of *Far Cry*), the rebellion is undertaken by allied factions. This reinforces the essentially libertarian politics of most shooters (in itself a product of a gameplay structure that requires a high focus on individualism and that benefits greatly from large organisations being cast as evil or incompetent to enable the types of plots that have been discussed). In other cases, the Outbreak compounds the breakdown of normality, adding another situation to be resolved: a very basic and simple means of deferring closure that coincides with the introduction of a new class of agents to apply exactly the same gameplay affordances to. Outbreak's are found (not including the initial suspension of normality, but as an additional plot device) in *Deus Ex*, *Return to Castle Wolfenstein*, *Halo* series, *No-One Lives Forever*, *Invisible War*, *Halo 2*, *Perfect Dark Zero*, *Cthulhu*, *Crysis* and *Blacksite* (plus Rebellions, as above). In addition to this, interfactional conflict that increases in complexity as the plot progresses can be found in *S.T.A.L.K.E.R.*, *System Shock 2* and *Bioshock*. *Halo 2* contains separate Outbreak and Rebellion devices. Thus, this simple device of using a generic plot device to transform the experiential qualities of gameplay without requiring additional affordances to be woven into the system is more or less ubiquitous across the genre.

Also very common is BETRAYAL – which can be found in *Half Life*, *System Shock 2*, *The Operative*, *Deus Ex*,

Halo, *Doom 3*, *Undying*, *Far Cry*, *Half Life 2*, *Halo 2*, *Painkiller*, *Perfect Dark Zero*, *F.E.A.R.*, *Condemned*, *Blacksite*, *Halo 3*, *Deadly Shadows*, *Bioshock*, *Unreal Tournament 3* and *Portal*. Unlike Outbreak, Betrayal does not even require a single shift to the affordance network, it reinvents the diegetic relationships between objects, enabling re-use of existing or completed goals, altered significance in agents and objects, even re-use of environments. In essence, it simply forces a new perspective upon the same activity. Whilst this is sometimes attached to a shift in affordances (such as *Bioshock*, albeit temporarily), this is not common. Betrayal is more normally purely diegetic.

Betrayal is powerful because it personalises the action, often providing a single figure as a route of the problem. This is important because as the diegesis expands and the conflict's complexity deepens, final resolution becomes equally complex. In *Bioshock*, the problem of what to do with Rapture is personalised into the problem of exacting revenge upon Fontaine (transferring into an Kill driver); in *Blacksite*, Somers' betrayal makes him the personal focus of Peirce's activities, rather than trying to single-handedly resolve the release of alien mutations into the state of Nevada; alongside stopping H.A.R.M.'s human-bomb program, Cate Archer can concentrate on the personal revenge on Goodman in *The Operative*; Chandra's betrayal of Jo in *Perfect Dark Zero* brings the corporate conflict (and soon-to-be-introduced alien artifact falling action) down to a very individual level. Betrayal does not have to establish a culminating event such as a nemesis showdown (for example, Kelly's betrayal in *Doom 3* does establish a new Boss, but it precedes the denouement), as it can be used to retrospectively recast prior action, a form of virtual expansion past temporal localisation of a type already discussed (Section 6.6); and along the same lines, introduce a non-ludic conflict to be resolved that runs parallel to the ludic conflict. These are closure deferral devices that can operate behind the micro- and short-term goal resolutions of play, like conspiracy, extending the half-life of the experience without requiring any actual visualisation, let alone dynamic representation in the play space.

Between them, Outbreak and Betrayal feature in nearly every game in the analysis, leaving only a handful without either: the *Half Life 2* Episodes (although, perhaps, the final sequences of *Episode One* could be described as a Rebellion, and the Antlion sequences of *Episode Two* as an Outbreak), *Resurrection of Evil*, *Quake 4*, *Hellgate* and *Fall of Man*. That is not say that these games are without their pivotal climaxes (aside, perhaps from *Episode One*), but rather than ramping up complexity through a new conflict, or a reinvention of goals and relationships through a Betrayal, they opt for different devices: Kane is Stroggified, Hale discovers the Angel and has a revelation about how to defeat the Chimera, the marine is told by McNeil he must take the artifact back to Hell, Freeman has a vision of the G-Man following Alyx's near-death. *Hellgate*'s avatar ventures into the Exospector (or Techsmith 314's mind (the failed assault on the *Hellgate* can also be read as an unsuccessful Rebellion). In these cases – and this structure is not unique to those games not featuring an Outbreak or Betrayal – a definable and

isolated moment of REVELATION can be identified.

This is defined as a major plot occurrence where previous knowledge is cast in a new light, probably affecting the choices of how to respond to the previously assumed relationships, and potentially being allied to a change in gameplay (although not necessarily any shifts in affordance structures). Thus, it is qualitatively different to the erosion of complexity of plot through ongoing closure in the falling phases, it is a catastrophic event that dramatically changes the understanding of what is occurring. Thus, although *Invisible War* has a clearly defined Revelation sequence, in the discovery of JC Denton in Antarctica, its predecessor doesn't really have anything on this scale (it has many smaller moments, such as realising the location of the MJ12 Lab). Equally, although *Fall of Man*'s revelation is highly underplayed, as Parker simply informs the player in a voice-over that Hale had 'suddenly realised' what to do, but it does personalise the Chimeran threat by introducing the ruling class of the Angels – if they are killed, the rest of the forces will follow. This is not dissimilar to what occurs in the personalising aspect of Betrayal, and it is no accident that Kane's Stroggification in *Quake 4* follows the re-appearance of the Makron, serving exactly the same purpose.

It is also worth noting, that Revelation often forms the pivotal moment of plot in games which include Outbreaks and Betrayals. For instance, although *Half Life*'s pivotal gameplay sequence is Residue Processing (where the avatar's undergoes a major parameter shift in losing all weapons), the plot hinges on the subsequent discovery (Questionable Ethics) that the invasion from Xen is not as accidental as Freeman has been led to believe. This has much of the flavor of a Revelation. The discovery in *System Shock 2* that Polito is actually S.H.O.D.A.N. is a Revelation too, as the player knows at this point that even though there is likely to be a Betrayal on its way, the plot suddenly shifts with a transforming knowledge of the world. The journey through the Portal in *Halo 3* is a moment of Revelation; as is the discovery of the Undying King in *Undying*. With the exception of *Halo 3*, these are not climatic moments of gameplay clearly demonstrating the plot climaxes are not required to be synchronous with climax moments in gameplay.

All of these devices occur without direct input from the avatar, who is cast in an essentially responsive position to the DIEGETIC CATASTROPHE (in the dramatic, rather than colloquial usage of the term) Thus, these catastrophes are designed to draw attention to the significant, even catastrophic, alteration to an object, or group of objects, or environment, or world and should thus be separated from the gradual process of change, or TRANSFORMATION found in FPS games. There are obvious references here to the radical break, but it also needs to be considered how other objects within the diegesis may shift dramatically, the second most obvious being the avatar. There is also the long-term transformation of the world, which may not occur in an isolated

event, but is nevertheless catastrophic over the period of the game. Thus, it may be said that the world of Mars City in *Doom 3* is transformed from a normal science-fiction base to a semi-organic, innard-strewn and warped charnel house over the course of the game, and this is over and around the trip to Hell and the radical break into the excavation site. Likewise, although the world of Rapture does not, in itself, transform (just that different parts of it are explored), Jack is both exposed as a genetically constructed assassin and then literally transformed into a Big Daddy, complete with changes to perception, sound and affordance/diegetic relationships with other agents (Little Sisters). What is critical here is that Transformations are certainly drivers, as they predetermine a shift in protonarrative relationships, but they differ from avatar drivers and catastrophes in that they generally occur over a longer period, and may be less dramatic in the short-scale (although not always, as with Jack's transformation into a Big Daddy). However, regardless of this short-scale subtlety, the overall change is significant. In other words, although it is difficult to pin down an exact moment, a catastrophe, where the Mars Base fundamentally changes, there is no doubt that the world presented towards the end of *Doom 3* (in the Delta Labs episodes, for example) is significantly altered from the initial representation of the Mars Base. Also note that this is not the same thing as either a mid-point or radical break – in *Doom 3*'s case, both of these remove the avatar to Hell and return them to a world undergoing transformation.

AVATAR DRIVERS				NON-AVATAR DRIVERS
	No Travel	Static Target	Traveling Target	DIEGETIC CATASTROPHE
Location Focus	Secure	Reach Extraction	Infiltrate Escape	Conspiracy Outbreak Rebellion Betrayal Revelation
Object Focus	Defend	Find [Operate] [Destroy] [Retrieve]	Deliver	
Agent Focus	Protect	Locate [Rendezvous] [Rescue] [Kill]	Follow [Escort]	
TRANSFORMATION OF AVATAR				TRANSFORMATION OF WORLD

Fig 81. Full table of plot drivers, including catastrophes and transformations

TRANSFORMATION OF THE WORLD occurs in *F.E.A.R.*, *Cthulhu*, *Prey*, *S.T.A.L.K.E.R.*, *Crysis*, *Half Life*, *System Shock 2*, *Halo 2*, *Doom 3*, *Quake 4*, *Blacksite* and *Halo 3*. It is telling that all of these game utilise the

bridging structure; that is, transformation is a powerful diegetic tool for underpinning environmental diversity. In the case of *Doom 3*, a more-or-less consistent visual and architectural style is gradually embellished by the addition of organic material interweaving with the plastic and steel. Not only does this enable the re-use of similar structures with a 'top coat' of additional transforming elements, but it reinforces the sense of position relative to the overall plot arc. A transforming environment is a useful signaling device: as the changes to Mars Base become more radical, a sense of building urgency is developed. Transformation is thus a visual indication of the distance being traveled away from normality and towards the denouement, the crisis point of the liminoid phase. Likewise, although *S.T.A.L.K.E.R.*'s environment does not radically alter in any given location, as Strelak moves north, the number and scale of anomalies and radiation patches increases, as does the frequency of visual illusions (particularly in the mid-point crisis of the X19 labs and the Brain Scorcher) and the introduction of the Monolith cult (which reduces the previous Factionalism down to a streamlining, accelerating two: Monolith versus everybody else; reinforcing the geographical approach of the NPP with a climax indicator). Even before the radical break, Black Mesa's architecture is changing both through the effects of combat and signs of alien occupation in *Surface Tension* and *Forget About Freeman*. Once again, transformations increase the intensity of the action, acting as virtual expanders once again as a deeper impact of the effects of the liminoid upon the ordinary world are inferred. Although there is not a catastrophic transformation of the world in *Deus Ex*, it could be argued that the introduction of the more fantastical sci-fi elements such as the Karkians, Greasels and Greys accelerates as the plot progresses, opening up a world that, whilst not transforming, is certainly deeper and more radical than the opening Sections would have us believe.

If transformation of the world serves the dual purpose of both underwriting new forms of environmental interaction (diversity and re-use) and acting as a dramatic orientation device, then TRANSFORMATION OF THE AVATAR focuses explicitly upon the second. In Section 9.1 it was noted which games enable a progressive configuration of the avatar (*System Shock 2*, *Deus Ex*, *S.T.A.L.K.E.R.*, *Bioshock*, *Hellgate*) and this should be distinguished from transformations which, according to the model developed above, should be fixed, permanent, radical and based upon shifts to relationships of protonarrative objects. Thus, Jack's conversion to Big Daddy is *Bioshock* is qualitatively distinct from the ongoing business of plasmid and weapon configuration. It is required to push the game forwards, there is a radical implication in terms of character development, a wholly distinct relationship is created between the avatar and the Little Sisters (in terms of both diegesis and affordances), and there is a significant shift to audiovisual representation. Transformations of the avatar push them away from normality themselves, which actually does have some resonances with the Hero's Journey and its demand for a rebirth as a deified figure. Kane is explicitly transformed in *Quake 4*, and his rebirth enables the destruction of the Strogg. Likewise, Hale's infection with the Chimera virus sets him apart from humanity and contains the

seeds for the resolution of the plot. The Point Man's separation from humanity is set-up near the beginning of *F.E.A.R.* and he clearly descends into both a new reality externally and internally over the course of the game, to the extent that his final set of challenges come from demonic agents whose actual reality is never resolved. Strelak, by virtue of the artifacts he acquires (such as the experimental psi-helmet), is able to venture into parts of the Zone unreachable by normal stalkers, even if this is less of an inner transformation, and the player comes to realise that Freeman has achieved a kind of folk hero status over the course of *Half Life 2*, perhaps culminating in his 'new abilities' with both gravity gun and, later, super gravity gun in the Citadel.

The denouements themselves need considering in a little more detail as they represent the apex of all of these drivers, particularly the catastrophes and transformations. A final Boss battle is frequently *not* the climactic moment of FPS games: it occurs in *Painkiller*, *Perfect Dark Zero*, *Condemned*, *Prey*, *Crysis*, *Undying*, *The Operative*, *Half Life*, *System Shock 2*, *Return to Castle Wolfenstein*, *No-One Lives Forever*, *Doom 3*, *Quake 4*, *Episode One*, *Halo 2*, *Blacksite*, *Bioshock*, *Unreal Tournament 3* and *Portal*, but in nearly half the games in the analysis, a boss battle is missing. This can be interpreted as an attempt at some form of ecological validity: can S.H.O.D.A.N., an AI distributed throughout two ships and about to make the jump into godhead really be taken on hand-to-hand? Partially, the Revenge driver is an attempt to tackle this; the showdown with Fontaine in *Bioshock* is a personal one. Plot is used in *Prey* to mask the inherent daftness of saving the Earth by simply killing Mother by having her turn on the Keepers in the final phases of the plot, in effect abandoning Earth for the chance of passing on her mantle to Tommy, again, a personalising device. The combat with S.H.O.D.A.N. occurs in cyberspace; it is inherently metaphoric, but this is simply a diegetic wrapping around shooting at an object until it blows up. In all of these cases, plot is used as a means of distracting attention away from the Big Red Button. Not that this is always necessary: both Nihilanth (*Half Life*), the Undying King (*Undying*) and the Nexus (*Quake 4*) are set up as being the personal, isolated root of all evil. In all these cases, the denouement rest on the Kill plot driver. *Far Cry* also uses Kill, but double the climax, giving the player the Boss battle with Krieger but adding a Betrayal and Kill plot twist in the final section.

Of the remaining games, all the denouements nevertheless fall under one of the plot drivers already described. *Half Life 2* and *Fall of Man* replace a single Boss with the destruction of an artifact, under the pressure of attack from multiple agents, which offer a greater degree perhaps of ecological validity to the proceedings (Destroy). *Deus Ex* and *Invisible War* offer multiple endings, but they all take the form of Destroy or Operate. *F.E.A.R.*, *Halo*, *Halo 3* and *Cthulhu* use Escape as means of increasing the speed of the final Section, replacing the intensity of a Boss with an increased temporal drama. *S.T.A.L.K.E.R* is essentially Reach/Destroy; *Deadly Shadows* is a series of Delivers, *Episode Two* uses Follow, and in all these cases, a larger number of agents replaces a single

Entity. *S.T.A.L.K.E.R.* and *Deadly Shadows* stand out in this regard, as any climactic tension is effectively reduced without either a singular Boss or time constraint. What is interesting is that basic plot drivers, in combination with a transformation or radical break, are enough to underpin the shift in intensity needed for a denouement without necessarily requiring any gameplay shifts.

Finally, the returns to normality, or endings of the games require attention, as the final result of all the open drivers being resolved. In fact, most games present a permanently altered world, although openings for sequels are common. Here the importance of understanding games in an industrial, economic context is clear. Ensuring that a sequel is possible is something that most developers keep half an eye on, and this must be managed, in terms of not destabilising the sense of achievement of completing the final challenges of the game. The first option is a final cutscene or voice over that extends past the completion of the final goal: *Half Life*, *System Shock 2*, *Doom 3*, *Half Life 2*, *Painkiller*, *F.E.A.R.*, *Condemned*, *Prey*, *Crysis*, *Blacksite* and *Fall of Man* all close as if the final action is final, but bolt an additional rising action plot detail at the very end of the experience. *Halo 2*, the *Half Life* Episodes and *Perfect Dark Zero* already exist within a larger temporal framework of plot so do not require the same full closure of a single title. The *Deus Ex* titles, *Far Cry*, *Return to Castle Wolfenstein*, *Halo*, *Undying*, *The Operative*, *No-One Lives Forever*, *Quake 4*, *Cthulhu*, *Deadly Shadows*, *S.T.A.L.K.E.R.*, *Halo 3*, *Bioshock*, *Hellgate*, *Unreal Tournament* and *Portal* all end definitely, which is to say that although there may be extensions to the story, they cannot be inferred from the game itself. In all of these, there is a greater potential for a return to normality, or closing of the liminoid world. In fact, this assumption can also be made in *Half Life* and *Prey*, where the avatar may now be privy to a new, expanded reality, but the conditions which prompted the game's actions are finished. In the case of the others, the denouement is only local; the immediate threat or part of the threat has gone (*Doom 3*, *Fall of Man*, *Blacksite*, *System Shock 2*) or the action is liable to continue, in other words, the liminoid conditions have a temporal range outside the game's actions (*Half Life 2*, *F.E.A.R.*, *Painkiller*, *Condemned*, *Crysis*). In all of these cases, the sense of victory or achievement is being deliberately undercut. Given this, it is perhaps not surprising that developers opt for a closed plot, even if this makes a sequel slightly harder work to establish. It also makes sense in terms of the need for closure for a satisfying plot.

Related to this, the majority of games do end positively, with some variation on the theme of the hero walking off into the sunset, with the job done. Even *Fall of Man* and *Halo 3*, both of which end with the apparent death of the avatar, tack on a final post-credit cutscene showing them actually surviving the denouement. Multiple endings are possible in *Deus Ex*, *Invisible War*, *Bioshock* and *S.T.A.L.K.E.R.* More ambiguous endings are found in *Half Life* and *Half Life 2*, *Condemned*, *Cthulhu*, *F.E.A.R.*, *Prey*, *Unreal Tournament 3* and *Episode Two*. In the last three, victory is coloured by the death of a PNPC (Jen, Jester and Eli). The others all utilise the implied extension

of the liminoid – the “it’s not over” motif identified above. Agent Thomas remains a fugitive at the close of *Condemned* and appears to be infected with The Hate; *Half Life 2* ends with the apparent destruction of the citadel and potential death of Alyx; Alma makes a sudden appearance at the end of *F.E.A.R.* and Aristide’s phone message makes it clear that the experimentation and cause of all the trouble is not over (and further intimates that the Point Man has been a pawn all along). *Cthulhu* takes the extreme option of cutting off the chances of a sequel by having Jack Walters commit suicide as the closing action (which synchronises with the expected result of any game based upon Lovecraft’s fiction, where a large number of protagonists are driven mad, killed, or kill themselves at the end of the story).

Section 9.6. Summary

What has briefly been defined is a structural template for stories, drawn from the recurrent devices found across the genre, in relation to their particular advantages and functions as gameplay devices. Just as with PNPCs, general populations, worlds and avatars, these structures lend themselves to easy classification, primarily due to their role in gameplay. This is not to downplay experimentation in the genre, but to recognise that there are key devices and drivers which are effective because they are closely allied to gameplay and demonstrate a high yield in terms of experiential effect and affective manipulation without requiring any changes to be made to core affordance relationships. These structures help to define the diegetic transformations experienced as the game progresses. Plot is a gameplay device.

Thus, although the application of traditional or generic plot structures, such as the Hero’s Journey, may be useful starting points, the reality is that FPS games do not fully conform to it and its use is rapidly exhausted. There *are* similarities: in most games a kind of shift in gears in the first quarter roughly comparable to the First Threshold can be identified, and games without significantly visible Climax and Denouement phases are rare. But when plot is reconsidered according to the definition developed as part of a protonarratively orientated, game-specific notion of story and narrative as set out in the first part of this thesis, what is found can be better understood in terms of particular gameplay functions.

Thus, a fundamental driver of FPS games is the need for action that supports the central notion of removing objects in the centre of the screen from play and, given the difficulties with internalised conflict, this requires an external set of conditions. The generic plot models of invasions, conflicts and amnesiacs exploring altered worlds all enable this structure to be supported by a diegetic scaffold. Frequently, these models skip the opening worlds one would normally expect in a plot altogether and push straight into the liminoidity, the action of the game. On

either side of the climax, rising and falling action are normally carried out within one of set number of core plot drivers, each of which not only supports the action, but acts as a focalisation device, managing significance, attention and exerting an influence on speed and style of play. The fact that plot is frequently asynchronous to gameplay episodes and climaxes further supports the idea that one of the fundamental features of plot is to virtually expand context and infer a wider, non-represented world, deepening the significance and adding a diversified diegetic wrapping to core, repeated applications of a limited number of affordance relationships. Diegetic Catastrophes are good examples of this process, where the degree of situationalised knowledge that can be expected of the avatar is reduced and brought across to the system, often through the device of a PNPC. This enables another Catastrophic device, the Betrayal, to be utilised, which not only reinvents the focus of the action, but forces a re-evaluation of what has gone before (increasing complexity of the experience) and, most importantly, hiding the fact that what will occur next is more or less exactly the same as what has gone before. The equivalent devices of Outbreak and Revelation fulfill a similar role.

When plot is considered under the traditional narrative definition of 'what happens', it is easy to get sidetracked into a discussion of the infantility of most FPS games. Whilst this is, no doubt, a discussion to be had, a focus upon the systemic qualities of the games is really required: what is the player-shaped hole the design creates by its negative space; what is the optimum experience designed into the system; what is the affective experience within a predetermined range that is being aimed for. This operates prior to any cultural readings of games: semantics must be understood as a product of the system. The plots that are found in FPS games are fundamentally constructed to serve a gameplay purpose, the network of fixed protonarrative relationships are angled to achieve a specific result, and a functional, structural investigation below the level of the Hero's Journey makes this explicit and self-evident.

Part Three: Conclusion

Section Ten

Section 10.1. Contextual Statement

This thesis began with the argument that by redefining narrative, a better understanding of homodiegetic devices found in FPS games could be obtained from the perspective of looking for their gameplay functions. Examining world, agents, avatar and plot, it is clear that these functions can be argued to underpin most of the diegetic structures found in the genre. It is therefore re-iterated that any understanding of story in FPS games should be anchored to this kind of analysis and, further, that the theoretical model of story/gameplay relationship may be extended to other genres as a general method of obtaining a better understanding of diegetic devices in games. In this section, the arguments and data presented in this thesis will be reviewed, and the case made that this process represents a significant contribution to the field.

In a recent column for DiGRA, Diane Carr noted that “The shortcomings associated with analysis that focuses ‘on the game itself’ are widely and casually acknowledged” (2007) referring to the line in the DiGRA2007 conference call for papers which stated “To truly understand the phenomena of digital games, it is not enough to merely study the games themselves or short-term impacts as described by laboratory experiments – they are only part of the story” (DiGRA 2007). The study of games as systemic objects is currently unfashionable, and it is ‘common knowledge’ that they require examination from a variety of perspectives, using many means from many fields, and always remembering to place them in the context of being interpreted cultural objects, as products of systems of production, as political acts of meaning, as relationships between the player and the game.

However, this rapidly evolving field is missing some basic foundational studies. Games are complex, difficult objects to study and it is quite extraordinary that an embarrassment of riches of high level theorising, deep readings of individual titles, and a burgeoning and critically important mass of studies about their impact, perception and understanding can be found, yet missing are serious comparative studies of game content. Systemic studies of game content, that is, studies which look very specifically for the functions of aspects of digital games across genres, are uncommon.

Elsewhere in her column, Carr argues that “subject position is not a vacant seat established by the game that is offered to (or imposed upon) the player-subject, who must then occupy this single position as a condition of

participation. Resorting to the figure of the 'ideal player' might be one way to theorise a consistent subject position, but I'm not sure how useful this would be". This may very well be the case from a theorist's point of view, but it does not sit easily with the fact that games are products of an economy designed to provide a certain type of experience that will fundamentally sell more games. This means an 'ideal experience' is absolutely present; there is, at the least, an affective experience within a predetermined range present in all games, and this means, like it or not, an 'ideal player'. Indeed, the idea that a game developer does not have a certain type of experience, gameplay and player in mind when designing a game is frankly unrealistic and naive. There is a player-shaped hole at the centre of every game and, thus, returning to the structures presented by the system as an artifact help to define what shape this hole is. This is arguably true for any designed object; it exists to serve a function, therefore, it must contain structures for usage, communication devices for enabling this usage, and requirements by the user in order for this usage to be carried out. Between this simple, but critical, understanding, and the lack of comparative analysis of game content, itself potentially a result of the ludology debates of early game studies, the necessity for the type of analysis carried out in this thesis clearly emerges.

The contributions to knowledge contained here are thus twofold. On one hand, there is the theoretical model which demonstrates that without violating the core principles of narratology or game studies, and by understanding narrative as a schematic cultural device best understood from a context of user psychology, a conceptualisation can be formed in which there is no essential contradiction between story and gameplay. Indeed, story and gameplay, understood from this perspective, are complimentary, and often interrelated devices, operating together to define a media experience. Narrative and gameplay are really the same thing, atoms in a network with the same basic function: to describe an experience and manage a player to deliver an appropriate set of inputs to a limited set of outputs.

The second core contribution to knowledge is the analysis itself: providing a substantial data set about the diegetic content of the FPS genre on a scale that has previously been missing from the field. In addition to this, the arguments presented for the gameplay functions of diegetic devices demonstrates how the theoretical model may be justified by the objects themselves.

In what follows, these two core contributions will be broken down further, and the findings from the analysis summarised.

Section 10.2. Contributions to Knowledge

Contributions made to the theory of gameplay models (Section 2)

- A model of gameplay was developed which held at its core the notion of affordances: actions allowed by a given system. It was noted that all objects can be defined by their affordance relationships, and that gameplay can be reduced to the interplay of a limited number of affordance types.
- These relationships are mediated by a series of parameters attached to each object, which describe their relative complexity. Contextual manipulation of these parameters constitutes gameplay. Further, some objects lock parameter changes to predefined states, which instantly alter affordance relationships according to predetermined rules.
- Even more complex objects such as avatar and agent affordances can be understood in these terms. Thus, a weapon yields a new state change, including a depreciating variable as a parameter for the number of times this can be activated.
- Gameplay as a network of affordances, defined by the parameters of objects, illustrates the simplicity of the core ludic structure of the FPS genre. Diversification is possible through the predetermination of contextual relationships, primarily through the complexity and adjustment of object parameters. The actual number of object types and affordances remains highly limited.

Thus, in Sections 2.1-2.7, a novel means of understanding gameplay was presented which exposes a discontinuity between the ludic structure of FPS games and their presented experiences. This new model also shifts the focus of discussion of objects away from their symbolic interpretation towards function or, at the least, demands that the gameplay function of this symbolic interpretation is seen as highly significant. As a new method for conceptualising the contents of a game system, it is therefore argued that this model is the first contribution to knowledge.

Contributions made to the understanding of narrative in relation to games (Section 3)

- A structural map of narrative was proposed, following an analysis of its core components as defined by a number of theorists. In particular, Barthes' atomisation of narrative elements was explored, and it was noted that there is a deep synchronisation between the way these function and the affordance-based model of gameplay described in Section 2.
- Plot was redefined, according to these terms, as the predetermined shifts in relationships between objects over a temporal period. It was again noted that this synchronises unproblematically with the affordance model of gameplay defined in Section 2.

In Section 3, traditional models of narrative were taken and deconstructed, laying bare their constitutional units, following Barthes. The synchronisation between the manner in which units of narrative are acted on, and act upon each other, and the manner in which units of gameplay are acted on, and act upon each other was noted. The essential lack of contradictory structures and operations between these two types of objects constitutes a contribution to knowledge, as it suggests that not only can they be highly compatible, but they may also be correlated or co-effective functions of the same unit.

Contributions made in the understanding of narrative in relation to games, and new model of ludically orientated narrative analysis (Section 4)

- The flaws in conceptualising games as interactive narratives were detailed, and a more robust definition of interactive narrative was proposed that required the narrative architecture to be open to change as a result of players actions. It was argued that it is inappropriate to view any FPS game as an interactive narrative.
- Instead, the role of narrative in psychology as a particular form of organising principle was introduced, and it was noted that there is no apparent problem with gameplay and narrative schema operating simultaneously. This lent support to the theoretical model developed in Section 3.
- Carr's protonarrative construct was proposed as an interim object above Barthes' units but prior to full-blown narrative conceptualisation. Particularly, the idea of a network of protonarrative units fits the affordance-based gameplay model, conceptualisation of plot as predetermined relationship shifts, and the notion of narrative schema perfectly. It was thus argued that understanding game content as a network of protonarrative and gameplay units provided the common structural ground for gameplay and narrative to be considered as parallel and even interlinked, or co-existing devices within the overall ludic framework.

This section represents the first of the two major contributions to knowledge, as it outlines a theory of narrative in games that bypasses the historical antagonism between the two. It thus establishes a framework for reconsidering the diegetic devices of games across the genre in terms of their gameplay significance; the issue of any perceived conflict or epiphenomenal relationship of story to gameplay having been resolved.

Contributions made in Section 5

Section 5 provides the first ever analysis of the gameplay significance of diegetic devices across a single game genre. The data generated in the following four sections justifies this methodology, as it both illustrates the

knowledge that can be gained from pursuing this method, and generates a significant amount of new data. In Sections 6-9, all findings are original and not found elsewhere in the literature,

Contributions made to the understanding of FPS worlds (Section 6)

- A representative survey of FPS worlds was conducted and data generated about initial realities, transformation of initial conditions, environment sets, relationships of environments to episodes, overall linking structures and diegetic scales. This data exists independently of its interpretation
- Interpretation of the data led to the following conclusions, each representing new knowledge in the field of game studies:
 - Diegetic realities are often enclosed or localised, exerting a control over the total number of objects and affordances which are made available to play.
 - Realities break from normality very soon into the game, or begin in a liminoid phase, thus reducing the expectations of normal complex actions, and suggesting to the player that is is not appropriate to question the reality that is presented in terms of its ecological validity.
 - The majority of FPS games link together environments onto a single bridging structure, and there is a relationship between this structure, the scale of the overall diegesis and the types of initial and transformed realities found. The ubiquity of this bridging structure may be due to its power as an epistemological orientation device for players, and its assistance in localisation.
 - Most games broadly synchronise episodes of play with environment sets, which may also serve an epistemological function in communicating the player's position relative to the overall game (particularly in bridging structures).
 - Most games break down into a definable and consistent number of sets, adding weight to the argument above, as it may result in the development of a gameplay schema. There is a notable correlation between the common radical break used to signal the games final sequences and the denouement of a plot. It was also noted that the radical break rarely changes gameplay and appears to be a purely diegetic device.
 - Devices such as virtual expansion create a diegetic illusion of greater complexity than is actually supported by the environment.
- It was therefore concluded that there appears to be a clear relationship between diegetic structures found in FPS worlds and gameplay. It was further concluded that there was clear evidence that diegetic structures could be used to support and manage gameplay, through player expectations and behaviour.

The extensive data generated in Section 6 represents a contribution to the field entirely independent of the

interpretation which has been offered. The degree to which the data is strongly supportive of the theoretical case made in Sections 1–4 is also significant.

Contributions made to the understanding of FPS agents and persistent non-player characters (Section 7)

- An argument was made to demonstrate how critical the generation of Intentionality is for in-game agents, and how this should be distinguished from the actual underlying AI systems. It was noted that representational characteristics, a diegetic property, of agents could be used to directly engender Intentionality, and to divert attention away from the constraints of the underlying AI.
- Persistent NPCs were defined as those agents who are diegetically significant and repeating. An analysis of their functions and characteristics was made to demonstrate that many of the latter exist because they support the former. Representational characteristics, such as personality and status were also argued to have a gameplay function in terms of influencing player behaviour.
- The following data about agents was generated:
 - Faction count against number of agents can be plotted to provide an illustration of the genre.
 - Linear shooters tend to have high numbers of agents, with low numbers of factions; there appears to be some relationship between numbers of factions and diegetic stability.
 - The vast majority of FPS agents have humanoid (anthropomorphised) characteristics.
 - There tend to be between 3 and 9 persistent NPCs in an FPS title, with no apparent pattern in relation to numbers of agent types or factions.
 - The majority of PNPCs are allied to the avatar, with fewer opposing or nemesis PNPCs represented in-game. There is no apparent pattern between PNPC usage and date of game (ruling out advances in AI determining PNPC use) or PNPC usage and total number of PNPCs in a given title.
 - The majority of PNPCs are represented in cutscenes or via audio and do not play an active role in gameplay.
 - PNPCs are frequently used to carry out ecologically valid activity that the avatar, with their limited affordance set, cannot.
- Interpretation of the data yielded the following
 - Factions can be used as means of virtual increasing the complexity of play, by increasing the potential for consequential actions without requiring AI investment
 - Factions can also be used to generalise reactions across a group, reducing need for individually ecologically valid response to context.
 - Low faction count and high numbers of agent types is suggestive that new agent types are used as a visual reward, with potential implications for steering gameplay.

- Diegetic characteristics of agents, particularly anthropomorphisation, may co-opt existing schema regarding behaviour to support AI and manipulate expectation.
- There is a strong relationship between environments and agents as some behaviour require space to be enacted. Thus, there is also a relationship between environment design, artificial intelligence and diegetics.
- PNPCs are predominantly used as orientation devices, assisting the player in performing actions by offering guidance as to what will be diegetically valid responses (and therefore supported by the affordances of the system).
- Use of audio and cutscenes means PNPCs do not intrude upon the player's mastery of the ludic space, however PNPCs are frequently higher status than the avatar and able to perform actions of arguably greater diegetic significance. This protects the ecological validity of the diegesis and virtually expands its complexity without requiring additional gameplay affordances.
- PNPCs are often in possession of greater knowledge about the diegesis than the avatar and are used as the system's primary means of communicating this information, arguably establishing an epistemological framework whereby the player becomes more passive in terms of seeking solutions, thus protecting the constraints of the game.

Throughout Section 7, further evidence that diegetic characteristics often supported gameplay was offered, ranging from using expectations of behaviour attached to agents to using factions to suggest a greater

Contributions made to the understanding of FPS avatars (Section 8)

- Section 8 provided two analyses, the first examining the functional capabilities of avatars and the second the representational strategies and diegetic information attached to them. Both of these analyses can be taken independently, but they are combined to argue an interlinked relationship between the two.
- The following data was obtained:
 - Around a core of ubiquitous affordances, FPS games vary in their complexity when divided into four affordance classes: combat, exploration, interaction and configuration.
 - However, there are no apparent patterns when combining these classes, meaning there is no smooth gradation of complexity across the genre.
 - FPS games usually offer a standard number of weapons, and generally use either inventories or carrying capacities to limit total number available at any given time if there are more than sixteen. Additionally, highly configurative games normally include the highest number of possible weapons.
 - There is a relationship between map functions and bi-directionality, where games with bi- or multi-

directionality have more complex map functions, and games with highly linear, monodirectional environments have less complex map functions.

- The majority of avatars utilise distinct diegetic information such as names, speech and visual representation to establish them as characters independent of the player.
- Diegetic characteristics of avatars normally synchronise with expected gameplay behaviour.
- Avatars frequently have low levels of local knowledge, mediated by factors such as amnesia or conspiracy, and tend to be outsiders
- Interpretation of the data yielded the following:
 - Levels of complexity exert an influence upon gameplay behaviour. The availability of an affordance over and above the ubiquitous set implies it is advantageous to gameplay.
 - Any division of the genre by avatar capabilities is problematic, due to the lack of clear patterns of complexity.
 - There are evident links between avatar functionality and environmental requirements
 - The notion of a vanishing, or minimally intrusive avatar in FPS play appears to be false, as emphasis is placed upon their construction as a separate character to the player.
 - Diegetic characteristics support particular behavioural responses on the part of the avatar's character, supporting the actual functional affordances available to the player
 - Expectation of the environment and player knowledge is mediated by avatar knowledge
 - Requirements for social interaction are mediated by the avatar's position outside the societies of the diegesis, reducing both need for AI communications, and the player's expectations of social contact.

The first part of Section 8 therefore offers a significant contribution to knowledge in terms of both creating a structural map of avatars across the genre, and a demonstration of how this may affect gameplay. The second part builds upon this to not only offer a contribution in terms of a map of representational characteristics, but an enhanced demonstration of how this may impact upon player expectation and behaviour. As with Sections 6 & 7, the data generated constitutes a significant contribution to knowledge, whether or not the arguments are contested. As it is, the evidence provided by the data supports the general argument for diegetic impact upon gameplay via the model developed in Sections 1-4.

Contributions made to an understanding of and method for analysing plots in FPS games (Section 9)

- Section 9 began with a recap of the definition of plot offered in Part One of the thesis, as the predetermined changes to the relationships between protonarrative objects, and it was stated once more that there is no apparent problem with integrating this construct with the affordance model of gameplay.

- A generic plot model, combining Volger's version of the Hero's Journey and Laurel's more generic model was introduced and the plots of FPS games included in the analysis were mapped against these. It was noted that there was significant deviation to even a generic plot model apparent in much of the genre, with some titles deviating so significantly that the use of traditional plot models to understand FPS plots could be questioned.
- An analysis was conducted of the plots and there were frequent significant omissions of key devices within the Hero's Journey model (Call to Adventure, Refusal of the Call, Mentor, Threshold Guardian). It was concluded that the Hero's Journey was not an appropriate model or means to understand plot in FPS games.
- The types of plot objects found in FPS games were categorised according to their synchronicity and integratedness. It was noted that many plot climaxes are asynchronous to gameplay events, whereas most transitions to the denouement phase of the plot are synchronous to gameplay events. A categorisation schema was proposed for all plot objects in FPS games.
- A taxonomy was proposed to categorise how plot is used to drive and manipulate gameplay. This was divided into events explicitly tied to avatar actions, and events occurring indirectly or outside avatar actions. These were further classified into object, agent and environment focused drivers (avatar-based drivers) and catastrophes/transformations (non-avatar-based drivers).
- It was argued that not only does approaching plot as a gameplay function yield a better understanding of why particular drivers and combinations occur in the genre than the application of traditional plot templates, but the categorisation system proposed as a template for doing just this arises naturally when the plots and gameplay goals of the genre are examined.

Section 9 therefore makes two major contributions to knowledge; firstly by demonstrating the limitations and errors in applying cross-media templates for plot to FPS games, and secondly, by proposing a set of analytical frameworks by which plot can be understood. This set is based upon the assertion that plot serves a distinct and recognisable function in manipulating player behaviour and affect and as such should be seen as a gameplay device. This was supported by the integration of plot into the theoretical model developed in Part One, and the categorisation scheme arising from an analysis of the genre.

Section 10.3. Future Work

There are four major strands to further work:

1. Firstly, all four major areas of study (worlds, agents, avatars and plot) can be cross-referenced as a means

of exposing further patterns within the genre. Space does not permit an extensive cross-analysis here, but it is clearly the next step to be taken.

2. Secondly, the sample group can be widened to continue to test the model and add data to the overall analysis. Although the sample group can claim to be representative of the genre, new titles such as *Clear Sky* (GSC GameWorlds 2008), *Far Cry 2* (Ubisoft Montreal 2008) and *Mirror's Edge* (EA DICE 2009) would be extremely interesting to consider in relation to the findings; as would RPG games that use first-person perspective, such as *Dark Messiah of Might & Magic* (Arkane 2006), *Fallout 3* (Bethesda Softworks 2008), and *Oblivion* (Bethesda Softworks 2006).
3. Thirdly, titles excluded from the subject group on the grounds of non-original IP, and those belonging to the historical sub-genre can be investigated using the methodology established here. This may create a new data set to further understanding of their specific relationships between gameplay and narrative; or may add new understanding to the overall analysis of the genre.
4. The model developed in the first part of the thesis can also be applied to other game genres, to create new data sets specific to them. For example, the relationship between gameplay and narrative may share patterns in genres such as third-person action adventure, role-playing games and survival horror. There is even indication that some of these relationships may be utilised in less narratively orientated games (evidenced perhaps by *SuperBreakOut's* introduction, certainly with titles such as *Wipeout* or *Driver*).
5. The data generated in the second part of the thesis can, of course, be used as a means of exploring other aspects of the FPS genre. For example, the functional capabilities of avatars can be used as the basis for studying non-narrative aspects of the genre; such as immersion, flow or empathic response.
6. Findings from the study have already led to the creation of experimental FPS mods that draw from the data obtained here. Pinchbeck (2008b) and Pinchbeck (2008c) present these modifications, and this process of applying data obtained to development-led research will undoubtedly continue.

To summarise, the generation of the body of data presented here opens up several extremely interesting and certainly important avenues of investigation. Creating a benchmark data set from which to examine the FPS genre with the potential extension of the model to other game genres provides the means to conduct a large spread of research studies, all of which can be seen to have value to the fields of game studies and game design.

Section 10.4. Closing Remarks

This analysis presented here is inevitably incomplete: these are immensely complex systems and the material presented here could be doubled in size with investigations into more of the specifics of how they work. Not only that, but an arbitrary time-line must be drawn. At the time of writing several new FPS games are readying to ship and the temptation to hold off just so *Clear Sky*, *Far Cry 2*, or *Mirror's Edge* can be included is ever present. However, I set out to make an argument for an approach and to prove its validity and I believe I have achieved those aims. The study of games as systems, in isolation from their production, in isolation from their interpretation, is not a dead-end, but a vital part of the games studies program. Counting barrels is not, obviously, as grand an exercise as assembling ornate theories, for sure, but it is the ground-level work that this field urgently requires. Otherwise, we are effectively building in the dark, relying on assumption and an inappropriately small data set.

This thesis has surfed the edge of qualitative, situated research, relying on a mix of surveys across the breadth of the genre with deeper investigations and examples of moments in individual titles to support the arguments. This has inevitably resulted in a work where a degree of knowledge about the primary media data may be felt to be needed in order to assess the validity of the arguments presented. There is no escaping this situation under the circumstances. At the same time, I feel it is critical, as is often proposed within the framework of such methodologies, to convey some of the experiential aspects of the object of study, to try and get under the skin of gameplay experience and produce a text which is evocative as well as analytical. This places the process under considerable tension, but it is nevertheless an approach I believe is fundamentally important. When a large portion of Section 7 was accepted for publication (Pinchbeck 2008a), one of the reviewers commented that “the author betrays his affection for the games” as a criticism of the style of the paper. I was therefore pleased to come across the following from a distinguished source as Henry Jenkins in the introduction to his book *Fans, Blogger and Gamers*:

...Media scholars have long sought to escape the stigma of fandom, often at the expense of masking or even killing what drew them to their topics in the first place... yet, since the 1990s it has become increasingly possible for people to merge the roles of fan and academic, to be explicit about the sources of their knowledge and about the passion that drives their research. (2006: 4)

We are scholars, but we are also players: we seek to understand our field not from a position of cold and removed objectivism but situated in our own personal histories and relationships to the media in question. Likewise, in

understanding games, we must not shy away from the actual business of gameplay, the experience of gameplay and the structures that enable and support gameplay. This means game content, and we need to engage with the diegetic architectures of this medium, in itself, on its own terms, without dragging largely theoretical problems that are the resulting hangover of the first few heady years of game studies into the mix. Once we have mapped the terrain, we can (and should) begin to question the cartographers' motives and propose new interpretative keys. But we have work to do before this, and this involves dismantling some of the creaky edifices of game/narrative theory and letting the landmarks we find already out there in this largely uncharted territory define our perspectives.

Appendix A: Environment and episodic structures across the genre

GAME	Major Episodes	Minor Episodes	Environment Sets	SYNCHRONICITY
Half Life	Anomalous Materials Unforeseen Circumstances Office Complex, We've got hostiles Blast Pit Power Up On a Rail Apprehension Residue Processing, Questionable Ethics Surface Tension Forget About Freeman Lambda Core Xen Gonarch's Lair Interloper Nihilanth		Labs Offices Warehouses Pit Complex Rail System Flooded Labs Processing Plant Bio Labs Black Mesa Exterior Lambda Lab <i>Alien Worlds</i>	Broadly synchronous; multiple episodes in some environments. Monodirectional.
Undying	<i>No episode or environment titles on loadscreens</i>		Mansion Catacombs Island Monastery Pirate Cove Oneiros Eternal Autumn	
System Shock 2	MedSci Engineering Hydroponics Operations Recreation Pod 1 Pod 2 Bridge Body of the Many Where am I?		MedSci Engineering Hydroponics Operations Recreation Pod 1 Pod 2 Bridge Body of the Many Cyberspace	Synchronous, multidirectional. Episodes titled by environment.
Deus Ex	<i>Liberty Island New York, pt 1</i> <i>MJ12 HQ Hong Kong</i>	Liberty Island, UNATCO HQ, Battery Park, Hell's Kitchen, MJ12 Labs, NSF HQ, Mole People Tunnels, Airfield MJ12 HQ, UNATCO	New York (Liberty Island) New York (central) Hong Kong Versalife Dockyard Graveyard	Episodes synchronous to environments but environment sets contain multiple episodes. Episodes named by environment. Multidirectional and repeating.

	<i>New York, pt 2</i> <i>Docks</i> <i>Paris</i> <i>US Underwater Labs</i> <i>Area 51</i>	HQ Market-Club, Tonomchi Road, Versalife Building, Versalife Labs Hell's Kitchen Docks, Ship Graveyard Catacombs, Streets, Chateau, Cathedral Vandenburg Labs, Gas Station Underwater Lab 1, 2, 3 Missile Silo Area 51 exterior, labs	Paris US various Underwater Labs Area 51	
The Operative	Misfortune in Morocco Berlin by Night (1-3) Unexpected Turbulence (1-2) Rendezvous in Hamburg (1-2) A Tenuous Lead (1-5) The Dive (1-3) A Man of Influence (1-3) Safecracker (1-6) Rescue Attempt (1-3) Trouble in the Topics (1-4) Low Earth Orbit (1-2) Alpine Intrigue (1-4) The Indomitable Cate Archer (1-4) A Very Large Explosion (1-2) Such is the Nature of Revenge (1-2)	1-4 1-3 1-2 1-2 1-5 1-3 1-3 1-6 1-3 1-4 1-2 1-4 1-4 1-2 1-2	UNITY base (training); Morocco, Germany (Berlin, Hamburg, Bremen, Frankfurt) Plane Freighter UK (Dumas Offices, Chemical Plant, Dumas Towers) America (Train, Underground Lab) Tropics (Facility) Space Alps (town, gondola, chateau)	Synchronous. Two environment sets (Germany, Alps) contain multiple major episodes. Monodirectional..
Return to Castle Wolfenstein	Ominous Rumours Dark Secret Weapons of Vengeance Deadly Design Deathsheads' Playground Return Engagement Operation Resurrection	Escape, Castle Keep, Tram Ride Village, Catacombs, Crypt, The Defiled Church Forest Compound, Rocket Base, Radar Installation, Air Base Assault Kugelstadt, The Bombed Factory, The Trainyards, Secret Weapons Facility Ice Station Norway, X-Labs, Super Soldier Bramburg Dam, Paderborn Village, Chateau Schufstaffel,	Castle Wulfberg Dig Site X-Plane base Kugelstadt SWF Norway Germany (Dam, Village, Chateau) Castle return	Synchronous, some major episodes contain multiple environment sets. Monodirectional.

		Unhallowed Ground The Dig, Return to Castle Wolfenstein, Heinrich		
Halo	The Pillar of Autumn Halo The Truth and Reconciliation The Silent Cartographer Assault on the Control Room 343 Guilty Spark Library The Two Betrayals Keyes The Maw	Reveille, AI Constructs and Cyborgs First! Arrival, Reunion Tour Truth and Reconciliation, Into the Belly of the Beast, Shut Up and Get Behind Me... Sir The Silent Cartographer, It's Quiet, Shafted I would have been your Daddy, Rolling Thunder, If I had a Super Weapon Well Enough Alone, The Flood The Library, Wait – it gets worse, But I Don't Want to Ride the Elevator, Fourth Floor: Tools, Guns, Keys to Super Weapons The Gun pointed at the Head of the Universe, Breaking Stuff to Look Tough, The Tunnels Below, Final Run Under New Management, Upstairs - Downstairs, The Captain ...And the Horse You Rode In On, Light Fuse - Run Away, Warning: Hitchhikers May Be Escaping Convicts	Pillar of Autumn (bridge) Foothills Truth & Reconciliation Cartographer Island Winter Landscape Swamp + Flood Rooms Library Pillar of Autumn (engines)	Synchronised to major episodes, each environment contains multiple minor episodes. One repeat (sandbox) but otherwise Monodirectional.
No-one Lives Forever	Cate Archer Must Die! Goodbye, Spy Project: Omega A Spy in H.A.R.M.'s Way	The Director, Call it a Hunch, I have bad news The Spy is Here, The death of Cate Archer The spectre of war, Welcome to Siberia, Causing Trouble (1), The Communications Tower, The Power Station, Causing	Inatokimura Siberia Ohio India Antartica India UK – UNITY HQ Aegean Sea Khios, Sea of	Synchronous, Environment sets span major episodes. Monodirectional.

	Night Flight Diary of a Double Agent Double Cross The Art of Murder Ice Station Evil The Curse of Kali The Interlopers Undersea Terror in the Deep Endgame Pre-emptive Strike	Trouble 2 OuterYard, The Old Records Building, Inner Yard, The Basement, Main Records Building The basement, Inner yard, Outer yard, Exfiltration, Surprise, Surprise Grasping at straws, The House where Melvin used to live, Storm Rolling In, Tornado Trouble, Carried Away Knife in the back, The Password, Planting a Bug, Wanted, Evil Alliance The Vault, Crossfire, The Getaway Antartica Proving Ground UNITY Headquarters Submarine Bay, Command desk, Crew Deck, Laboratories Armstrong in Peril, The Devil and the Deep Blue Sea / Expect Flooding – (CHOICE), Fire in the Hole I think we should presume she failed, Manhandled, Sweet Revenge, Isako's Debt The fate of Khios	Marmara	
Doom 3	<i>Mars City</i> <i>Alpha Labs</i> <i>EnPro plant,</i> <i>Communications</i> <i>Recycling Centre</i> <i>Monorail,</i> <i>Delta Labs</i> <i>Hell,</i> <i>Delta revisited</i> <i>Central Processing Site</i>	Intro, Mars City underground, MC, UAC administration 1-4 EnPro plant Communications Transfer, Communications 1-2 Monorail 1,2a,2b,3,4 Hell Delta 5 Central Processing, Server Banks Site 3, Caverns 1 & 2, Primary excavation site	Mars City Alpha Labs EnPro plant, Communications Recycling Centre Monorail, Delta Labs Hell, Central Processing Site	Synchronous to major episodes. Minor episodes occur within single environment set. Episodes named by environment. Monodirectional.

Far Cry	Training Carrier Fort Pier Research Treehouse Bunker Steam Regulator Control Rebellion Archive Cooler Boat Catacombs River Swamp Factory Dam Volcano		Island one Aircraft carrier Island 2 (fort – pier) Island 3 (research, treehouse + bunker) Island 4 (steam, regulator, control, rebellion), Archive (follows from island 4, but all inside and substantively different? – archive, cooler), Island 5 (boat), Island 6 (catacombs, river), Island 7 (swamp [bridge Section], factory), Island 8 (dam, volcano)	Very large sandbox environment sets contain highly discrete environments. Environment sets contain multiple major episodes. Monodirectional.
Invisible War	<i>Seattle</i> <i>Mako Ballistics</i> <i>Cairo</i> <i>Trier</i> <i>Antarctica</i> <i>Cairo Revisited</i> <i>New York</i>	Tarsus Academy, Upper Seattle, Inclinator, Lower Seattle, Inclinator Pt. 2, WTO Hangar Mako Ballistics Medina, Arcology Street, The Black Gate, Templar Compound Shackleton Shelf, Denton's Sanctuary, Versalife Base Liberty Island Medina, Arcology Liberty Island, UNATCO Base	Seattle Mako Ballistics Cairo Arcology Trier Antartica Liberty Island	Multidirectional, repeating, Synchronous, episodes titled by environment.
Half Life 2	Point Insertion A Red Letter Day Route Kanal Water Hazard Black Mesa East We don't go to Ravenholme Highway 17 Sandtraps Nova Prospekt		City 17 Canals Black Mesa Ravenholme Coastal Highway Nova Prospekt City 17 ruins Citadel	Broadly synchronous; multiple episodes in some environments. Monodirectional.

	Entanglement Anticitizen One Follow Freeman Our Benefactors Dark Energy			
Quake 4	<p><i>Landing Site</i></p> <p><i>Operation Advantage</i></p> <p><i>Stroggification</i></p> <p><i>Operation: Last Hope</i></p>	Air Defense Bunker, Air Defence Trenches, Hangar Perimeter, Interior Hangar, MCC Landing Site Operation:Advantage, Canyon, Perimeter Defence Station, Aqueducts, Aqueducts Annex, Nexus Hub Tunnels, Nexus Hub Strogg Medical Facilities, Construction Zone, Dispersal Facility, Recomposition Centre, Purification Centre, Waste Processing Facility, Operation: Last Hope, Data Storage Terminal, Data Storage Security, Data Storage Terminal Return, Tram Hub Station, Tram Rail, Data Processing Terminal, Data Processing Security, Data Processing Terminal – Return, Data Networking Terminal, Data Networking Security, Nexus Core, The Nexus	Landing zone MCC Canyon Nexus Hub Medical Construction Processing Data towers Nexus Core	Generally synchronous, some minor repeats. Episodes named after environments; environment sets contain multiple episodes. Monodirectional.
Halo 2	Cairo Station Outskirts The Arbiter Oracle Delta Halo	One Size Fits All, Home Field Advantage, Priority Shift, Authorized Personnel Only, Return to Sender, They'll Regret That Too, A Day at the Beach, Speed Zone Ahead Metropolis: Ladies Like Armour-Plating, Field Expedient A whisper in the storm,	Cairo Station New Mombassa Cloud Base Delta Halo (lakes) Delta Halo (battlefield) Delta Halo (library) High Charity	Environment sets contain multiple minor episodes; some synchronisation between major episodes and environment sets, but major episodes also span multiple environment sets. Monodirectional, some (limited) sandboxing

	Regret Sacred Icon Gravemind Uprising High Charity The Great Journey	to the Hunt,Juggernaut, Hey, watch this!, Dead or Alive... Actually, Just Dead Helljumper, You Break It-You But It, Off the Rock-Through the Bush-Nothing but Jackal Testament, One-Way Ticket, Sorry-were you in the middle of something? Uncomfortable Silence Buyer's Remorse, 100,000 Year War, Healthy Competition, Shooting Gallery, That Old-Familiar feeling Inside Job OK, So That's How it is, Step Aside-Let the Man go through, Fight Club Cross-purposes, Please, make yourself at home, Sanctified, Once More, with Feeling Your Ass-My Size-24 Hoof, Backseat Driver, Delusions and Grandeur		
Thief: Deadly Shadows	Checking Inn – Cashing Out End of the Bloodline St. Edgar's Eve Into the Pagan Sanctuary The House of Widow Moira The Sunken Citadel Killing Time Of Brethren... and Betrayers Robbing the Cradle Still Life with Blackjack	City sequences linking missions	Inn Castle St Edgar's Cathedral Pagan Tunnels Keeper Library Sunken Citadel Abyssmal Gale House of Widow Moira Clocktower Shalebridge Cradle, Fort Ironwood Wieldstrom Museum City (South Quarter, Stonemarket, Stonemarket Plaza, Audale)	Synchronous to episodes, plus generic city environments used multiple times to link travel from mission to mission. Multidirectional (city environments)

Painkiller	<i>Section One (Sections distinguished by separating cutscenes)</i> <i>Section Two</i> <i>Section Three</i> <i>Section Four</i> <i>Section Five</i>	Cemetery: Atrium Complex: Catacombs: Cathedral: Enclave Prison: Opera House: Asylum: Snowy Bridge: Town: Swamp Train Station: Abandoned Factory: Military Base: Ruins Castle: The Palace: Babel: Forest: The Tower City on Water: Docks: Old Monastery: Hell	Cemetery: Atrium Complex: Catacombs: Cathedral: Enclave Prison: Opera House: Asylum: Snowy Bridge: Town: Swamp Train Station: Abandoned Factory: Military Base: Ruins Castle: The Palace: Babel: Forest: The Tower City on Water: Docks: Old Monastery: Hell	Synchronous to minor episodes – occasional use of environment sets to enclose multiple minor episodes. Monodirectional.
Res. Evil	<i>Erebus</i> <i>Phobos</i> <i>Delta Labs</i> <i>Hell</i>	Main Excavation, Erebus Dig Site Erebus Labs, Erebus Control, Erebus Research, Erebus Station, Skytram Labs (sector 5), return to Skytram, Reactor (sector 3), Labs revisited Delta Labs Hell	Underground Erebus facility Skytram Phobos Delta Labs Hell	Synchronous, episodes named after environment. Some return to environment, but mostly monodirectional.
Perfect Dark Zero	Datacore (Demolition) Nightclub (Stakeout) Subway (Retrieval) Rooftops (Escape) Mansion (Infiltration) Laboratory (Rescue) River (Extraction) Trinity (Infiltration) Trinity (Escape) Jungle (Storm) Temple (Surveillance) Outpost (Rescue) Bridge (Assault) Arena (Showdown)		Datadyne Hong Kong China Pacific Ocean South America Africa	Synchronised – major episodes to environment sets; minor episodes to environment sets. Monodirectional.
FEAR	Inception Initiation, Escalation Infiltration, Extraction, Interception, Redirect		Auburn (Warehouses) Wastewater Treatment Plant Armacham Offices	Synchronous to major episodes, some environment sets contain multiple episodes. Monodirectional.

	Desolation Incursion, Revelation, Retaliation		Auburn #2 (Residential) Rammelmeier Compound (+vault)	
Condemned	Weisman Office Buildings Central Metro Station, Metro Station Platforms, Grid 4 Subway tunnels Bart's Department Store Metro City Library St. Joseph's Secondary School Apple Seed Orchard Processing Center	Bumback Alley	Office Buildings Metro Store Alley Library School Orchard	Synchronous to major episodes. Occasional use of environment sets to contain multiple episodes. Monodirectional.
Call of Cthulhu	Prologue A Visit to the Old Town Attack of the Fishmen Sewer Jailbreak Escape from Innsmouth The Marsh Refinery The Esoteric Order of Dagon A Dangerous Voyage Devil's Reef The Air-Filled Tunnels		Cult House Innsmouth Sewer Innsmouth Refinery Dagon House Boat Reef Deep One City	Synchronous to major episodes. One large environment set used for first half of game. Monodirectional.
Prey	Last Call Escape Velocity Downward Spiral Rites of Passage Second Chances All Fall Down Crash Landing Sacrifices There Are Others Guiding Fires The Old Tribes Hidden Agenda Jen The Dark Harvest Following Her The Complex Ascent Centre of Gravity Resolutions	On the Run Wall Walking, Poor Bastards Overgrown Deep Freeze Close Quarters Surface Fight Hidden Allies Surgical Strike Search for Jen The Harvesters Crossover Asteroid Mining, Plasma Venting Onward and Upward,	Bar Spirit World Death sequence Sphere#1 Sphere#2(Plane) Sphere#3(Shuttle Transit1) Sphere#4(Elhuit) Sphere#5(The Complex) Sphere#6(Ascent) Sphere#7(Jen/Kee pers) Sphere#8(Mother)	Little environmental distinction between episodes – little distinction between environments. Spirit world synchronous to episodes: Bar (Last Call) Spirit World (Rites of Passage, Oath of Vengeance) Monodirectional.

	Oath of Vengeance Facing the Enemy Mother's Embrace	Scaling the Spindle Kindred Sprits Divide and Conquer, Into the Hive Mother: Chamber, Mother: Finale Six Months Later		
HL2: Ep1	Undue Alarm Direct Intervention Lowlife Urban Fight Exit 17		Citadel City 17 Streets / tunnels Hospital Station	Synchronous to major episodes with some buffering. Unidirectional.
STALKER	Cordon, Garbage Agroprom Dark Valley Wild Territory Yantar Military Warehouses Red Forest Pripyat Chernobyl NPP Sarcophagus Additional ending: Teleport sequence	<i>Nimble, Embankment (FoxS)</i> <i>Bes (S), Gray (S)</i> <i>Save Mole, Agroprom</i> <i>Sewers (S-Stash),</i> <i>Military Documents,</i> <i>Bar</i> <i>Break into bandit camp</i> <i>X-18 Lab</i> <i>Escort Kruglov</i> <i>Radiation readings</i> <i>X16 Lab</i> <i>Lab escape (tunnels)</i> <i>No critical missions, but (Freedom complex Bloodsucker village)</i> <i>Travel to Scorcher</i> <i>Control Bunker</i> <i>Reach the Power Plant /Stadium</i> <i>Exterior</i> <i>To monolith / secret lab</i> <i>Find C-Conscious</i>	Cordon Garbage Dark Valley Wild Territory Agroprom Military Warehouses Yantar Red Forest Pripyat Chernobyl NPP	Largely asynchronous with some synchronicity between minor episodes and interior environment sets. Multidirectional.
Crysis	Contact Recovery Relic Assault Onslaught Awakening Core Paradise Lost	Divided we Fall, First Light, The Lusca's Call Trespass, Crossings Left Behind, Departure Bradley, Incursion, Calvary Team Idaho, Phase Line Alpha Tremors, Descent,	Beach-Bay-Village Base-Excavation- Research Dome- Extraction Valley-Mine Core Mountainside- Evacuation Point VTOL valley	Sandbox environments contain multiple minor episodes with large buffer zones. Some synchronicity between major episodes and environments. Monodirectional in episodic structure.

	Exodus Ascension Reckoning	Guardian Laws of Nature, Abyss, Legion Frozen, Passage Stronghold, Hunter, Strickland's Order Turbulence Good Intentions, To Hell and Back, Last Stand	sequence Ship	
Blacksite	Iraq Quarantine Rachel Counter Insurgency Topside Wrecked	Liberators, Crude methods, Down range, Bunker busters, WMD MIA, Proliferation, Mission accomplished The first casualty, Boots on the ground, Homeland security, Coalition of the willing, Targets of opportunity Fighting over here, Just a piece of paper, Quagmire, Eminent domain, Domestic surveillance, Somebody call FEMA Misunderestimated, Hearts and minds, Rules of engagement, Transfer of authority, Cut and run, Hold until relieved The surge, Oversight, Category 6, New shit, Catastrophic success, Making progress, Stay the course Junk science, Last throes, Regime change	Iraq Rachel Approach Rachel (Downtown, Suburbs, Trailer Park, Drive-In) Military Base Airborne Dome Approach Dome Complex Dome Approach Underground Facility	Synchronous to major episodes, environment sets contain multiple minor episodes. Monodirectional.
HL2: Ep2	To the White Forest This Vortal Coil Freeman Pontifex Riding Shotgun Under the Radar Our Mutual Friend T-Minus One		White forest Mines (+Antlion Lair) Highway Village Base Complex Base Exterior	Broadly synchronous to major episodes. Monodirectional.
Fall of Man	York (Operation Deliverance, A Lone		York Conversion Centre	Synchronous to major episodes; each environment

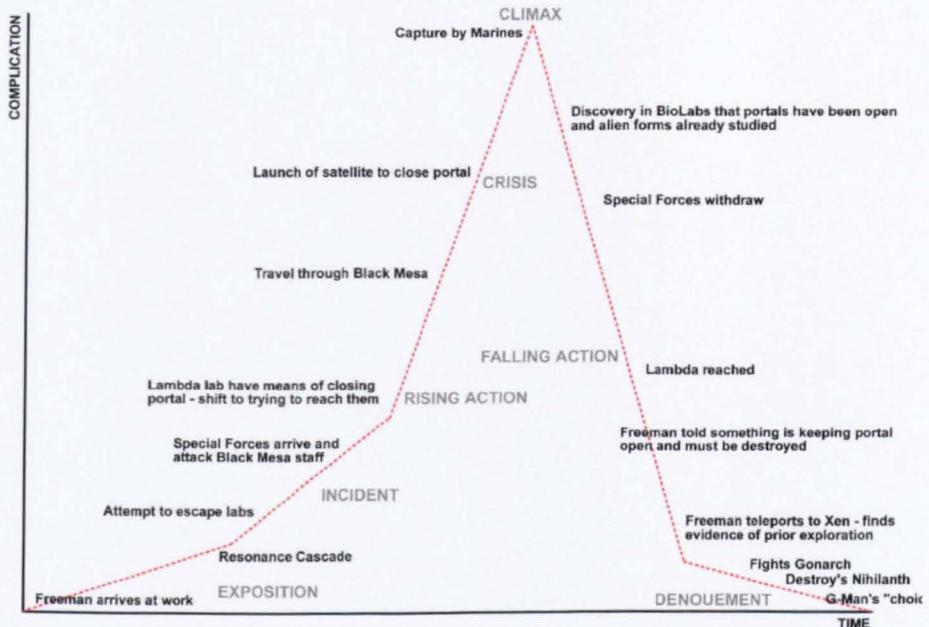
	Survivor, Spires) Grimsby (Fates Worse Than Death, Conversion, Hunted Down) Manchester (Path of Least Resistance, Cathedral, Outgunned) Nottingham (Into the Fire, Conduits, Viper's Nest) Cheshire (No Way Out, Secrets, Angel) Somerset (Search and Rescue, Common Ground, A Disturbing Discovery) Bristol (Devil at the Door, Evacuation, Parting Ways) Bracknell (Into the Depths, In A Darker Place) London: Outskirts (A Desperate Gamble, Ice and Iron) London: River Thames (Burning Bridges, On the Ice, Giant Slayer) Chimeran Tower (Angel's Lair, Last Hope, The Core)		Manchester Nottingham Human Base Cheddar Gorge Bristol Chimeran Tunnels London (Outskirts) London (Thames) Chimeran Tower	set contains multiple minor episodes. Monodirectional.
Bioshock	Welcome to Rapture Medical Pavilion Neptune's Bounty Arcadia Fort Frolic Hephaestus Olympus Heights Point Prometheus	Neptune's Bounty, Smuggler's Hideout Farmer's Market, Arcadia II Hephaestus, Rapture Main Controls Olympus Heights, Apollo Square Proving Grounds, Fontaine	Medical Pavilion Neptune's Bounty Smuggler's Hideout Arcadia Farmer's Market Fort Frolic Hephaestus Olympus Heights Apollo Square Point Prometheus Proving Grounds (Museum)	Environments synchronous to minor episodes. Multidirectional
Unreal Tournament 3	Distributed			Monodirectional – some choices of branching episodes
Halo 3	Sierra 117 Crow's Nest	Walk it off, Charlie Foxtrot, Quid Pro Quo Know your role, Gift	Jungle Crow's Nest (base) Tsavo Highway	Synchronous to major episodes, each environment set contains multiple minor

	Tsavo Highway The Storm Floodgate The Ark The Covenant Cortana Halo	with purchase, Last one out, get the lights Full Contact Safari, The Broken Path Ghost Town, Judgement It Followed me Home, Shadow of Intent, Infinite Devil Machine Installation 00, Forward Unto Dawn, Real Men Don't Read Maps Trident, If You Want it Done Right, Journey's End, Revelation Rampant, Nor Hell a Fury Full Circle, The Way the World Ends	Covenant Dig site Flood cruiser The Ark Gravemind	episodes. Monodirectional.
Hellgate	Act I: Holborn Act I: Covent Garden Act II: Covent Garden Act II: Charing Cross Act II: Oxford Circus (6 secs) Act 3: Charing Cross Act 3: Temple Act 4: Liverpool Street Act 5: St Paul's	Break on Through, A Fine Welcome Hell's Yard, Test Monkey, Truth Spoken Wisdom and Chaos Books & Riddles, Arms & Answers, That'll Get Infected, Hold Fast, The Wall, Mind Mysteries Temple Trek The Infection, Hooked, Gundown, Severed Samples, Scrub the Deck, Big Sister's Song	Randomised environments leading from core Hubs: Holborn Covent Garden Charing Cross Oxford Circus Temple Templar Base Liverpool Street Missing One here? St. Paul's	Multidirectional, synchronous to minor episodes.
Portal	Prelude 19 Tests The Cake Glados		Test environments Facility AI complex	Monodirectional.
Timeshift	Arrival Back Again New Blood Infiltration Ground Floor Heist Getaway Disputed Airspace Better Late Point of Impact Liberation		Occupant Base / City City-Park Construction Site Admin Building Zeppelin Mountains (plus crash site) Prison Road Trip Munitions Plant	Monodirectional

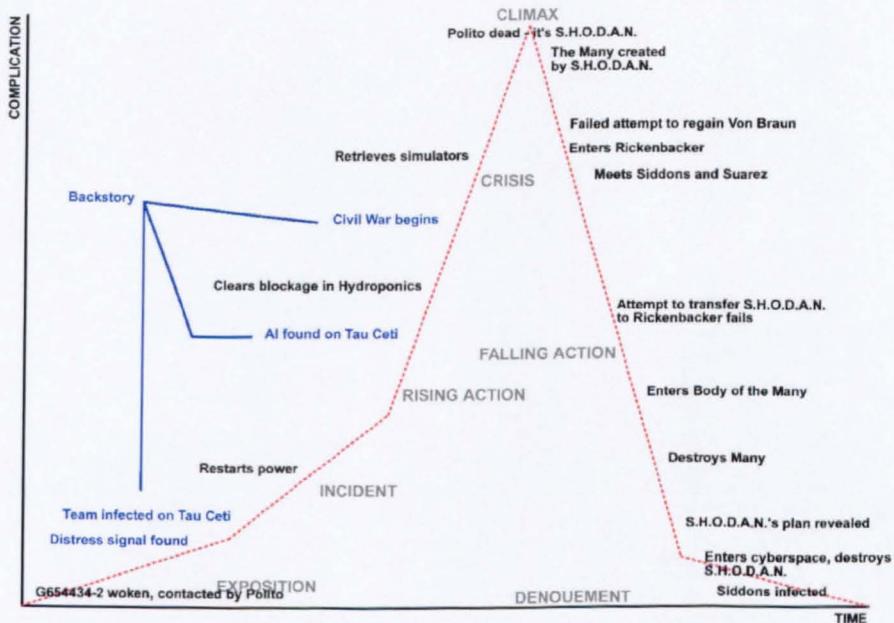
Road Trip	Zeppelin Factory
Forced Entry	Alpha Sector
Test Labs	
Factory Recall	
Some Assembly Required	
Sabotage	
Exeunt	
Drive-By	
Gate Crashers	
The Wind Tunnel	
Repo Men	
En Route	
Consequences	

- Italics denote cases where there are no explicitly titled episodes, or major episode distinction from minor episodes but there is nevertheless a clear grouping of minor episodes into major Sections of the game's arc.

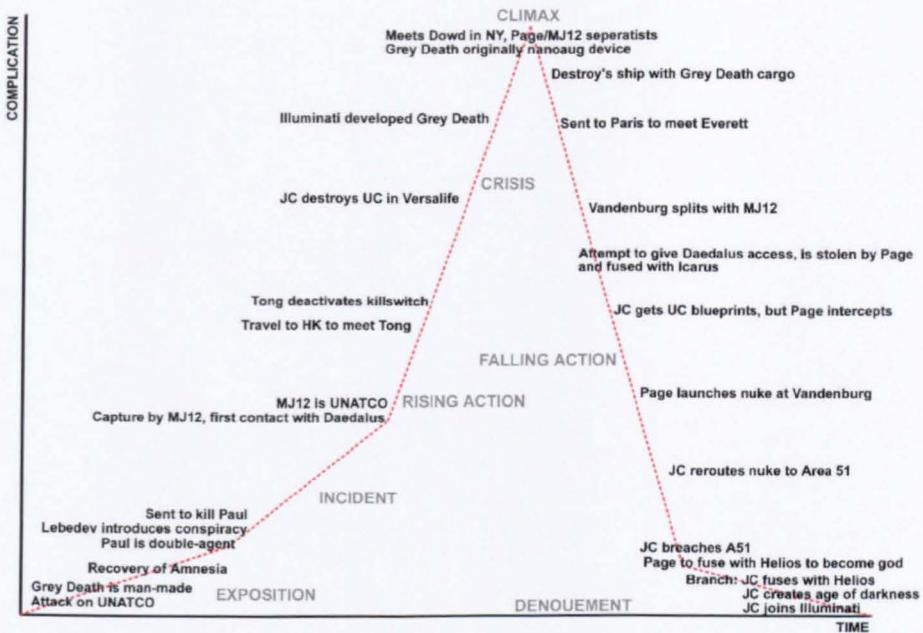
Appendix B: Application of generic plot models to the genre



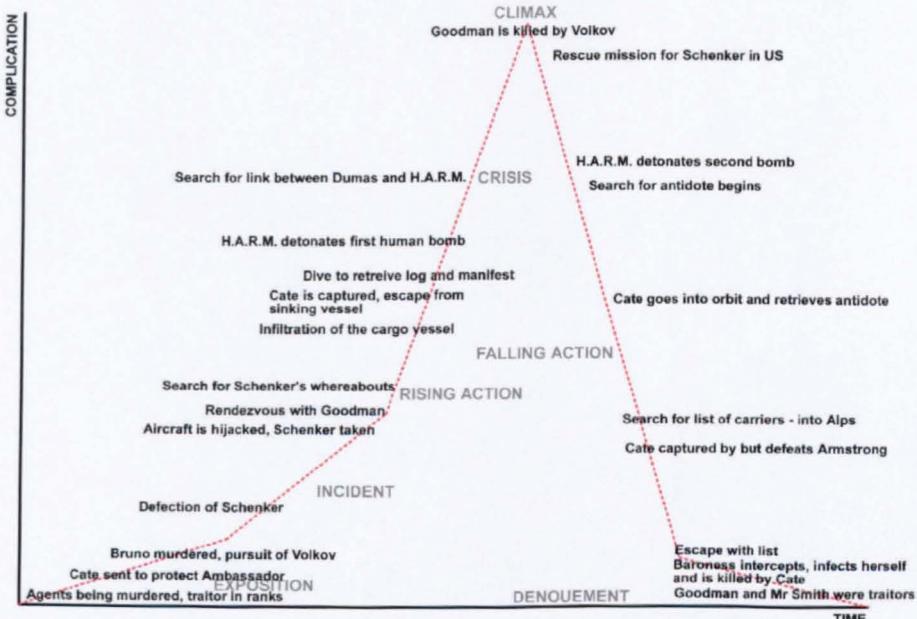
Half Life



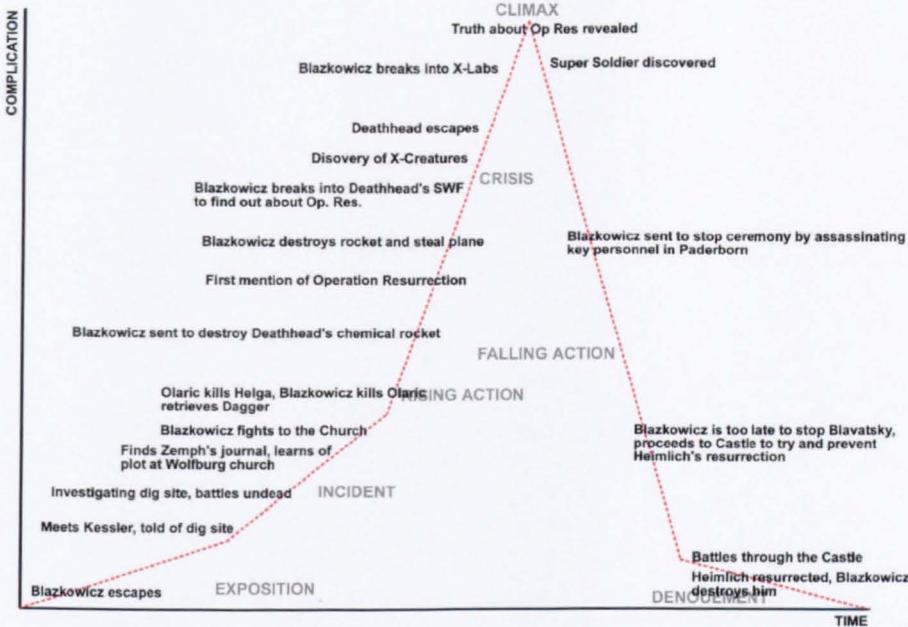
System Shock 2



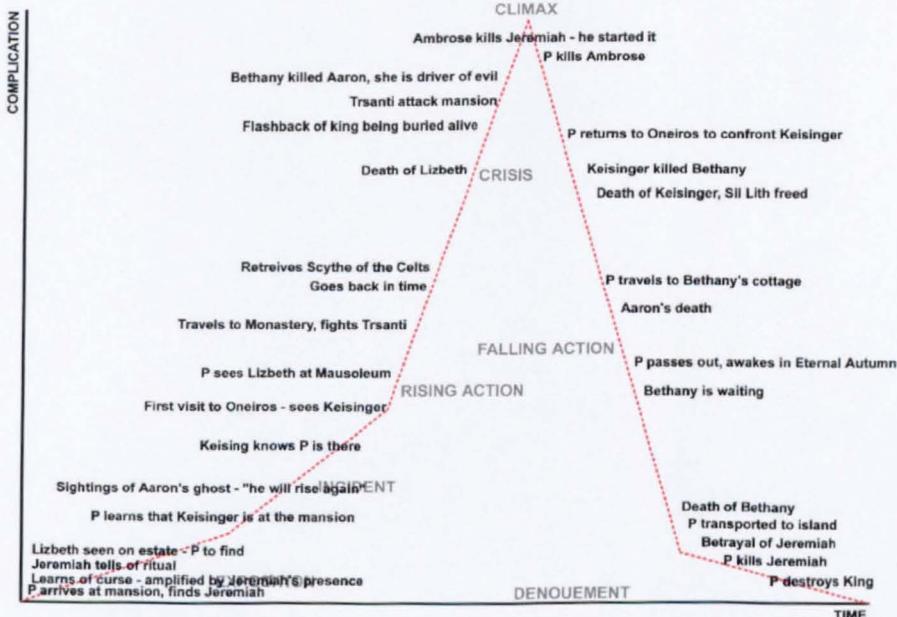
Deus Ex



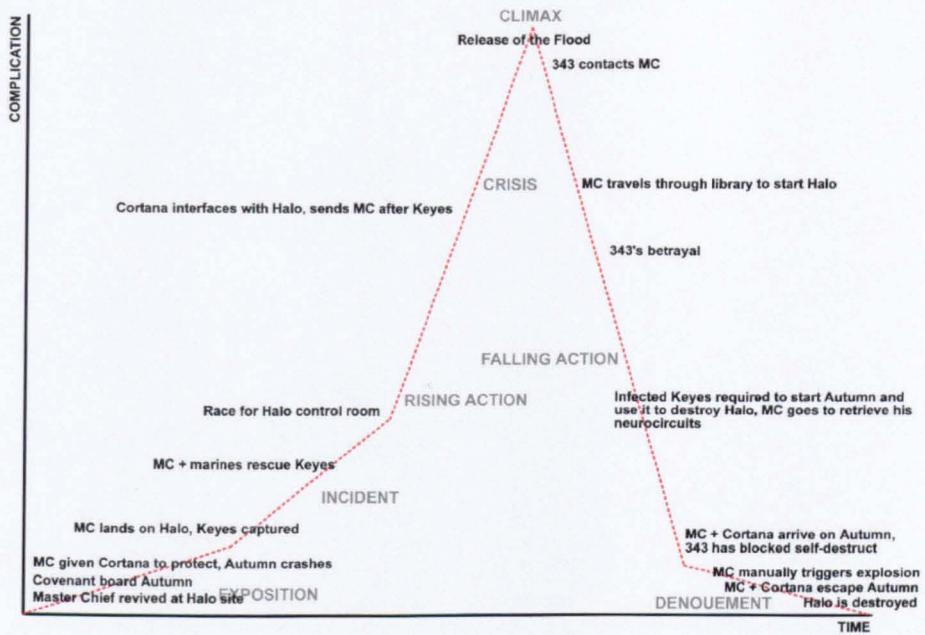
The Operative



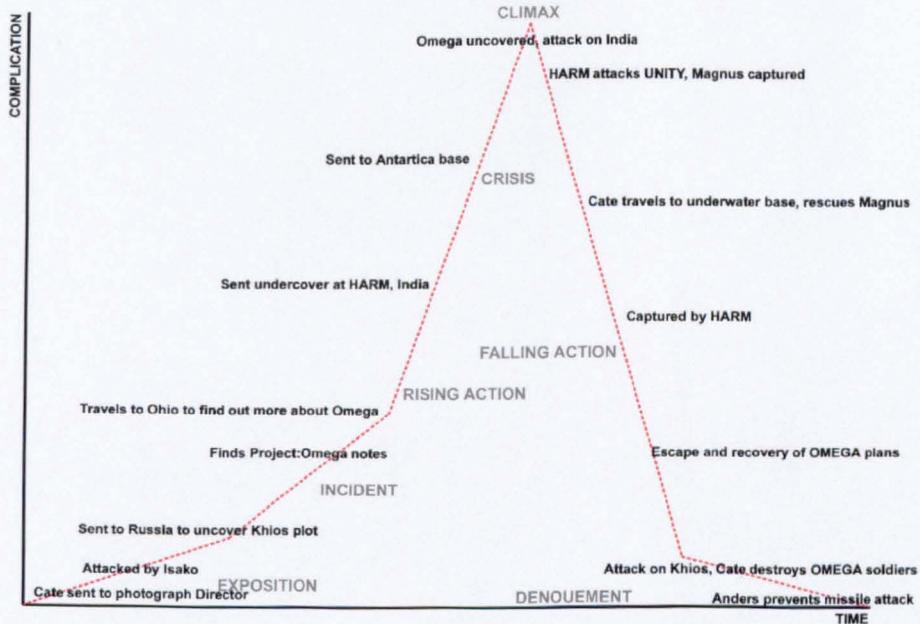
Return to Castle Wolfenstein



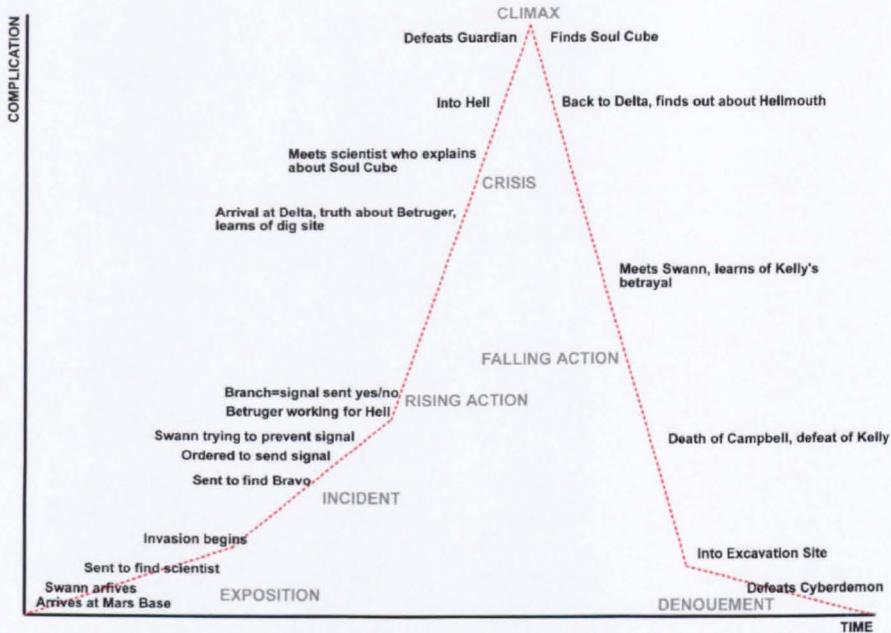
Undying



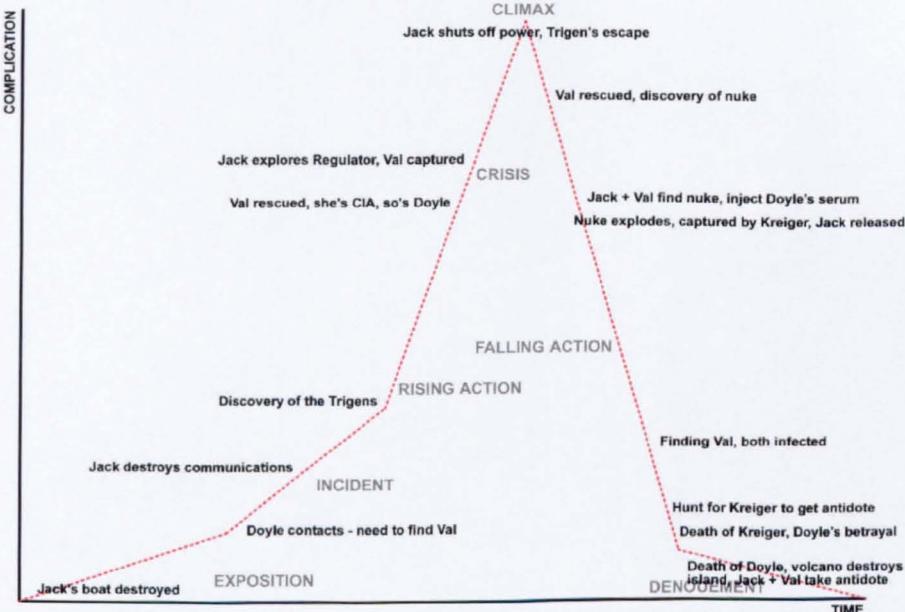
Halo



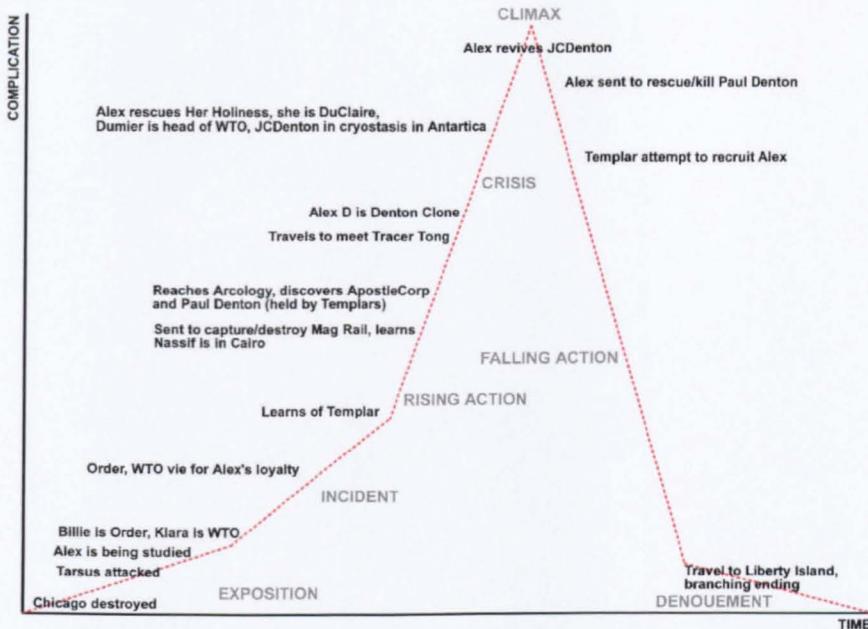
No-One Lives Forever



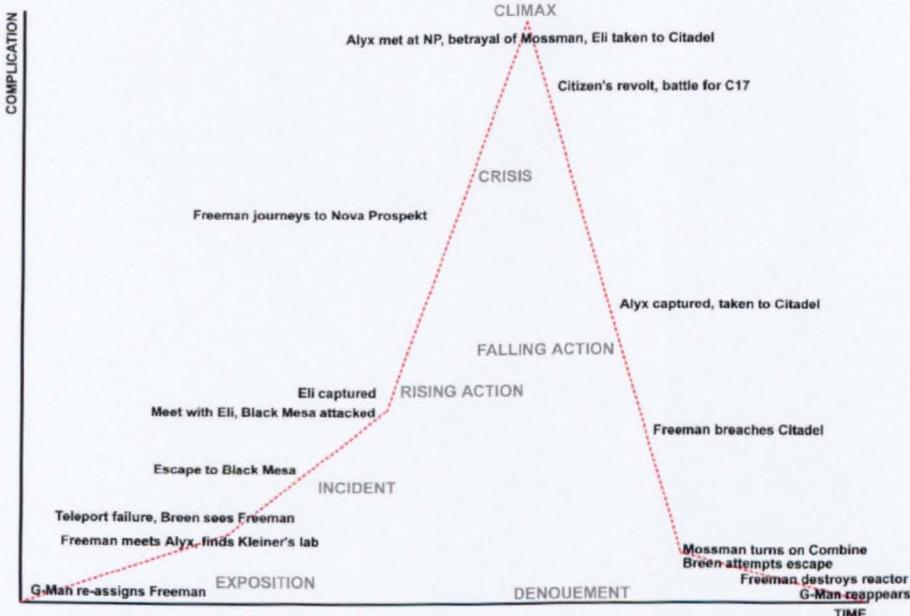
Doom 3



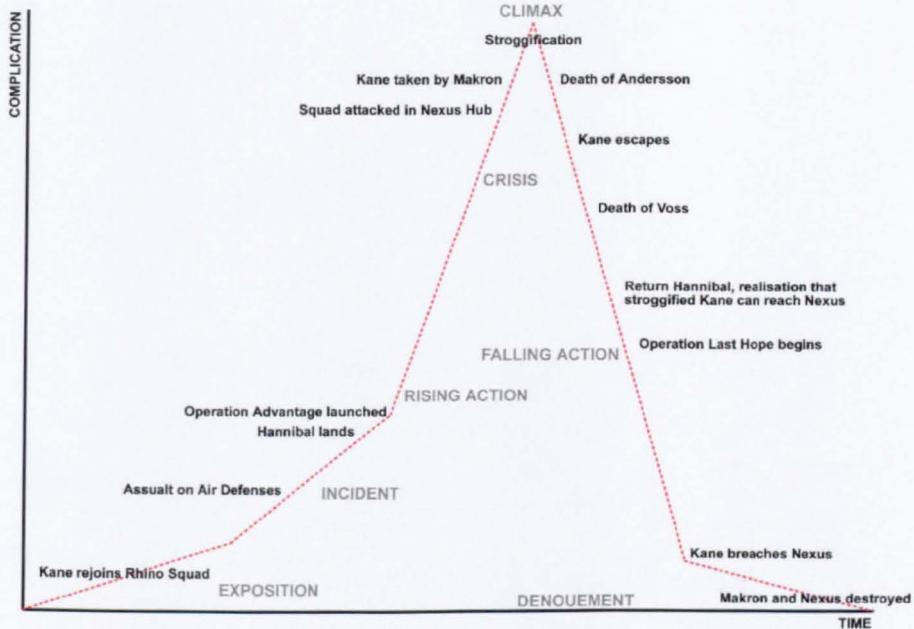
Far Cry



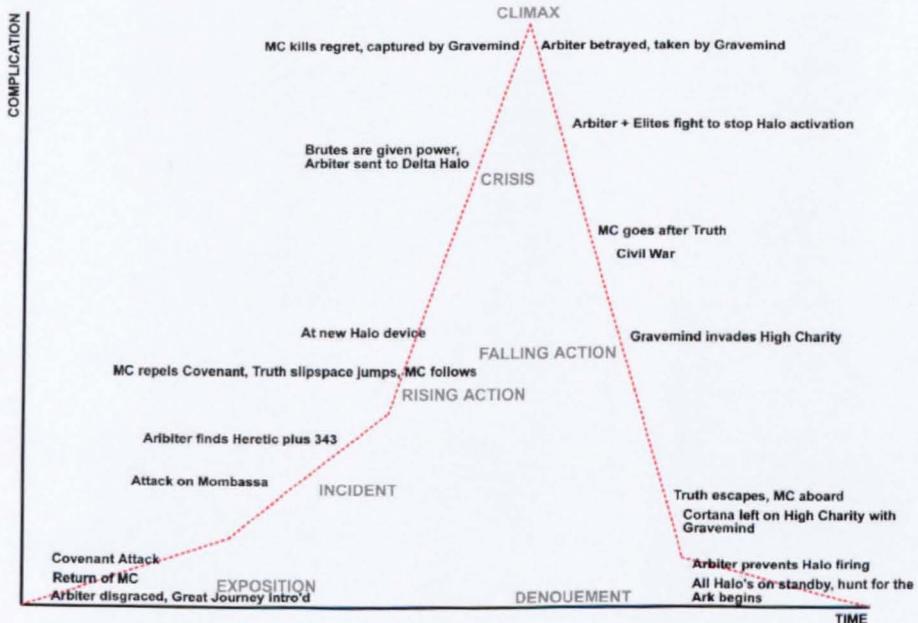
Deus Ex: Invisible War



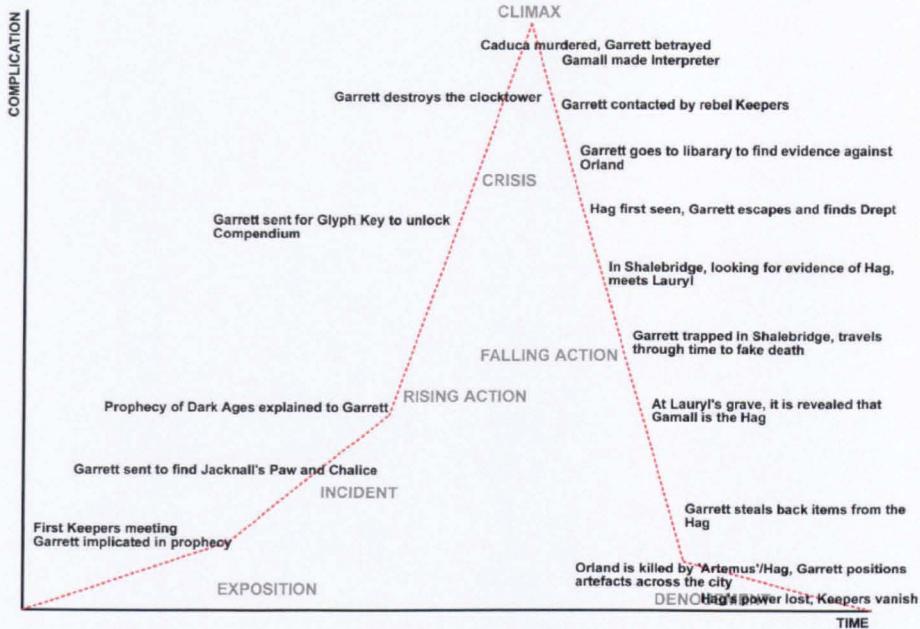
Half Life 2



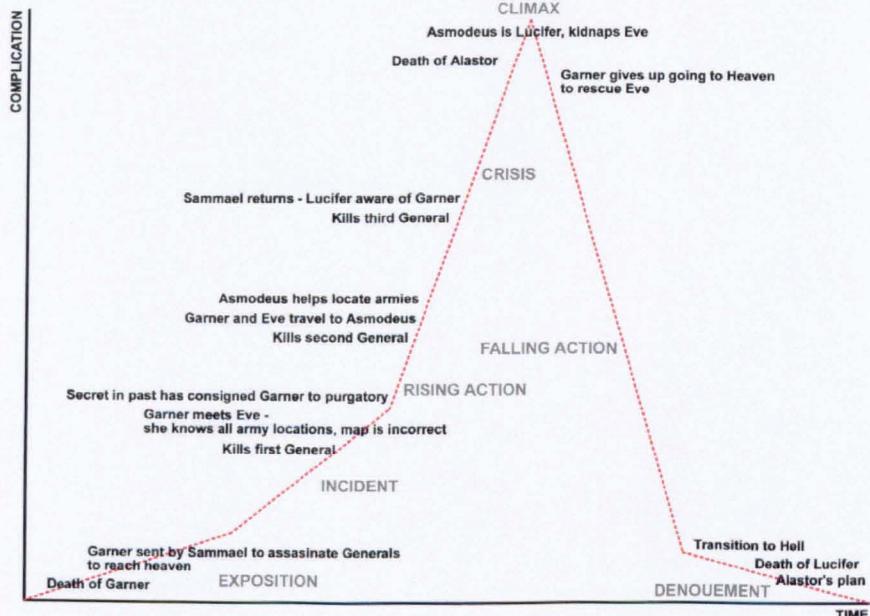
Quake 4



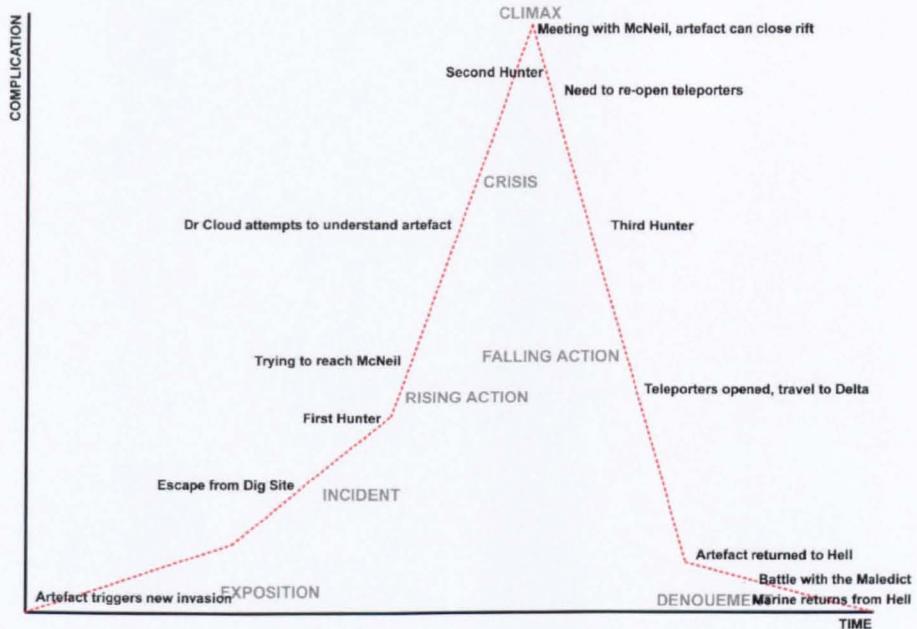
Halo 2



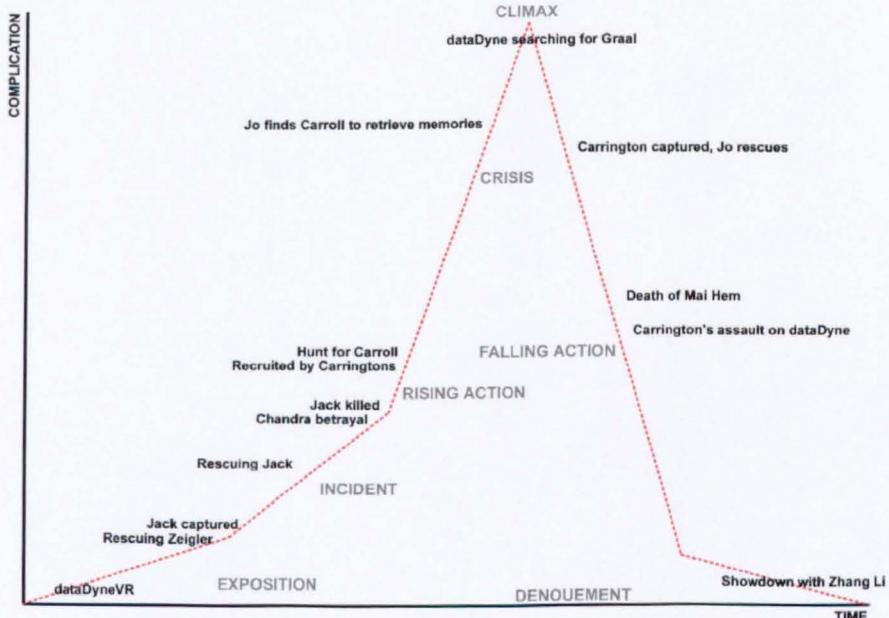
Thief: Deadly Shadows



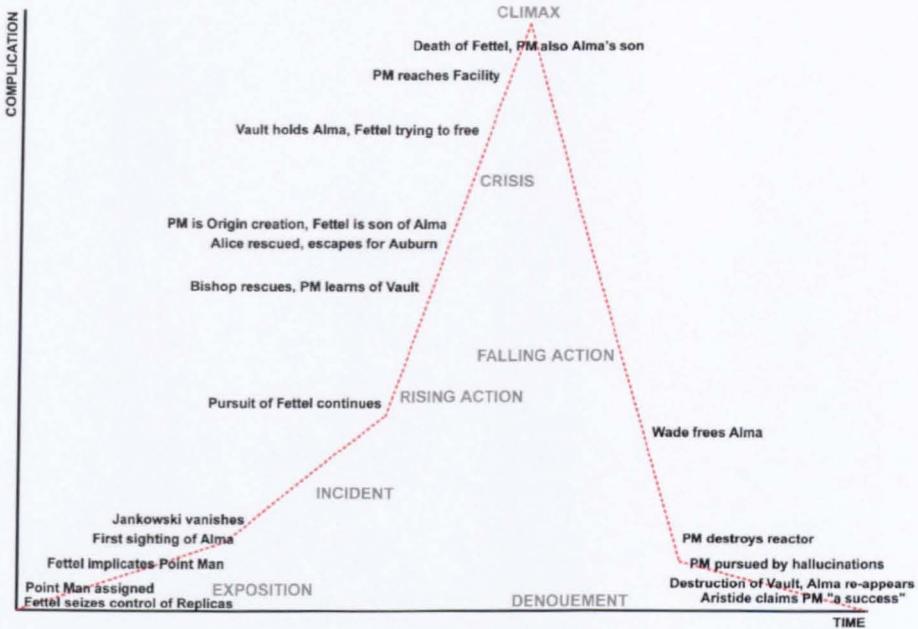
Painkiller



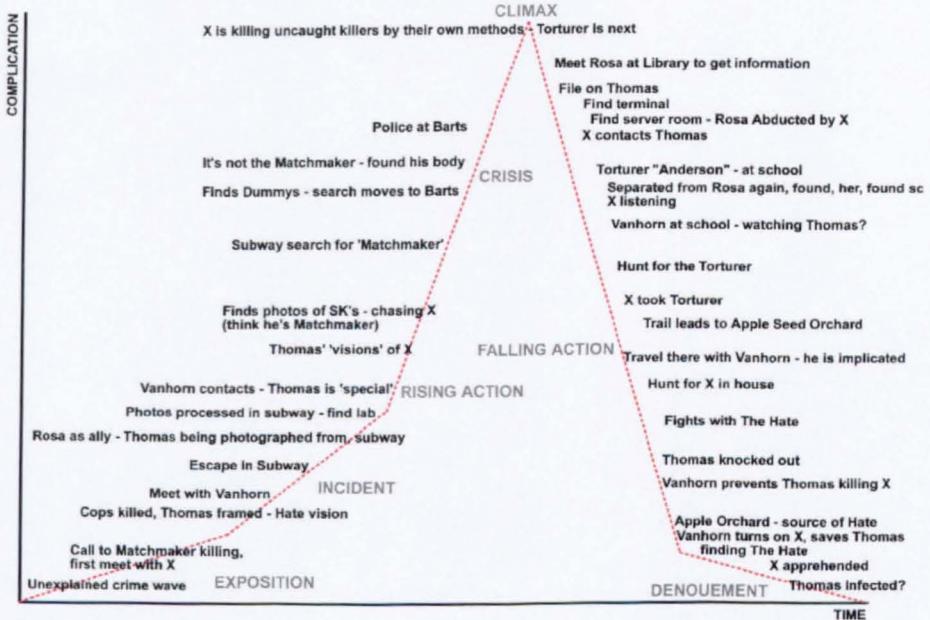
Resurrection of Evil



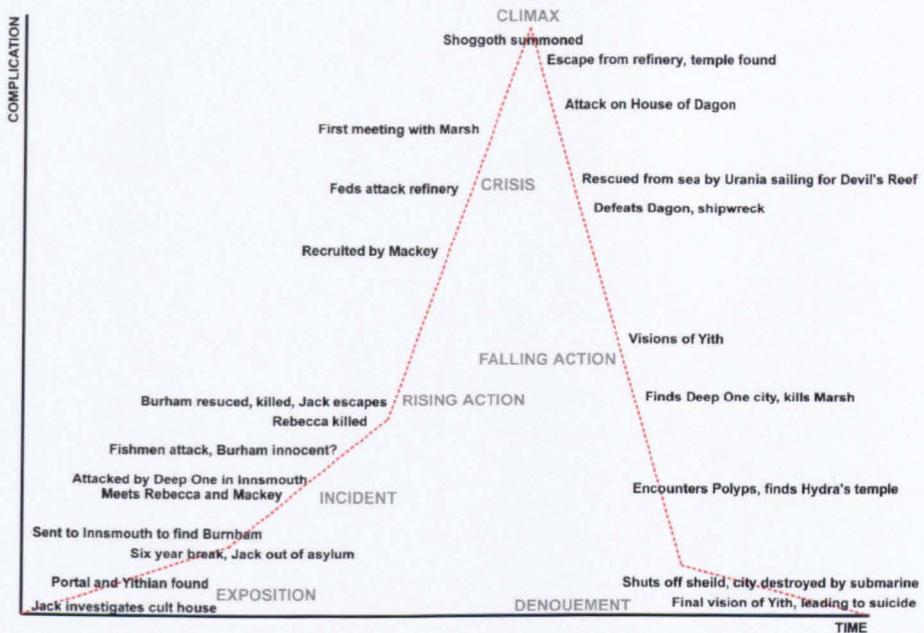
Perfect Dark Zero



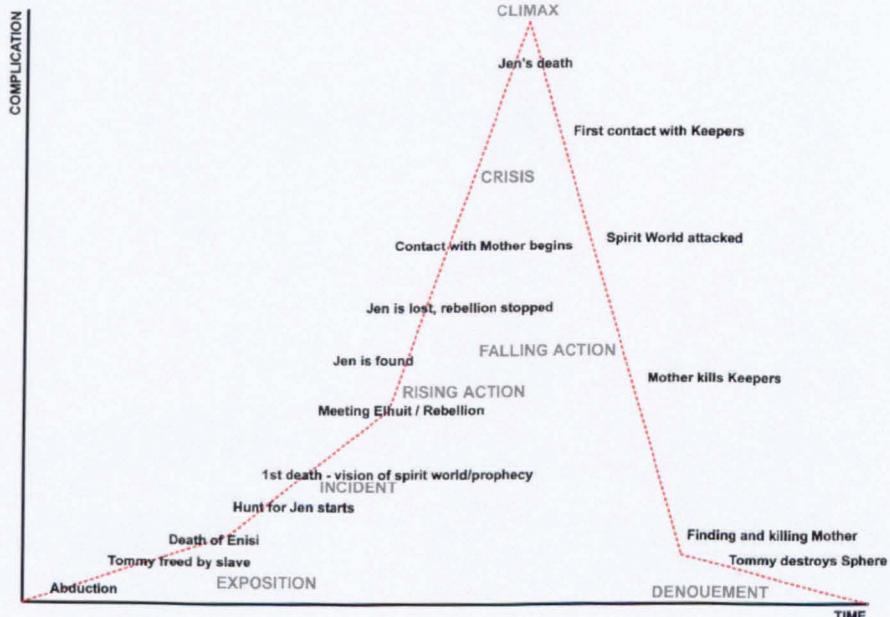
F.E.A.R.



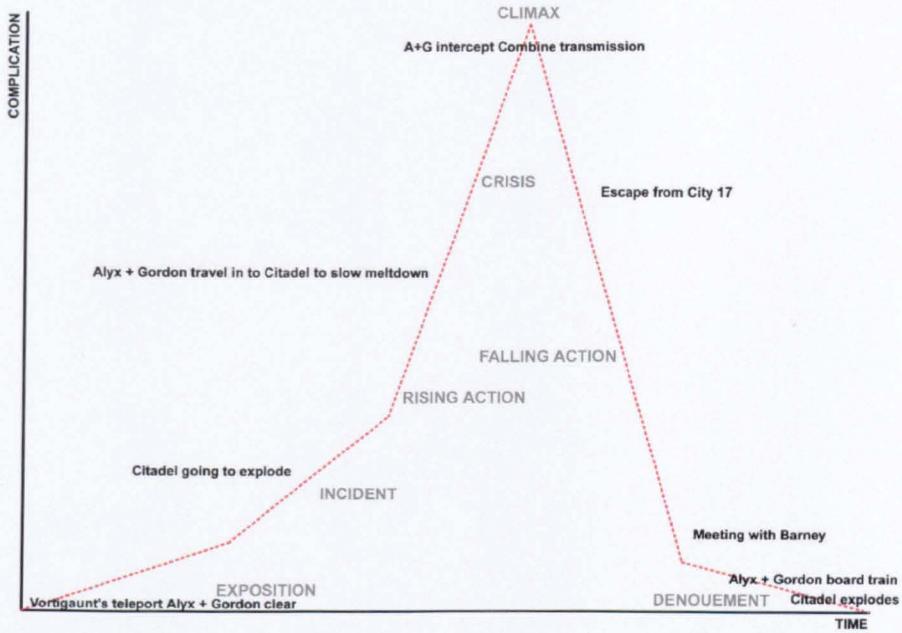
Condemned



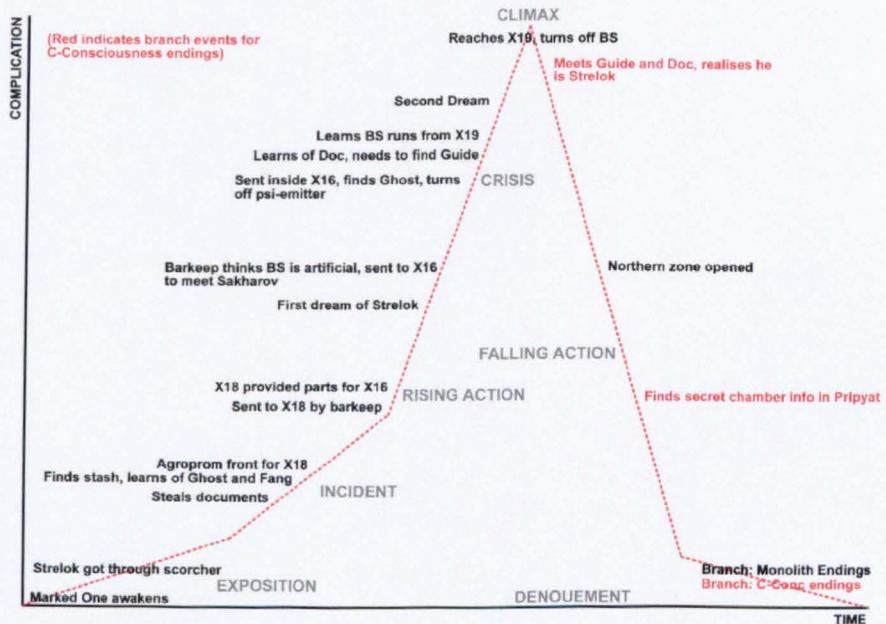
Call of Cthulhu: Dark Corners of the Earth



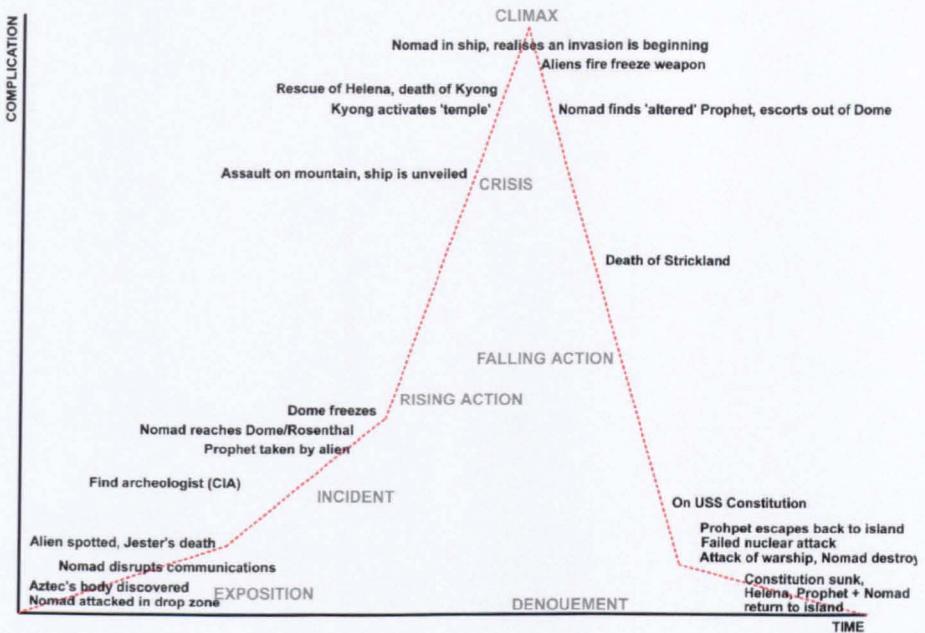
Prey



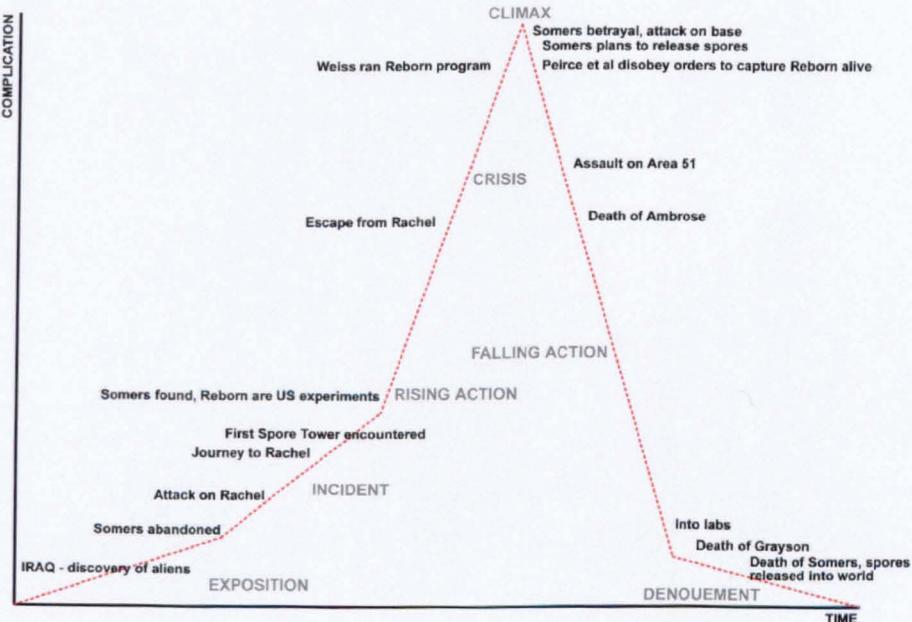
Half Life 2: Episode One



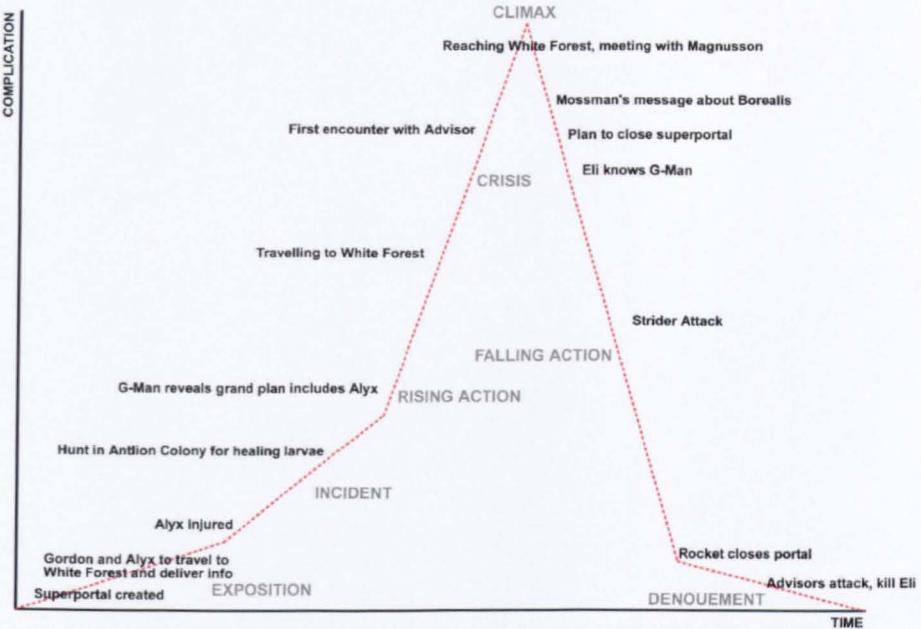
S.T.A.L.K.E.R.: Shadow of Chernobyl



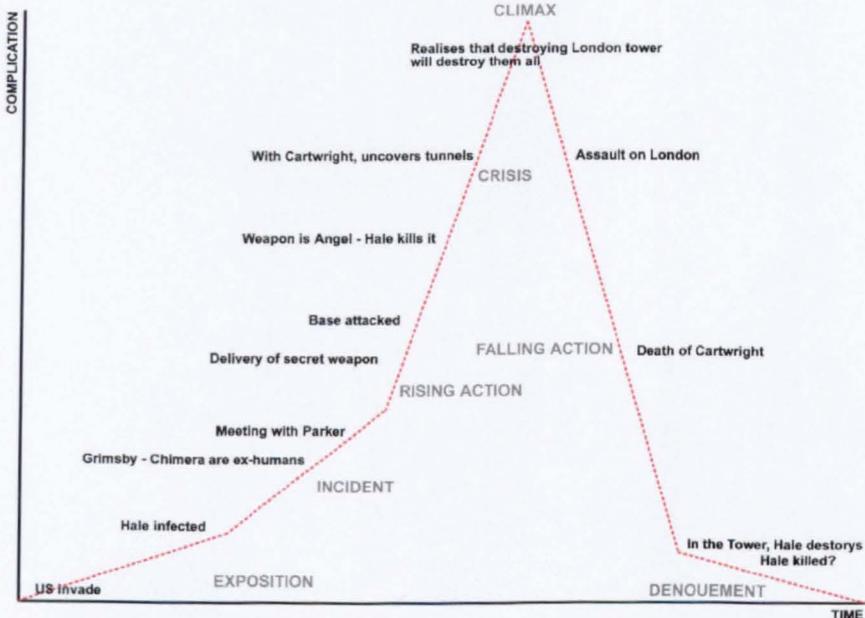
Crysis



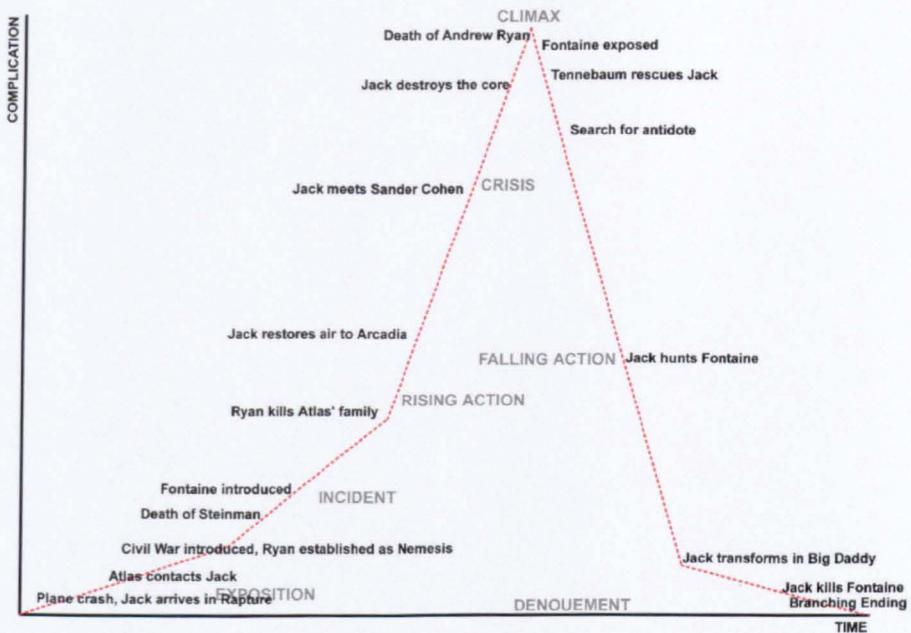
Blacksite: Area 51



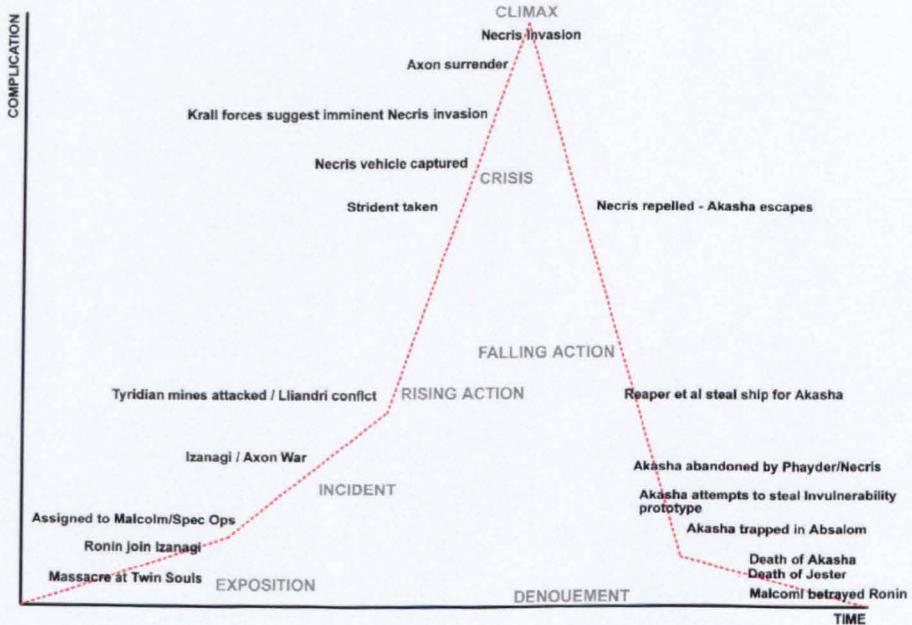
Half Life 2: Episode Two



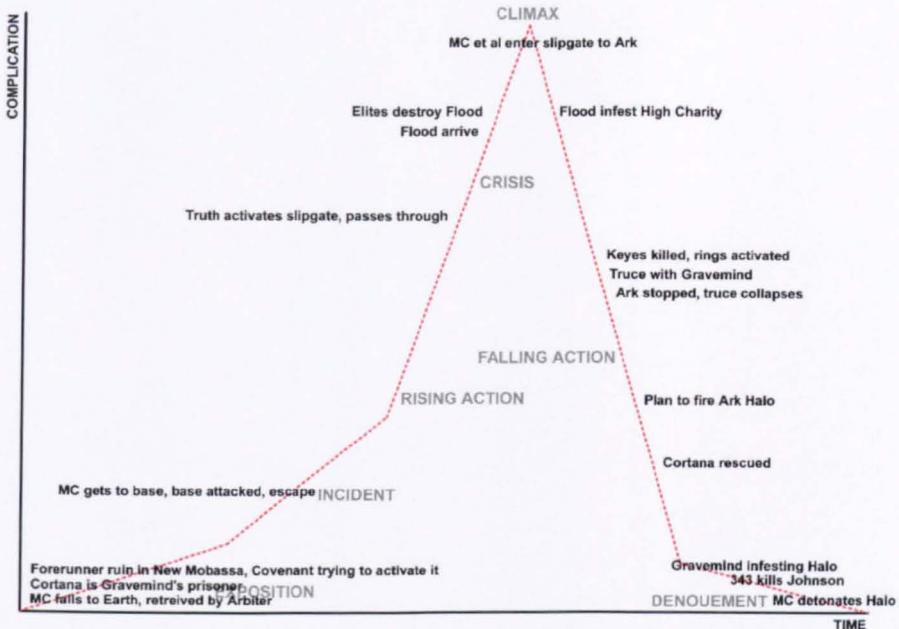
Fall of Man



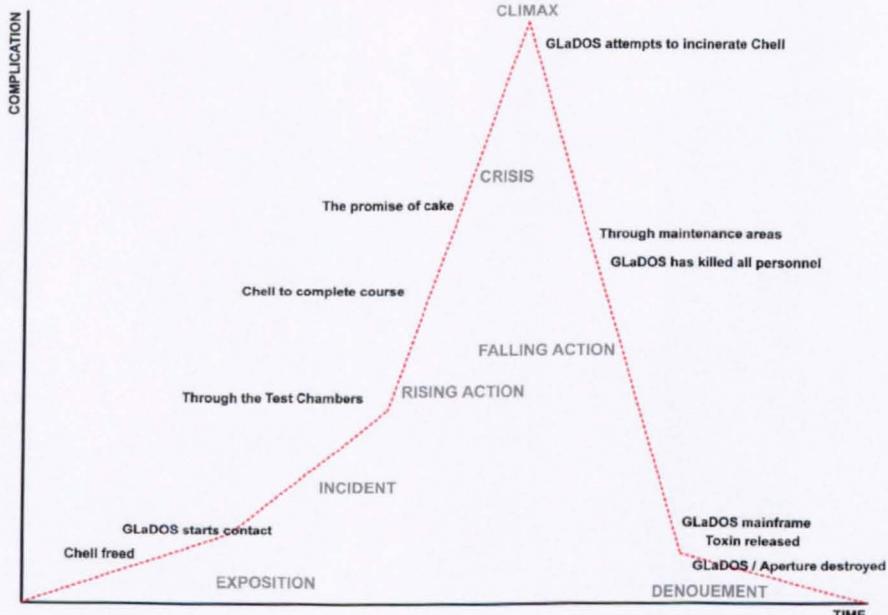
Bioshock



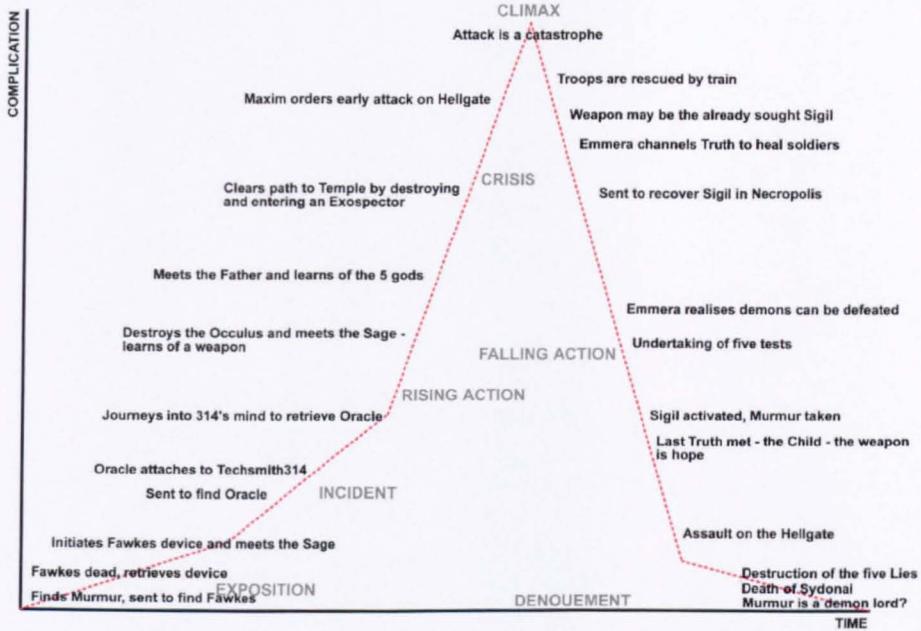
Unreal Tournament 3



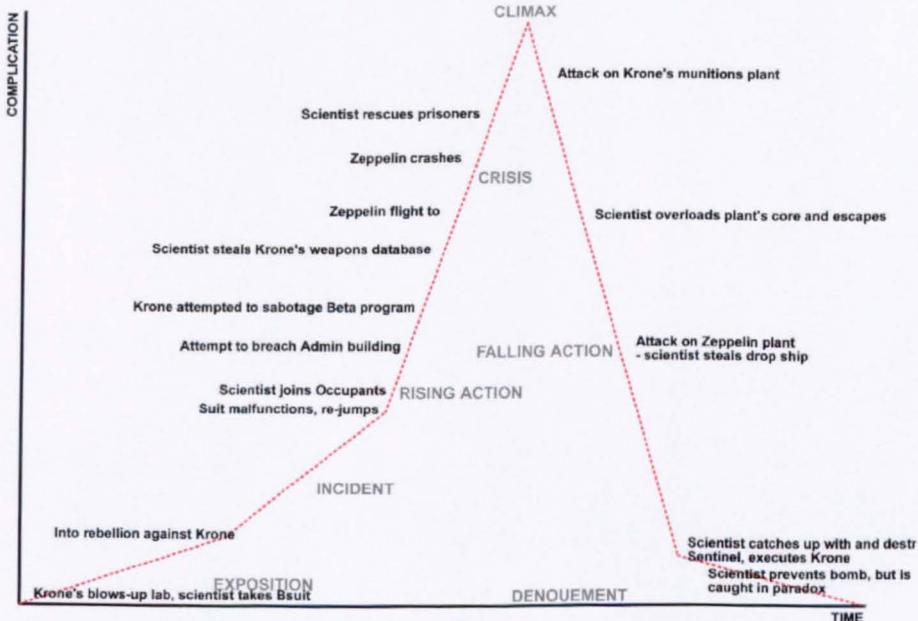
Halo 3



Portal



Hellgate



Timeshift

Appendix C: Plot Drivers across the genre

TITLE	Sequence of drivers
Half Life	Reach, Operate, Escape, Reach (Lambda), Destroy (Alien), Operate (Power On), Operate (Launch Rocket), Escape (Plant), Rescue (Scientists), Operate (Reactor), Reach (Nihilanth), Protect (Scientist being killed before portal opens), Kill (Nihilanth)
System Shock 2	Rendezvous (Polito), Operate (Core), Operate (Hydroponic blockage), Kill (Cyborgs), Retrieve (Sim Units), Retrieve (Codes), Destroy (Shuttles), Reach (Bridge), Destroy (Eggs), Destroy (Many), Kill (S.H.O.D.A.N.)
Deus Ex	Rendezvous (NSF leader), Rescue (Hermann), Rendezvous (Manderley etc), Retrieve (Ambrosia), Rescue (Hostages), Rendezvous (Paul), Destroy (Generator), Kill (Lebedev), Rendezvous (Paul), Operate (Distress Signal), Rescue (Paul), Escape (MJ12), Destroy (WeaponLock), Retrieve+Deliver (Sword), Infiltrate (Versalife), Operate (UC), Rendezvous (Dowd), Destroy (Freighter), Destroy (EMP field), Rendezvous (Silhouette), Rescue (Silhouette Hostages), Rendezvous (DuClaire), Retrieve (Computer Room), Reach (Cathedral Computer), Retrieve (Gold), Reach (Metro Station), Rendezvous (Everett), Operate (Bot system), Reach (Command Centre), Rescue (Tiffany), Infiltrate (Lab), Retrieve (UC blueprint), Operate (Missile Launch), BRANCHING ENDING: Rendezvous (Helios), Kill (Page), Operate (Reactor)
The Operative	Reach (Briefing), Escort (Assassination Attempt), Rendezvous (Bruno), Operate (Bombs), Rescue (Hostages). Kill (Volkov), Infiltrate (Smugglers), Reach (Briefing), Infiltrate (Compound), Retrieve (Classified Info), Rendezvous (Werner), Rescue+Escort (Schenker), Extraction (Plane), Reach (Briefing), Rendezvous (Goodman), Rendezvous (Goodman, Bremen), Operate (Explosives), Infiltrate (Freighter), Retrieve (Photograph Barrels), Escape (Freighter), Escape (Hotel), Retrieve (Manifest/Log), Retrieve (Dumas intel), Infiltrate (Plant), Retrieve (Ledgers), Rendezvous (Dumas), Infiltrate (Dumas HQ), Retrieve (Info from safe), Operate (Explosion), Rescue+Escort (Schenker), Operate (Sabotage), Reach (Rocket), Retrieve (Antidote), Infiltrate (Chateau), Retrieve (Names), Retrieve (Antidote), Rendezvous (UNITY troops), Extraction (Mountain), Rescue (Civilians), Kill (Goodman)
Deliver to Castle Wolfenstein	Escape (Castle), Rendezvous (Kessler), Reach (Catacombs), Retrieve (Journal), Reach (Church), Kill (Helga), Destroy (Rocket), Destroy (Radar), Extraction, Reach (SWF), Retrieve (Xlab location), Retrieve (SSoldier info), Kill (SSoldier), Kill (Officers), Infiltrate (Ceremony), Reach (Castle), Kill (Heinrich)
Undying	Rendezvous (Jeremiah), Protect (Jeremiah), Kill (Lizbeth), Retrieve (Amulets), Retrieve (Scythe), Rendezvous (Jeremiah), Kill (Ambrose), Kill (Keisinger), Kill (Aaron), Kill (Bethany), Kill (Undying King)
Halo	Extraction (Pillar), Locate (Troops), Rescue+Escort (Keyes), Reach (Map Room), Reach (Control Room), Rendezvous (Keyes), Escape, Retrieve (Index), Destroy (Generators), Retrieve (Implant data), Reach (Bridge), Destroy (Reactors), Escape
No-One Lives Forever	Reach (Meeting), Retrieve (Khios data), Operate (Plant Explosives), Escape, Rescue (Pilot), Operate (Bomb), Retrieve (Omega info), Extraction, Retrieve (blackmail info), Operate (Bug), Retrieve (Posters), Retrieve (safe contents), Operate (Plant Bombs), Extraction, Retrieve (Omega info), Extraction, Rescue (Civilians), Retrieve (Glasses), Operate (Bombs), Rescue (Armstrong), Retrieve (Mission Statement), Kill (Mime King), Escape, Destroy (Generator), Escape, Kill (Volkov), Kill (Isako), Destroy (Submarine), Kill (SuperSoldiers)
Doom 3	Rendezvous (scientist), Escape (to marine command), Rendezvous (Bravo Team), Reach (EnPro), Operate (Transmission), Operate (Reactor), Operate (Cancel Transmission –

	branch), Operate (Pump system), Operate (Power-up Delta – multiple Retrieves), Operate (Override), Retrieve (SoulCube), Kill (Sarge), Destroy (HellGate)
Far Cry	Escape, Rescue (Val), Destroy (Comms Tower), Rendezvous (Doyle), Reach (Bunker), Rescue (Val), Retrieve (Plans), Destroy (Steam generator), Escape, Rescue (Val – with reach bunker again), Destroy (Towers), Destroy (Freighter), Retrieve (PDA), Kill (Crowe), Retrieve (Bomb Codes), Protect (Val arms Bomb), Escape, Kill (Kreiger), Kill (Doyle)
Deus Ex: Invisible War	Rendezvous (Nassif et al), Escape, Reach (WTO), Retrieve (Info from Nassif's apt), Operate (Toxin clean up), Rendezvous (Black/Johnson), Reach (Order), Escape, Retrieve (Mag Rail) / Kill (scientist), Reach (Arcology), Rescue (Klara), Reach (Hangar 24), Operate (Nano Clearance), Rendezvous (Tong), Rescue (DuClaire), Operate (Teleporters), Reach (Sanctuary), Operate (JC Resurrection), Operate (Versalife base power), Rescue (Paul), BRANCHING ENDING: Operate (Aquinas spec) / Kill (Dentons) / Destroy (Machine) / Kill (Everyone)
Half Life 2	Escape, Reach (Kleiner's labs), Reach (Black Mesa), Rendezvous/Follow (Grigori), Reach (Nova Prospekt), Destroy (Bridge Forcefield), Kill (Gunship), Rescue (Eli), Escort (Alyx), Reach (Citadel), Escort (Alyx), Destroy (Suppression Field), Rescue (Alyx), Destroy (Portal)
Quake 4	Rendezvous (Rhino Squad), Escort (Anderson), Destroy (Hangars), Escort (Rhodes), Operate (Cannon), Reach (Hannibal), Reach (Briefing Room), Escort (Convoy), Rescue/Escort (Newberry), Operate (Shutdown grid), Reach (Aqueducts), Infiltrate (Node), Escort+Protect (Strauss), Operate (Forcefield deactivation), Escort+Protect (Strauss), Destroy (Coolant Pumps), Follow (Andersson), Escape (Recomposition Centre etc), Destroy (Soyent Processor), Extraction, Reach (Briefing), Operate (Hangar Doors), Reach (Tower), Operate (Processing Tower Power), Infiltrate (Core), Kill (Makron), Destroy (Nexus)
Halo 2	Secure (Boarding), Operate (Bomb), Rescue (Marines), Reach (New Mombassa), Rendezvous (Reinforcements), Destroy (Scarab), Kill (Heretic), Destroy (CloudBase), Retrieve (Index), Reach (Towers), Reach (Temple), Kill (Regret), Retrieve (Scared Icon), Reach (Library), Retrieve (Index), Rescue (Marines), Kill (Truth), Kill (Brutes), Escape (High Charity), Reach (Control Room), Operate (Prevent Halo), Kill (Tartarus)
Thief: Deadly Shadows	Retrieve (Bag), Retrieve (Opal), Rendezvous (Fence), Reach (Fence), Rendezvous (Keepers), Retrieve (Paw), Retrieve (Chalice), Deliver (Chalice+Paw), Rendezvous (Artemus+Isolde), Retrieve (Ship's Manifest), Reach (Mansion), Retrieve (Compendium), Retrieve (Glyph Key), Reach (Library), Destroy (Clocktower), Reach (Library), Escape, Reach (Graveyard), Reach (Library), Retrieve (info from Artemus + Orland), Extraction, Rendezvous (Drept), Reach (Cradle), Retrieve /Destroy (Lauryl's objects), Operate (Past/Memories), Kill (Self), Follow (Lauryl), Retrieve (Artifacts), Retrieve (Unbinding), Retrieve-Deliver (Artifacts)
Painkiller	Kill (General), Kill (General), Kill (General), Rescue (Eve – never completed), Kill (Lucifer)
Resurrection of Evil	Escape (Dig Site), Rendezvous (McNeil), Retrieve (Tablet), Retrieve (Multiple power cells), Reach (Armory), Operate (Security Bot), Follow (Security Bot), Operate (Teleporters), Deliver (Artifact-Hell), Operate (Re-route power), Operate (Teleporter), Reach (Hell)
Perfect Dark Zero	Destroy (CPU), Extraction (Labs), Rescue (Jack), Retrieve (Briefcase), Extraction (Evac Point), Escort (Jack), Kill (Killian), Reach (Mansion), Operate (Security), Operate (Server), Kill (Mai Hem), Rescue (Jack), Operate (Shutdown systems), Extraction (River), Operate (Radar), Kill (Brothers), Escort (Carroll), Operate (Obtain program), Extraction, Escort (Defend Dropship), Reach (Dig Site), Rescue+Escort (Pilot), Operate

	(Sabotage lifters), Operate (Tracking Device), Kill (Phantoms), Rescue (Carrington), Destroy (Dropships/Convoy/Defenses), Kill (Mai Hem), Escort (Carrington), Reach (Bridge), Destroy (Mortars), Reach (Coliseum), Kill (Zhang Li)
E.E.A.R.	Rendezvous (Jankowski), Kill (Fettel), Rendezvous (Jankowski), Infiltrate (Offices), Operate (Hub), Rendezvous (SFOD-D Team), Rendezvous (Bishop+Holiday), Kill (ATC), Reach (Main Building), Operate (Security Override), Rescue (Alice Wade), Retrieve (Harlan Wade data), Escort (Alice Wade), Kill (Replicas), Reach (Compound), Rendezvous (Harlan Wade), Operate (Vault Doors), Destroy (Reactor), Escape
Condemned	Retrieve (Crime data), Locate (X), Escape, Retrieve (Photo lab), Rendezvous (X), Retrieve (Lair in subway), Retrieve (Body in Barts), Escape (Barts), Rendezvous (Rosa), Operate (Server) Rescue (Rosa), Rendezvous (Rosa), Retrieve (School Data), Rescue (Tibbets), Kill (X), Kill (The Hate)
Call of Cthulhu	Infiltrate (Cult House), Operate (Portal), Infiltrate (Innsmouth), Escape (Innsmouth), Rescue (Burnham), Escort (Burnham), Escape (Truck), Rescue (Ruth), Infiltrate (Refinery), Operate (Generator), Rescue (Hoover), Kill (Marsh), Escape (Shoggoth), Infiltrate (Secret Chamber), Destroy (Shoggoth), Reach (Mansion), Rescue (Mackey), Infiltrate (Temple), Secure (Urania), Retrieve (Armory Key), Operate (Fix Engine), Kill (Dagon), Infiltrate (Reef), Operate (Shutdown barrier), Escape (Prison), Reach (Hydra Temple), Kill (Hydra), Escape (City)
Prey	Kill (Bikers), Escape (Machines), Rescue (Jen), Reach (Spirit Test), Rendezvous (Others), Kill (Keeper), Rescue (Jen), Destroy (Core), Kill (Jen), Kill (Keeper), Defend (Spirit Realm), Rendezvous (Mother), Kill (Mother)
HL2Episode1	Operate (Containment Fields), Escort (Alyx), Escape (Undercity), Extraction (City17), Reach (Station), Escort (Citizens), Kill (Strider)
S.T.A.L.K.E.R	Kill (Strelak), Rescue (Nimble), Retrieve/Deliver (Military Documents-Barkeep), Rendezvous (Mole), Reach (Strelak stash), Kill (Bandit Leader), Retrieve (X18 Docs), Extraction (X18), Deliver (X18 docs), Rescue/Escort (Kruglov), Escort (Kruglov), Retrieve (Vasiliev data), Operate (Turn off PsiEmitter), Extraction (X16), <i>Rendezvous (Guide)</i> , <i>Rendezvous (Doc)</i> , Operate (Turn off Brain Scorcher), Reach (NPP), Retrieve (Pripyat stash), Operate (Monolith), Reach (Control Room), Destroy (C-Consciousness)
Crysis	Rendezvous (Jester), Rescue (Aztec), Operate (Shutdown GPS), Reach (Distress Signal), Rescue (Jester), Reach (Comms Trailer), Rescue (CIA), Rendezvous (Prophet), Operate (GPS Jammer), Retrieve (Tactics), Extraction, Infiltrate (Research Dome), Extraction (Extraction Point), Destroy (AA Units), Operate (Jam GPS), Operate (AirStrike Target), Rendezvous (Strickland), Reach (Station), Operate (AirStrike Target), Reach (Mine), Rescue (Hostages), Kill (Kyong), Escape (Alien Ship), Escort (Prophet), Rendezvous (Strickland), Rescue (Rosenthal), Reach (Constitution), Rendezvous (Morrison), Rescue (Deck), Operate (Repair Reactor), Rendezvous (Rosenthal), Kill (Exosuit), Kill (Warship)
Blacksite	Reach (Guard Post), Operate (Comms), Destroy (Bridge), Reach (Village), Rendezvous (Weis), Infiltrate (Bunker), Extraction (Bunker), Follow (Grayson), Reach (Rachel), Infiltrate (Downtown), Rescue (4 th Infantry), Escort (Somers), Rendezvous (Green, Grayson), Reach (Rooftop), Rescue (Medical), Reach (Armory), Destroy (Spore Tower), Secure (Base), Rendezvous (Chopper), Reach (Dome), Kill (Brute), Destroy (Spore Tower), Infiltrate (Dome), Kill (Somers)
HL2Episode 2	Reach (White Forest), Deliver (Combine Data), Operate (Transmission), Rescue (Alyx), Rendezvous (Vortigaunts), Protect (Alyx), Retrieve (Larval Extract), Retrieve (Car), Reach (White Forest), Destroy (Autogun), Rendezvous (Eli, Magnusson, Kleiner), Operate (Silo Doors), Destroy (Striders), Follow (Alyx)
Fall of Man	Escape (Battle), Rendezvous (Baker Co.), Destroy (Guns), Defend (Depot), Escape

	(Conversion Centre), Rendezvous (Convoy), Defend (Convoy), Kill (Stalker), Kill (Mortar Teams), Rendezvous (K Troop), Rendezvous (Cartwright), Kill (Pylon Teams), Operate (Generator), Extraction (Command), Defend (Angel Tank), Rendezvous (Cartwright), Infiltrate (Gorge), Infiltrate (Base), Extraction (Gorge), Infiltrate (Southern Command), Reach (Hangar), Secure (Hangar), Rescue (Evacuees), Infiltrate (Tunnels), Escape (Tower), Reach (Central Tower), Kill (All Stalkers), Protect (Bridge Demolition), Rendezvous (Cartwright), Reach (Bridge), Destroy (Bridge), Infiltrate (Tower), Destroy (Reactor)
Bioshock	Escape (Crash), Reach (Higher Ground), Reach (Neptune's Bounty), Rendezvous (Atlas' family), Reach (Emergency Access), Retrieve (Steinman's Key), Operate (Open EA), Rendezvous (Atlas), Retrieve (Camera), Operate (Photo Splicers), Reach (Submarine), Kill (Ryan), Reach (Metro), Rendezvous (Langford), Retrieve (Specimen), Retrieve (Samples), Operate (Lazarus Vector), Reach (Hephaestus), Retrieve (Cohen's Masterpiece), Operate (Core Overload), Retrieve (EMP parts), Kill (Ryan), Retrieve (cure for programming), Retrieve (Big Daddy parts), Escort (Little Sister), Kill (Fontaine)
Unreal Tournament 3	Extremely difficult as many branching missions; however, each mission is one of a basic type: Kill (Deathmatch), Destroy (Core), Retrieve/Deliver (FlaG). However, overall plot drivers are: Reach (Axon Territories and destroy the corp); Retrieve (Tyridian); Kill (Akasha); Defend (from Necris Attack); Reach (Necris Homeworld); Kill (Akasha)
Timeshift	Kill (Krone); Reach (Meeting Room), Rendezvous (Cooke), Defend (Occupants), Reach (Construction Site), Infiltrate (Admin Building), Retrieve (Server Info), Extraction (Evac Point), Defend (Zeppelin), Rescue (Delta Battalion), Reach (Crash Site), Infiltrate (Prison), Reach (Rendezvous Point), Infiltrate (Munitions Factory), Operate (Flush Reactor Coolant), Extraction (Dropship), Retrieve (Zeppelin), Destroy (WTF doors), Operate (Prepare Zeppelin), Retrieve (Alpha Drive), Destroy (Sentinel).
Halo 3	Extraction (Evac), Rescue (Johnson), Secure (Base), Rescue (Marines), Operate (Bomb), Extraction (Base), Escort (Marines), Reach (Voi), Destroy (Covenant Ground Forces), Destroy (Flood vessel), Rescue (Cortana), Destroy (Air Defenses), Reach (Cartographer), Follow (343), Operate (Deactivate Shields), Prevent (Truth), Kill (Truth), Operate (Ark Halo), Rescue (Cortana), Destroy (High Charity), Reach (Control Room), Kill (343), Operate (Halo), Escape
Portal	Reach (End of Test Chambers), Escape (Incinerator), Escape (Aperture), Destroy (GLaDOS)
Hellgate	Escort (Murmur), Rescue (Fawkes), Operate (Fawkes device), Retrieve (Oracle – multiple), Reach (314's mind), Retrieve (Exospector's Heart), Destroy (Boils), Destroy (Oculus), Rendezvous (Arphaum), Rescue (Templar), Rescue (Lann), Operate (Modified Fawkes device), Kill (Tower Beast), Retrieve (Train parts), Rescue (Forces), Defend (Emmera), Infiltrate (Necropolis), Retrieve (Marker), Operate (5 trials), Reach (Hellgate), Kill (5 lies), Kill (Sydonai)

Appendix D: Walkthroughs, scripts and game guides used in the analysis

Data for games was gathered primarily via playthroughs, with FRAPS screencapture software used to record sessions for post-play analysis. However, a number of walkthroughs and game guides were also consulted during the analysis process and require referencing. In all cases, dates refer to last updates.

Half Life

<http://www.gamefaqs.com/computer/doswin/file/43362/20170>

Walkthrough, Rodrigo Argenta 2003

<http://www.gamefaqs.com/computer/doswin/file/43362/29847>

Game Script, Matthew Sullivan 2004

System Shock 2

<http://www.gamefaqs.com/computer/doswin/file/185706/27508>

Walkthrough, Basil Brush 2003

<http://www.strangebedfellows.de/shocklog/shocklogs.html>

Audio Log Scripts, StrangeBedFellows.de 2005

Deus Ex

<http://www.gamefaqs.com/computer/doswin/file/250533/51057>

Game Script, Luke Kowalski & Anton Forsander 2007

<http://www.gamefaqs.com/computer/doswin/file/250533/8354>

Walkthrough, Matt Renfrow 2000

<http://www.gamefaqs.com/computer/doswin/file/250533/33172>

Walkthrough, Tarrun 2007

The Operative

<http://www.gamefaqs.com/computer/doswin/file/913839/9599>

Walkthrough, J Novakouski 2001

<http://www.gamefaqs.com/computer/doswin/file/913839/26950>

Walkthrough, Jeffrey H / ColdNRG 2004

Return to Castle Wolfenstein

<http://www.gamefaqs.com/computer/doswin/file/913853/15718>

Walkthrough, LordKrell 2002

Undying

<http://www.gamefaqs.com/computer/doswin/file/914322/24317>

Walkthrough, Daniel Engel 2004

<http://www.youtube.com/watch?v=AGX2qA5sIy4&feature=related>

Video Walkthrough, NetMoverSitan 2008

<http://forums.somethingawful.com/showthread.php?threadid=2920965>

Video walkthrough and journal scripts, Vexation 2007

Halo

<http://www.gamefaqs.com/computer/doswin/file/291594/15651>

Walkthrough, R. K. Raja / DaRkLoRdXThree 2004

<http://www.gamefaqs.com/computer/doswin/file/291594/24749>

Game Script, Wesker 2004

<http://nikon.bungie.org/misc/cutscenes/>

Halo (plus Halo 2 & 3) cutscene library, HaLo2FrEeEk / Inectionist Machinima 2008

No-One Lives Forever: A Spy in H.A.R.M.'s way

<http://www.gamefaqs.com/computer/doswin/file/532478/19767>

Walkthrough, Tex Gotanda 2005

Doom 3

<http://www.gamefaqs.com/computer/doswin/file/469881/49345>

Walkthrough, kingkamikazeXXI 2008

Far Cry

<http://www.gamefaqs.com/computer/doswin/file/371314/29726>

Walkthrough, Vlad Danilchuk / AllYourBaseBelong2Us 2004

Deus Ex: Invisible War

<http://www.gamefaqs.com/computer/doswin/file/528588/28305>

Walkthrough, J.Paterson 2004

Half Life 2

<http://www.gamefaqs.com/computer/doswin/file/914642/33738>

Walkthrough, Greg Turnage 2007

<http://www.gamefaqs.com/computer/doswin/file/914642/38075>

Game Script, vegetarian_onos 2007

Quake 4

<http://www.gamefaqs.com/computer/doswin/file/531883/41687>

Walkthrough, Lord Krell 2006

Quake 4 Game Guide

Walkthrough, GRY-OnLine.pl for Gamepressure.com 2005 (www.gamepressure.com)

Halo 2

<http://www.gamefaqs.com/console/xbox/file/562116/33366>

Walkthrough, Iain Shanks 2005

<http://www.gamefaqs.com/console/xbox/file/562116/34100>

Game script, Rachel Maille / Ferrik_Grey 2005

Thief: Deadly Shadows

http://www.archive.org/details/Thief3_100p_13115

Speed Run video archive, Daniel Burns 2006

Painkiller

<http://www.gamefaqs.com/computer/doswin/file/534813/31168>

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