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“NARRATIVE AND GAME MECHANICS”

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INTRODUCTION

When an aspiring game developer sets out to learn about the creation of video games, they are faced with a myriad of disciplines, each important to a game in their own right. As a result, the disciplines are usually examined individually, separating components such as story from interactions, visuals from technology. Given that each of these aspects contains another vast set of subcategories, teaching specialized knowledge to create expertise on at least one field is an utilitarian approach to game design. Yet in the end, a game is not about its interesting visuals, or challenging mechanics, but about the experience it elicits within the player.

The experience is the result of the interconnections between all of these compounds, created by the designer, perceived in the individual context that the player creates for themselves when playing the game.

The main task of this thesis will be to examine how player interaction shapes narrative, and thus the perceived gameplay experience.

In this context, the term narrative is limited to the implicit narration, generated solely through the interaction with the system, which is what the player would perceive if the game was stripped of its direct exposition. This excludes story transported through pre-rendered means, such as text or video, because while these are also vital components that support the experience, they are already widely researched means of narration because of their use in traditional media.

The systemic narrative, the story that develops through the use of mechanics, on the other hand is a result of the innate interactivity of video games, and it is shaped by two essential factors:

For one there is the gameworld, and its inherent story, the emerging mechanics and lore that the designer has planned out in order to deliver the experience. Secondly there is the player, who brings their own history, expectations and personality into the interaction.

The player is the limiting factor of the entire experience, which the game should acknowledge by providing a space of opportunity for the player to make their own decisions, creating a sense of agency that allows the player to take authored directions and turn them into something personal.

To be able to approximate the player's perception and their influence on the experience, the designer needs to understand the inner workings of a person during the game.

So in the first part of this thesis, we examine the concept of the player. The player is one of the fragments of self that is formed during the interaction with a game, a cross of the cultural circumstances, personality and ideals acquired throughout life as well as the motivations and goals created during play, as a reflection upon the content provided by the designer. In order to include them into the game design, an understanding of each of the existing fragments as well as their individual goals and perceptions of identity is vital to create an experience that resonates on a personal level.

The second part describes how mechanics and their structural integration influence the narrative. Here, we distinguish between experiences that either stimulate the self-expression of the player, or experiences that require the reaction of the player to the authored content of the gameworld. For expressive experiences, the mechanics need to have multiple points of interaction with themselves and the gameworld, in order to offer the player the space needed for their expressive interaction. Reactive experiences on the other hand arise when framing interactions with narrative connotations, putting the player's actions into a dramatic context.

This shifting focus requires the emphasis on either the mechanic itself or the structure in which it is set up, which can heavily change the narrative connotations of an action, putting the player's action into a dramatic context.

Through examples from games that employ mechanics from both sides, expressive and mechanics-driven as well as reactive and context-driven, we can build a working foundation on how to infuse interaction with narrative and vice versa, that can help designers figure out what type of experience they want their game to transport, and how by including the player's perspective into the design process they can help generate an experience that is both interesting from a narrative perspective as well as meaningful to the player.

Before diving into the main content, definitions of the core terms will help establish a common vocabulary, and a brief detour into the current state of the art in the video game industry will explain how experience-driven game design is relevant to push the medium forward.

TERMINOLOGY

GAME

In the context of this thesis, the term game describes software running on a computer, or computer-like device, that is specifically designed to elicit a certain experience triggered through interaction. Though this definition mentions the aspects that are important for the designer to know, namely the player as the originator and the experience as the goal of the game, it is a far cry from an all-encompassing definition. However, it is difficult to find a universally applicable definition, since core properties of what constitutes a game can vary greatly, depending on who is looking at it. To get an overview of several possible lenses under which games can be examined, we look at different academic fields and their perspective on games.

The academic interest for games and their cultural significance started with the Dutch historian Johan Huizinga in 1938. Since then several scholars from different fields of expertise have started to analyse their inner structure as well as their exterior significance in regards to personal behaviour and society at large

In 1959, French philosopher Roger Caillois¹ distilled games into four essential categories of play:

- Competition: Skill determines whether a player wins or loses. This is the basis of most sport games, table top games such as chess, and most video games within the action genre
- Chance: The victory is based on a random component that is unpredictable. Chance is the core concept of any dice game for example, but it is also a component in many other games, usually integrated to even out the odds created by player at different levels of skill.
- Imitation: Taking on the role of someone else. In children's games this is often seen in 'playing-house', where children take on the role of a grownup. In most video games the adapted role is something more fantastic, with the player taking on the character of a savvy action hero or a stealthy thief. The goal of

¹Egenfeld-Nielsen, Heide Smith, Pajares Tosca (2013), p. 31

this type of play is not necessarily winning something, but the experience of being someone else.

- Vertigo: Games that focus on the pleasure that a certain type of physical activity elicits. Swings and roller coaster are real life examples, but the physical simulation within a digital space that can be found in racing games or fast-paced jump 'n run games are based on the same type of experience.

Furthermore, Caillois differentiates between what he calls *paidia* and *ludus*. *Paidia* is the purest form of unconstrained play, action for just the fun and no productive value and quantifiable outcome, while *ludus* describes rule-bound play with a winning condition. Although Caillois perceived his classifications as a scale and the categories of play as a grid that any game can easily be sorted into, the reality is that some games, especially video games with a complex structure and a multitude of possible actions and combinations of them, often fall into so many categories at once that the partitioning seems quite useless to begin with.

There are a multitude of other classification systems, but they all suffer from the same problem, namely that they classify games based on the mechanics they employ rather than the content they are trying to transport. The most practical diversification is probably the distinction between structured and unstructured play. Video games inherently have a basic amount of stated rules, or structured play, because this is the only way the underlying code structure can work. However this does not mean that there is no undirected play possible, within the boundaries of that logically created world.

A different aspect on games comes from the field of psychological studies. Professor K. Anders Ericsson has described games as deliberate practise machines. Deliberate practise is designed to improve performance through repetition, it provides continuous feedback, should be mentally demanding and challenging, and require clear set goals. While these are aspects that many games share, and it is indeed widely accepted that games provide a learning mechanism, a criterion for games has often been whether it is 'fun', and not whether it creates expertise. However, fun is a very limiting quality to attach to games if game designers still aspire to create games that have a more meaningful impact on the player. Instead, other measurements for the quality of games should be introduced. There are myriads of emotions that games can elicit within the player, such as happiness, fear, ambiguity or regret. These emotions are the reason that people play games, not the mechanical mastery that is created while playing, which is more of a by-product. For this reason, some researchers, Caillois amongst

others, uphold the definition that games should be 'unproductive'. Unproductive does not imply meaningless, rather it describes the idea that games should be played voluntarily as to not divert the player from experiencing these emotions.

These definitions so far are true not only for video games, but are valid for all sorts of play ranging from child's play to table top strategy games. Narrowing the definitions in on video games, a stronger focus is set on the competitive or challenging aspects of a game. For game designer Jesse Schell, the term game can be summarised as follows²:

"A game is a problem-solving activity approached with a playful attitude."

For Schell, this implies that a video game should fulfil the following prerequisites:

1. Games have to be entered wilfully
2. Games have goals
3. Games have conflicts
4. Games have rules
5. Games can be won and lost
6. Games are interactive
7. Games have challenge
8. Games create their own internal value
9. Games can engage players
10. Games are closed, formal systems

Upon entering a game, the player wilfully commits themselves to a learning experience, continuously testing their acquired abilities against a system until a certain goal is reached.

Within this thesis, the subgenre of video games will be the main focus; thusly from here on the term *game* shall describe software, running on a computer or computer-like device.

Schell divides the video game into four equally important and interconnected elements, not all of which are visible to the player, but vital to connect them to the software,

² Schell (2008), p.34

enabling the interactivity. The elements are *Mechanics*, *Story*, *Aesthetics* and *Technology*.

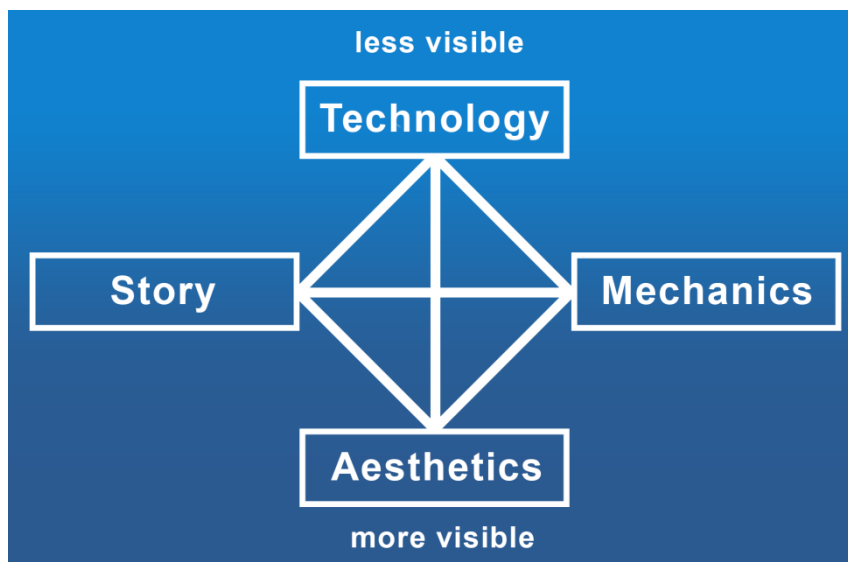


FIGURE 1 : SCHELL´S GAME ELEMENT TETRAED

The *Technology* is the device the software runs on and enables the interactivity through input devices. This could be a PC with mouse and keyboard, the gaming console setup in front of the TV or even a mobile phone. *Aesthetics* are the visualisation of the game, the direct communication with the player to the system, they define what the game looks, sounds and feels like. The *Story* is in this case the sequence of events that unfolds throughout the game, in the form the player experiences it. The story can be branching and emergent or strictly linear, but the player will experience it in only one sequence determined by their own action. This is what the player would tell their friends later about what happened in the game.

Lastly, *Mechanics* are what define the interactivity of the game, in what ways the player can interact with the simulated world and on what conditions which goals can be achieved. While *Mechanics* are the single actions that can be taken, like running or jumping, or commanding the movement of a supply unit, all these actions combined form the *gameplay*.

As valuable as these compounds are in the advanced development for a game, when starting out, during the ideation and conceptual stage of development, the holistic, experience-driven approach is more reasonable. It allows the developer to look past the limiting factors of each compound, by defining a goal, an experience that is to be achieved, that can be used as a beacon and measurement of success throughout all the later stages.

NARRATIVE

GAMEWORLD: GAMEPLAY & EXPERIENCE

The gameworld is the core of the game, containing all the relevant concepts that are geared towards the experience the game will want to elicit.

From a narrative perspective, this includes of course the main characters with their respective story arcs, but also any other facets of a world that are required to make the audience feel that the story is taking place in a believable system, such as societal and geographical structures, physical properties of the world, and life outside the boundaries of interaction. All of these factors form a coherent base for creating side stories, environments and mysteries that further the narrative by allowing the player to explore it. The gameworld also includes the interactions that are possible for the player, defining what means the player has to become a part of the gameworld, and what influence their actions can have. Just as the narrative core, these mechanics are geared towards the specific goal defined by the experience.

Experience is a vague term, hard to describe because the nature of experience is abstract. It is probably best summarised as the feeling a game can create within the player, while playing. More specific examples can be found in the chapter about abstraction. Another reason why experience is hard to pinpoint is because it is a largely subjective impression. No experience will be exactly the same for every player.

Game scholars Ermi and Mäyrä describe experience in a game as follows³:

“Human experience in virtual environments and games are made of the same elements that all other experiences consist of, and the gameplay experience can be defined as an ensemble made up of the player’s sensations, feelings, actions and meaning-making in a gameplay setting. Thus it is not a property or direct cause of certain elements of a game but something that emerges in a unique interaction process between the game and the player.”

To create the gameplay experience the player is meant to have, the designer has two tools: The action itself and the context it is set in.

³ Ermi, Mäyrä (2005)

The actions themselves have narrative compounds and can elicit base emotions solely through the use of their mechanic, which will be more closely examined in part II. Another factor that plays a role in creating gameplay is the level of challenge, the balance between difficulty and mastery that continuously engages the player through increasing the difficulty of the challenge according to their level of skill. However, this has less to do with an amount of emotions experienced during play, and more with the continuous engagement. The context of the mechanic shapes the perception, and thus the meaning of the action.

To illustrate the importance of context, we can look at the video game *Portal*. In one sequence, the player is asked by the malevolent AI GlaDos, who guides their movement through the entire game, to press a button. This by itself is an easy and insignificant task, that the AI could easily do herself. But the context of this action is a different one: By pressing the button, the player will incinerate the Companion Cube. The cube itself is lifeless and has no personality, but through the game, the player has spent a certain amount of time carrying the cube around, using it to solve puzzles, and protecting it from destruction. Through clever comments of the sarcastic AI, the companion cube is portrayed as a friend, the only ally the player has within the walls of the deathly laboratory. The player cannot continue without destroying the cube, and although there is little reason why they should care about it, they often spend a lot of time trying to figure out a way to avoid the cruel death of the cube. In this context, the press of the button has a significant meaning to the player, it stands for admitting defeat, losing a friend and a growing resentment towards the AI, fuelling the motivations of the player to defeat GlaDos and find a way out of the laboratory.

Conclusively, the gameworld is expressed in the gameplay experience. This experience is influenced by the narrative context of the gameworld as well as the engagement and challenge the interaction creates.

TYPES OF NARRATIVE

The definition of the term narrative depends largely on the perspective of the person describing it. Different academic fields use different wordings, and for some the use of the term in this text would seem completely out of context. In this thesis, narrative is an umbrella term that describes the storyworld of a game, the story that is created alongside the gameworld, to create a space and certain events that the player can live

through as their own, personal story. So narrative includes every aspect of the game that is specifically designed towards revealing information in a planned context. Since this includes almost anything that can be found in the gameworld, we narrow it down to more specific applications, by dividing the term on the basis of how the delivery of information takes place⁴:

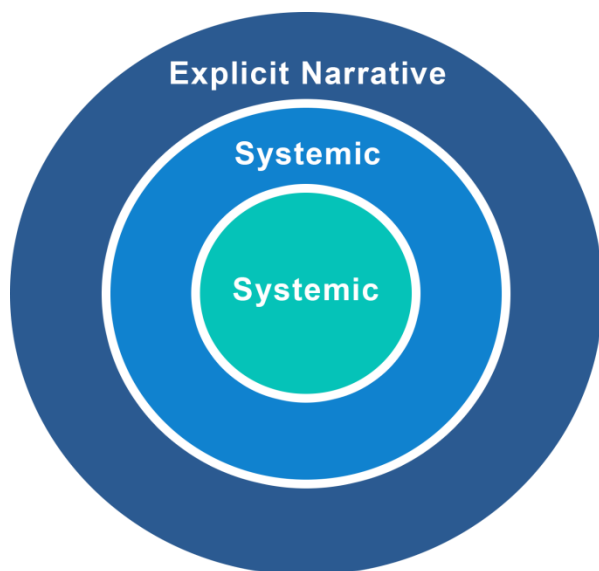


FIGURE 2: TYPES OF NARRATIVE

- **Explicit Narrative:** The part of the narrative that is explicitly told in a predetermined sequence, sometimes also called story. It describes every exposition that is made through dialogue, text, **voice-over** or **cut-scenes**. While explicit story takes place in a game world, and is part of the representation of authored (as opposed to player created) events in this game world, it is designed to convey information, without requiring much or any additional interaction to retrieve this information. Usually, exposition such as cut-scenes are automatically triggered when the player has reached a choke point in the storyline, and it is designed to chain the previous, often branching or non-linear actions, together in order to carry on with the plot. While this is necessary for establishing context or setting a mood, it does not depend as heavily on the interactivity of the medium as the other forms of exposition.
- **Systemic Narrative:** The information that is uncovered through the interactions of the player and the revelations that come with the use of mechanics. This also includes the design and composition of the visible elements that constitute the environment of the gameworld. Compared to the explicit story, systemic narrative requires activity from the player to receive information, through direct interaction, exploration and reflection, and depending on how strictly authored the context is, most of this happens with the player's own pace and direction. This means that the information delivered through systemic narrative is often puzzle-like and non-linear.

⁴Based on Kasavin (2010)

- **Structural Narrative:** The core experience of the game, which encapsulates the designer's vision of the gameworld and its effects on the player, the grand story arc that will unveil itself throughout the game in all its possible combinations. It is the part of the narrative that includes the lore of the gameworld, the gist of the story. This part of the narrative is not something the player comes directly into contact with. It is the metaphorical source code of the experience created by the designer, and the user can only access it on the layers of systemic and explicit exposition.

The emphasis in this thesis will be on the structural narrative. There will be a number of examples that demonstrate how a game's narrative core can be translated through the means of systemic narrative, them being mechanics or interactions.

NARRATOLOGY AND LUDOLOGY

Since the rise of interactive media, there has always been a conflict between scholars about whether story and interaction are compatible. The conflict is based on the idea that stories are always a linear sequence of events which form dramatic tension, while interactivity has to provide a range of choices. Narratologists fear that combining choice with the sequence of events would diminish the dramatic tension, destroying any engaging experience. Ludologists on the other hand worry that enforcing any kind of narrative structure on the game would threaten the 'purity' of the medium of games, which defines itself as a construct of interactivity and choice, enabling only the player to dictate the events.

One of the causes for the rift between both opinions is the very narrow definitions of both story and interaction. As many designers have empirically proven, multilinearity can be successfully adapted into storytelling in a number of ways: The first experiments had their roots in literature, and with the digital age the concept of multilinear stories have become increasingly intricate, from hypertext to the first text adventures to what we today know as video games, where, although the 'purity' is contested, multilinear and dramatic stories are existent.

On the other hand, interactivity does not automatically imply the lack of a dramatic story arc, although there are some inherent problems. The problems stories in games

are facing as a result of the conflict of self-determined action and an authored storyline will be discussed in a later chapter.

To overcome the academic conflict, Jenkins⁵ proposes to include multilinearity and spatiality into the 'classical' definition of narrative, spatiality already being a necessary part in game design. Furthermore, by distancing themselves from the assumption that narrative has to be self-contained, and allowing the audience's perception to be a part of the dramatic construct, interaction not only becomes possible, but even necessary to construct a story. When looking at the definition of gameworld, we can see that it includes the story as well as the mechanics, and both are vital expressions of the authored content of the storyworld. So in the end, the ludology versus narratology debate might shed light on why some stories in games seem contrived, but the answer is usually an incoherent translation of the gameworld, and as such a faulty design, rather than an innate incompatibility of these two aspects. For our experience-based approach to game design, we consider both aspects as an expression of the same core concept.

⁵ *Jenkins (2004)*

INTERACTIONS & MECHANICS

Mechanics are the rules that define the interactivity in a game, and as such are a vital part of how the experience is shaped. Essentially, a game system⁶ is a black box, that the player manipulates through the use of mechanics, and in turn receives feedback about the inner workings of the black box. Actions like running and jumping with the character in the game, every obvious manipulation the player can achieve through an input device is a mechanic⁷.

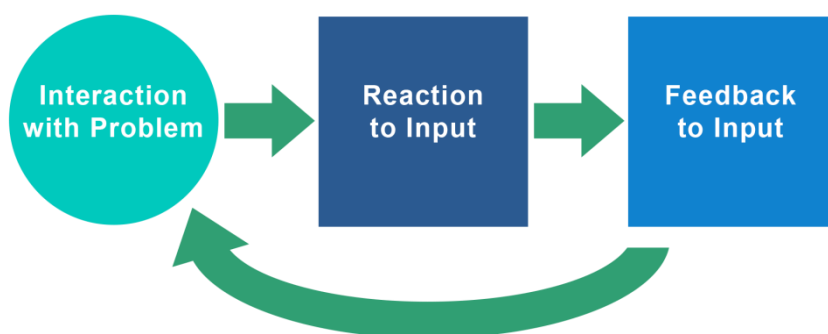


FIGURE 3: INTERACTION LOOP WITH A GAME SYSTEM

Yet not all mechanics are equally important in the course of the game. The mechanic that constitutes the bulk of the interaction performed most frequently, and thus has the highest influence on the experience, is called the core mechanic. Actions performed less frequently are called secondary mechanics, although the range of performance can go from 'quite frequent' to 'only occasionally'. Movement such as running or jumping is in most cases a necessary core mechanic, taking the player through the gameworld. Other core mechanics like shooting or flying are slightly more unique, because performing these actions is mentally connected to a meaning, which allows the core mechanic to be tied into secondary mechanics and the underlying narrative more easily, forming a coherent experience. The game *Flower* for example has flying as a core mechanic, where the character is not a person played, but a petal traveling through wind. The secondary mechanic builds directly upon this core mechanic, because it tasks the player with reviving as many flowers as possible while flying. Both mechanics tie tightly into the narrative of restoring polluted environment and eliciting the light, peaceful experience of a petal drifting through a natural environment.

⁶ Salen , Zimmerman (2004): *4 elements of a system: Objects as the parts, elements or variables within the system, Attributes as the qualities or properties of the system and its objects, Internal relationship as the relation among the objects, and environment as the context that surrounds the system, p. 54*

⁷ N.N. (2012)

However, it is not solely the action of flying which turns the experience into what it is. The 'feeling' of taking the action, the shape of the feedback of the action, and the atmosphere, the environment reacting to the interactions are all vital aspects to the emergence of the experience.

This is why using the common definition of the term mechanic is sometimes not sufficient as a description. Alternatively, the term interactivity might be appropriate, because it includes the feedback that is not the reaction to an explicit input, acknowledging that seeing and thinking are actions even if it means that no button was pressed solely for that purpose.

Salen and Zimmerman offer a more specific definition by categorizing interaction into four different modes of engagement with an interactive system, in their "Multivalent Model of Interactivity"⁸:

- *Mode 1: Cognitive interactivity or interpretive participation:* This mode of interactivity is less about physical actions as it is about the cognitive interpretation of interaction. It is the emotional, psychological and intellectual participation created while observing events, automatically comparing them to personal experience and moralities.
- *Mode 2: Functional interactivity or utilitarian participation:* The physical component of interaction with a system, as defined by the hardware that is used for that interaction. The feeling of pressing a button, how responsive the game world appears to be to this input, the legibility of the events on screen and the acoustic responses all count as functional interaction.
- *Mode 3: Explicit interactivity or participation with designed choices and procedures:* This is the kind of interaction that is defined by the mechanics, shaping the direct interaction within the system of the game. These are things like steering the character or making the choice to go down a specific path.
- *Mode 4: Beyond-the-object interactivity or participation within the culture of the object:* This is the kind of interactivity that takes place even after the engagement with the system has ended, whether it is just thinking about the events in the game, exchanging opinions about it with others, or even creating personal material based on the gameworld.

⁸ Salen, Zimmerman (2004), p.59

There are two aspects which have to be considered when designing interaction:

For one, the designer needs to be aware of the common rules of interaction, which are not limited to the world in the game. These are mostly the unwritten rules that guide every person's behaviour in real life as well as around interactive systems, derived from everyday experiences. Since a game is an interactive system, the mechanics, and the entire game world, need to adhere to this knowledge, obey to the most common rules of interaction design and teach new rules as necessary. Disregarding these principles of interaction will either stifle interactivity at its core or present a false working model of the world, complicating any further interaction with the world and thus inhibiting the experience for the player. To understand this, we examine how design enables interaction, how an action takes place, and how the player processes the information they receive, by building a blueprint of the world with all its possibilities.

The second aspect is the emotional component of the mechanic, how feedback from the game is processed, and how this cognitive interaction shapes the gaming experience. This means not only thinking of the mechanic as a systemic hurdle that creates artificial challenge, but also seeing the mechanic as a metaphor that is part of the game world.

PRINCIPLES OF INTERACTION

Affordance

Whether the interaction is of the cognitive or explicit kind, for an interaction to take place, the player first has to acknowledge the interaction as a possibility. For this, they need to be able to tell what that specific object is and what it can do. This can be summarised as the *affordance* of an object.

Affordance⁹ describes the range of possibilities and constraints an object possesses. Taking scissors as an example - even if someone had never seen a scissor before, concluding from the blades and their knowledge that blades can cut things, one can assume that a scissor affords cutting. The constraints provide even more clues about what the object does. The hinge between blades restrict the movement and range of the blades, clueing the observer in that there is likely to be repeated cutting in between those blades, and because of the restriction only objects up to a specific diameter can be cut. As for how the cutting takes place, the holes on the handles are just large enough for fingers to fit in, the larger hole providing more room while the smaller hole only leaves room for one finger



wiseGEEK

FIGURE 4: SCISSORS

So just by testing out the physical affordances of the scissors, one could conclude what they are used for.

A person is encountering new objects almost every day, even if that encounter and the following appraisal is happening mostly subconsciously. Whether it is the sliding door at the newly renovated public building or a fancy office chair, the process is always the same. The range of movement is evaluated, where the object can be moved and where it is fixed, what kind of movement is the result of this, and how much force is needed to execute this movement. Then there is the check for obvious points of interaction- does the object have anything that can be grasped, talked to, or manipulated? The design of the grip on a door for example largely influences the interaction. If the grip is shaped like a latch it affords pulling the door as the most natural interaction. If there is not really a grip, but a horizontal bar across the door, it affords pushing rather than pulling. Or an even more obvious interface - a button usually has a small indent at the top, that allows

⁹ Norman (1988), p. 96

for the natural placement of a finger. Also, unlike a rotary switch, it only has two modes, up or down, active or not active. So the most natural interaction with a button is putting a finger in it and pushing it, with the expectation of a binary state change, for example light on or off. Most input devices rely on this obvious affordance, but they also require what is called 'natural mapping' for the user to be able to use the device effortlessly. Natural mapping is the logical relationship between the spatial and the functional components of the objects. If, for example, we have two light switches in front of two light bulbs, a natural mapping would mean that switching on the left button would turn on the left light bulb, and not the other way around.

From this simple setup, the design gets vastly more complicated the more complex the functional component is. Game controllers¹⁰ for example have a very abstract, complex function, the player needs to be able to effortlessly navigate in a fictional space and perform a handful of other specific actions the game requires, and they need to do this in a short amount of time without much thought, because that would distract them from the game itself. Gaming controllers took decades to evolve to a state where the handling and affordances of the device correlate naturally with the functional mapping, but they still challenge new and seasoned users with learning the layout and the game specific mapping.

But affordances and mapping are not limited to input devices, they permeate every aspect of game design, from mechanics to visual design. When the designer wants to direct the player down a certain path, they orchestrate this by making the path the most natural way for the player to follow, marking a way by laying down a trodden path, a hole in the fence and way between the trees, or by illustrating the most obvious path with a flashy carpet. The core of puzzle design is to find the right balance between obvious and obscured affordance, leaving just the right amount of visual and functional clues that allow the player to solve the puzzle.

But how does the designer know that the design is right, that the affordance of the object, or puzzle piece, gives all the clues the player will need at that moment? The interaction with the player can fail at many stages throughout the engagement, and to improve the interaction, the designer needs to know at what stage.

¹⁰ Portnow (2014)

Designing Action

The base structure of an action is always the same. Taking focus of the goal you want to achieve, Norman calls this forming an intention, followed by manipulating something in the world to achieve that intent, and then examining the world to see if the intent was reached. So essentially there are two stages, execution and evaluation¹¹.

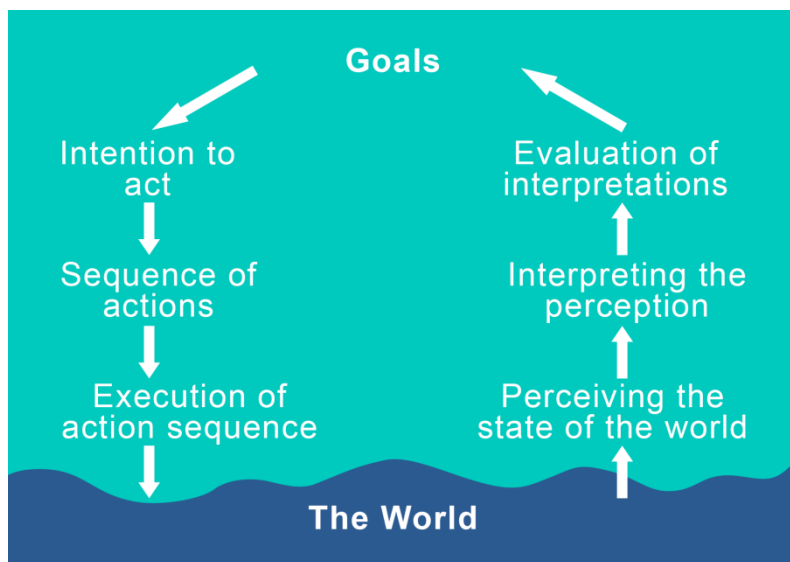


FIGURE 5 : NORMAN´S 7 STAGES OF AN ACTION

If we want to evaluate at which stage of the game the interaction is stuck, we have to examine the player´s behaviour through **playtesting**.

The player can fail during forming the intention, either by not realising that there is a specific goal to be reached or by not making out the relevant parts which are required for the manipulation. To counteract this, the visual clues need to be strengthened. Taking a simple lock-and-key mechanic as an example: Usually the key and the lock have a similar design, like the same colour or decorations, to indicate that they belong together. If the player cannot mentally connect these two objects, the affordance is not communicated strongly enough. Another design flaw might surface when the lock is hidden and the player cannot seem to find a use for the key, thus failing to find the goal of the puzzle. To counteract that the lock would have to be presented more obvious, e.g. through staging or lighting. Even if a part of the puzzle is intentionally obscured so the player has a puzzle to solve, not giving any sort of clue at all will most likely leave the player feeling helpless and disoriented, which are not feelings a designer would want to provoke.

¹¹ Norman (1988), p. 47

Another possibility for failure is during the execution of an action. Here the player has figured out the parts that should go together, but they cannot get them to work in the intended way. One reason for this might be because the player is trying to use the wrong puzzle pieces, which would indicate a miscalculation at the stage of forming the intention. Alternatively, the player might get stuck because the system does not respond or interact with the pieces the way they thought it would. Taking the key example - usually one would expect that taking the key, putting it into the lock and then turning it would achieve the goal of opening the lock. But if the designer intended the key to have the functionality of a lever, this course of action would bring no result. So either the functionality has to be adapted to the intent, which can only be done by **playtesting** thoroughly and finding the most common path of action, or again, the visual clues need to be amplified, in this example the key would have to have more lever-like features.. A rule of thumb is to overemphasize strongly at this point, because although the right path is often painfully obvious for the designer, for someone who is navigating through that stage at the first time and is not familiar with the workings of the environment and its visual language, clues can get lost easily in between all the new impressions and distractions.

The last pitfall can be encountered during the evaluation. The player has now successfully solved the puzzle, but they cannot tell whether they were successful. If the turning of the key does not result in any kind of feedback, a small unlocking sound, or the opening of a door, the player will question the success of their actions. Instead of feeling smart or empowered, the player again is left confused.

Shapes of Feedback

In games especially, the feedback for evaluation is critical because they significantly shape the type of experience, because it has a strong narrative connotation.

As we can conclude from the evaluation of the paths of actions in the chapter before, the feedback always needs a functional component which helps the player with the logical evaluation of their actions.

But feedback also has an emotional component. Feelings like relief, pride, cautiousness or wariness are reactions that can be essential at different points during the course of the game to generate motivations of both character and player to guide upcoming interactions. To achieve this, the feedback to an action needs a narrative

component that ties the action to the events and is incorporated into the narrative structure.

The frequency of feedback is also critical. The player does not only evaluate their action at the end of the current problem, but at every step of the way to get there. Occasionally giving an affirmative feedback will let the player know that they are on the right path.

Rewarding feedback can be systemic, like experience points, levels or achievements, with regards to content, such as a further piece of exposition, or aesthetical, like playing a satisfying sound and have god rays surrounding the character.

But there is also the danger of too much feedback. Continually showering the player with rewards will dull the its effect and cloud perception of what is an important interaction and what is not. The feedback should also be coherent with the aesthetics of the game. If during a stealthy first-person shooter flashy visual effects are used as a reward, the quiet secrecy of the setting is disturbed and the player will feel alienated. In these cases, a more subtle approach, like having an NPC saying a few words of praise, or just a narrative reward like a few lines of exposition that illuminate the NPCs character, would be a more appropriate shape. In general, the rewards should reflect the amount of effort that went into the action. An expansive video montage is not the right amount of feedback for a very simple action, like picking up a key; it would be more suited as a reward after a difficult series of challenges

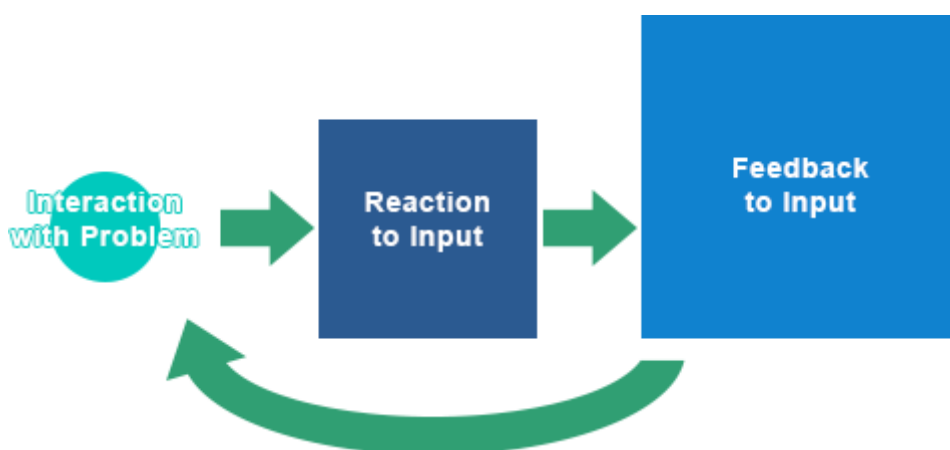


FIGURE 6 : UNEVEN SIZED INPUT AND OUTPUT

Small action amounts small feedback, large action large feedback. Although this concept seems quite self-explanatory, a lot of games seem to ignore this principle for a number of reasons.

For example, casual games do not have long enough play cycles to build up to a big reward the player receives after a complex puzzle. So for the player to still leave the game emotionally satisfied, comparatively large and positive rewards are given out even for the smallest actions in the beginning, to encourage the player to keep going.

On the other hand, many **AAA games** have the technical and financial means to include many different impressive animations and effects, but having to teach the player each time how to execute this new specific action would quickly exhaust the player's attention.

To still be able to include these actions, a **quick time event** is implemented instead. Usually in a fast paced environment, the player is prompted to click a specific button, or a combination of them, in a short time span. Clicking this button will result in an elaborate, **pre-scripted** reaction of their character in the game that are more like movie sequences than any consciously planned action the player could have planned for. The resulting action seems unproportional to the simple press of a button, and while it can be used as a reward, to show an impressive conclusion of the player's action after a specifically challenging sequence, using it continually as a mechanic will give the player the feeling that they are not in control of the actions of their character. This has the effect of furthering the motivation gap and risks the disengagement of the player from the experience.

Conceptual Model

A conceptual model, also called mental model, is the working knowledge every person has of everything in their life that constantly adheres to a specific ruleset¹². Most forms of interaction, like tossing a ball of paper into the trash, or pressing a button at a traffic light to cross the road, are done without much contemplation. This is possible because throughout life, the constant exposure to physical, mechanical or social interactions have formed, through instructions, experience and repetition, a working conceptual model of the most common systems. When encountering novel situations, this working model is the foundation for approximate decision-making.

The transfer of conceptual models onto unknown systems however is a challenge for the designer. This transfer happens mostly subconscious, and if it is not obvious that an as of yet unknown course of action is required, the person trying to interact with the system will be stumped when the usual form of interaction will not bring the expected

¹² Norman (1988), p. 12

results. This is especially problematic when trying to transfer conceptual models formed in real life onto systems found in video games, because although systems found in the gameworld might be visually identical or functionally similar to systems in the real world, they often have different affordances.

For example someone who is an able swimmer in real life would not consider a waterway to be an impossible barrier for travel. However in video games, water often marks a dead end the player cannot cross.

Social interactions are another system which do not translate well into video games. No sane person would consider it a good idea to assault and rob random passers-by's, while in games such as *Grand Theft Auto* (GTA) such actions are not only possible, but even expected.

So when starting to play a game, the player has to be taught the workings of the world from ground up: what movements are physically possible, which kinds of interaction can be expected with the environment and NPCs and wherein lies the challenge of the game, so that the player knows what environmental clues to look out for. Of course the player is not really a clean slate knowledge wise; they bring in experiences of other media with similar genres. For example, anybody who has ever consumed any media of the horror genre can conclude by having seen the title screen and box art (the promotional picture that can be found on the box of the video game) that the game belongs to the horror genre, and would approach the situation in the game accordingly. They would approach NPCs with a suspicious attitude, and only walk through dark foggy alley when there is no other option.

A conceptual model consists of two kinds of knowledge. On the one hand there is declarative knowledge, knowledge that consists of arbitrary information, of facts and rules, things that have to be taught, such as the alphabet - Norman calls this the knowledge *of*.

The other kind of knowledge is procedural knowledge, the knowledge of *how* things work the way they do. Unlike arbitrary information, this kind cannot be taught easily, it is a compound knowledge of an abstract idea that can be approximately explained, but will only ever result in a working conceptual model by exercising the action. Knowing how to play an instrument or throwing a ball would fall into the category of procedural knowledge. Unlike with most arbitrary knowledge, procedural knowledge has the advantage of forming meaningful relationships, branching into many different facets of memory, which makes it easier to recall the knowledge. Norman gives the example of

how by singing the arbitrary alphabet alongside a tune, the cantation becomes a lot more memorable because it is combined with procedural knowledge.

The most efficient meaningful relationships can be formed when there is an underlying causality to the relationship, so that the spectator can actually understand why things react the way they do. If the working mental model is causality-driven, it allows the player to derive from the model onto novel situations; the transfer of conceptual models becomes easier and more accurate. While this kind of procedural knowledge takes longer to form and to recall, it is a solid base for approximating the interactions with more complex systems.

What the designer should be aware of is that the forming of these models is not necessarily a conscious process, but rather a reaction to the encounter of a novel concept. The human mind always tries to make sense of what it sees, forming and iterating models constantly. This process becomes troublesome when the designer has not put enough thought into the causality of the system, and by a lack of explanations or misplaced clues, allows the human mind to form an incorrect model. Having an incorrect conceptual model can be even more troublesome than having none at all, because then the person would confidently walk into the situation thinking they have the right solution to it, instead of looking for new clues on how to adapt to this situation. Let us look at the horror game example from before. If, instead of a suitable introduction to the mood and the genre of the game, the designer had presented the player with a light-hearted, romantic scene at the beginning, the player would have applied a false mental model to the game, which is not appropriate for its actual genre. With the expectations of social interactions that can be found in romantic comedies, it would make sense to approach a limping, bent-over person when walking by, because the player would not expect an attacking zombie. If then the system reacts completely contrary to the player's expectations, the player is forced to re-evaluate what conceptual model to use, throwing them out of the flow of the game until they have found an appropriate path of action. Because of that, completely overthrowing a conceptual model is a design tool that should be used very carefully. It might be a great way to accentuate a plot twist or refocus the attention of the player, but using this too often or at the wrong stages will most likely only result in confusion.

So in conclusion, the conceptual model is what is taught during the game. And because the challenge of the learning process ensures the continuous engagement with the system - the fun that comes with figuring things out - this learning process should never stagnate. To ensure the constant adaption of challenge to the skill of the

player, the conceptual model needs to slightly change all the time, offering new information the player can learn. This can be done with mechanics, requiring a more complex input or strategy which requires combinations of mechanics. Alternatively, the cognitive interaction can be stimulated, either implicitly through mechanical affordances or environmental storytelling, or with explicit storytelling means. While these aspects might not be considered to be 'challenging' because they do not necessarily need a correct input as a reaction from the player, cognitive interaction can be just as engaging, even though the processing is not traceable. But both forms of interaction help to shape a conceptual model of a gameworld, to be constantly challenged, adapted and expanded, and thus preventing the experience to dim into a process of boring, repetitive recall.

RELEVANCE OF EXPERIENCE-DRIVEN DESIGN

Video games have come a long way in the past years. They have evolved from a past time that was considered frivolous and reserved for children to a widely-spread activity performed by almost all possible target groups. Already in 2011, almost every third German citizen was playing digital games, 44% being female, with an average age of 31¹³. Playing video games has become a mean of self-expression for recent generations, the codetermination seeming to hold a strong appeal that no other medium can offer.

As the first generation of people who have grown up with video games, and have played them throughout their lives, entered the video games industry, their seasoned expectations and beliefs began increasing the production standards. Just as the grown-up players are demanding a wider range of games to experience, the developers are eager to push the boundaries and explore what exactly is possible with video games.

While the old arcade games had to focus on short, demanding play cycles due to their technical limitations, today`s technology has advanced to a point where it is possible to play through long, challenging stories, explore elaborate worlds and have realistic physical simulations. The maturing expectations along with this change in technology has led to a trend in the industry towards creating emotional experiences rather than games that require a high degree of mechanical expertise to win. In an increasing number of games, the focus is on the emotional journey the player embarks on, rather than on the competitive goal of climbing up a highscore. However, instead of providing emotionally challenging, thought provoking or even revolutionising experiences, that are comparable to memorable titles in other media, e.g. so-called Bildungsromane, it is often falsely assumed that the vision of a mature title in the eyes of a gamer has to be gritty, dark, violent and with strong sexual undertones.

There are several reasons of why video games might still be limited in this regard.

One factor is that although gamers in general have statistically grown up, the audience most heavily catered to still seems to be the male teenager. Not from a legal perspective, since most games that feature casual, graphic violence and sexual references should not be available to this target group in the first place, but from a perspective that judges the maturity of interests. The core market is assumed to prefer video games that provide 'easy fun', similar to summer blockbuster cinema. This

¹³ *ESA survey (2013)*

implies usually that they should be heavy on the action, visually spectacular, and easy to digest content-wise. And judging by the sales record of the *Call of Duty* franchise¹⁴, this is still a valid sales strategy. But there is only so much variation a single sales strategy can provide, and so these games are bound to become repetitive¹⁵.

As a result, it is, or at least was in the past years, a trend for games with a high production value to cater mostly to primitive emotions, rather than social ones¹⁶. Primitive emotions are emotions like fear, excitement or aggression. These types of emotions are rather easy to trigger from a design perspective, and work especially well with kids and teenagers, because of their hormonal alignment. But these emotions are delivered in short bursts and fade quickly, and thus they are harder to employ in the context of long complex storylines. Social emotions on the other hand, feelings like happiness, sadness, anger or shame, are much more complex and harder to elicit, because they depend on a variety of aspects. They would need to be carefully constructed in the narrative, and most importantly, they require the player to empathise with the character in the situation. However hard to elicit, these are the types of emotions that would give a game a feeling of depth, and leave a lasting impression on the player.

STIFLING FACTORS FOR INNOVATIVE GAMES

Another reason why games have problems with maturity is the lack of a common terminology that enables scholastic dialogue, and is unique to the medium of games. Because it is a young field of science, there is little precedence, and academic work has to venture outside the field of interaction design, measuring video games on the basis of other media. Film and literature have a solid foundation of research, some of which are well applicable to the field of games, but of course they cannot answer some of the inherent problems that interactivity entails. This is not only a problem in the academic world, a lot of game designers have the same problem, making the fallacy to believe that just because video and text are a compound of games, strictly the same rules apply to the structure. To illustrate the problem lack of a foundation creates, game designer Jim Brown points to the differences between media that rely on Oral Storytelling and those with a Print Tradition.

¹⁴ *The highest grossing title being Call of Duty: Black Ops II with an estimated €360 Million, Gamespot (2011)*

¹⁵ *Schiesel (2010)*

¹⁶ *Cage (2009)*

Oral Storytelling	Print Tradition
Content is mediated via Performance	Content is mediated via artefact
Content is mutable and transient	Content is fixed and hard coded
Stories are personal, emphasis determined by the teller	Content is homogenised
Aggregative and mutable mosaic	Single source and sequential
Interference from the audience is expected, the teller improvises	Interference is avoided
Shared authorship, tales build upon each other	Authoritative author

Instinctively, most game designers would say that games should belong into the category of oral storytelling, as this seems to be the 'medium' with the most interactive criteria. But realistically, many games are produced in the print tradition, mimicking what works well with movies and books, but not necessarily encourage any sort of interaction with the audience. As a result, game stories derived from print tradition favour story progression that is strictly predetermined and discards the feeling of ownership that interactivity could create within the audience. Breaking away from the structural ties of traditional media and integrating scientific research and common design practices into a general terminology would help video games to establish its own identity as a medium that can stand on its own, without falling short to the experiences offered by traditional media. For this, game designers need to embrace the interactivity, using game design like a bard would create the setup of a fairy-tale, while allowing the player to interfere and make the experience their own.

THE ART CONTROVERSY AND MATURE EXPERIENCES

The more popularity the game as a medium has gained in the past years, the more frequently the discussion surfaced about whether or not is justifiable to label games as art.

The credibility that the term art offers as creative leeway to these before mentioned traditional media is something that the medium of video game arguably does not have at the moment. Although budget wise games are on par with Hollywood movies, general consent in society and politics mostly seems to be of the opinion that challenging themes are not suited to be dealt with by the means of a game. A lot has been said in the ongoing discussion of whether games are a medium capable of producing art, but in the end it mostly boils down to semantics, a personal definition of what art is and what it should do. Yet many critics, such as Roger Ebert¹⁷, are of the opinion that video games cannot yet considered to be art, and this is an opinion that is supported by a large part of society, although probably mainly those parts that have never played a game. And the arguments against games as an art form are at least somewhat legitimate. Although of course this is a subjective impression, there are many games that are derivations and caricatures of already existing cultural goods, and as such they are not art, but Kitsch¹⁸. Again, this is a subjective opinion, but there are very few games that offer the enlightening, contemplative experience that comes with the confrontation of art. But the same is true for every media, which is why denying acknowledgement when it comes to the potential to create art is a hasty conclusion. The question of games being capable of producing art is not asked for vanity, but is fundamental to the credibility of the medium. Games which were trying to address controversial themes have been publicly denounced, because the medium was not seen fit to deal with the topic. For example, the game developers of Atomic Games wanted to make a first-person shooter based on the Second battle of Fallujah, one of the deadliest battles of the U.S. Marine Corps in the Iraq War in 2004. They interviewed survivors and participants, carefully recreating the events to convey the scary, unpredictable atmosphere during the battle, mindful of all parties and the opinions of the soldiers. However after announcing the title, the public outcry over the game being in 'poor taste' towards the events put pressure on the publisher and made them back out of the project, leaving the developers with no funding and little hope to ever make their vision public. The lack of confidence in the capability of the medium to

¹⁷ Ebert (2010)

¹⁸ Kulka (1996)

convey a suitable, thought-provoking experience translated from society to the publisher, who by backing out of the project further undermined its potential. *Six days in Fallujah* is not the only project that has been stifled for these or similar reasons. In most of these cases, ultimately the commercialisation of the game was inhibiting the realisation of the project.

If game designers want to be on par with the relevant beacons of other media, they need to fight for public acceptance by creating experiences which hold the same emotional, social or intellectual qualities. And even if the mass market is unlikely to fund these endeavours, there are enough options available to publish their works to an interested audience.

As with most works of art, truly revolutionary concepts will likely come from developers producing outside commercial constraints, financially independent instead of bound to a publisher. Because of that, it is up to the audience to support and promote these games, and procure them recognition in the industry which shows that there is an active demand and a target group for these types of experimental games. The current climate for these Indie games seems favourable, with titles like *Stanley Parable* and *Dear Esther* being remade because of their popularity. Democratised funding with platforms such as Kickstarter or Patreon, where supporters can give their monetary support directly to the developers, are another opportunity for Indie developers. And they are taking the opportunity, judging from the numbers - in 2012 games were the most funded projects¹⁹. In the context of the recent distributing revolution, platforms like the App Store (Apple), Play Store (Google) or providers like Steam allow developers to make their games available without having to rely on a publisher or external funding, further increasing their independence.

¹⁹ *i.e. the niche that backers spent the most money on, with \$81.1 million, with 17 project being funded by over \$1 Million. This is not solely digital games, about half are table top games, Kickstarter (2012)*

PART I: UNDERSTANDING THE PLAYER

Because the player is an active component in the entire process of facilitating an experience, the parameters that constitute the player's "system" need to be included in the design just as any other component of the process. This chapter is dedicated to the consciousness of the player within the game, and how it shapes and adapts according to the player's own interaction, and the content and possibilities provided by the gameworld.

The first part will examine the motivations that people have for playing games, ranging from cultural to personal, and how a game can utilize these motivations. This part will also include research that maps game experiences to personality profiles, creating a chart that can show why people would play a game from a user perspective, based on the experience it elicits, rather than a mechanical, design-driven perspective.

Subsequently, we review the methods of how the perspective of the player can be altered in-game, by changing their point of view and the degree of specification of the role the player is going to adapt.

As a result of this adaptation, the player's consciousness develops several layers of identification, creating additional fragments of personality that review the gameworld from various distances. While one fragment seeks to immerse itself into the gameworld, another one creates an awareness of the gameworld as a manipulable system. In order for all fragments to be equally involved in the gameworld, the narrative needs to address all fragments, steering their different motivations into the same direction.

PLAYER MOTIVATION

LAYERS OF IDENTIFICATION

We have already established that experience is facilitated by the gameplay and the context of the narrative. However, this so far does not include the reflection of the player on this experience. Designers strive to create the most diverse kinds of experiences, yet whether or not they succeed in creating this experience within the player is determined solely by the player themselves. The player tends to seek out games which are *meaningful* to them. The meaning is generated when the gaming experience resonates with the player's identification, their perception of self which is shaped through layers of personality, past experiences, and outer influences of society and culture.

So to better understand what motivates people when pursuing meaningful participation, we are going to examine these layers to determine how, and on what level, meaning is created.

There are several layers establishing the perception of self. One of the most well-known theories is Sigmund Freud's structure of personality²⁰, ranging from the layer that dictates primal urges and instincts, the id, over the ego that adapts the personality to everyday activities, to the super-ego which upholds societal ideals and morals.

For the outer layer of the super-ego, games, like any media, generate meaning through myth reinforcement²¹. Myths are an essential part of human society. Throughout history, every tribe has had its own myths, conveyed in song, story or art. This lore was passed down generations, forming, adapting to changes and ultimately guiding the behaviour of the members of these societies. Just by hearing stories about heroes and villains, foolish mistakes and love, certain behaviour becomes favoured, another one is condemned. This shapes moral values on a vague level, and interaction with the community as a whole. Not sharing these myths means a separation from this community, and, from an evolutionary perspective, a diminished chance of survival. This general myth reinforcement has little to do with why people play video games, as this whole process is subconscious, but it stresses the importance of the connection between the medium and society. By feeding into this pool of myths that frame our

²⁰ N.N. (2011)

²¹ Bates (2005)

society, game designers take part in the process of establishing new myths and changing others, even if it is in just a small capacity.

Still on a subconscious, but on a more concrete and personal level, a number of psychological and physiological prerequisites are required for an experience to take place. According to Brian Sutton-Smith, experience is created through sensorial input from the game, cognitive processing within the player, and output from the player that feeds back into the game²². The sensorial input is made up of all visual, auditory and haptic descriptions of the game, basically everything that can be perceived with the five senses. The cognitive processing is facilitated through the concentration of the player on the game, the focus of attention that allows them to perceive the input and process it. The processing is the part where meaning is created through the learning of the game patterns and reflecting on them. Lastly the result of the player's mental processing is fed back into the game through its controls. However, this is just the description of the mental processing during a game; it does not take into account whether the result of this process is of any relevance, or meaning, to the player.

A definition of 'meaningful play' from Salen and Zimmerman²³ list the prerequisites which mechanics in a game have to fulfil in order to become meaningful to the player: For them, the factors discernibility and integration are crucial. Discernibility is the feedback an interaction should always provide, to let the player know that their interactions had any effect at all. Integration means that this feedback should have an effect on the gameplay as well, that the player, by taking these actions, has had a discernable impact on the gameworld.

These factors are all relevant prerequisites to enable the experience, more concrete examples on how meaningful interaction can be implemented will be discussed in the second part of this thesis.

Lastly, on a conscious and personal level, most players tend to seek out specific experiences after a personal preference, based on past gaming experiences and the current mood.

²² Salen , Zimmerman (2004), p. 315

²³ Salen , Zimmerman (2004), p. 34

CHARTING OUT GAME EXPERIENCES

To gain a more concrete insight into how these specific personal preferences are formed, and how they relate to the content of the game, game designer Jason VandenBerghe combined psychological research on personality mapping with game studies, filtering out five domains of play from the results of personality profiles²⁴.

For the personality profiling he used the OCEAN test, a standardised test²⁵ which helps psychologists to map out personality specifications onto a scale. OCEAN is the acronym for Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. Each of these categories has another set of sub-categories, so for example openness contains the category of imagination, artistic interest, emotionality, adventurousness, intellect and liberalism.

Concluding from the personalities and their preferred experiences, the personality facets were projected as domains of play as follows:

Conscientiousness	↔	Challenge
Openness	↔	Novelty
Extroversion	↔	Stimulation
Agreeableness	↔	Harmony
Neuroticism	↔	Threat

So Novelty, Challenge, Stimulation and Harmony are the subordinate domains of an experience, each of it containing two subcategories which, if pronounced, will strongly determine the taste of the experience. On the other hand, VandenBerghe deduces that Neuroticism and its subcategories do not reflect why someone is playing a game, but rather why a person would be quitting a game although they seem to otherwise enjoy it. Since this is not a desirable playing experience, it is discarded as a personal motivation factor, although it still might hold relevance when it comes to playtesting for weaknesses of a game.

VandenBerghe further differentiates the appeal by subdividing each aspect into two polarising categories, discarding the other facets as not descriptive as a playing experience. So for example, the novelty aspect of a game experience would include

²⁴ VandenBerghe (2013)

²⁵ [Link to online version in sources](#)

the personal preference of the player for either fantasy or realism, depending on how pronounced the imagination facet of their personality is. The adventurousness facet determines how likely a person is to prefer a building experience over an exploration one. So a person with a pronunciation on both adventurousness and imagination would fit the personality profile of an adventurer. A game that enables these experiences, such as the fantasy role-playing game *Skyrim*, would likely be a favourite to this person.

At this point it is important to note that a pronunciation on one quadrant, and its implied lack of presence at the opposing side of the scale, is not a qualitative statement regarding the experience. Fantasy is a component just as valid as realism, and the reason why someone would prefer one over the other is found in the individual personality.

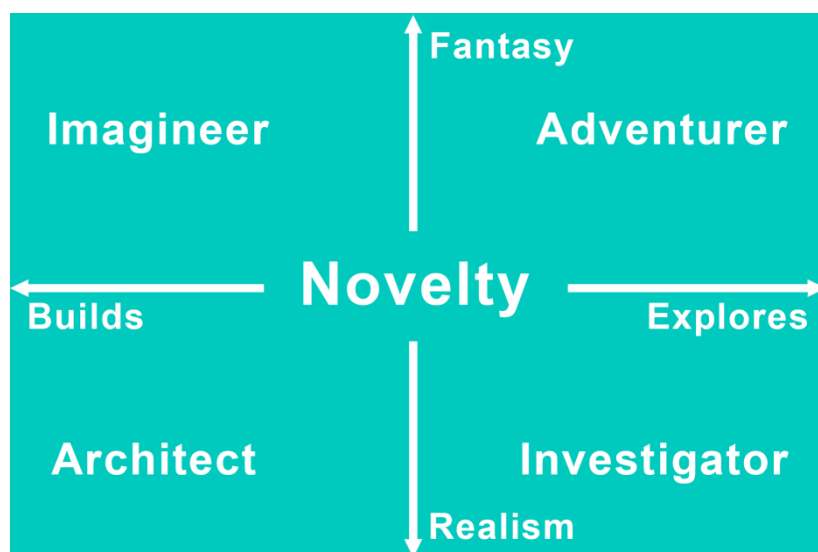


FIGURE 7 : GAME EXPERIENCE QUADRANT NOVELTY (DETAIL)

After arranging all four domains and their dimensions onto a larger grid, we can see a comprehensive chart of possible play experiences and their individual characteristics.

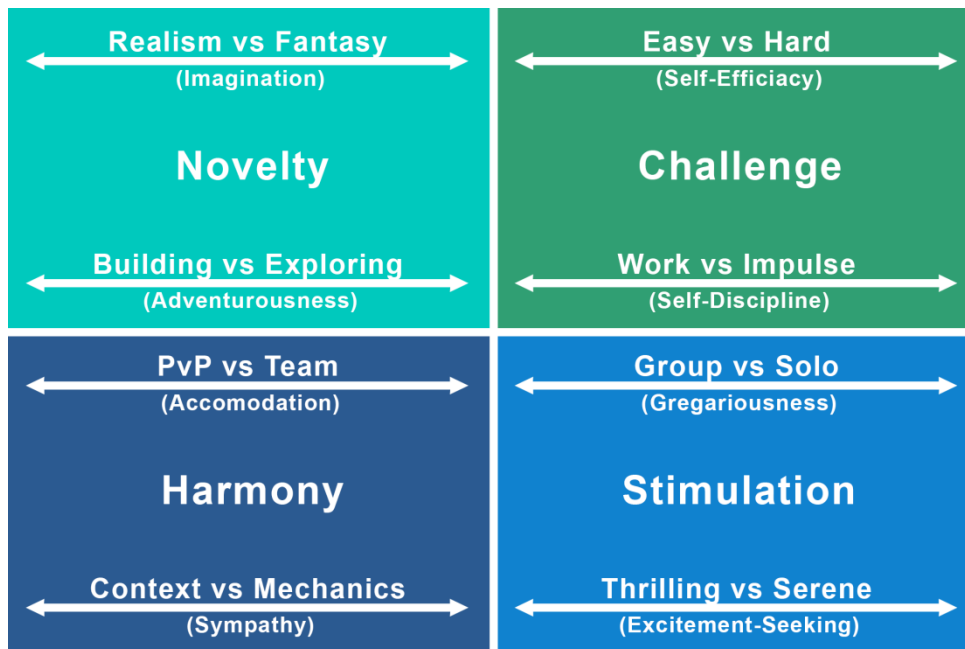


FIGURE 8 : GAME EXPERIENCES WITH SUBCATEGORIES

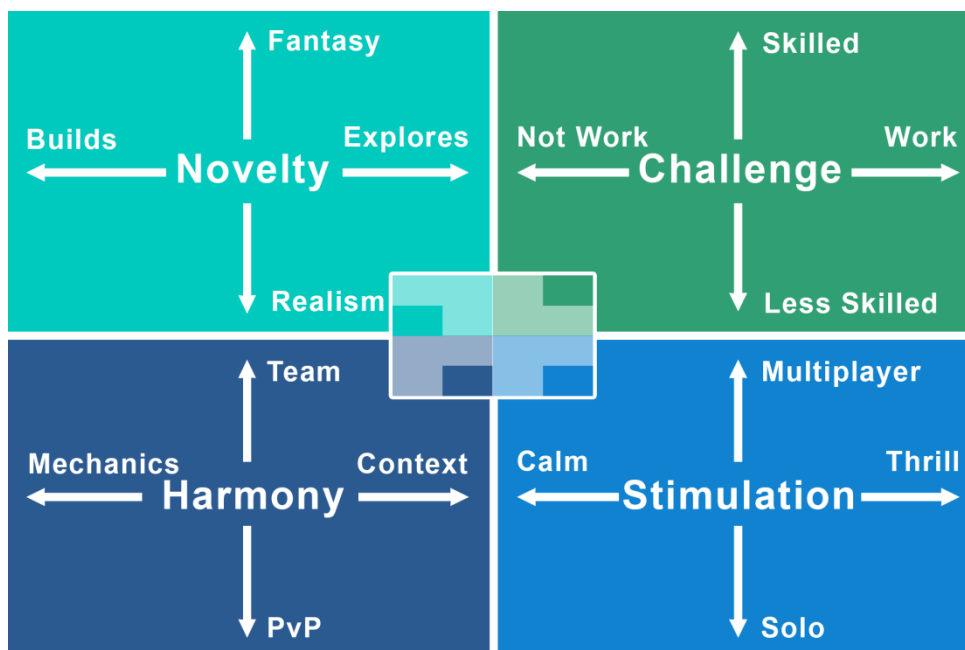


FIGURE 9 : GAME EXPERIENCE CHART WITH PRONOUNCED QUADRANTS

Every game has an individual experience that can be described within each quadrant. The Building versus Exploring scale in the Novelty quadrant describes how much freedom of movement an experience provides, while the multiplayer versus solo scale describes the social integration the gameplay experience offers.

Although this research was so far done only in qualitative studies, it gives a solid overview of what types of experiences games can offer based on mechanics and their narrative implications. These implications can be found for example in the Realism versus Fantasy scale, or the Team versus PvP (Player-versus-Player) scale, describing whether an experience is cooperative or competitive.

The first conclusion we must draw from this is that an all-encompassing experience is impossible, as these motivations are polar opposites from each other. For example the experience that the quadrant of stimulation describes: While it is possible to make a game single and multiplayer, it would be a lot more difficult to make a game which is calm inducing and thrill seeking at the same time. Of course the attributes of a scale can be simple not pronounced, but that would also imply that the game has no distinct features that would apply to a personality profile.

Instead, targeting a more concrete experience and implement this thoroughly and coherent seems a more reasonable approach than spreading themselves thin by trying to reach each possible player.

This research also implies that gaming preferences are the result of a personality, and thus playing them is at least partially motivated by reinforcing already established patterns. The players have found the experiences they are comfortable with, resonating with their personality profile, and are not very likely to come out of their comfort zone by playing games which are very much outside their usual preferences. However, as we established before, personality is only one factor shaping preferences, but because personality is not an unchanging constant and venturing outside a pattern is something most people do a regular basis, it cannot be concluded that a game will only be played by exactly one specific personality profile. The processing of an experience is unique to each person, and it might create an individual appeal that was not originally intended when mapping out the game's experience.

Finally, VandenBerghe stresses the importance of this research to the designer as well: When creating a game, the designer is inevitably making something reflecting their own personality. This also implies an 'emotional blind spot' at quadrants of experiences where the personal distinction of the character is not pronounced. When trying to design for experiences outside the own personality profile, the designer should systematically analyse gaming experiences unfamiliar to them, to understand how players who prefer these experiences evaluate the quality of them.

So from myth to personal ideal reinforcement, people tend to seek out games which offer a meaningful experience, something relevant to their life at the point of playing. But from the motivation to the actual delivery of the experience that leads to meaning-making, a number of requirements have to be met first, from the player as well as the game.

IMMERSION AND THE QUALITY OF AN EXPERIENCE

There is no definite list of what requirements constitute a fulfilling game experience, as individual experiences all have their own standards that have to be met. So as a measure of quality, often the player's level of engagement while playing has been taken as an indicator of quality. Occasionally, the term 'immersion' is even used as a motivation why people play games. But more often the term is used as a marketing slogan, without any specific parameters, for example when a **publisher** is promising an experience which is to be so amazing that the player will forget everything around them. But immersion is not a concept that can be just applied to a game to make it worthwhile, it is only a description for the level of involvement of the player with the game. Of course, as the designer of a game it seems logical that the more involved the player is, the better the experience. But not all experiences can or should offer 'full-on' immersion, in some cases this might even be counterproductive.

This is only true for one specific stage of immersion, so first we should clarify what the stages of immersion are and how they are defined. According to Brown and Cairns²⁶, there are three stages of immersion. To enter each stage, commitment, which is to say time, effort and attention of the person playing the game is required, as well as a careful construction of the experience from the designer.

- The first stage is *engagement*. Engagement can be barred by several factors. For one, as VandenBerghe's research has proven, gamers tend to favour certain gaming experiences while neglecting others, denying themselves the engagement with these games. Thus, frame of mind is a first prerequisite. Another barrier is the physical access. Whether it is the lack of specific hardware or the insufficient mapping of playing controls, if the first contact with the game does not work as the player intends, they are unlikely to engage any further.

²⁶ Brown, Cairns (2004)

- The second stage is *engrossment*. In this stage, the player has already engaged with the game, they are now starting to learn the rules and form a mind map, becoming emotionally invested in the game. Here, the rules of the game are starting to invoke the experience. While learning and interacting with the system, the player will test the boundaries and discover any incoherencies that might destroy the investment. The difficulty of the game needs to steadily increase to keep the attention of the player on the game. During this stage, the real life environment starts to fade out in the consciousness of the player, and coming back to reality might even be connected to a feeling of slight disorientation and emotional drain.
- The third stage is complete immersion, or as Brown and Cairns call it, *presence*. At this stage, the player forgets that they are actually playing a video game; the computer becomes their only centre of attention and source of emotion. The barriers to this stage are empathy, as opposed to simple attachment, and atmosphere, the address of all senses with a coherent, stimulating environment. Not all games are equally equipped to create this feeling of presence. Games on a mobile handheld for example would be hard pressed to create this state in a player.

Ultimately, immersion is not a measure for the quality of a game. To elicit an experience, often reaching the stage of engrossment is more than enough to resonate with the player. And even games that require true empathy with the events in the gameworld can do so without the player being in the zone of immersion all the time. The borders of the stages become blurry, and more often than not the player is continually fluctuating between them, as a result of the double consciousness between the identities of player and character. And this is not a negative influence if we consider that engrossment leaves the player feeling slightly unsettled. Continuous, true presence would probably amplify that effect²⁷.

Salen and Zimmerman describe the misconceptions which arise when describing a game's immersive quality with something they call the *immersive fallacy*:

"The immersive fallacy is the idea that pleasure of media experiences lies in its ability to sensually transport the participant into an illusory, simulated reality"

²⁷ Amongst others, reported effects of flow on the player are loss of control, loss of self-consciousness and altered time perception, Flow is considered a vital component of immersion. compare Weibel, Wiessmath (2014)

Presence, as the last step of immersion, is not the ideal condition all games should aim for. And if we think about the core experiences of some games, such as stimulation, where situations could arise which are designed to elicit negative emotions such as fear or aggression, becoming completely immersed would rob the player of the ability to reasonably reflect on the experience, since the processing of these emotions is mostly done in identity fragments of the player and person. And in the end, if the experience is not processed properly, there seems little use in trying to pursue it the first place.

So the effect of immersion cannot really be considered a measure of quality for the experience, although this might depend on the type of experience. Engagement and engrossment however are necessary steps that the player needs to take in order to enjoy the game experience.

DEFINING PLAYER IDENTITY

The role the player can adapt in the game is one of the most defining aspects of a game. It is no coincidence that every game description includes the player representation, as it is one factor which (though not always conclusively) tells the most about the gameplay experience that the player can expect from the game.

By dictating the player's perspective and the character's identification, the designer creates a frame of reference for the player to adapt. This frame can be described by several attributes:

Character Perspective

The first one is player perspective, the perspective view the player takes on the gameworld as intended by the designer. As the player explores the gameworld through the character's eyes, the perspective forms a lens through which the experience is distorted. If the player adapts a first-person perspective, they will see directly through the character's eyes, with no visible barrier between them and the gameworld, other than the occasional hand or reflection.

Since the character is not always visible in this perspective, it allows a direct access to the world, giving the player the feeling that they are mostly themselves as they are exploring the game. Another perspective is the third-person perspective, where the player's camera is directly behind, or in an orthogonal angle to, the character they control. The visibility of the character is a constant reminder of the role they are playing in this game, and is thusly better suited for games where the experience depends on the frame of mind a different role provides. So for example most adventures and fantasy games rely on this representation to reinforce the theme of the game. The third perspective can be described as a 'god view'. Here, the player is not represented by any character at all, but is floating freely above the world, not restricted by any physical boundaries. Most simulations or strategy games employ this view, as they do not depend on the empathy that a specific character creates, and the detachment of the player from the world encourages logical thinking and pattern recognition which is central for the experience of these types of games.



FIGURE 10 : FIRST - PERSON PERSPECTIVE, IN *PORTAL*



FIGURE 11 : THIRD - PERSON PERSPECTIVE, IN *UNCHARTED*



FIGURE 12 : GOD VIEW, IN *BLACK AND WHITE*

Character Specification

The other aspect defining a game character is elaboration. This includes any type of description the designer imposes upon the character, the personality and backstory mostly expressed in dialogue and cut scenes, as well as the possibilities of interaction the player has with their character, shaping them to their liking.

Toby Gard²⁸ proposes that there are three different player characters that vary in their degree of specificity. On the one side there are *avatars*, which are more or less a direct representation of self, on the other side are *actors*, where the character is part of a story. In between is the *roleplaying character*, whose traits and abilities are shaped by the player throughout the game.

These definition can be projected onto the scale that designer Matthias Worsch proposes, where the player definition is a scale ranging from puppet character, a character with no predefined traits (=avatar), to a vehicle avatar (=actor), which is described as

*“A sort of vehicle from which the world can be seen and otherwise experienced. This character both constrains us and opens up possibilities”*²⁹

A puppet example, as a character with little authorial input, is the character Chell from the *Portal* Series, and recent examples for vehicle avatars include Nathan Drake (cp Fig08) from the *Uncharted* Series, or Joel from *The Last of Us*, both very faceted and highly detailed characters.

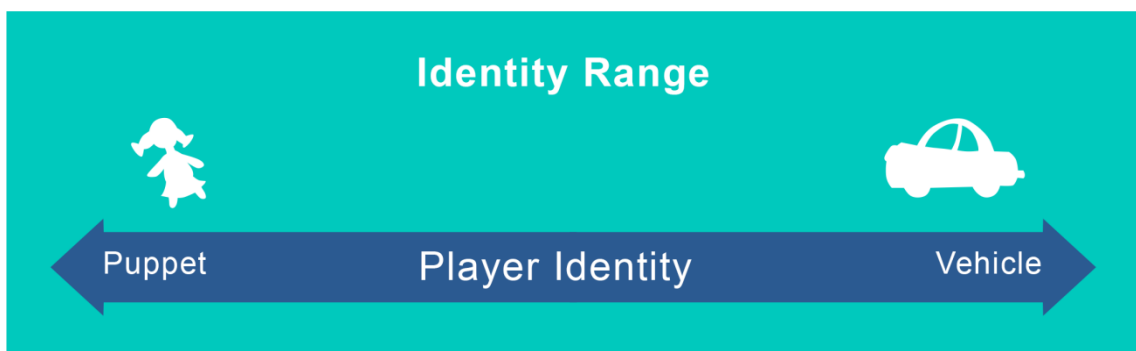


FIGURE 13 : M. WORSCH´S RANGE OF CHARACTER SPECIFICATION

Independently of how much of an empty vessel the character is, the player will always feel a split consciousness, the subconscious knowledge that they are partaking in

²⁸ Egenfeld-Nielsen, Heide Smith, Pajares Tosca (2013), p. 203

²⁹ Worsch (2011)

make-believe. Usually, by entering the game the player acknowledges a kind of unwritten contract, where they agree to suspend their disbelief and accept the fantastical world the designer has created as the only reality for the course of the game session. This concept is also known as the *magic circle*, a term first introduced by Huizinga in his famous work *Homo Ludens*³⁰. Huizinga's original definition, that the magic circle creates a barrier between the game world and the real world and these worlds do not overlap, has long been disproved. There are many recorded effects games can have on real life and vice versa, such as influencing the mood and affecting the physical capabilities of the player. However the concept of the magic circle is still seen as vital to the impact of the gaming experience, often cited to be one of the main conditions for immersion, as a part of the engagement process. But this contract needs to be upheld from both sides. Just as the player has to show willingness to engage, the designer has to promise to create a world which follows a logical construct the player can identify and empathise with.

This empathy is destroyed when the goal of the game, the imposition of the designer, and the motivation the player generates during the game as a reflection on the content, drift apart.

EMERGING PLAYER IDENTITY

Alongside the definitions that the designer devised for the player, the player will adapt to the gameworld in their own way, as a reflection on the events and their personality. This personal identification cannot be controlled by the designer, however it can at least be somewhat anticipated, and integrated into narrative.

A lack of motivation regarding the events in the gameworld can be explained by looking at what layers of identity harbour specific motivations, and how they can be addressed within in the game.

Everybody has had this experience every once in a while, when reading a book or watching a movie: While being absorbed in a fascinating story, suddenly the plot takes an unsuspected twist, or one of the characters does something incoherent with any of their previous actions, and suddenly the logic of the gameworld is breached. And once we as the audience begin to question the inner logic of the fictional world, the inquiry

³⁰ Huizinga (1939)

expands to questioning the illusion of the entire work, leading to a destruction of any suspense of disbelief.

The same is true for video games, maybe even to a higher degree, because interactivity creates yet another frame of mind against which the experience is tested for coherence.

Identity Fragments

Matthias Worsch calls these frames of mind identity fragments, three of them constitute the player's consciousness while playing a game, constantly interacting and influencing each other.

- One frame is the frame of the *character*. The character is the fictional role in the game, with their own traits, appearances and motivations which are set up during the game. In *Portal* you are the character Chell, although you do not know how this character looks, you share their motivation to be free, to break out of the maze of suffocating testing chambers. Usually they follow the classical archetypal figures³¹ or pop culture schematics, like fictional characters in books and movies, and as such any player who is remotely familiar with these archetypes will be able to identify their goals even if they are not explicitly stated. When playing the game, the person playing the game will empathize with this character, and thus will likely be aware of their motivations and try to fulfil them, but they will never *be* this character, as in assimilating their personality and behaviour.
- The second frame is the one of the *player*. The player is the fragment that is generated by the person's desire to play, chasing a certain experience, and the interaction with the game. The player's motivation is to solve the puzzles, master the newly shown technique, level up or collect certain **achievements**, or just systemic advancement in general. This player is also the fragment which feels primitive emotions during the game, either through their own actions or as a reaction to the character they have empathized with. This identity fragment is a product of the interactivity of the medium, the result of the person knowing they can influence the events in the world according to their own liking.

³¹ *C.G. Jung has compiled a list of archetypal figures that can be found recurring across all cultures, e.g. the figure of the Hero or the Trickster*

- The third frame is the one of the *person*. The person is who the player is outside of the game, with an own idealized perception of self, past experiences, ideologies and everyday worries and wishes. While the frames of character and person are actively involved in the game, the person frame is usually seen as debarred, left outside the magic circle, only occasionally fading in with distractions of real life, like upcoming appointments, during the game. But thinking that the person frame does not have any influence on the design would be a mistake. The person is the distinct part of the player harbouring the longing for myth reinforcement and ideals, and a wish for social connections. If the game manages to address these, the experience of depth in the gameplay becomes a lot stronger, resonating on a frame which does not dissipate as soon as the player leaves the magic circle.

Motivations of the Fragments

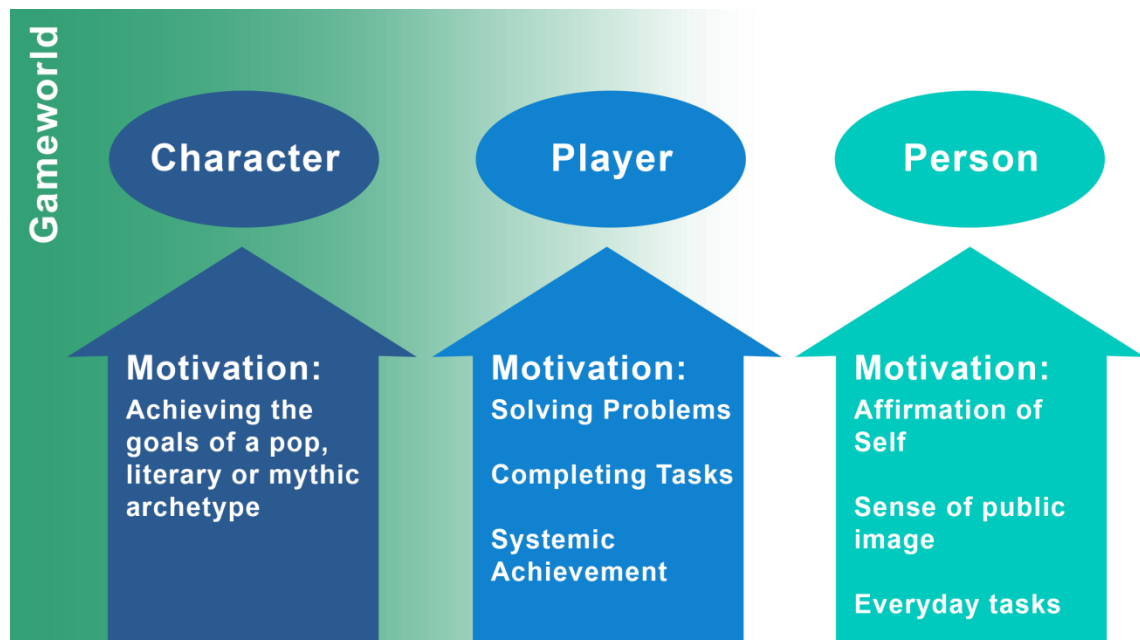


FIGURE 14 : FACETS OF PLAYER AND THEIR MOTIVATION

Looking at these fragments, it is visible at what point a gap of motivation might form. The character frame has a motivation, dictated by the authored storyline. The player has their own agenda which needs to be addressed. If both motivations are steering into the same directions, the identity within the game is maintained. This feeling of identity is also called **agency**, and it describes one of the benefits of interactivity, the sense of self-fulfilment and feeling of ownership of the experience.

However, when this motivation gap is drifting apart, the game develops a dissonance, creating a conflict between the narrative imposed by the designer and the actions the player wants to take as a result of the narrative generated through their interactions. Almost any game suffers from some dissonant aspects, although they tend to be more pronounced in games with a vehicle-type character, since these characters tend to have more explicit exposition which can counteract the systemic narrative perceived by the player.

Taking *Uncharted II* as an example, the main character Nathan Drake is generally described as a good-natured, charming guy with a passion for history. However in the course of the game not only does the player have to literally kill thousands of enemies, but they leave a trail of destruction in ancient ruins of undisclosed civilisations, without the character showing any apparent qualms or doubts. And as it is the problem with all vehicle characters, the character Nathan takes a lot of choices within the game that the player has no influence on. It serves his characterization, but furthers the gap in identities between *character* and *player*. The more vehicle-like a character is, the more the focus of the gameplay experience shifts. The goal of self-expression turns into becoming the archetype the character represents, similar to the experience of watching a movie. Looking back at the charts of game experiences, this is a preference that can be found in the Harmony quadrant. It is a personal preference to either follow the context driven storyline presented by the author, or to strive for personal expression by utilizing the game's mechanics. So in this case, Harmony is referring to the player's tendency to either harmonize with external stimulation, or with their internal motivation. But even if the player prefers to harmonize to stimuli, the frame of the player and its motivations are still a present factor that needs to be considered, and so the goals still have to be readjusted to keep up a parity of motivation between the fragments and prevent the player from disengaging.

Aligning Identity and Motivations

The key to creating parity, or at least harmony, lies in establishing complementary goals for both the *character* and the *player*.

Once again we can look at *Portal* as an example. Finding a way through the deadly testing chambers is the same goal for both fragments - for the character it means finding a path to freedom, while for the player the chambers are linked directly to their

skill progression, each chamber containing a different, more difficult puzzle to master. At the same time, the AI GlaDOS is continuously mocking the character, but because she directly addresses her without ever using names or other descriptive terms, her talk becomes directed to both the character and the player, establishing her as an enemy for all fragments. But because the game's natural boundaries, the limited space of the testing chambers, and the characters rather primitive end goal of 'breaking free', the game has it relatively easy keeping the player's motivation on track.

If the game's story is something more complex, or requires a lot of emotional investment, the game mechanics have to involve something that steers the player into the same direction as the character through interaction, and even better it also has to address the *person's* ideals. Similar to the cinematic principle of 'Show, don't tell', in video games the principle 'Do, don't show'³² can be applied. Performing an action with a certain goal at least temporarily assigns this goal a measure of importance and thus heightens the awareness of the problem. For example, a lot of games feature missions where the player has to guide a non-player character (**NPC**) through dangerous situations. But only a string of exposition along the lines of "This is your friend, you have to protect him" will not make the player care about the NPC, making them unwilling to risk their systemic progression to protect them. Instead of motivating the player to tackle the task set by the explicit game story, the NPC is becoming a liability to the player's narrative.

The Last of Us shows how to turn this liability into something relatable. The game takes place in a zombie apocalypse, where mankind has retreated into safety zones. The main character Joel is more than capable to hold his own against the threat outside the safe areas, but is a lone wolf, damaged by the loss of his own daughter. His journey starts when he encounters the teenager Elli, and receives the task to safely escort her through the infected areas. But the game manages to create an appealing character with Elli, without resorting to the shallow appeal of the primal instinct of 'protecting the little girl'. In the beginning, the incentive to protect her is personal reward, given by the people that want Elli to be delivered to them. Their offered reward links the goal of delivering Elli closely to the player's goal of systemic achievement. Later it is discovered that Elli carries the cure for the pandemic, so the goal transforms into the myth reinforcement of saving mankind and being a hero. Only in the end, after the player had hours of meaningful interaction with Elli, which have characterized her as a

³² *Describing a situation from the character's point of view, not the author's. This obscures the presence of an all-knowing narrator and leads the audience to empathise with the character in order to come to the same conclusions.*

funny, lovable girl who has proven her resourcefulness repeatedly, the player has to fight for Elli's sake. The general goal of being a hero has transformed into something much more personal, to the point where the player is willing to give up on the myth of being a hero for the sake of truly 'saving the girl'. But it is not only the exposition which makes the player care for Elli. Throughout the game it has been established as the ultimate goal to protect Elli, and by association, yourself. All of the player's actions were centred on this one goal. Winning has become closely linked to keeping Elli alive, thus the progression in the game has become a progression of their relationship.

At some point in the game, the player will either have not started caring for Elli and in consequence stopped playing the game, or has started caring about Elli and will want to protect her. Not caring for Elli but continuing to play is an unlikely choice, because the human mind does not like to invest time in activities it deems meaningless. So in order for the player to continue playing, they will convince themselves that they care about the future of the character to justify the fact that they spend more time playing the game³³.

³³ Leon Festinger: *Theory of cognitive dissonance: Every human strives to achieve internal consistency, either by avoiding situations where their actions and opinions would have to separate or by adjusting either belief or action to achieve consonance again.*

PART II: HOW MECHANICS SHAPE THE EXPERIENCE

Now that we have covered how interaction shapes the perception of the player, the following part will examine what shapes the mechanics can take to influence the game's narrative.

A mechanic in a game serves two purposes: On the one hand, it provides means of expression to the player fragment, helping to reach their goals of personal wish fulfilment and systemic achievement. On the other side, a mechanic is the method the designer has implemented to fulfil the character's role in the gameworld, promising the player that if they interact as intended they will be rewarded with a meaningful narrative experience that the character fragment can empathise with. Additionally, a mechanic can resonate with the person fragment, intellectually and ideologically.

Those purposes are conditions that need to be addressed through the mechanic, otherwise there is the risk that one of the fragments might disengage.

However, depending on what type of experience is desired, the emphasis of what fragment should be addressed shifts, resulting in different requirements for the mechanics and their narrative connotations.

In terms of gameplay experience categories, the quadrant relevant for defining this type of experience is the Harmony quadrant, with its Context versus Mechanics scale.

Games with an emphasis on the Mechanics side require systems of interactions which are both complex and flexible, giving the player the possibility to express their creativity and personal play style without being too restricted by an authored ruleset. The quality of mechanics regarding player freedom is often judged by how much emergent gameplay they afford, emergence being the unscripted result of the rules of systems, interacting with each other. For these mechanics, the designer's task is to provide a base toolset of combinable mechanics, and then leave enough space for creative problem-solving to emerge from the situation.

On the Context side, the author takes more creative control over the succession of events in the game, in order to induce dramatic situations which will help the player to become emotionally invested in the gameworld. This requires characters and situations which are fleshed out enough to allow the player to empathise with them, putting the player in a role being more reactive than proactive. This implies that the goals directing

player behaviour are created through reflection on the gameworld and the character's behaviour, rather than the self-determined goals of expressive mechanics. Yet even in these situations, the player fragment is the factor which determines whether the engagement with this reactive gameworld will succeed, and so it does need to be included within the predetermined structure by integrating choice and decision-making in situations that are meaningful in the player because they express their personal ideals and strategies. The chapters on reactive mechanics and environmental storytelling will examine how systemic narrative can be set up to communicate vital information the player needs in order to successfully integrate themselves into the story without losing the feeling of agency.

But before diving into development and setting up a structure, a few fundamental aspects need to be covered first, explaining how to arrive at the idea of a mechanic which in form and content supports the aspired experience. There is no concrete formula that would guarantee success, but by looking at the game's goals through a lens of abstraction, the essence of the experience might become clearer, and subsequently help to find a form of interaction to transport this essence.

CREATING AN EXPERIENCE: ACTION AS A METAPHOR

Whenever we are describing the actions the player takes in a video game, we tend to reduce the mechanics to their physical use, because it is easier to describe and not as subjective as the emotional component it contains. But if we intend to use mechanics as a bridge between narrative and game world, we need to utilize this very aspect. Since systemic narrative is implicit, its function is to strengthen the feeling the story is trying to convey, not in a linear progressive chain of events as the explicit narrative, but with every action the user is taking on their own accord.

And since interactions will more strongly shape the perception than passive exposition, not having coherent narrative attached to these interactions will separate the player's agenda from the game's storyline, creating a motivation gap. If the designer sees the mechanic merely as a combination of input, which in the right combination will achieve a certain goal, without any meaning attached to the execution, it is likely that the player will as well. Most frequent players will remember a situation in a game where a decision was not based on a personal motivation, but on the thought "This is obviously what the game designer wants me to do", because of the trained response to the

system' tasks rather than really understanding what the meaning of the problem is. This has a disengaging effect, amplifying the split consciousness, turning 'playing for the experience' into 'playing for the achievement'.

The designer can counteract this effect already during the concept phase, by not referring to the game as a combination of black box mechanics, and instead thinking of the interactions of the game as an extension of the experience residing in the gameworld. This obscures the 'systemic' part of the mechanics and strengthens the narrative component, making the player not only ask how something is working as a functional, closed system, but why it does so in the context of the gameworld.

While this sounds plausible from a theoretical perspective, creating a holistic experience from an abstract concept poses many different challenges for the designer.

Finding the essence of an experience is the first challenge. Coming up with an idea on how to translate the experience into a mechanic loaded with narrative, while still maintaining the essence, is the second one.

There is no fool proof approach for how to achieve this, and it is not unusual to first design the interactions and afterwards double check for their integrity within the experience. But this approach requires a distanced, unbiased look at the own creation, which becomes harder the further one is involved in the project. A more efficient and integrated approach is to think about the meaning of the interaction in context right from the beginning, as the mechanics being the direct manifestation of the gameworld.

This means to think of mechanics as an abstraction of action.

One definition of abstraction is that of 'a process of stylisation and distillation of a phenomenon in order to produce meaning'³⁴. Abstraction can be compared to a prism, bundling and shaping light, an otherwise abstract concept, and visualising it as a rainbow. Abstraction is found in many variations throughout all art forms, removing unnecessary detail to create a more universally comprehensible image.

In game design, seeing mechanics as an abstraction of action is a common principle. Interactive systems are abstracted to verbs to describe associated actions. This is already a helpful simplification which shows what type of experience can be achieved through these core mechanics.

³⁴ *Sharp (2012)*

However, the limitation of the verbs to achieve experiences becomes obvious if we look at the ones most frequently used in popular titles. As game designer Jesse Schell points out³⁵, the verbs most commonly used in game design are rather limited: Actions like running, jumping, flying and shooting are what constitute most of the gameplay experiences. Compare this to the much wider range and higher sophistication of verbs e.g. in movies: While the physical verbs are necessary for action movies, verbs like talking, asking, negotiating, and arguing make up many more, just as successful motion pictures. The absence of these kind of ‘head’ verbs, as opposed to the physical ‘body’ verbs is limiting the range of game design.

Using verbs as an abstraction is helpful, but it does not describe the context a mechanic has in the game world, or what shape the feedback takes, and as such it is an approach that is far too detailed for the planning stages of the development. For a more contextual approach, we can look at action as a metaphor for meaning.

Abstracting can help distil meaning during ideation, depending on what part of the game experience it is directed on. John Sharp suggests several applications for abstraction as a design tool:

- For one there is abstraction used as *inquiry*. Sharp illustrates this form by using his art history background: Throughout hundreds of years, it was the purpose of a painting to realistically depict a desired concept³⁶. But then painters like Monet slowly started to inquire how the perception of the painting is assembled, by disassembling the imagery. Even later, artists like Pollock completely dislodged art as a mean of representation and abstracted it in a way that the meaning was to be found in the process of creation, splattering paint onto a canvas, highlighting the artist as subject. The game *The Stanley Parable* is exemplary in this regard, inquisitive about the choice driven nature of games and its relation to the player. The game questions through its combination of narration and interaction the player’s relation to rules imposed by the system. The controlled character is a man in an office, who finds his actions dictated by a disembodied narrator, commenting his every move. The player can chose to go along or diverge from the laid out path, opening up new strands of story, diving deeper into the rabbit hole.
- Alternatively, abstraction can be used as *expression*. For games this would mean using interaction to express emotion, similar to how choreographers

³⁵ Schell (2013)

³⁶ Not that the subject matter had to be realistic, but its depiction - the painting was a mean to explain and spread an idea, but held no further value in itself

employ dance as an abstraction of movement. Game designers already use a concept Jenkins calls 'expressive amplification' regularly. It is applied to exaggerate specific actions by shaping the feedback, so that the player feels an increase in pleasure when executing these actions. Little mechanical gimmicks like screen shake³⁷ or rebound when firing the weapon significantly increases the feeling of satisfaction for the player. Yet, these knacks are, while light abstractions of their realistic counterparts, still in the domain of purely representational. They are hardly an indication for the expression of the player themselves, but of the mechanic that is used in the way the designer intended to. However, if the interactions are geared to allow expressions of the player in the world, by encouraging building, or enabling intuitive creative or kinaesthetic expression, the game starts reflecting the motivations of the player instead of those of the designer, becoming a creative canvas.

- Abstraction might also serve as a new structure for creation. Taking already existing elements and abstracting them in an innovative way might even be the easiest starting point when trying to use abstraction as a design crutch to explore physical experiences. Taking the video game VVVVVV as an example, where the classical game element of jumping has been abstracted and redefined so that the player does not jump, but change gravity.
- Lastly, maybe the most helpful form of abstraction when trying to convey narrative, is abstraction as *representation*. Just like with the prism, action can be used to describe an otherwise indescribable concept, that is based on a feeling rather than any representational aspect. Sharp cites the game *Journey* as an example of a game that abstracts the concept of belief, epiphanies and coming to an understanding about the world you are living in. From an verbs perspective, the interaction is little more than running, jumping, and collecting bits to boost the player's jump-ability. But this is not the experience the player has when playing the game. Through a meticulous arrangement of aesthetic compounds and a balance of guidance and exploration, the player goes through a silent hero's journey which, in Sharp's mind, evokes the meditative, enlightening experience of belief. Just by seeing how hard it is to put the playing experience into words, it shows that the medium videogame was chosen justifiably, because the experience needs to be acted out rather than passively consumed. So in order to successfully convey the desired experience, the

³⁷ Willem Nijman (2013)

impact of the mechanics, the design of the gameworld and every aesthetic compound has to be abstracted with the goal of eliciting this emotion.

A smaller, and freely accessible, example is the flash game *Loneliness*. In this abstract game, the only player interaction is moving a little black square upwards and to the sides. Throughout the game the player encounters other black squares, all looking like the character the player is controlling. These squares all seem to engage in some kind of activity together, sometimes in an animation that seems playful, sometimes organized. But whenever the player reaches these groups they dissipate, scattering away in all directions, leaving the player on their own again. The other dots' reactions never change throughout the game, although through the grouping and timing of the dots the player's expectations are continually challenged. These mechanics facilitate the emotions of loneliness and rejection as a part of the designer's message displayed at the end (image). Although the player may emotionally react in different ways throughout the game, ranging from outright anger at the dot's reactions to undefeated optimism, the experience of loneliness at the end is constant.

Because of this, the idea of the experience needs to be defined from the very beginning of the design process, since all further implementations need to meet these criteria. The underlying message of the game experience is not something which can be plastered onto the game as an afterthought, throughout each step, the designer has to ask themselves whether this interaction will provoke the emotion that supports the game's narrative.

Depending on what type of experience is desired, the emphasis between the sole use of mechanics and the structured use shifts. In the following chapters we will look at game design practises for both kinds.

EXPRESSIVE GAME MECHANICS

An expressive gaming experience means to give the player meaningful tools to express themselves, their opinion or creativity and all their self-imposed goals, in the gameworld. It is solely up to the player to build or explore, and little to no external control is imposed by the designer through missions or storylines. In games such as *Minecraft* the player can explore endless spaces without being directed down a specific path. If the environment is generated procedurally, meaning it is generated by an algorithm instead of a hand-crafted environmental space, the distance the player travels can literally go on forever. Together with the variety of tools the player can use, whether they represent real tools like a pick in *Minecraft*, or an array of objects that serve the sole purpose of building things like in *Gary's Mod*, the world becomes a giant sandbox for the player to act out all their personal desires and whims. However it takes a player with a strong predisposition towards creative building and exploring, who does not need any additional incentives beyond their own desire to create. Since this is a rather specific target group, these kind mechanics are far more often employed with an, albeit sometimes quite loose, narratorial framework, so that the player has something to focus on when the playing around in the sandbox becomes uninspiring.

One of the most popular examples are the games of the *Grand Theft Auto* (GTA) series, especially the more recent titles. In these games, the player gets to play one, or several, low-life thugs that can work their way up in the ranks of a criminal organisation, by completing missions of a more dubious nature. But beyond these missions, the player can explore the city the game plays in, usually referencing to real-life metropolis' like New York, and act out their character in a variety of settings. The GTA games have become increasingly more intricate simulations of real cities, offering diversions such as shopping, walking a dog, playing golf, flying a plane or just driving around in your (stolen) car, following the traffic rules or sparking a city wide car chase with the cops. All of these possibilities are geared towards the experience of freedom, playing with the thought of what someone could do if there were no moral boundaries. The player gets to act out fantasies of violent encounters, robberies and hijacking, in various combinations with sometimes thought-provoking and occasionally hilarious results. The main mission the player can follow, if they so choose to, is in comparison much more sombre, so the possibilities outside the storyline also have an uplifting function.

In the game *Dishonored*, we can see how this concept can be employed in a story-focused environment, how the idea of highly creative gameplay is reflected within the

mechanics. *Dishonored* is a stealthy action-adventure, in which the player can control the assassin Corvo, who possesses many different physical and magical abilities. While the overall story arc is authored, the single missions with their precise objectives are randomly generated. This, together with the multitude of possibilities Corvo's many abilities entail, leads to a heavily choice-driven gameplay. The player can choose to complete an objective stealthily and passively or aggressively fight their way through, and in between these choices there are again many different options allowing the player to use abilities to their liking, or a combination of them. Thus, the gameplay allows for an improvised, creative path of action and the personal expression of morality. Additionally, most of the storytelling is environmental, giving the player the option to choose how and when to deepen the storyline.

CREATING EXPRESSIVE GAME MECHANICS

To understand what a mechanic that can provide such a creative expression looks like, we can look a little more closely at the development of *Dishonored*.

Director Harvey Smith³⁸ explains how they achieved their choice-driven gameplay by utilising the concept of complex, reactive mechanics. There are probably quite a few similar concepts and different names for the same idea, but the team of *Dishonored* calls these mechanics "General Purpose Systems" (GPS).

A GPS is a game object which has several interactive properties assigned to it, and these properties are commonly shared with and functionally connected to other GPSs and their properties. Each object has an input/output system that classifies the input/output and is commonly shared amongst all GPSs, forming logical connections which specify the possible interactions. These classifications cannot be arbitrary. The player has to be able to make sense of them in order to use them in a meaningful way. Because of that, the objects have to have an obvious affordance, the function and usability deductible from the narrative construct assigned to the system. This system structure becomes more accessible looking at an in-game example:

³⁸ Smith (2013)

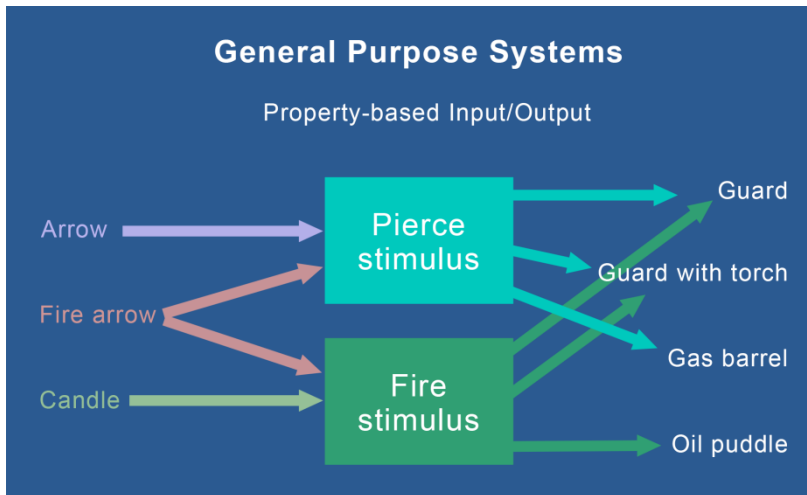


FIGURE 15 : DIAGRAM OF A GENERAL PURPOSE SYSTEM (GPS)

Imagine the following scenario: The character is hidden in a dark corner, and has to get past a guard on the other side without causing much uproar. The player now has to consider two variables helping them to achieve this goal. For one, they have their own inventory, objects available for use. In this case they have an arrow, a fire arrow and a candle. Each of these objects has several properties; the arrow for example has a 'piercing' property, which it shares with the fire arrow. The fire arrow additionally has a 'fire' property, which it shares with the candle. All of these properties, their affordances, can be logically deduced from the appearance of the object. It is a logical conclusion that the fire arrow can pierce things and set them on fire. Nonetheless, usually interactive items have to be introduced in a setting which allows the player to experiment with it, to find out their properties. Not every object in a game could possibly have the same properties they would have in the real world, for example the fire arrow might not be designed to actually set everything which might seem burnable on fire, as this would expand the scope of the level that needs to be designed beforehand into an unreasonable scale. It is also vital that the player cannot accidentally navigate themselves into a deadlock that would end the game, like setting everything around them on fire with no means of escape.

Now, scanning the room, the player sees several possibilities where these properties could be applied. For one, there is the guard, which would interact with the 'piercing' property of the arrow for example, likely leading to a resulting state change. Simply said, hitting the guard with an arrow will most likely kill or at least injure him. Alternatively, they could make use of the 'piercing' and 'fire' property of the fire arrow to shoot the gas barrel, which would likely lead to the rather deadly state change of the barrel into a ball of fire, but this would be an unwise decision since it would loudly alert

every one of the player's presence. Or the player could also try to utilise the shadows and hidden paths in the environment to sneak past the guard, not even engaging in contact.

These are all possible paths for the player as a result of complex, i.e. interconnected, mechanics. The items the player is carrying interact with each other, they can interact with the environment, and the environment itself is a navigable system.

But looking at the bigger picture, the scene in the context of the storyline, the player could also take a path which completely destroys all dramatic tension of the moment, just because they have the mechanical means to do so. Throwing a grenade into the room where the final boss is waiting may be effective, but it would be a rather anticlimactic finale which does not have the same rewarding feeling a direct encounter and the witnessed defeat of the enemy would have.

So these complexly connected systems can have a multitude of effects on the gameplay experience. As mentioned before, each scene can be played through in a unique manner, with an array of meaningful choices that will result in a feeling of high agency for the player. This appeals to players with an inclination in the quadrants of skilled work (Challenge), building (Novelty) and of course mechanics (Harmony). However, the interconnection between the mechanics will only become visible if the game has been played for a while, when the player is already well into the stage of engagement, done with learning the basics and diving into deeper exploration of the possibilities.

A much more immediate impact on the gameplay is how the systems are integrated into the gameworld. It is the visual and functional affordance, the how and why an object appears the way it does, and what its existence signifies, which extends the narrative of the gameworld into the game experience.

Narrative Connotations of Mechanics

All objects, their appearance and interaction, are part of the narrative of the gameworld. The interactions the player can have with a system shape how that system is perceived, whether it is friend or foe, valuable or disposable. The affordances of this system are implicit exposition: Whether it is a crossbow with medieval visual references and affordances, a nuclear powered vehicle or a mysterious injection fluid that awards

the consumer special abilities, the mere existence of these systems and their inherent functionality allow the player to come to conclusions about the game world without ever being explicitly told what their meaning is.

However, with every implementation the designer should think about whether this is a functionality they want to have in the game, whether the system makes sense in the context of the gameworld and the aspired experience. Sometimes there are a lot of reasons why a specific interaction is *not* used.

One example for this is the implementation of weapons. It is rooted in the human mind to make use of the tools available, along the lines of 'to a hammer, every problem looks like a nail'. By giving the player a weapon, they have a tool of power, domination and protection, because this is what the concept of a weapon usually implies. If an environment is littered with possible weapons, it implies the player is in a dangerous situation, because obviously everyone living in in this environment has a weapon, and they need to protect themselves. So if the game experience requires the player to feel helpless and insecure, giving the player a weapon would be counterproductive.

This is not something the player would generally give a lot of thought to, only becoming obvious when the affordance or imposed narrative of the object contradicts the conceptual model the player has of the world. There are a lot of examples where the desired function of the implemented object contradicts its narrative denotation. For example establishing a collectable item as a rare and precious currency, but having the player find it on top of trashcans openly in the streets, surrounded by homeless thieves, seems somewhat unlikely. In *Bioshock Infinite*, there are literally vending machines for weapons and ammunitions, contradicting the setting of the peaceful, harmonic American suburbia, where violence would be quickly condemned and locked away. On the other hand, the *Bioshock* example shows how this can be used as a tool to make the player question the obvious narrative against the implied one, creating a layered meaning which can hint at conflicts within the gameworld.

Advantages and Drawbacks

Having only a few of those complex, reactive systems will not automatically create high-agency gameplay. The implementation of these mechanics has to be thoroughly planned from the first development stages, so that during the development there is enough time to create a large number of systems with several parameters,

implementing possible connections to give the player the opportunity to find many meaningful connections. This means that a substantial amount of time will have to be designated to the task of designing and programming the many interconnections even before the first gameplay tests are even possible. Furthermore, with the number of connections increasing, the number of possible choices start going up exponentially. At some point it is likely that the designers will not have thought of and tested for all possible combinations, which on the one hand can create emergence, but on the other hand potentially makes the game unstable. Additionally, the entire level design has to be adapted to offer the space necessary for all possible paths of action, forcing the designer to create paths and content for every perspective.

All this heavily increases the scope of the game for the programming and level design team, and games which intend to fully rely on the use of these reactive mechanics tend to either have a very lengthy development process or are in a more or less perpetual **beta-phase** because of the continuous improvements. Why complex systems are still a desirable feature in a game can be explained by looking at *emergence*.

EMERGENT GAMEPLAY

Emergence is a concept which can be witnessed in every 'system' which has rules defining the interaction within this system as well as with outside systems. The combination of rules constituting behaviour create emergence, an unforeseen³⁹ result or state. For example, looking at the movement of a flock of birds, simultaneously reacting to outside influences of wind and obstacles, while carefully balancing their movement with the other birds of the flock⁴⁰, the pattern of the flock of birds in flight is emergent. This pattern was not planned, rehearsed, or dictated from an entity in the flock, it is a result of the rules of the bird's natural instincts reacting to the environment.

Another example can be found in the game of Poker⁴¹. 'Bluffing' in Poker, pretending to have better cards than you actually do, so the other players become discouraged and quit, is not stated in the rules. It is a naturally emerging strategy, acknowledging the 'system' of confidence of the opposing players as another factor which needs to be accounted for in order to win.

³⁹ *unforeseen as in not the reason why these rules exist, not directly governing the behaviour for that specific purpose*

⁴⁰ Egenfeld-Nielsen, Heide Smith, Pajares Tosca (2013), p.149

⁴¹ Salen, Zimmerman (2004), p.164

Within a video game, there are two kinds of emergences possible⁴² :

One kind is the result of the interaction of the systems which constitute the gameworld playing off of each other, for example physical simulations of seasons and weather, without the influence or even the witnessing of the player.

The other kind would be the 'system' that is the player - i.e. all mechanics the player can use, acting with the gameworld to create unscripted results. Yet in the end, the player is part of the gameworld as the character fragment, and bound to the game rules, so the distinction between these two kinds is somewhat blurry, but still can make uncontrollable decisions because of the player or person fragment.

Also, it should be mentioned that the complexity of a system does not directly correlate with the number of rules, and as such is not a prerequisite for emergence. Chess has a lot more stated rules than Go, but in Go the possible outcomes and strategies to win are far more numerous, and in the end unpredictable, so that, unlike in Chess, even a super-powered computer cannot predict the winning strategy. Although it is hard to exactly pin down what amounts to emergence, spatial freedom to encounter interaction (the Go board is larger and the movement of the pieces not restricted) and non-specification (all pieces have the same colour and abilities, thus can be used in many different situations) seem to be at least a factor.

So in what ways is emergence a desirable concept in game design? Warren Spector defines emergence as "*engines of perpetual novelty*"⁴³. Since the idea of emergence is that the end result has not been predetermined when creating the rules, each time the game is played the situation might turn out differently, which is why the player can keep coming back to play the game many times without getting bored. Another reason why many developers strive for emergent gameplay is the impact the player's choice has on the course of the game. Emergent events are a natural result directly to the player's action, and not predetermined by a designer. So emergence is natural integration, an important part of the "meaningful play" prerequisite according to Salen and Zimmerman.

These are the advantages of emergence out of complex systems. However there are also a few downsides to this concept. For one, as already mentioned, the self-determined, choice-driven gameplay is not for everyone, some people prefer a narrative framework which helps directing their actions towards a more specific goal.

⁴² Kaveh (2010)

⁴³ In: Alexander (2013)

In addition to this, the unpredictable nature of emergence can also lead to undesirable results, like a combination of interactions that can be used contrary to the desired goal of the setup, exploiting the system. One famous example is the proximity mine exploit in *Deus Ex* (2000), where the player could propel themselves above the scene geometry by using the mechanic of a mine in an unexpected way, effectively destroying the gameworld's believability.

EMERGENT NARRATIVE

When designing a game with the goal towards emergent gameplay, the designer should be especially aware of the narrative impact of these mechanics. As described before, the appearance of the mechanics is a narratorial extension of the game world. Of course this is not exclusively an attribute of emergent mechanics; even the most linear, pre-scripted game mechanics should make an effort to have their affordance reflect the gameworld. But when complex systems are not used in the context of a story driven game such as *Dishonored*, but are the sole expression of story in the game world, as in sandbox games such as *Minecraft*, they become the only possible expression for the narrative. And since the narrative is always a vital part of the game's experience, regardless of whether it is structured or emergent, this component needs to be designed to appear integrated into the gameplay as well.

Jenkins describes in what ways the characteristics of these emergent narratives shape the experience⁴⁴:

„Emergent narratives are not pre-structured or pre-programmed, taking shape through the game play, yet they are not as unstructured, chaotic, and frustrating as life itself.”

So while the complexity of the parameters are still not as manifold as they would be in real life, the game still becomes a vastly complex structure, mostly without explicit guidance through means such as story or stated goals. The narrative 'takes shape' through the game play, meaning that the interaction and its feedback have to logically connect affordance of the system and meaning within the gameworld. For this to work, the mechanics have to become a legible narrative. As an example, Jenkins cites the simulation game *The Sims*. This game is basically a dollhouse simulation, where the player can build a house and characters to play with, have them form relationships with

⁴⁴ *Jenkins (2014)*

each other and build a successful career. During the game, any object the player can add to the scenario has some kind of impact on the surrounding or the characters in the game, deducible from the meaning the object holds. So for example a bookshelf holds the meaning of knowledge, the Sim can read to gain specific knowledge or as a diversion, increasing the mood.

Conclusively, narrative emerges from complex systems when their meaning is deducible by the player and connected to the interactions they provide with the gameworld. This means that in these specific kind of games, narrative can only be produced through interaction, and its progression will always be non-linear, the final result barely predictable.

But emergence does not only have to be about self-expression, it can also create emotional, sympathetic experiences, although it still might require a superimposed structure to work.

By dictating a goal, the experience becomes more predictable, however when there is no specific goal, the player will still play, creating a goal and an experience for themselves.

This allows the player to direct their actions down a path they feel to have chosen themselves, and thus is meaningful to them.

Again, *Journey* serves as a helpful example, this time with the abstraction of interaction with another human being. Throughout the game, the player comes across other players, and their only mean of interaction is 'singing', releasing a chirping sound, that can be varied in length but nothing else. So the player's sole interaction is through movement, jumping and singing, however there are no rules that confine the players to each other. Every player can chose to play alone by simple leaving the other player behind, and suffering no real disadvantages from it. Yet if the players chose to stick together for the rest of the adventure, a story of friendship develops, two people helping each other through hardships and emerging stronger than before. The experience of understanding and belonging created through this setup is intended by the designer, but since no rule is strictly enforcing it, it can still be considered an emerging natural reaction, a combination of personal preferences and an environment supporting this inclination.

This is an important conclusion which applies to every gameplay experience - by giving the players rules, and a win state they should achieve through these rules, the designer is establishing a context upon which each interaction is judged. If the designer decides

to explicitly set a goal, the player will direct their motivation towards this goal, focusing their attention on the rules that will most likely result in this win state. As a side effect, the player is likely to ignore gameplay not related to this win state, which could enrich the experience, but is not encouraged through any rules. For example, if in the game of *The Sims*, the player was told that the goal is to let their character reach the highest step on the career ladder, they would dismiss actions like decorating their house or creating a family in favour of achieving the expressed goal.

An alternative guiding tool to the win state is the implementation of a fail state, a condition upon which the player loses the game. This is a far less restrictive method to guide interaction, encouraging experimentation while still providing some sort of difficulty.

Even in games with no enforced structure there is likely to be at least one fail state to prevent the situation from becoming stagnant. In *Minecraft*, this catalyst can be found in the creeper creatures, zombie-like enemies that come out at night, forcing the player to prepare during the day.

As the variety of examples show, it is hard to pinpoint a setup of mechanics which will ensure emergent gameplay. The complex mechanics of *Dishonored* give the player a wide array of options to express themselves. So while the result might feel like emergent gameplay, it is actually the result of a very close knit, heavily authored ruleset, which seems contrary to the definition of emergence. The singing mechanic in *Journey* can provide a beautiful emergent social interaction, but if there was no additional helping set of rules, the player might miss out on this experience by accident. If the player in *Journey* decides to ignore the first person they encounter, they will continue to meet new players, on the chance that they changed their mind and want to continue together. This concedes to the idea that while friendship can only arise on a voluntary basis, it still might need encouragement. Other than the pairing mechanism, the game provides a solid gameplay that is enjoyable on its own. This ensures that even if the player decides against the emerging companionship, they are still creating a beautiful experience. Also, the emergent social interaction in *Journey* would be meaningless if it had no structural frame to impose the challenging events upon the team of players, to test and deepen their friendship.

Conclusively, it is hard to say whether it is desirable to strive for a mostly emergent gameplay, or if it is sufficient to just imitate the experience of emergence by offering interactions that are complex enough to anticipate the bulk of the player's preferred play styles.

By combining mechanics with an authored structure, the game can become an emotional experience which can be anticipated and still give the player enough room for personal expression and the development of agency. In the next part we are going to look at a few examples of games which have successfully utilized authored structures for complex games and 'emotionally' emergent systems.

REACTIVE GAME MECHANICS

In this chapter, we will explore how to employ mechanics in a narrative authored context. The difference between the before mentioned expressive and the narrative-driven mechanics is that instead of encouraging player expression, narrative-driven mechanics are designed to draw a reaction from the player to the world, and steer the player into a certain direction in order to ensure a compelling dramaturgy. This implies that the freedom of the player is restricted, by cutting down their possibilities of interactions with a superimposed structure of authored events.

Structured narrative, amongst other factors, includes the means and pacing by which the story is transported, and it is one of the most critically discussed aspects of interactive narrative, as the before mentioned ongoing debate between narratologists and ludologists proves. However far video games have come to delivering dramatic, multilinear experiences, there are still a few core problems when it comes to delivering story by the means of interactions.

Schell calls this problem the 'Story/Game duality'⁴⁵, comparing it to the 'wave-particle duality' of electromagnetic waves and subatomic particles. They are both a manifestation of the phenomenon of light, just as story and mechanics are differently perceived manifestations of the same thing, the core experience of the gameworld. So while the consequences of these factors should theoretically be the same, transporting the experience, in practise it is problematic to unify them under the same set of rules.

The core problems, according to Schell, are:

1. The Problem of Combinatorial Explosion: This problem originates from the structure of narrative which is supposed to support multiple paths of a story to include player's choice. As soon as the story evolves from one linear path to several paths intending to include decisions into the path of the narrative, the scope of the game is starting to expand, and can reach exponential dimensions if the path diverges at every possible decision point.
2. The Problem of Unity: Most stories start with a problem which already has a natural solution that will be the most satisfying ending. There are simply not many choices which could be made within the range of the story, which would not subvert the arc of suspense expected by the audience, and would still be logical within that experience. This is especially a problem when working with

⁴⁵ Schell (2008), p. 262

'established' story arcs, the archetypical stories popularised throughout all kinds of media. It is hard for a story based on the hero's journey to include the possibility for the player to make choices which run completely opposite the expected direction of that story, and still satisfy the dramaturgical expectations of the player. This does not mean this would be an impossible feat, acknowledging these boundaries could even encourage the designer to challenge them, reinventing the classical formats and question their often excessive use of clichés.

3. The Problem of Disappointing Multiple Endings: Similar to the Problem of Unity, this is a problem stemming from the interaction of the player with the story. Even if the story is not an obvious archetypical one, it still is problematic to come up with multiple, equally valid endings that facilitate the desired experience. Both these points will be discussed in the 'choice' part of the chapter.

Acknowledging these problems is not a concession to the incoherence of interactivity and drama, as these problems can be avoided by careful design, and of course the integrated use of systemic narrative. While there are games which can generate dramatic tension solely through the use of complex systems, these gaming experiences tend to only focus on the player's personal goals. This is a limitation that should not be applied to the spectrum of experiences games can offer. Many experiences depend on the feeling of social emotions within the player, on their sympathy or empathy with characters in the gameworld and the motivation originating within these feelings. This is where structure comes into play.

STORY STRUCTURE

Structure in a narrative is the placement and pacing of 'events' which influence the dramatic tension of the experience when they are revealed.

Most experiences which feature social emotions as a form of motivation for the actions in the game require a dramaturgical framework, which establishes context, characters and their motivations in the game to allow for these social emotions to develop.

Three-Arc Structure

The most well-known construct is probably the classical Three-Act Structure, where the story elements are arranged in three segments, building towards the climax points at the end of each act. The First Act deals with the set-up of the situation, introduction of characters and their motivations, and the event which triggers the happenings which are about to take place. The Second Act showcases all the confrontations the characters have to go through with increasingly threatening obstacles obscuring their goal. This leads up to the big crisis at the end of act two which kicks off the final climax, testing the characters for the knowledge that they have acquired during their journey. If they pass this test, the crisis will dissolve, and the remaining problem will unravel themselves in Act Three.

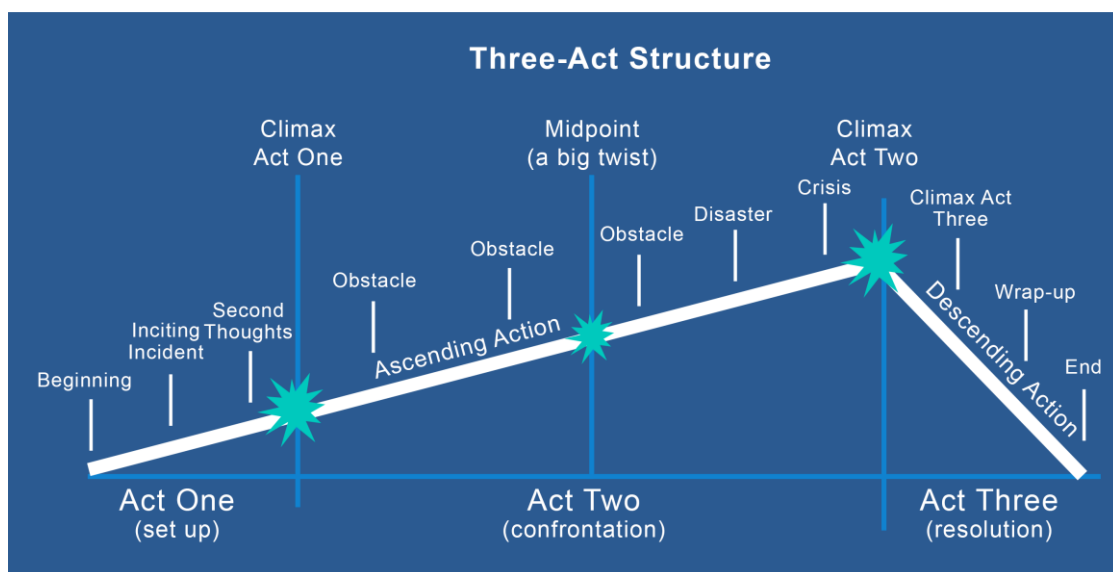


FIGURE 16 : THREE-ACT STRUCTURE

Most popular movies and novels adhere to this construct, as it is the ideal arrangement to build up emotional investment within the consumer of this story, and have them empathising with the struggles the characters go through with each obstacle. As these are non-interactive media, the path is linear, with no place to integrate the choice of the audience, although these media still have a layer of cognitive and beyond-the-object interaction.

A diagram of a story which includes several points of decision would look like figure 17, where a diverging story path leads to different story endings.

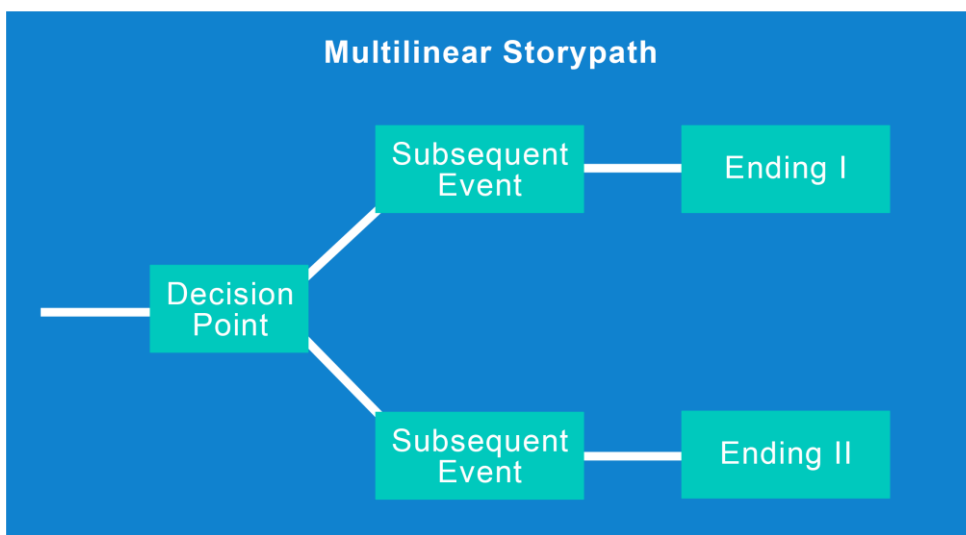


FIGURE 17 : EXAMPLE FOR A MULTILINEAR STORYPATH

Too many points of decisions will lead to the combinatorial explosion Schell mentioned, where in the worst case scenario of an exponential number of choices will blow up the game's scope. To prevent that, it is common practise to have the diverging paths merge again at a later point in the game, creating 'choke points' in the story.

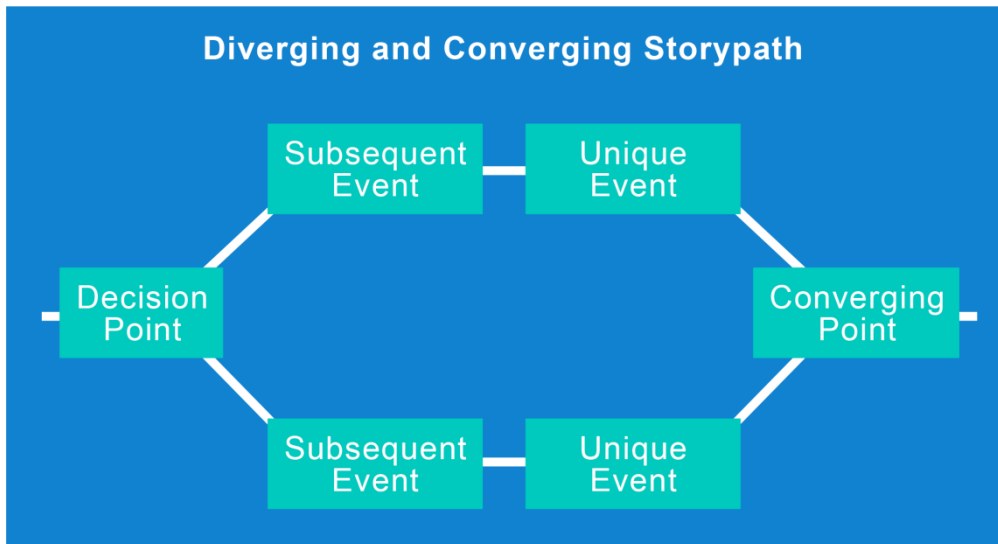


FIGURE 18 : EXAMPLE FOR A CONVERGING STORYPATH

Another problem with the Three-Arc Structure video games have is the path of action. In the Three-Act Structure, the action is slowly building up towards the climax, and then descending. In video games, action is a necessity at all stages, it cannot start as late in the game as the second arc. While the importance of the action the player takes, as well as the intensity of the feedback, can be authored so that it dramatically correlates with the tension of the first act, it is unlikely that the player will continue to sit patiently through the non-engaging exposition during the first act until the first dramatic point where the action will finally start to pick up. The beginning of a game is vital to build up immersion, the player has to be able to engage with the game so they are willing to spend the time necessary to complete it, which is hard when the player does not feel as though they get to do something meaningful. Basically, a game has to get rid of or fundamentally adjust the First Act. There are several known ways to achieve this:

- For one there is the tool of 'in medias res', where the player is thrown right into the action of act two, either as a non-linear story part or a introductory mission. For this, the scene will have to work without any given context, and the action required of the player cannot be as difficult as the actions which would otherwise be required in act two, since they did not have time to develop the necessary skill yet. The game *Uncharted 2* offers an exemplary starting sequence which immediately triggers the interest of the player by showcasing all the opulent action the player gets to live through in the game. The main character Nathan Drake wakes up bloodied and confused in an empty, trashed train department, dangling over a cliff. The very first action the player has to take is as simple as it is important: climb out of the train or die. There is not a lot

of emotional investment or exposition necessary. The train is arranged sufficiently threatening and the character is hanging with one hand at the last rail, so if the player does not want to quit immediately they have to climb up and save the character. In story progression, this scene takes place towards the end of the game, and when the player has played through most parts and arrives at this plot point again, enough time has passed that the memory of the scene has become a puzzle piece in the chain of events that start off the final climax.

- Another crutch often used is simply letting act one drop completely, justifying the absence of any characterisation or motivation with the explanation that the character is suffering from amnesia or similar afflictions. This puts the character at exactly the same level of knowledge as the player, which is helpful when trying to avoid any motivation gap. However, the excessive use of this method has resulted in a somewhat dull aftertaste. It is important to note that the lack of memory should not mean absence of any characterisation. When done right, the own absent backstory becomes an interesting puzzle which can be pursued throughout the entire act two, although it is hard to employ it as the only motivation for the player. This is also where mechanics can be used as narrative means, allowing the player to fill in the gaps about the character based on what skills they have, what they look like or what items they carry.
- A more common design solution for act one is having the player apply the same actions as they can do in act two, albeit in a more simplistic form in order to teach the player, yet not for a goal which requires a lot of involvement for the player to sympathise with. This kind of tutorial is often necessary so that the player does not become frustrated when being tossed directly into the action⁴⁶, but tutorials which are not integrated into the game's story do have a bad reputation for being condescending and boring. However, they are the starting point for the player's interaction, the first point of contact with the game, and so in order to not immediately suffocate any kind of engagement it would be foolish to skimp on time designing the first moments of the game.

Another problem with the Three-Act Structure is the establishment of an overarching goal.

Unlike in a movie, being the one doing the action and not merely witnessing them, it is easy to lose sight of the overarching goal, when every small goal the player is presented with becomes equally important because of the time and effort they have to

⁴⁶ Lee (2014)

spend to achieve it. This leads to what designer Jeremy Bernstein calls the “Action Problem”⁴⁷. This problem manifests in several symptoms, the most prominent of them being confusion. This is usually the result of reactive mission statements, the player is being fed the motivations and goals via explicit narrative, a cut scene or a voice over, without having any personal motivation or ties to the situation. As a result, the goal will not be remembered, and during several points of the mission the player will feel confused, and ask themselves “why am I doing this?”. Another symptom is repetition, the feeling the player gets when the current objective is all too similar to the previous ones, most likely because the mission is a filler which will occupy the player and lead to a longer run time of the game, but has little impact on the progression of the story or a specific skillset of the player.

These are symptoms which are quite likely to occur in a game where the story progression is not linked to the gameplay progression, and likely resulting in a player-character motivation gap.

Sequence Structure

To prevent the feeling of heteronomy, Bernstein proposes a construct called Sequence Structure, a narrative framework that is derived from the Three-Act Structure, but has a focus on objective-driven progression.

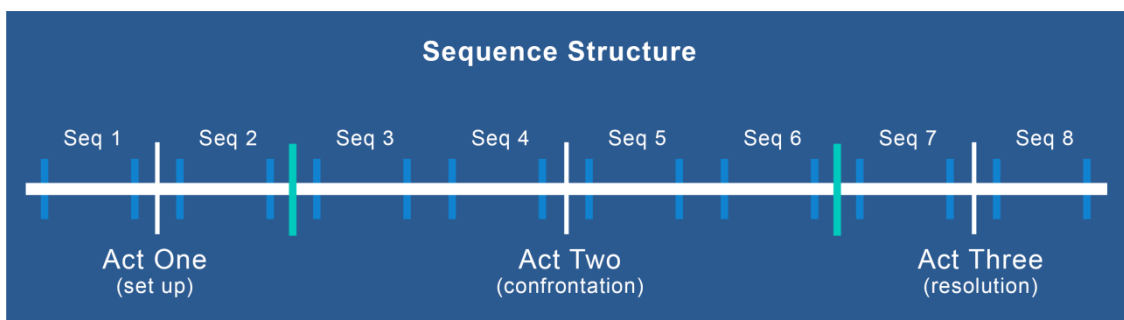


FIGURE 19 : SEQUENCE STRUCTURE (IN MOVIES)

Bernstein’s Sequence structure, while still adhering to the road points set by the Three-Act Structure, subdivides the story progression into 8 self-contained parts, all with their own course of set up, confrontation and resolution, with the number 8 here being more a guideline than a rule. Every scene is the result of the events, triggered through the interactions of the player, within the previous scene.

⁴⁷Bernstein (2013)

Bernstein's definition of a story builds on someone who wants something badly, thus pursuing an objective, yet having a hard time getting it, hence the establishment of an obstacle being the incentive for gameplay.

Based on this definition, the application of sequence structure seems natural. Games are usually subdivided into levels anyways, and the object-oriented nature is a design direction which includes an active player perspective by default.

To still create a meaningful connected sequence fitting into a larger narrative framework, the resolutions of each scene's unique obstacle is always tied to a cliff-hanger, causally connected information which will lead to the events of the next scene. This creates a natural loop of tension, which transfers the unresolved objective of the most recent goal onto the subsequent scenes, directing the player's attention towards the next series of obstacles.

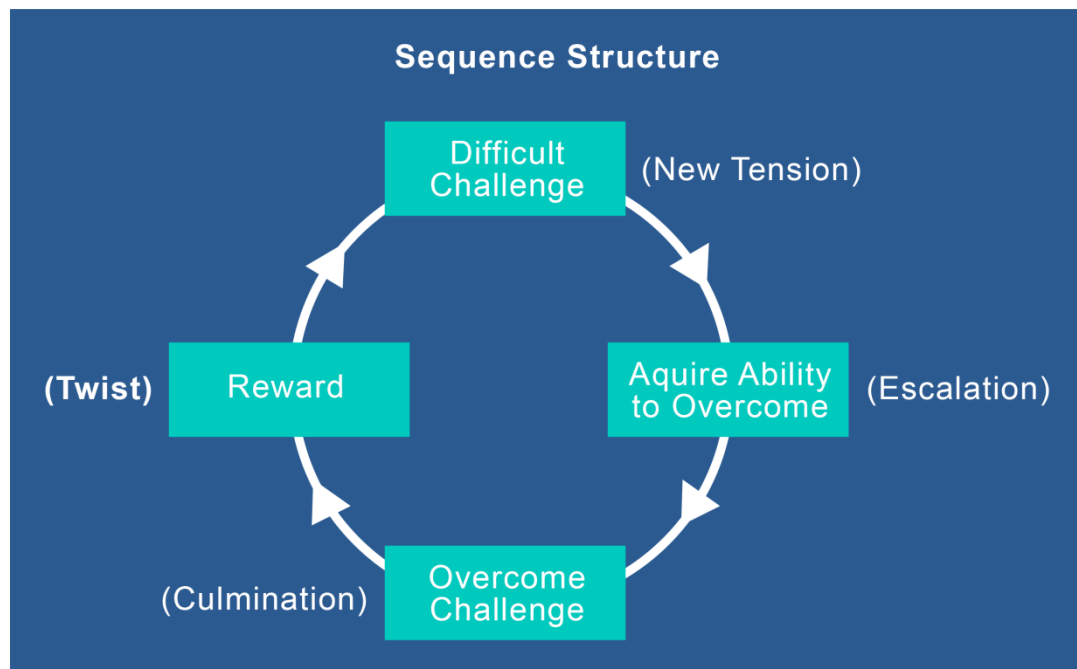


FIGURE 20 : CAUSALITY LOOP IN SEQUENCE STRUCTURE

Each of these self-contained arcs should feature just as much background information and motivation, the attention span of the player permits. In film, where sequence structure originates from, the length is set to about 15 minutes, so that after 8 sequences the final length of a feature film is achieved. It can be assumed that this is a slightly short time span for a video game, where one gameplay session cycle can easily take the time of around 30 minutes. The longer the session spreads, the likelier it is for the player to become distracted again, the attention drawn away from the original goal.

The causal connection between the arcs is another benefit. Just as a solid explanation helps the observer to build a well-rounded, flexible mental model, seeing the own actions as the origin for further actions will on the one hand be better memorable and on the other hand give the game world a more realistic appearance, because it appears as a reactive environment.

So a causal narrative structure is yet another tool which can create a feeling of agency within the player by emphasising the importance of their own actions within the gameworld.

CHOICE

By adhering to a narrative structure, the player's freedom of interaction is limited. To understand what these limitations entail, we are going to look at the concept of choice in a video game, what it is and what it means in gameplay terms.

Maybe the most quoted words regarding choice are from Sid Meier, designer of milestones such as *Civilisation*⁴⁸:

"A game is a series of interesting choices."

By putting choice as the very definition of a game, Meier's stance on the importance of choice is obvious. The aforementioned feeling of agency is generally assumed to be a product of choice, because what else could deliver a feeling of self-expression if not one's own decisions?

But how much freedom does the player really need while making a decision to have the feeling that this choice is their own free will? Which parameters really constitute a choice?

⁴⁸ Meier (2012)

Choices in Games

To answer this question, it might help to list the varied types of choices a player can encounter during the gameplay⁴⁹:

- The first kind is barely a choice: Pressing a button to move the player forward is a *necessary* 'choice' to continue the game, but it is *unimportant*. Similarly, there are choices such as deciding to jump instead of walking - in no case necessary to reach the game's goal, but the freedom to do so is important to the player to at least a small degree. Generally, this is a degree of freedom which is assumed to be existent and only catches attention when it is not, as the result of a badly translated or falsely explained mental model: If, for example, the character controller offers realistic movements of walking and sneaking, a natural assumption would be that the character can also jump. It is usually a mild annoyance to the player until they have corrected their conception of movement within the game. These kinds of choices can also facilitate a simple form of emergence, which might not be contributing to the large scale of events, yet still express player intent.
- Another kind of choice is *unimportant*, as in 'not necessary to continue the game', but *meaningful*. Expressions of morality can sometimes fall into this category, when the player can choose to make a judgement and act accordingly. This might not be impactful for the upcoming events of the game, but the possibility for the player to reinforce their ideals or act out other ideals grants a feeling of depth to the gameworld. Customization of a character also falls into this category- changing the in-game looks does not always have any consequences for the gameplay, but even if it is just an expression of personal taste, the player will likely enjoy to do so because it shapes the experience just a little bit more according to their liking.
- Finally, there is the *influential* choice, which is impacting subsequent gameplay, and as such is *meaningful*. Ideally, a diverging choice like this should always be causally connected with the player's actions, to not only be meaningful from the structural perspective, but also be perceived meaningful by the player. These diverging points are a way to include player expression, like showing sympathy for a specific character or following a personal agenda by taking sides. Looking at the narrative structure, this is where the path of the story diverges, the player

⁴⁹ Meier (2012)

has to choose a side in order to continue, and that will affect the context of the immediate subsequent choices and events.

Now to prevent combinatorial explosion, the paths are likely to converge again later on at a choke point, limiting the longevity of the impact of most influential choices. Still, these choke points are not only necessary to limit the scope of the game, but also to realign the motivations of character and player which may have been diverging with the choices the player had taken before.

From a design perspective, it is vital to broadcast the longevity of a choice to the player, so they are aware if they make a choice which will impact a game in the long run and thus have the chance consider it accordingly. During a game, the player always has a number of goals of varied importance, some self-imposed through the player fragment, others the result of the gameplay. Yet, sometimes important end goals get buried under a perceived urgency of several short-term goals. So if the player is currently occupied with reaching a short-term goal, but a choice they are about to make will also have long-term consequences, they need to be aware of that fact.

In a game the situation might look like this: The player would leave an ally behind in order to reach a door, which helps them to reach the short-term goal, but leaving the NPC behind will lead to their death and affect the gameplay strategy in the future, changing the game in the long run. If the player unwittingly makes a choice which will take impact on their strategy for the long-term goal, it is likely because of faulty conceptual model of the game.

So when it comes to choices like this, the player has to be taught early on in the game what the feedback for a long-term decision looks like, so when they are about to make one, it is the conscious part of a strategy. In this case the mortality of NPCs would have to be introduced earlier, and the input-feedback size with this type of consequence should remain consistent throughout the game.

Strategic Choice

With every decision regarding the planned use of a single mechanic, or a combination of mechanics, the player makes a strategic choice. Strategy is weighting the factors of a choice against each other and deciding on the most useful one for the given situation.

This implies that a choice always needs a trade-off, that one result of a decision has attributes the other one has not.

However in a video game, the consequences of an important choice should be equally valid from a systemic perspective, even if the narrative parts diverge at that point. If one decision has an obvious advantage over the other one, it ceases to be a sensible choice. Meier illustrates this point with the decision making in a typical car racing game: The player has the choice between the car that has a high maximum speed, but a slow acceleration, or a slightly slower car that has a faster acceleration. Since one car has an advantage on straight paths but the other one is easier to handle in curves, there is no fixed correct path for the choice. The significance of each choice is determined by skill of the player and the context of the game, of what the racing course looks like and what cars and skills the competition has. This is all part of 'balancing' the game mechanics. Balance is a vastly complex topic, too extensive to spell out on a side note.

However to give a short overview, there are several kinds of balance⁵⁰: Perfect balance describes the equal significance of each choice, creating symmetrical gameplay which, amongst others, can be found in chess. Slightly Imbalanced implies that each choice has a slight drawback in one value, which forces the player to adopt a strategy where the imbalanced choice fits the context of the application. Cyclical balance is an imbalance created through circumstances which are not necessarily programmed into the choice, but occur through the number of times someone has made this choice, cancelling out the inequalities through rarity. This type of balance can often be found in online-multiplayer games, where e.g. a large number of players have chosen one character type, and so choosing a different character set is not an advantage because it has inherently better statistics, but because it has better statistics in the context of a game world where this type of character is rare.

Like cyclical balance for multiplayer games, type of balance has their benefits and drawbacks, making them more suitable for a specific type of gameplay. Generally

⁵⁰ Portnow (2014)

speaking, it is necessary that every gameplay strategy has a drawback in one parameter and an advantage in another one, in order to create an interesting choice that the player can adjust to their play style, and a long running game session does not become stagnant because choice has become a mere routine.

As it goes with most rules, there are exceptions. This kind of trade-off choice is only possible in games where there actually are strategies possible, multiple ways to reach the goal, which is not something every game needs. Rhythm games such as *Guitar Hero* for example require an entirely different approach to win, there are no different choices that can be made in order to succeed, the player either only hits the right button on time or they do not. However the gameplay experience is not determined by interesting choices, but by getting into a cathartic flow of execution, that synchronises with the music and makes the player feel as if they are the ones playing their favourite song.

Moral Choices

Strategic decision-making requires logical evaluation of all factors, and knowledge of personal strengths and preferences. But the strategic choices are usually not the ones shaping the experience, because regardless of whether they work out or not, the player will likely not reflect this choice back onto themselves in a way which influences their fragment of person.

For this to happen, the choice needs a narrative connotation which ties the decision into a personal aspect meaningful for the player, their idealized perception of self or their moral world view.

This is not something that the player can freely experiment with in real life, because of the consequences for their social life, but games provide a safe environment that encourages the playful dispute with moral aspects the player would otherwise not seek to contest. They can broaden the player's horizon and understanding of self, and thus become meaningful for the player on a personal level.

The principles of choice remain the same when connected to 'social' interactive systems, but unlike with strategic choices, the stakes and whom the consequences affect, differ.

Consequently, games which want to feature moral choices, narrative-driven choices which are based on the social context of the character rather than any systemic achievement, will have to think about the perception of morality and ideals of the player fragment. If morality is dictated by the authored character, it is quite likely that the player fragment will not agree with it, and so the designer has to find a way to incorporate the belief of the player into the decision making process.

However, this does not mean that every socially motivated choice does have to be approved by the player. The authored character can very well make decisions of their own, but at the very least the conflict the player might have with this situation needs to be acknowledged, and the way the character acts has to be justified. The player might not even want to choose a path which is identical to their true personal beliefs because the game's environment allows them to freely act out their curiosity regarding differing beliefs.

Like the make-belief games which children play, adapting the role of heroes and villains, or testing out the far more interesting in-betweens, this kind of play is, while not always designed to be fun, an important part in the development of a person's character and self-image.

When considering the choices in these games, the trade-offs the player should think about are not statistics and strategic advantages, but morals and the impact of the actions on the own emotions. This complicates the design principle which states that a core mechanic should always be numerically ascertainable, but combining both emotional decision making and systemic payoff can make for interesting decisions. In the game *Papers, Please*, the player is assigned the role of an immigration officer at the border of a totalitarian Eastern Bloc Country, controlling who gets to enter and who is denied. The true difficulty of the game emerges when the player wants to act against the rules, allowing freedom fighters or underprivileged people to cross the border even though the character will receive an immediate reprimand, which will negatively influence the life their family. However the game manages to never become truly punishing for making an idealistic choice, because although the immediate effect seems negative, in the long run the players moral stance is rewarded.

Papers, Please is just one of many games published recently that have incorporated morality and ideals of the player into the gameplay, if not as the core gameplay mechanic then at least as an additional layer giving the game a feeling of depth.

Game designer Richard Rouse has summarised several guidelines which can be useful when trying to design for moral choices⁵¹:

- *Clarity of intent*: When morality is supposed to be a statistically ascertainable mechanic, it has to follow the same rules of visibility and predictability of interaction as any other physical complex system, accounting for the number of 'good' or 'bad' decisions and assigning a result from the sum. The player needs to know that they are being witnessed and judged by the game, and as such have to pay attention to their choices in this regard. One less subtle way is adding or subtracting points on karma scale, a bar which constantly shows where on the scale the player is between 'evil' and 'godlike', which is part of the user interface or a text overlay telling the player the consequences of their choice. More integrated feedback could be changing the appearance of the character in-game to look more or less evil, or the initial reaction of NPCs to the character.
- *Redemption*: The size of the feedback still needs to be appropriate to the input. For example interactions like stealing or killing someone should not be judged equally. This gains importance if the player wants to change their gameplay approach, in case that they cannot identify with it anymore or become bored. The system should be flexible enough that the player is able to redeem themselves by working hard enough, to gather the karma required for the new approach.
- *Acknowledging the grey zones*: The balancing of the mechanics should acknowledge that the concept of morality reaches beyond a simplistic black and white view of positive or negative points on a karma scale. This is the main problem many games face when trying to utilise morality as a core mechanic, because in order to have a quantifiable outcome which can be expressed as a result, it forces morality to become a countable measure. Once a binary scale is established, and the player has seen through the scoring system, they are likely to decide on one side ("I want to be a villain") and stick with it throughout the entire game without considering each decision individually. Taking a morally grey route or alternating convictions has a less visible strategy to success, whereas sticking to one side will at least guarantee success for one conviction. If this is the case, then the game has failed to create a believable make-belief

⁵¹ Rouse III (2011)

scenario which resonates with the person. Instead it makes the player play an obvious system.

- *Showing both sides*: To counteract this trap, the complexity of an ideological conflict has to be acknowledged. Some of the most common conflicts are for example faith versus science, environment versus business, or security versus freedom. To integrate these issues reasonably into the decision making process, arguments for both sides must be showcased equally to the player. The player then needs to be able to make a decision freely, without fearing punishing consequences which are exclusively for choosing one side over the other. Of course this does not mean that the choice should not have negative consequences, as this would make the whole point of incorporating morals into the game meaningless. It should just mean that the player should not perceive the game as if explicitly punishing them for taking this exact decision. This requires a mixed feedback provided to the player, showing them the positive and negative consequences of all their actions.

The game *Deus Ex: Human Revolution* offers some interesting examples. In one of the first missions, establishing early on that there the game acknowledges idealistic actions, but does not judge them, the player has to sneak into an hostilely occupied building where hostages are being kept, with the mission goal to capture the criminal leader, but no further directions regarding the hostages. There is a variety of choices the player can make during the process, including the choice between incapacitating the hostage-takers or killing them, or avoiding contact and to primarily try to secure the hostages' safety. Whether it is a conscious choice or a heat of the moment act, killing the criminals will get very mixed social interactions when talking to civilians later on. Some will congratulate the player on their hard stance; others will express their concern at the unnecessary cruelty towards the criminals, who turned out to be coerced into the situation as well. While the player might feel remorse or verification at the comments, it is clear that the game does not condone one path over the other, instead it conveys the utilitarian message that ideals and reality do not always work well together, and sometimes, there is no 'right' path at all.

Putting someone in this position, forcing them to make a decision even though they have no control over the situation, is an experience which might be unique to the medium of games, because it requires interaction. Simply watching a situation like this, even if portrayed by an excellent actor, might arouse sympathy for the character acting, but it is unlikely that the audience would go through the same thought process,

weighting the lives of the people affected by this decision against the personal belief of what would be the right thing to do.

Rouse calls this situation '*The Quandary*'. Being in the shoes of someone who has to make a decision with the knowledge that every possible outcome is not desirable, but not acting at all is even worse, is an experience hard to deliver, but is likely to be a learning experience for the person.

But morality and idealistic conflicts are not something which has to be applied heavy handedly all the time. Almost every system in a fictional world comes with an at least slightly ideological influence on the gameworld.

In *Assassin's Creed IV: Black flag*, the historical setting in the 18th century Caribbean, with pirate warfare and common slave trade, allows for a few interesting ideological disputes, even if it is an action game at its core⁵². One of the better implemented mechanics can challenge the player's reflection is how appearance changes the treatment of the character in the game. One role the player can adapt is that of a biracial woman, who can change outfits and thus roles. The direct contrast between these roles of a high-born lady, a pirate and a slave all have different consequences for gameplay, but more importantly it also highlights how the simple act of changing cloths can have a life-altering effect in a society driven by status and appearance.

So by recognising this aspect of their mechanics and treating the issues with respect, that is assigning realistic, non-judgmental consequences, they have successfully created a thoughtful undertone in a game where moral ambiguity is not the core mechanic.

Illusion of Choice

However ingrained the use of choice is when thinking about the definition of a game, in reality no game can offer unlimited choices, and a great number of games heavily limit the choices which would theoretically be possible within the physical frame of the gameworld. On the one hand, by cutting down on the number of connections of complex systems and by narrowing down the spatial movement of the player, the scope of the game can be limited, making the game a realistic, marketable project. However, choice and narrative have a far more complex relationship. As it was

⁵² Franklin (2014)

mentioned in the introduction of this chapter, drama and choice do not tend to develop abreast. If the desired experience requires the player to be in a tight spot, the player usually would not be there if they had the choice over what happens in the game all the time, and so the designer has to engineer a way into those situations which is believable to the player, but still maintains their feeling of agency, feeding into the player's beliefs that there is a chance to get out of these situations as well.

This problem mostly affects games on the vehicle side of the scale, where the experience is largely character driven and based on the constant feedback loop between the player empathising with the characters and reflecting on the situation. Unlike in games such as *Dishonored* or *Minecraft*, proactive games where events happen *because* of the player and not *to* them, the experience in these games is a *reactive* one.

A very popular title which fits into the reactive category is *The Walking Dead*, an episodic point-and-click adventure where the player gets to control the convict Lee Everett throughout the events of a zombie breakout, with the goal to survive and protect the little sidekick Clementine from zombies and desperate survivors, all trying to deal with the new disastrous situation. The game is quite linear in its story structure⁵³, often decisions lead to the same result. However it was one of the most lauded interactive story experiences of the year 2012.

Sean Vanaman⁵⁴, designer working on *The Walking Dead* series, explained that in order to convey the essence of their desired experience, there was truly only one 'perfect' story path they could offer. If they had added more story paths, alternative momentous choices, for the sake of interactivity, the result would not have been a more meaningful experience for the player. They decided that giving the player more than one path to follow, with the knowledge that all but one would be subpar, would destroy the importance of the choice and in turn ruin the trust of the player, who engages with the game under the assumption that they cannot consciously ruin their own experience. The interactivity is still prevalent, but is focussed on a more emotional, reflective experience.

This does not mean that the player needs to feel as if they forfeited any control or that there will be no sense of agency. Many times it is enough to create the feeling that there has been a meaningful choice made in order for the player to feel integrated,

⁵³ A diagram of all possible choices in the walking dead can be found in the sources

⁵⁴ Vanaman, Rodkin (2013)

even though the choice did not have all of the meaningful, permanent consequences which might have been possible.

The most obvious example is the use of branching and diverging story paths - at some point, the player has to go through the decision making process and receive an immediate feedback for their decision, and the story path diverges. When later on in the story the paths converge again, technically the effect of the player's choice has been annihilated. But it is unlikely that this is what the player will notice over the effort of the decision, without actively playing through several possibilities. Even though *The Walking Dead* is heavily authored in long-term consequences, as there are no alternative endings, it still manages to feel as if every event at some point was dictated by the player's actions by using short branching story paths.

Additionally, the game designers utilise several knacks to amplify the feeling of agency. The NPCs refer back to situations where the player has made a decision; sometimes they quote the words chosen at some point back at the player. And, however unobvious the method, sometimes during a conversation, a popup will show saying something like "Clementine will remember that". Although not everything said in that moment will be relevant later in the game, it still is a constant reminder of the fact that your choices have consequences.

Unlike in a game where the mechanic is physical and the consequences need to be predictable to be able to use the mechanic, *The Walking Dead* has the player interact with mostly unpredictable systems of characters. Each NPC has a basic affordance communicated through appearance and animations, but the only way the player can truly get to know them is by interacting with them, e.g. by going through dialogue trees, or by witnessing their reactions to actions. The player can assess their general stance towards the own character, but they cannot control or foretell the reactions with definite certainty.

In a game like this, it is acceptable for the player that their interactions with the emotional complex systems of the characters can be unpredictable in their consequences.

If in a game, where the interactions are based on physics puzzles, the physical rules are inconsistent, this will lead to a great deal of frustration because the system seems broken. However, uncertainty and exposure to elements which cannot be controlled are a core component of an emotional experience. In a way this simulates real life, where we get to make decisions everyday which might be meaningless or unpredictable. We

are accustomed to the feeling of making choices without knowing all the factors, but this does not diminish the emotions the consequences elicit. Only when going through the same situation several times, or comparing the consequences of the different paths, the impact of the consequences decreases and it becomes repetitive, which is why these kinds of games have a rather low replay factor.

Creating the experience is not only the burden of the designer; the player has to bear a part of the responsibility as well, by playing the game as it was intended. This is what Ernest Adams calls the *Designer-Player Contract*⁵⁵, which states that upon entering the game, the player will behave in a coherent, credible way so that the designer can provide a coherent, credible story. The more freedom the player has, in regards of choices and mechanics, the higher their responsibility to contribute to this experience.

⁵⁵ Adams (2011)

REACTIVE GAMEWORLD: ENVIRONMENTAL STORYTELLING

The environment in a videogame is the space within the game in which the player can travel freely. Through the aesthetics and arrangement of the elements in the environment the idea of the gameworld is transported to the surface, to be interpreted by the player.

An environment in a game serves several purposes⁵⁶:

1. The environment constraints and guides the player along the narrative path, by utilising its physical properties. Architectural elements like walls and stairs naturally restrict the movement. By placing interactive elements, such as items the player can pick up or use locally, or enemies the player has to fight or sneak around, the movement is guided naturally. The decision space which is created by the function and placement of these elements is called gameplay ecology, and it facilitates decisions the player can make, resulting in meaningful play.
2. The environment provides narrative context which helps the player to make out simulation boundaries and affordances of the world. It takes the story of the gameworld and translates it into familiar visual references. The story of the gameworld used to generate the narrative for the environment can be divided into two parts:
 - a. One part is setting, which is “*the general socio-historico-geographical environment in which the action takes place*”⁵⁷. In the game *Bioshock*, this setting could be described as an underwater city built in the 1940s, where the attempts to create an utopia unconstrained by conservative morals have corrupted and ultimately destroyed the city’s society. The player enters the city, called Rapture, 20 years later and has to face the remains of society, mutated by experiments and driven to madness. So setting is society, its origins, their morals, as well as social and political structure, and the geographical space with its physical constraints. But this is just the starting point for the narrative.
 - b. The second component is the spatial frame, which is the actual environment the player can traverse, the idea of the setting translated into images. So when the player first comes into the city in a submarine, and carefully climbs up into the hallways, the spatial frame expands from the small space of the submarine into the larger hallways which

⁵⁶ Worch, Smith (2010)

⁵⁷ Ryan

show the destroyed remnants of life and the ocean pressing against the outsides of the windows, clearly communicating the boundaries of the environment. And even though the player has never actually seen the 1940s, and the destroyed, dimly lit surroundings do not help very much with recognising the details, the meaning of the environment quickly becomes accessible. By referencing to genre syntax⁵⁸, the literary repertoire familiar from other media, the player immediately has a familiar frame of reference for the environment. A frame of reference is a requirement - it can either be a familiar surrounding or a familiar character, but if both the world and the inhabitants are alien, the player will have trouble evaluating the feedback of their actions. In *Bioshock* those references include playing distinctive music from the 1940s, using typical interior design, pictures and typefaces. By putting it into the right context, the player can classify the information and conclude what the basic affordances are. After getting out of the submarine, the player tumbles into the remains of a destroyed New Year's Eve Party at a bar. The player might only get a glance at the small silver spots scattered around, but seeing them in the vicinity of green rectangles and a cash register the concept of money becomes recognisable, as do the bottles of alcohol standing around. Collecting money as an exchange for goods and alcohol, as a mean of consumption that affects health, are familiar concepts, and by picking them up the player knows what interaction the environment is likely to provide

3. The environment shapes and reinforces the player identity. By giving the player a character to control, the games asks the player to assume an identity. Then this identity is contextualised within the game's environment, by referencing social norms and behaviour afforded by the environment. In *Bioshock* the environment communicates decadence and greed which resulted in societal recklessness and ultimately the collapse and decay of this society. It is not a pristine, well-maintained surrounding which would urge the player to stay clean and well-behaved. The scattered wealth and luxury facilities such as alcohol and beauty clinics, coupled with the wrecked interior, encourage the player to loot and indulge without constraints⁵⁹. The recklessness transcends into the own actions, when the player chooses to use power-ups to gain special abilities, they do so by brutally shoving a needle into their arm, injecting fluids

⁵⁸ Altman (1998)

⁵⁹ Comparable to the 'Broken window theory'

which are known to have a deteriorating effect on physical and mental health. Considering the frame of mind the environment puts the player into is important to assemble the experience. In the case of *Bioshock*, the dark corners, flickering lights and unexplainable noises are used to establish a feeling of unease and threat within the player, making them receptive for upcoming events. On the other hand, for a game which has a 'smell the flowers' kind of experience; the environment would have to employ other references, like light flooded meadows and peaceful leaves in the wind, to trigger the desired associations.

Narrative Function of Environmental Storytelling

So how does Environmental Storytelling (ES) expand the narrative of the game? Structurally, ES is considered to be episodic⁶⁰, because the elements are fixed locally, only to be 'activated' when the player moves through the space, perceiving and interpreting the elements. Since the movement, and the decision to engage with the elements, is non-restricted and erratic, it is generally hard to forecast the sequence in which the player retrieves the narrative, resulting in a non-linear structure.

The engagement with ES is voluntary. It is usually not necessary to find and interpret all elements in order to continue, which means that the narrative the ES conveys should be mostly self-contained and not vital for the gameplay, although it can reward the player's effort of interpretation by providing additional information and clues about the gameplay, or upcoming events. By using guidance and constraints, the designer can determine with reasonable certainty the movement through certain spaces, and with the help of staging, which includes lighting, colour and frequency of details, can direct the attention towards certain elements. This should only be used for important information and choke points, not for all additional information strings scattered in the world, as to not exhaust the attention of the player. Jenkins describes the narrative ES should convey with an accordian:

"Certain plot points are fixed, whereas other moments can be expanded or contracted in response to the audience feedback without serious consequence to the overall plot"

⁶⁰ Jenkins (2011)

The function a designated storytelling element has in the narrative can vary, ranging from non-specific and context dependent to unambiguous. Worch & Smith summarise the uses into three categories:

- *Association of elements*: This is the most commonly used function for environmental elements, probably because it is almost impossible to not use it. The human mind excels at bringing everything it sees into context. Psychologists call this the *Law of Closure*⁶¹, which enables humans to recognize patterns, linking elements together so they form a meaningful, logical connection. Evolved derivations of this idea are utilized throughout most media, for example in film the idea is called *Mise en Scène*, and the concept is always the same:

The calculated arrangement of elements in the scene for the player to piece together the untold story of these elements. This cognitive interaction is so deeply ingrained into our minds that doing so is a mostly subconscious process, which, while providing background information, takes little effort and is unlikely to have a lasting impact on the attention of the player. Only if the solution is not immediately obvious in the line of sight, or the conclusion leads to another question, the puzzle becomes a little more engaging, and the player is likely to start actively looking out for more clues.

Smith visualises the concept of expanding curiosity by showing a series of photographs, taken by Robert Polidori⁶². In the first picture we can see two goldfish, stuck on a window at about eye level, next to a washed out curtain. This image sparks interest, makes the viewer want to know what happened at this place before and could have led to this situation. Zooming out of that frame, we can see a larger room which must have once been a kind of living room, only the interior is destroyed. Dirt and water damage cover the walls and the furniture seems as if it was thrown around, the couch standing on top of the table. This provides further context and an idea how the fish ended up on the window. The last image finally reveals the extent of the situation, it shows the outside of the house and the neighbourhood, all equally afflicted with water damage, many houses eroded with only puddles on the ground and driftwood left.

- *Interpretation*: For the elements which do not have an obvious affordance in the context of the scene, it is up to the player to come up with an explanation. And

⁶¹ In: Rutledge (2009)

⁶² Polidori (2006)

since every player has a slightly different mind-set, as a result of personal views and memories outside of the game, the conclusion can be very unpredictable. The designer might have drafted a reasonable explanation which resulted into a final arrangement of storytelling elements, but this does not mean that the player will recognise it as such. The concept of the arrangement can even be abstract and of personal meaning to the designer, and it is likely that the care and effort translate into the scene, however, as with many artistic works, the meaning can only be generated within the viewer. Designer Jordan Thomas calls this creation of *white space*⁶³. Derived from the compositional idea of negative space, a space devoid of concrete meaning is created so the player can fill it in. Like with all interactive parts of the game, the player becomes a dynamic compositional element, a vital part in creating the meaning of the experience.

- **Telegraphing:** Telegraphing implies that an element unambiguously communicates something that is vital to the gameplay. The elements leading up to a fixed plot point on the accordion of the story, or a specific path of action, need to increase the player's attention to the surroundings by telegraphing the upcoming events or affordances of a space which requires interaction. Bloodstains on the ground which lead to a hiding spot of a monster, or a sizzling electric fence with electrocuted bodies in the vicinity are elements clearly telegraphing events which require attention from the player. For these elements, the line between environmental and mechanical is blurry, as the affordances of both bleed into each other. The sparks and bodies of the electric fence might not be interactive, but they can be seen as a staging for the interaction with the mechanic of the fence.

⁶³ In *IGN Interview (2010)*

When and How to use Environmental Storytelling

ES is a helpful tool to transport additional narrative of the gameworld and to increase the feeling of agency, by providing an additional layer of choice the player can choose to engage with. It can be used alongside expressive, emergent mechanics, or in a linear, strictly authored experience. The only prerequisite is that the player has enough space and freedom of movement to explore the environment. The following chapters briefly examine how to create a coherent environment which echoes the experience of the game world, and what rough guidelines can be considered during the ideation.

Advantages of Environmental Storytelling

The advantage of ES lies in its ability to engage the player into the gameworld. The more interest is sparked from additional information, the more likely it is that the player becomes invested in the events, and the game world becomes more believable. ES is also called a pull-based narrative, because it requires the player's effort to pull the story from the details and recreate their own idea of the events. The opposite, push-based narrative, is the direct exposition which is imposed upon the player regardless of their level of interest.

The type of player interested in ES is a very specific target group, usually fond of context- and exploration-driven game experiences. Not every player will go through the effort to follow every strand of narrative, and so a lot of the information is bound to get lost. And yet, implementing more complex ES will allow the game to reach an audience which would otherwise be less interested in the game.

For example, although *Bioshock* has a challenging shooter core mechanic, through the careful integration of a complex, meaningful narrative, a lot of which is pull-based, the game has reached an otherwise untapped audience, with an ingrained motivation to explore the environment and its narrative strands. But even if the player is only interested in the action parts, and not as attentive as they could be when traveling through the levels, the feeling that there is something going on behind the scenes in the gameworld is vital for the atmospheric experience, which is the most obvious reason for the game's critical success.

Intertextuality and References

As to how to start visualising the game world's environment, it might be helpful to first think about what type of associations the world should elicit, which could be helpful to establish the mood necessary for the experience. Ultimately, the implicit narrative of the environment and mechanics as well as all explicit exposition should establish intertextuality, a term describing the different layers of meaning of a medium⁶⁴. Meaning in a medium is created by references, either by referring to other parts of the narrative in the gameworld, cultural references or genre conventions.

The adventure game *The Cave* for example utilises genre conventions to generate a lot of its humour. One of the roles the player can adopt is a knight, and when they encounter a princess kidnapped by a dragon, the fairy-tale reference is obvious. The reference becomes ironic when the solution of the puzzle is found by recognizing the reference and subverting it, allowing the dragon to roast the princess to be able to steal his treasure. Cultural references can be hints at prevalent cultural ideologies or beliefs, or simple curiosities. As easy as it might be to fall back to the use of clichés with these kinds of references, it becomes far more memorable for the player if the cliché has a twist to it.

However the most convincing references are the connections established within the game world itself. If the characters have ties to each other, a common history and personal motivations unrelated to the actions of the main characters, this produces ample space of information the player can explore.

Creating Mystery

In practise, when translating from setting to spatial frame, the designer has to see the world through the eyes of the player, the paths which they use to travel the space, and set up the bits of narrative along the way. This can be compared to leaving a trail of breadcrumbs in the world which the player can follow and connect through causality. The key to keep the player interested in the breadcrumbs is to spark curiosity through

⁶⁴ Jullier (2007)

mystery. Kevin Levine, director of *Bioshock*, calls this principle the ‘mystery balloon’⁶⁵. The hot air in the balloon is the mystery, the unknown entity the player wants to know more about. The mystery needs to be in constant proximity to stay of interest to the player, floating before them, guiding the way. The hot air resembles the mysteries which keep the balloon afloat- having too few mysteries will cause the ball to sink, signalling the decreasing interest of the player. Too many mysteries, unresolved hints or unrelated information, and the balloon will float away. To achieve this balance, questions which have come up need to be answered not too long after they have arisen, as a result engaging the player in a learning process, and new questions need to be asked. Taking Smiths example of the fish on the wall: The first picture asks a very definite question the second picture answers. But in doing so, a new question arises, “how did the fish get here?” turns into “how did the flood happen?” With each step, more information is offered, helping to put the initial puzzle into the context of the world, and in doing so the player learns more about it.

Coherence to Game Experience

To have the environment support the desired experience, it has to be coherent with the world at large, the structural core of the narrative. Even story strands not directly related to the main plot should adhere to the theme the gameworld suggests, creating a self-reinforcing loop, where the premise spawns the events in the world, and the events continually remind the player of the premise.

Coherence also includes that any events described with ES should obey to the physical boundaries of the world just as the actions of the player do. If the inhabitants of the world seem to be able to do things the player cannot, without reasonable explanations, then this will likely communicate false information to the player about their own abilities. For example, showing NPCs swimming in the water will communicate to the player that water is a traversable space, if the player was never meant to be able to do these things, this ES is misleading.

And lastly, with the environments telling stories about past events, it is only logical that the player leaves traces of their action as well. This only applies to circular single-player space⁶⁶, which is space the player will travel through multiple times and no other

⁶⁵ Levine (2008)

⁶⁶ Fernandez Vara (2012)

player beside them could have left the traces. But even when the player is not coming back to the afflicted area, there are ways to allow the player to look back, like surveillance cameras or an observation platform at the end of the level. Seeing the impact of their own actions, the remnants of a fierce battle, or the small town that has grown to prosperity thanks to their actions, awards the player with a feeling of accomplishment and agency.

Beyond the single-player realms of games, ES can also provide additional layers of interaction in multiplayer games. In the fantasy role-playing game *Dark Souls*, even when playing alone, the player can choose to pick up notes other players have left at specific points in the game. These notes can be something like “Look out for the hidden treasure to your right!”, and it is up to the player to decide whether to trust these notes or not, as the information others leave can be helpful or viciously misleading.

CONCLUSION

Interactivity is the unique feature of video games which separates them from other mass media. Yet many games do not seem to fully utilize this attribute, constraining the actions of the player within isolated compartments of the game so they do not collide with the carefully constructed world in the game as planned out by the designer. This confines both the player and the designer. The player does not feel integrated into the world and thus distanced from the actions they are required to take, and the experience the designer has aspired the constructed and intended for the gameworld to elicit cannot transpire with this observational distance.

One of the core presumptions of this thesis is that narrative is not self-contained, and a game designer has to willingly forfeit control over the perception and actions of the player for the experience of the gameworld to evolve, allowing the player to fill in spaces intentionally left blank. This does not mean that the designer has no influence over the final product; they can still plan out the narrative affordances of both mechanics and the environment. Yet it is important, in order to produce a specific experience, to know when the player needs either more leeway to explore their personal goals or more restrictions that create meaningful narrative consequences for their actions, reinforcing the cognitive involvement with the game world.

So one prerequisite for an engaging experience is that the designer knows what type of experience they want to achieve, to assure the coherence of all subsequent design decisions.

Aiming for a player-expressive experience, focussed on complex mechanics which inspire the player to create personal goals and motivations, instead of a more closely authored story, does not mean that there is no narrative. Not having an explicit story only means that the game needs to implement more flexible, meaningful tools, which enable the player to create a narrative of their own.

While the range of choice is one of the most basic decisions that needs to be made to define the experience, it is only the first step. Every interaction, whether it is cognitive, functional or explicit, will automatically lead to meaning-making within the player, and it is tributary to the design of the interactions whether this meaning is beneficial to the game experience.

Giving the player a shotgun or an axe, expansive wild planes to traverse or seasons to work with will create a narrative just as creating characters and facilitating dramatic confrontations will.

The mechanics are a metaphor for the narrative core of the game world. If the experience is about personal growth, the mechanics should allow the player to grow alongside the character, in skill as well as in emotional maturity. If the story is about a relationship, mechanics should support this theme by enabling the player to meaningfully interact with all parties.

The reverse idea is also true; the context the narrative creates for an action is what gives the mechanic a meaning and thus a motivation to the player.

Conclusively, interaction and narrative are functionally inseparable, and both are means to the same end, which is transporting an experience.

Of course they are not the only mean a game can draw upon to transport an experience, and mechanics are usually not on the top layer of visibility, meaning the first thing people notice about a game. Systemic narrative is the flesh of the experience, but in the end a game is a compound medium. The outer layer of skin, consisting of explicit narrative, aesthetics, animation and audio are the coating the player comes into touch with first, dragging them over the hurdle from disinterest into engagement. Just as the game controls and the handling of the mechanics, they give the game flavour and atmosphere, which is the most obviously visible aspect because it can be displayed without any required interactions. But the mechanics underneath are the layer that will incite the player to keep coming back, offering hours of distraction or intense focus.

For the vision of the experience to come to life, the systemic narrative does not only need to be coherent with the gameworld, but also with the outer layers, which in turn are required to be thematically coherent with the narrative core of the world.

In this thesis, the aspects which were most closely discussed were the influence player freedom and choice have on the narrative representation of the game world.

But there are other attributes mechanics can have, which influence the narrative perception of the player just as much. To broaden the understanding of the dynamics between narrative and interactions, further research could for example examine how mechanics integrating social interactions with other players impact the personal narrative, and how the narrative for entire groups can be incorporated into that.

GLOSSARY

AAA games: A term usually used in marketing for a game with a high production value, comparable with a blockbuster movie. Initially, each A was an indicator that the game was awarded for reaching the highest industry standard regarding critical success, innovative gameplay and financial success.

Achievement: A systemic reward for additional effort, for example an unusual play path or gameplay strategy (example)

Agency: Feeling of ownership, no discrepancy between action and motivation, fuelled by choice or the illusion of choice. At the core a measurement of how well the interactivity is working, if the player has the feeling to want something different than the designer or if they are working towards the same direction.

Beta phase: The time span during production shortly before official release, often used to playtest the game. While the game might be publicly accessible during this phase, it is still a work in progress, bugs being fixed and mechanics balanced according to the feedback of the beta-testers.

Controller: The input device that the player uses to control the game with. This can be a gamepad, keyboard and mouse, or touchpad etc. The character controller describes the handling of the character, the physical movements that can be done with it whether or not it “feels good”. The feeling is vital for an enjoyable gameplay experience, if the movement is not accurate, laggy or feels off, the player is likely to disengage early on in the game. There are few definite parameters that help getting the feeling right, although there are statistics about the “correct” jump height or velocity, mostly it differs from game to game. Getting the movement feel right can often only be done through rigorous playtesting and constant iteration.

Cut-scene: A non-interactive video sequence, where the control of the player is forfeited and the characters act autonomously, usually at a dramatic point in the storyline.

Developer: Person or group that develops the game

Gameplay: The experience of the game as a whole

Ludology: The academic study of (computer) games, focussing on the importance of interaction and mechanics. Sometimes seen as opposed to narratology when talking about video games.

Mechanics: Often used to describe the actions the player chooses to execute that define the gameplay, verbs such as running and shooting. Can also be seen as a general term for the possible points of interactions of the player, also including cognitive functions.

Narratology: The academic study of story and structure

NPC: Acronym for non-player character, the characters in the game that are not controlled by the player

Playtesting: Testing the effect of a game by observing the interaction with the player, without offering any clues or disturbances

Procedural: Generated by an algorithm rather than an author, the result is always unique.

Publisher: company that funds the Developer during the development, usually organises marketing of the game and in turn setting the project deadlines and requirements for the development team.

PvP: Player versus Player, playing against another human being. Opposite to PvE, player versus enemy, which is playing against the artificial intelligence of an NPC:

Quick time event: A prescribed action sequence that the on-screen character acts out autonomously, triggered only by one button. Usually in the context of a fast paced action sequence, where the challenge for the player lies in pressing the right button at the right time.

Voice over: A narrator's voice is blended over the atmospheric sound of the game, for example describing events or backstory.

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