

Playing Differently: Designing asymmetry in games

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Resumo

A assimetria está amplamente presente nos jogos contemporâneos, permitindo aos jogadores desfrutarem de diferentes experiências ao jogarem o mesmo jogo através de perspectivas diversas ou ao assumirem papéis de jogador alternativos. No entanto, tanto os acadêmicos como os designers de jogos tendem a discutir apenas as expressões mais visíveis da assimetria e a ignorar as situações em que esta desempenha um papel mais subtil na diversificação das experiências de jogo.

Nesta investigação, oferecemos uma abordagem holística da assimetria. *Asymmetry Bricks* é uma *framework* conceptual para a análise da assimetria nos jogos, no que diz respeito às formas como esta se pode manifestar e aos mecanismos através dos quais pode emergir durante o jogo. A *framework* funciona também como uma ferramenta de design para guiar designers no processo de conceção de mecânicas de jogo assimétricas.

As conclusões visam alargar as discussões sobre a assimetria, oferecendo uma lente através da qual os académicos a podem analisar. A terminologia proposta contribui para facilitar a comunicação entre os designers de jogos, jogadores e outros agentes, enquanto a ferramenta de design inspira todos a explorarem a assimetria de novas e interessantes formas.

Palavras-chave: *Assimetria, Gameplay Assimétrico, Mecânicas de Jogo, Design de Jogos.*

Abstract

Asymmetry is widely present in contemporary games, allowing players to enjoy different experiences by playing the same game through diverse perspectives or by assuming alternative player roles. However, both scholars and game designers tend to discuss asymmetry only in its most pronounced expressions and to ignore instances in which it plays a more nuanced role in diversifying gameplay experiences.

In this research, we offer a holistic approach to asymmetry. *Asymmetry Bricks* is a conceptual framework for the analysis of asymmetry in games, in regard to the ways it can express itself and the mechanisms through which it can emerge during play. The framework also acts as a design tool to guide designers in the process of ideation of asymmetric gameplay mechanics.

The findings of this study aim to broaden discussions of asymmetry, offering a lens through which scholars can analyse it. The proposed terminology contributes to facilitating communication among game designers, players and other agents, while the design tool inspires all to explore asymmetry in new and interesting ways.

Keywords: *Asymmetry, Asymmetric Gameplay, Gameplay Mechanics, Game Design.*

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Abel Neto

“Asymmetry is the rhythmic expression of functional design.”

Jan Tschichold

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Introduction

Contextualisation

Our passion towards videogames began early, playing *MS-DOS* games on a computer running *Windows 95*. Our access to new games was limited, and we had to take turns playing with our brother, rigorously following an agreed-upon schedule. When it was time for us to hand control over, we rarely opted to engage in other activities until it was our turn again. Instead, we sat on a second chair and watched the ways in which they would engage with the game. It was often the case that they would pursue paths we ourselves hadn't explored, struggle in sections we completed with ease, and excel in challenges we were unable to surpass.

Even today, with our professional and academic involvement in video games, we find ourselves fascinated by that contrast in experiences. We seek the opinions of others regarding the games we play and find delight in their descriptions of the things we did not encounter during our own playthroughs. The differences in our experiences create a sense that our involvement with a given game is unique, defined by the circumstances we face and the choices we make in the face of those circumstances. They also instil in us a sense of wonder by making it clear that the game world exists beyond what we have explored. It was this fascination with differences in gameplay experiences that fuelled the development of this work.

Asymmetric gameplay is prevalent in games, allowing players to experience a game differently by acting in it through diverse perspectives or by assuming alternative player roles. These dissimilarities in the options available to each player run the gamut from slight differences in affordances to completely distinct ways of perceiving and interacting within the game world.

Games that feature asymmetry enjoy a number of benefits and opportunities. A game's replayability increases the more new experiences it can provide to players (Shafer, 2013), with the variations in gameplay boosting a game's potential to remain interesting throughout numerous play sessions.

In multiplayer games, asymmetry can make games feel more interesting and realistic (Adams, 1998), which can lead to player interactions that are analogous to those we encounter in real life, with different actors having an impact on each other by means of different roles and spheres of influence.

Asymmetry can also make games more appealing to a wider range of audiences, allowing

players with different gameplay preferences to enjoy the same game together. It can also diminish the barriers of entry to gaming. For instance, it may allow players with less available time to participate through roles that require a smaller time investment, or that could even be played asynchronously. It could also allow older players, who typically have increased thinking-actuating latency (Thompson et al., 2014), to be able to participate through roles with gameplay mechanics that are not time-sensitive, allowing them to engage in multiplayer interactions with younger players.

Despite its advantages, asymmetry has seen little academic discussion, and game designers and scholars alike only discuss it in its most pronounced forms. Effectively, discussion surrounding asymmetry seems to focus only on what are usually called ‘asymmetric games’, games that feature a great degree of asymmetry, such that players have very distinct sets of mechanics. As we will expand on throughout the first chapter of this work, we find this to be a short-sighted perspective on asymmetry and the ways it exists in games. We find that the lack of a holistic approach to analysing asymmetry does not contribute to the challenges that impair its exploration. Games with a large degree of asymmetry are notoriously hard to design, as the variety of options available to the players must be implemented, balanced, and tested – all while also ensuring that they remain fun and engaging for the player.

Research Questions and Goals

With this in mind, we set out to explore asymmetry through a broader perspective that goes beyond the study of ‘asymmetric games’, and to analyse its expressions across all games. How can asymmetry exist in games? How can it emerge during play? And how can we facilitate its design?

Our answers to these questions culminated in the development of *Asymmetry Bricks*, a conceptual framework that categorises asymmetric gameplay mechanics. The framework also facilitates the conceptualisation of these mechanics by supporting a process of ideation consisting of the combination of two elements: a) the kind of asymmetry that is being presented to the player, and b) the mechanisms through which it emerged during play.

Methodological Approach

Fundamental research is the nature of this study. Our methodological approach was exploratory, and relied on inductive reasoning and the qualitative analysis of video games. Our work was divided into three phases: 1) *Literature Review*; 2) *Field Study*; and 3) *Conceiving a Framework and Design Tool for Asymmetric Gameplay*. By dividing our work as such, we were able to a) review the current understanding of what asymmetric gameplay entails; b) develop our own holistic perspective on asymmetry; and c) build a conceptual framework that illustrates and operationalises our findings.

Phase 1: Literature Review

We began by examining the literature on the topic, both through academic and non-academic sources. We wished to understand the ways asymmetry is analysed by scholars and to acquire some foundational insights that could serve as the basis for our research. Although academic work surrounding the topic is scarce, we ultimately saw that as an opportunity to take matters into our own hands and attempt to develop a foundational structure to support future studies regarding asymmetric play.

Throughout our work, we also sought to understand how game designers approach asymmetry. Particularly, we wanted to know their perspectives on its benefits, the challenges related to its implementation, and the strategies they have implemented to approach those challenges. To this end, we conducted a netnography¹ into gamer and game designer communities online, which we will describe in greater detail in Chapter 3. One insight we took from that analysis was the fact that designers find themselves in disagreement regarding the characteristics of asymmetric gameplay. We believe this can be explained by the fact that designers use terminology related to asymmetric gameplay ambiguously. When the same term can have different meanings from one discussion to another, it is no wonder that designers struggle to agree on aspects related to asymmetry.

With this in mind, we realised that in order to aid the analysis and design of asymmetry in games, it was imperative that we offer scholars and designers terminology that they can use to communicate aspects related to asymmetry.

Phase 2: Field Study

To develop said terminology, we first had to understand how asymmetry can exist in games and the ways it can emerge during play. The games we analysed were those with game mechanics that have a distinct ability to cause variations in gameplay experiences. Games were analysed across different genres, as asymmetry is pervasive, and not restricted to only some types of games. We distanced ourselves from current trends in the discourse surrounding asymmetric gameplay by analysing both multiplayer and single-player games. By doing this, we were able to understand how asymmetry can also exist between two different playthroughs of a single-player game, whether they were experienced by two separate players or a single one.

We also analysed games from distinct eras to observe how earlier games fostered asymmetry and compare those methods with those of more modern examples. Although we focused on video games, we occasionally even looked at board games for examples, especially when those were historically relevant or established trends that would later be followed by video games.²

Our empirical knowledge was fundamental in the selection of games, as some forms of asymmetry were already apparent to us from the start. For instance, we knew that some games feature different goals for each player and that some games allow players to act through different sets of

¹Netnography is a qualitative and interpretive research method for the study of online communities. It involves the analysis of naturally occurring public conversations in digital communication channels (Kozinets, 1998).

²E.g., *Dungeons & Dragons* (1974) and the way it inspired early computer role-playing games.

abilities. Other more elusive expressions presented us with the challenge of searching for something we weren't even aware existed. Fortunately, having played games throughout our life and having experience analysing them critically both in academic and professional endeavours, we often stumbled upon new findings while playing games or recalling past experiences with them. Once a new expression of asymmetry was discovered, we were able to explore more of its different implementations by, for instance, searching for games with features or systems of mechanics similar to those in the game that triggered the initial discovery.

It was important that, whenever possible, we experienced those games first-hand, only resorting to other media³ surrounding them when we did not have access to those games. By doing this, we were able to more accurately understand not only the mechanics of the games we studied but also the dynamics that those mechanics fostered. This gave us a better picture regarding the rules of those games and how players might act within the context of those rules.

Ultimately, our work during this phase led us to discover the Types and Vehicles categorisations. These categorisations offer terminology that can be used to describe the different forms asymmetry may take in games, and the mechanisms through which it can emerge, respectively.

Phase 3: Conceiving a Framework and Design Tool for Asymmetric Gameplay

In order to compile our findings, we decided to develop a framework and design tool. Both consisted of the combination of the different components in our Types and Vehicles categorisations, with the purpose of describing the functioning of game mechanics in regards to their capacity to foster asymmetry.

We developed a digital implementation of a design tool that facilitates an ideation process supported by the framework. This design tool acts as an alternative and accessible way for designers to learn about our findings, and to put them in practice through a process of ideation. In order to allow designers to interact with our tool, we ran a series of workshops that we used to evaluate and iterate on the tool based on the participants' feedback.

Structure of the document

This thesis is divided into seven chapters:

- **Chapter 1** focuses on how asymmetry is currently discussed. It offers a definition for asymmetry and discusses the ways in which it differs from current discourse.
- **Chapter 2** presents an historical overview of asymmetry, and describes a number of ways in which it exists.

³Such as gameplay videos, articles, or wikis where information regarding the game in question is gathered. Sometimes, even in cases where we were able to play the game we were analysing, the information available in that game's wiki provided clarity regarding the internal functioning of some mechanics.

- **Chapter 3** describes the analysis of how asymmetry is perceived by game designers and players.
- **Chapter 4** presents the categorisation of Types of asymmetry, describing the different forms asymmetry may take.
- **Chapter 5** presents the categorisation of Vehicles of asymmetry, describing the mechanisms through which asymmetry can emerge during play.
- **Chapter 6** presents Asymmetry Bricks, a conceptual framework for the analysis of asymmetry in games, built upon the categorisations described in the two previous chapters. It also demonstrates its functioning as a design tool to support the ideation of asymmetric game mechanics.
- **Chapter 7** describes the process of evaluating and iterating the design tool by having designers use it in workshops and collecting their feedback through interviews.

Published articles

During our research, we have published the following articles:

- **“Asynchronous Interactions Between Players and Game World”** (Neto et al., 2021a) looks into the dynamics that result from allowing players to engage with a game asynchronously. Some of its findings went on to shape the way we examined *Time Frame*, one of the Vehicles of asymmetry we identified.
- **“Character Progression for Asymmetric Play”** (Neto et al., 2021b) offers a deconstruction and analysis of current systems of character progression and how they generate asymmetry. This article fed into our study of *Progression*, one of the Vehicles of asymmetry we identified.
- **“Asymmetric Gameplay: Types and Perspectives”** (Neto et al., 2023) presented our Types of asymmetry categorisation. It was later expanded into a book chapter (Neto et al., 2024). The Types categorisation has since been revised, with the up-to-date version being the one we will describe in Chapter 4.

Chapter 1

About Asymmetry

In this Chapter, we discuss how the term "asymmetric game" is commonly used, why we find it to be inadequate and restrictive, and offer a new approach as to how we may discuss asymmetric play in a more holistic way by putting aside current assumptions and examining asymmetry across a larger spectrum.

1.1 Asymmetric games: A flawed nomenclature

We feel that it is adequate to begin our discussion by meeting the reader where they are. As players, scholars, and game designers, we are likely to first encounter the topic of asymmetric play in discussions surrounding asymmetric games. The term "asymmetric game", as colloquially used, typically describes a game with:

- a) Online or local multiplayer; and
- b) Players that are sorted into different teams with different abilities, sometimes using different input devices.

To paint a clearer picture, let's look at some examples. The first is *New Super Mario Bros. U* (2012), in which some players act through the traditional platformer game mechanics of running and jumping, while another player uses a touchscreen-equipped controller to interact with the game environment by placing platforms and manipulating enemies in order to help the other players. As players are given very different ways of interacting with the game – both in regards to the actions they can perform and the interface they use to do so – they will experience the game in distinct ways.

In *Propnight* (2021), four Survivor players face off against one Killer player. Survivors must repair five machines placed across the map and escape. They can transform into nearby objects, so as to evade the Killer, whose goal is to find and eliminate the Survivors before they escape. The

¹Source: <https://www.youtube.com/watch?v=IQHa4qindfE>. Retrieved January 10, 2024



Figure 1.1: *New Super Mario Bros. U* (2012). The player using the touchscreen controller created the green platform by using the stylus.¹

two different roles have slightly different perspectives – the Killer has a first-person view, while the Survivors play mostly in third-person²–, but it’s the disparity in abilities, goals, as well as team size, that truly differentiates their gameplay experiences.



(a) The “Killer” player chases two players disguised as objects.



(b) A “Survivor” player is repairing one of the machines.

Figure 1.2: The different player perspectives in *Propnight* (2021).³

For a third and final example, let’s look at *First Class Trouble* (2021), a social deduction game with hidden roles in which two Personoid players and four Resident players navigate through three levels inside an intergalactic cruise ship. Residents have the ultimate goal of deactivating the rogue artificial intelligence that controls the ship, while Personoids are tasked with preventing this from happening. Since Residents are unaware of which team the other players belong to, they must collect information and deduce who they can and cannot trust. On the other hand, Personoids must deceive Residents, ingratiating themselves into being trusted, all while sabotaging the other team’s efforts or even eliminating them. The two different roles require players to engage in different social dynamics in pursuit of their asymmetric goals, and entail different gameplay experiences.

²Whenever they are disguised as an object or repairing machines, the “Survivor” players play in third-person view. Only when moving around in their character’s human form are they playing in first-person view.

³Source: (a) <https://www.youtube.com/watch?v=BLbKwE04Ic>; (b) <https://www.youtube.com/watch?v=kWgsQ5aIQ4>. Retrieved January 10, 2024.



Figure 1.3: A Personoid player in *First Class Trouble* (2021) sabotages the ship's oxygen supply, shortening the amount of time the Residents have to complete their objectives.⁴

As unique as they are, all of these games can be described as asymmetric games, because they promote different experiences for each player. The problem with this nomenclature emerges when we examine games that typically wouldn't be described as asymmetric.

Need for Speed Heat (2019) is a racing game in which players can select, customise, and upgrade their car before competing in a race against other players. Each of their choices will heavily influence the specific characteristics of the vehicle, and some of the available configurations may even be strictly better, depending on factors such as the race course itself.

In *World of Warcraft* (2004), players can create their own character, choosing from different races and classes. Each of them brings unique advantages and weaknesses that influence what actions the player can execute, as well as which roles they can perform while collaborating with other players.

Why are these games not commonly seen as being asymmetric? Don't the player's choices affect how the game will unfold and, subsequently, the player's experience? The only answer we can posit is that yes: these games do promote different experiences – but to a lesser extent. If this is the case, it seems that whether or not a game is considered asymmetric comes down to a matter of degree: *how different are the players' experiences?*

The problems with this go beyond it being an arbitrary distinction: it obfuscates what asymmetry is by consigning discussions regarding it to its most extreme forms. In reality, asymmetry exists beyond these types of games. It is not contingent on multiplayer, nor does it require players to have different actions at their disposal. As we will discuss throughout this thesis, asymmetry permeates current games to different degrees, and in different forms. In the next section, we will continue to look at the phenomena that are at the core of asymmetric play, and venture forth a definition of asymmetry that will serve as the lens through which we will analyse games.

⁴Source: <https://blog.playstation.com/2021/10/27/first-class-trouble-a-survival-guide-to-an-ai-uprising/>. Retrieved January 10, 2024.

1.2 What is asymmetry?

In order to discuss asymmetry, we must first define it. The literature we have been able to find offers several definitions for asymmetric games, often even giving examples of how games can be made asymmetric, but almost never attempts a concise definition of what asymmetry is.

For instance, Fullerton states that “[i]f you give opponents different abilities, resources, rules, or objectives, your game will invariably be asymmetrical” (2018). While we agree that these are ways to make a game asymmetrical, this definition only gives some examples of asymmetries that can be present in games, and doesn’t attempt to bring forth a definition that binds them all together. As such, we risk focusing only on certain types of asymmetry — usually the ones that already exist in games — while we should instead be looking at the overall picture. As most of the pre-existing definitions we will discuss share this issue, we will acknowledge it, while also attempting to extract valuable insights that we can adopt when creating our own definition of asymmetry.

Bortolaso et al. state that in asymmetric games, “players take on different roles, sometimes using different forms of interaction, different hardware, and different views of the game world” (2019). We will discuss what roles are at a later stage, but we posit that roles aren’t necessarily bound by a game’s mechanics. They can also be more informal, with players opting in and out of roles as the game evolves. Furthermore, we believe that asymmetry in games does not occur only at the level of its mechanics.

The real world is permeated with asymmetries, and our differences shape how we perceive and experience the world around us. Different players will have different backgrounds, preferences, and capabilities. Harris et al.’s definition sees asymmetric games as the ones that embrace these differences between players, cater to them, and leverage them to create multi-faceted appeal (2016). Games with asymmetries allow players to pursue their preferred playstyle, e.g. by choosing a specific character.

All these definitions point to the fact that asymmetry arises from the contrast between how different players act within the game world, as well as how they experience it. This doesn’t, however, disqualify single-player games from containing some degrees of asymmetry, as we will discuss later.

In order to reach our own definition of asymmetry we must describe the lenses through which we wish to analyse asymmetric games. Salen and Zimmerman’s game design schemas of *Rules*, *Play*, and *Culture* serve as a way to frame and analyse games in general (2004).

- **Rules** is a formal primary schema, and focuses on the intrinsic mathematical structures of games.
- **Play** is an experiential primary schema, and emphasises the player’s interaction with the game and other players.
- **Culture** is a contextual primary schema, and highlights the cultural contexts into which any game is embedded.

These primary schemas, each containing a set of secondary schemas, are meant to act as “ways of thinking that allow us to assimilate the knowledge of a game”. They are lenses through which we can understand games by sorting through their complexity and highlighting particular features (Salen & Zimmerman, 2004).

The primary schema of *Rules* concerns itself with the game’s inner structure, and its formal identity. It strips away any experiential and contextual considerations (such as the materials of the pieces in a chessboard, or the location in which the game is taking place), and observes the inner form and organisation of games – that is to say, their rules.

Salen and Zimmerman posit a number of characteristics shared by all game rules:

- **Rules limit player action;**
- **Rules are explicit and unambiguous;**
- **Rules are shared by all players;**
- **Rules are fixed;**
- **Rules are binding;**
- **Rules are repeatable.**

Furthermore, they identify three different kinds of rules:

- **Operational rules.** The guidelines players require to engage with the game. In non-digital games, these are the written rules that accompany the game. In digital games, they include the use of input devices such as a mouse or a game controller.
- **Constitutive rules.** The underlying formal logical and mathematical structures that exist “below the surface” of the game.
- **Implicit rules.** Unwritten rules that concern etiquette, good sportsmanship, and proper game behaviour.

To define asymmetry in games solely through the *Rules* lens, would mean to disregard how the resulting implications that such asymmetric game rules have on games as they are experienced by the players. In fact, Salen and Zimmerman state the same in regards to all games:

From a formal point of view, the rules of a game indeed constitute the inner “essence” of a game. But there is a danger in limiting the consideration of a game solely to its formal system. [...] Rules are merely the means for creating play. (Salen & Zimmerman, 2004, p. 302)

As we’ve touched on in the previous section, this problem occurs with the informal definition of *asymmetric games*, which does not encompass games with only slightly different sets of

mechanics, nor does it encompass games in which players can reach very different gameplay experiences depending on their own preferences. The turning point after which a game has sufficiently different mechanics to be described as asymmetric is also nebulous, which contributes to the shortsighted nature of this definition.

Another issue with defining asymmetry taking only the *Rules* schema into account, is that it would disqualify any games without asymmetric rules, but that can be played in asymmetric ways and result in distinct experiences, from being discussed. Throughout this text, we will analyse asymmetric rulesets as well, but we must not lose sight of the fact that games are experienced by players. It is in those experiences that asymmetry ultimately lies.

With this in mind, we will also make use of the Play schema. This schema concerns itself with experiential aspects of games. Play occurs when the rules are set into motion and experienced by players.

Salen and Zimmerman present a three-part model for understanding how players experience a game. This model consists of sensory input, player output, and internal player cognition.

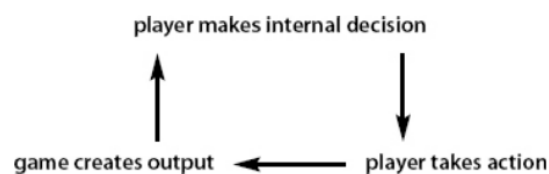


Figure 1.4: Salen and Zimmerman’s three-part model serves as a general structure to examine players’ experiences (2004, p. 316)

As evidenced in the diagram, this model excludes a game’s rules from consideration, instead focusing on how players inhabit, explore, and manipulate that set of rules.

[T]he experience of play is not something that a game designer creates. Instead, play is an emergent property that arises from the game as a player engages with the system. (...) The game designer only indirectly designs the player’s experience, by directly designing the rules. (Salen & Zimmerman, 2004, p. 316)

We believe this to be an important schema to use in our analysis of asymmetry. If two users engage with a symmetric game in different ways, they will undoubtedly experience it differently. Asymmetric experiences are not exclusively derived from asymmetric rulesets. Of course, when we speak of asymmetries in player experiences versus asymmetries that are encoded into a game’s rules, we are speaking of two different phenomena that we will differentiate in time. Nevertheless, we believe these are both phenomena of asymmetry in games.

Knowing this, we venture our definition of asymmetry:

Variations in gameplay caused by how differently players can act in a game.

This definition allows us to observe differences in how players can act within the context of the game. It also encompasses variations in how players experience and interpret the game.

Including these aspects in the discussion will allow us to achieve a broader perspective in regards to its potential to be harnessed for the creation of gameplay experiences that better reflect the heterogeneity of human experiences. For instance, a greater knowledge of asymmetry could be used to create experiences that convey themes related to sociocultural diversity, income inequality, or even empathy.

1.3 Endogenous and exogenous asymmetry

It is evident that variations in game mechanics can fundamentally alter the different players' experiences within a single game. However, there is also another category of asymmetry: one that concerns aspects that are external to the game, but nevertheless impact it in one way or another. These aspects can include differences between the players themselves, or the context in which the game is taking place.

Let us return to our quasi-symmetrical example of a game of Chess. An amicable match between friends will invariably feel very distinct from one in a tournament, as much as a match between two similarly skilled opponents will be dissimilar to one between a teacher and their pupil.

In these examples, asymmetry at the level of game mechanics will surely emerge throughout the match, as players trade pieces or establish different positions on the board. However, at the same time, the context the game is taking place in, as well as the players' respective skill levels, will also play a role in shaping expectations and goals for each player, therefore fundamentally influencing their experiences with the game. Figure 1 illustrates the influence that differences in player profiles have in each of the three design components described in Robin Hunicke et al.'s MDA framework (2004).

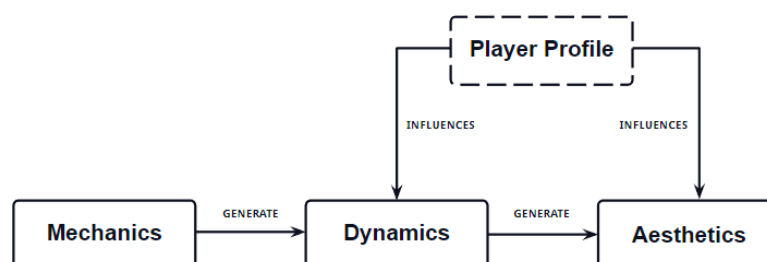


Figure 1.5: Player profile's influence on a game's dynamics and aesthetics.

Here, *player profile* refers to any and all aspects that will affect a player's input in the game, as well as their gameplay experience. These aspects can include factors such as:

- The player's level of skill and proficiency with the game;
- The player's motivations and expectations;

- The player’s current frame of mind; and
- The play context⁵ in which the player is interacting with the game.

While different player profiles cannot exert influence in a game’s mechanics, they can have a substantial impact in how its dynamics and aesthetics unfold during play.

We took to referring to these two categories *endogenous* and *exogenous* asymmetry, as a reflection of where the origin of those asymmetries lie: either inside, or outside the explicit rules of the game, respectively. As seen on Figure 1.6, endogenous asymmetries exist at the level of a game’s mechanics, while exogenous asymmetries are the way a game’s dynamics and aesthetics can be influenced by the player. Of course, these components still exert influence on one another, as described in the MDA framework. That is to say, different *mechanics* will generate different *dynamics*, which will, in turn, generate different *aesthetics*.

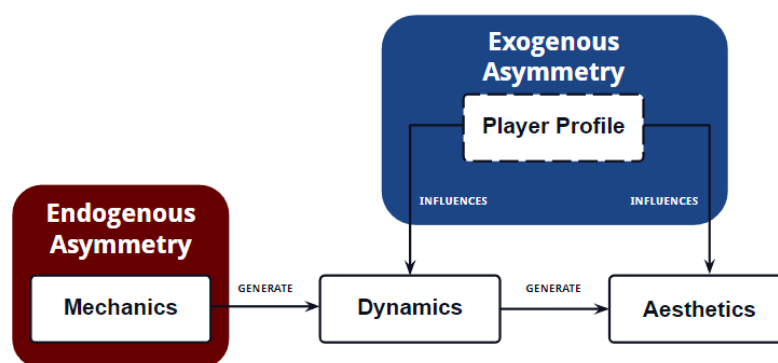


Figure 1.6: Endogenous and Exogenous asymmetry.

The inclusion of a category for asymmetries originating from aspects outside of the game’s rules may seem fruitless – after all, these asymmetries are beyond pervasive: they are inevitable – but in fact, games often take exogenous asymmetries into consideration. Skill-based matchmaking systems can be described as simply methods of diminishing asymmetries related to the players’ skill levels. Games also often include accessibility options meant to facilitate their use by people with impairments. We acknowledge exogenous asymmetry not with the impossible goal of avoiding it, but in order for game designers to better understand its role in shaping a gameplay experience and accommodate for it.

The inclusion of these two broad categories in our definition of asymmetry will allow us to gain a deeper understanding of how it might be used for the design of gameplay experiences that more accurately capture the diversity of human experiences. That being said, the focus of our work lies on the mechanics of asymmetry and how they can interact with one another, rather than exogenous asymmetry and the specifics of player experience and interpretation of a game.

⁵As defined by Horneman, play context relates to “the when and the where” a game is taking place, and “how those factors influence how people feel and which devices they use” (2015).

1.4 Asymmetry beyond starting conditions

The colloquial understanding of asymmetric play seems to be that for a game to be asymmetric, it must offer players distinct experiences right from the start. We disagree, as asymmetry fluctuates over the course of play, often in response to player choice. Some games have player characters start from a blank-slate state. In *Runescape* (2001), all players' characters start with their skills at level 1 and are all able to do the same actions. Only by engaging with the levelling process do players unlock different actions by progressing through the different skills.

Other games feature asymmetry from the start. In class-based role-playing games such as *Diablo III* (2012), the player character's chosen class will impact the actions they have available at the start. However, even in this case, asymmetry only increases further and further as the game progresses, as each class will unlock more and more actions that distinguish it from the others.

It might seem from the previous examples that asymmetry can be seen as an entropy-like feature in games, always increasing over time. However, there are instances where asymmetry can also decrease. For instance, two players in *Battlefield V* (2018) may unlock guns at different rates, depending on the amount of time they can dedicate to the game. However, at some point, one of them will reach a point where they have unlocked every weapon available. From this point onwards, the asymmetry between the two players (in respect to which weapons they can use in the game) will decrease over time.

Not all games follow these simple patterns of increase and subsequent decrease of asymmetry. Some allow for asymmetry to fluctuate more freely and in interesting ways. In *OBEY* (2015) all players spawn as bunnies. However, the first player to enter the giant robot in the level gets to control it. There is an extreme power differential between the robot and the bunnies that the robot player uses to coerce the other players. However, the catch is that the bunny players may decide to covertly conspire against their overlord, with ultimately one of the bunnies hijacking control of the robot. In this example, the great power asymmetry associated with being in control of the robot is constantly shifting from player to player, evolving over time in interesting ways.

Any of the types of asymmetry discussed in this text could be designed to be shaped over time by the actions of players. By rejecting the idea that asymmetric play presupposes static differences between players, we hope to encourage designers to create innovative ways in which this feature evolves over time, fostering interesting and unique gameplay narratives.

1.5 Roles

The term roles is often used in discussions pertaining to asymmetric gameplay. More often than not, a role encapsulates a set of responsibilities and specific types of actions that a player is expected to undertake in the context of the game. For instance, a player in the Killer role in *Dead by Daylight* (2016) is expected to play the part of the antagonist to the players in the Survivor role.

Their abilities reflect ways in which the game expects them to act: they are tools through which the player can chase, monitor, and damage the other players in the game.

Each role will often have its own set of gameplay goals to accomplish, but this is not always the case. A Tank player's goal in an MMORPG is not to withstand damage and prevent enemies from attacking their party members – that is their responsibility. Their goals are the same as the other players': to defeat the enemy, to complete the dungeon, and to accrue power through its rewards.

In current discourse, asymmetric roles entail asymmetric abilities. To revisit the previous example, the Tank player's character class, progression path, and the abilities they have access to are what allow them to perform their role. In so far as games explicitly use the term role, this seems to track: different roles usually necessitate different abilities.

Of course, there are exceptions. In MOBA games, roles are more closely associated with the tasks they are expected to perform, and, in a way, where they are expected to perform those tasks. For instance, a player who chooses the Top role in *League of Legends* (2009) is expected to defend the turret located in the upper regions of the map; the jungler is expected to roam around the map defeating neutral camps and ambushing unsuspecting members of the opposing team.

A strict definition of what a role is becomes even harder to reach when we take into account what we might describe as implicit roles. In *Journey* (2012), a player might encounter other players while they navigate the game world and its challenges. Take a scenario where a first-time player encounters one who has already experienced the game, and decides to guide them through the game. The guide leads them through the game, showing them which elements to interact with, which directions to travel, and perhaps even showing them a spot in the game world where they can appreciate a particularly compelling view of the game's landscape. Both players have access to the same abilities, they are pursuing the game goal,⁶ and cannot even communicate except through the sound of a musical chime. And yet, it would seem misguided to say that the players are not engaging with different roles. In fact, the emergent, implicit roles described in this example would inevitably colour each player's experience with the game in different ways.

We could seek to resolve this conundrum by appealing to the endogenous and exogenous dyad, and attempt to define what the term role means in relation to a game's mechanics versus in relation to aspects that emerge from the players' profiles. However, it might be the case that the term role escapes strict definitions. At a very basic level, the concept seems to be inextricably connected to the players' perceived responsibilities in the game. From there, roles seem open to being coupled with a number of other aspects such as the player's goals, the abilities they have at their disposal, and the many other concepts we will later explore while describing the different types of asymmetry. With this in mind, we venture that a role is a set of responsibilities a player perceives and is perceived to have in the context of the game, as informed by the way in which any and all asymmetries – endogenous or exogenous – distinguish that player from the others. In other

⁶However, the player's goals are not interconnected in any meaningful way: if a player advances to the next area while the other lags behind, they are separated, but the game continues with each player individually striving towards the goal of navigating to the end of the game.

words, a player's role is what they ought to do, considering what they can do that other players cannot.

In the ways we've discussed them, roles seem to necessarily entail interactions between different players – in a way that asymmetry, as we've argued, does not. They could conceivably emerge even from asynchronous interactions in which players are not playing concurrently, but may nevertheless engage with the game in a way that allows themselves and other players to develop expectations regarding their actions. Additionally, a player's role can change due to, for instance, new asymmetric constraints, or even changes in personal preference. Nevertheless, because roles are upheld by interpersonal responsibilities and expectations, they cannot emerge in single-player games.⁷

Like we've discussed, roles can be highly informed by asymmetries in a game's mechanics. Designers should be aware that the endogenous asymmetries they design into their games are likely to result in the emergence of roles, whether they are explicit or implicit. They should also be aware that roles can emerge even in games where no such asymmetries exist in the mechanics. Being cognisant of how interpersonal interactions can result in the creation of these constructs, may be a path towards greater insight into the possibility spaces of multiplayer games.

1.6 The spectrum of asymmetry

Asymmetry can be represented as a spectrum. At one end of the spectrum, there are games that are symmetric or have negligible asymmetry. An example of such a game is *Rock Paper Scissors*. There is no first turn advantage, as players act simultaneously. They both have access to the same choices: rock, paper, and scissors. Additionally, the game is sufficiently devoid of themes, preventing players from gravitating towards a particular choice depending on, for instance, their cultural backgrounds. Despite all of this, *Rock Paper Scissors* can still have a small degree of asymmetry when played for more than a single round. Players can develop their ability to detect their opponent's patterns, becoming more proficient at the game. For instance, if a player wins a round, their probability of repeating the same action in the next round was found to be considerably higher than their probabilities of choosing a different action (Wang et al., 2014). A player that harnesses their ability to discern these kinds of patterns can create a skill differential that skews the experience of playing *Rock Paper Scissors* for each player. Also, if players are keeping score (e.g. playing a best of five), they will inevitably be navigating the tension that comes with that. If the game is currently 2-0, the losing player is on the verge of defeat, while the winning player sits comfortably with their point advantage. If a comeback occurs and the game ends with a 2-3 score, the players will experience the overall gameplay narrative from opposing sides: one will be feeling the thrill of an astonishing turnaround, while the other will be vexed by an unexpected

⁷To disambiguate, we do not mean to say that a player cannot roleplay a certain type of character in a single player game like *Fallout: New Vegas* (2010). Our discussion is concerned not with this usage of the term, but instead derives from its usage in contexts pertaining to asymmetric gameplay.

defeat. Even a game that at first glance can be described as symmetrical can hold the potential for asymmetries to take place during play.

On the other end of the spectrum, we have games in which the different players' experiences are so dissimilar that it might be considered that they are engaging with different game genres. For example, take a game like *Battlefield 4* (2013), with its Commander role. While most players in a match are engaging in the team competition through first-person shooter mechanics, the Commander player acts in the game through mechanics more akin to those of a strategy game: giving orders to the different squads and triggering supply drops and missile launches.

Davis put forward a working categorisation of how these different degrees of asymmetry could be divided across four discrete categories (2022). These were written regarding board games, but are interesting nonetheless. As described by the author – and preserving the terminology used to describe them – these categories are:

- **Trivial asymmetry:** developmental⁸, non-exclusive (i.e. you can't get a power that the other player(s) are unable to access) and not thematically significant. Examples: more or less every game.
- **Weak asymmetry:** developmental asymmetry with some exclusive powers, and/or relatively minor inherent differences between players. Examples: *Wingspan* [2019], *Suburbia* [2012], *Tzolk'in: The Mayan Calendar* [2012].
- **Strong asymmetry:** inherent, thematically significant, exclusive differences between players. Examples: *Terra Mystica* [2012], *Twilight Imperium* [1997], *Scythe* [2016], *Magic: The Gathering* [1993] if the players are running different decks.
- **Extreme asymmetry:** strong asymmetry plus significantly different rulesets and/or methods of victory for each player. Examples: *Vast: The Crystal Caverns* [2016], *COIN* games [2012], *Netrunner* [1996], *Captain Sonar* [2016], *Dune* [2019]⁹. (Davis, 2022)

We believe that it may be misguided to divide the spectrum of asymmetry in such a nebulous way. Nevertheless, these categories and the examples tied to them show us that board games have used asymmetry to different degrees for different kinds of gameplay experiences.

Modern digital games have also run the gamut of this spectrum of asymmetry. Although they seem to lean towards more asymmetric designs, when analysing games for endogenous asymmetries only in the starting conditions we can find some exceptions to this rule. *Puyo Puyo Champions* (2018) is a puzzle game somewhat akin to *Tetris* (1984) in which the two competing players

⁸Developmental asymmetry, as Davis describes it, relates to asymmetries that emerge in runtime, as players opt for “sometimes radically differentiating strategic paths” (2022). Davis gives the example of when a game allows one player to claim an item that gives them new abilities that the other players do not have.

⁹Our emphasis and dates.

are faced with the same sequence of blocks. However, this game is one of the latest¹⁰ entries in the *Puyo Puyo* game series, which originated in 1991 and kept most of its core mechanics unchanged.

Some simple games that heavily rely on social dynamics and player input also seem to go against the trend of endogenous asymmetry. For instance, in *Know What I Meme* (2023), players are given the same text prompt, to which they must respond with a GIF image. The response that is voted the funniest wins the round.

These are some of the very rare exceptions to the rule, and their degree of symmetry could be attributed to either the fact that they are based on designs that are decades old, or to the fact that these games' appeal comes from their simplicity, which is not a property that games with a higher degree of asymmetry tend to possess.

In Chapter 2, "Prevalence of Asymmetry in Digital Games", we will look at how prevalent asymmetry is in games, the ways it can express itself, and the role it plays in competitive and cooperative player interactions.

¹⁰The latest entry at the time of this writing was *Puyo Puyo Tetris 2* (2020), in which one player might be playing through the mechanics of *Tetris* (1984) while the other does so through those of *Puyo Puyo* (1991). This adds a significant level of asymmetry to the competition, which makes it an inadequate example for this context.

Chapter 2

Prevalence of Asymmetry in Digital Games

In this chapter, we will analyse the pervasive nature of asymmetry in games. We will start with an historical overview, and then examine how asymmetry permeates contemporary games, both analogue and digital.

2.1 Historical overview of asymmetry in games

Asymmetric gameplay is not a recent development in games. *Tafl* games were a family of strategy board games, played in Northern Europe as early as the fourth century CE (Murray, 1952). These kinds of games were played on a chequered or latticed game board, where each player controls one of two armies of asymmetric numbers. The White pieces are clustered at the central area of the board, with a *King* piece occupying the very centre. The Black pieces, of which there are double the number, are placed surrounding the white pieces. Although no unambiguous description of the rules exists (Murray, 1952), White's objective is to have their *King* escape to the board's periphery or corners, while *Black* strives to capture the King.

Wargames are also great examples of asymmetry in games. These are strategy games in which players control opposing armies, using miniatures on a map-like board depicting either a real historical conflict or a fictional one. From their tradition as tools for military simulation, to their adoption as a commercial hobby following the success of *Tactics* (1954), these games depict asymmetric conflicts with varying levels of realism. The fact that the asymmetry in these games stems from the fact that they were conceived to simulate real-world scenarios is evidence of the fact that asymmetry is embedded in real-world conflicts.

One of these wargames, *Chainmail* (1971), eventually evolved into *Dungeons & Dragons* (1974), a game in which each player controls not an army, but a single character. In this game,

¹Source: <https://medium.com/boardom/how-to-play-hnefatafl-32d8db70bd16>. Retrieved January 10, 2024.



Figure 2.1: Tafl board.¹

a player's character belongs to one of three different classes of characters: *Fighting-Men*, *Magic-Users*, and *Clerics*; and one of four different races: *Humans*, *Dwarves*, *Elves* and *Halflings*. However, the game's creators made a point to encourage the players to further diversify their experience with the game, stating that "[t]here is no reason that the players cannot be allowed to play as virtually anything" (Gygax & Arneson, 1974, p. 8), so long as they began as relatively weak characters with the potential of working their way up to the top.



Figure 2.2: A group of players gathers around a table to play Dungeons & Dragons.²

Each character also has their ability scores randomly generated by rolling three six-sided dice for each different ability. These included *Strength*, *Intelligence*, *Wisdom*, *Constitution*, *Dexterity* and *Charisma*. This meant that even characters belonging to the same class will most likely have differing stats, making them more or less proficient at executing different in-game tasks. This, coupled with the loosely structured nature of the game, allows each player to truly differentiate

²Source: <https://eu.newsleader.com/story/news/2019/04/20/dungeons-and-dragons-new-class-players/3532155002/>. Retrieved January 10, 2024.

their experience with the game and to impact the ongoing narrative in ways very specific to their character.

We argue that this is a prime example of asymmetry being used to impact gameplay narratives and experiences in a meaningful way. Players' discussions of past play sessions are rife with moments of emergent gameplay fostered by how the different characters' actions interact. These in-game stories are also imbued with a sense of individuality and responsibility. For example, when a character casts a magic spell at a crucial time in combat, turning the tides of the battle, it is because that player selected that class during character creation; because they elected to research that spell, investing in-game time and currency to be able to use it; because they chose to hold off on using that spell until the right moment came; and finally, because they chose to use it at that moment. In that crucial moment, they experience the payoff of their earlier decisions, impacting the game in a way that other characters would be unable to, and, in this hypothetical scenario, saving the day for the rest of the party.

Dungeons & Dragons later influenced programmer Reginald "Rusty" Rutherford III, who wrote the role-playing game (RPG) *PEDIT5*, in 1975. It is the earliest Computer RPG of which there is still information available. It heavily features the basic features from *Dungeons & Dragons*, such as hit points, monster levels, experience and treasure awards. The player character's ability scores were also borrowed from the tabletop game, and are similarly randomised at the start. While the multiplayer component is not present in this digital adaptation, points of comparison can still be found in the different playthroughs a player can experience. Aside from the randomly generated ability scores, the game also features random monster and treasure placement. This means that the player can encounter different configurations of the game's challenges and rewards in each playthrough. The game also features *permadeath*,³ meaning once the player's character dies, it is permanently gone, which encourages players to do multiple playthroughs and encounter different configurations of the dungeon.

While in actuality these randomly generated variations in gameplay are very rudimentary compared to modern examples, the game went on to inspire the creation of games such as *dnd* (1975) – a more complex riff on *PEDIT5*'s formula⁵ – as well as *Rogue* (1980).

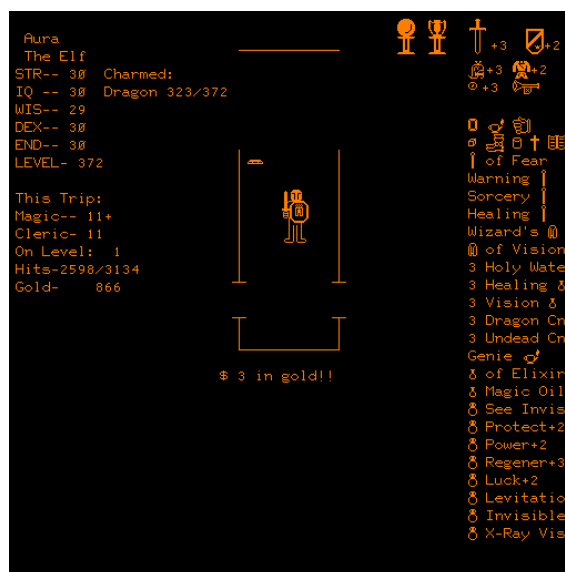
Much like in *PEDIT5*, *Rogue* has players control a character while they explore a dungeon, fending off enemies and collecting treasures. However, alongside the monster and treasure placement, the dungeon is also procedurally generated, assuming different configurations in each playthrough.

³This feature wasn't unprecedented. Even in earlier titles such as *SpaceWar!* (1962), the game would be over after the player's avatar was defeated. However, the character progression present in games such as *PEDIT5* would warrant a higher level of player investment in their avatar, making their eventual permanent death more impactful.

⁴Source: <https://analoggamestudies.org/tag/pedit5/>. Retrieved January 10, 2024.

⁵*dnd* was the first game to have shops where players could buy items such as weapons, armor, and potions to help them in their quest. The enemy placement was not as arbitrary as in *PEDIT5*: the player would encounter stronger enemies and get better treasures as they advanced through the game. The game is also reportedly the first to feature monsters that were vulnerable to different types of attacks, as well as the first to feature boss and mini-boss enemies (RPG Fanatic Carey, 2012; Zerothis, 2007).

⁶Source: <https://www.gamedeveloper.com/design/the-history-of-rogue-have-you-you-dreadly-zs>. Retrieved January 10, 2024.

Figure 2.3: *PEDIT5* (1975).⁴Figure 2.4: *Rogue* (1980).⁶

The treasure items themselves are randomly generated as well. For example, the player might find a magic scroll with an incomprehensible title such as “*rozgij qob yiz wuq*”, and only by reading the scroll would they be able to identify its actual effects,⁷ which ranged from positive boons to negative repercussions for the player’s character. This meant that in each playthrough, the player could encounter items with different effects that would influence the gameplay in various ways, fostering asymmetry between playthroughs. This approach was so influential that it originated a new genre: *roguelike* games, which use procedural generation, permadeath, and randomly distributed items and power-ups for the player character (Brewer, 2016).⁸

So far our examples of asymmetry in computer games were related to single-player games

⁷This could also be done by utilising an *identify scroll* on an unidentified item. Other items such as potions, rings, and staves would also need to be identified either by this process or by experimentation.

⁸Recent prominent examples include *The Binding of Isaac* (2011), *Slay the Spire* (2019) and *Hades* (2020).

that add asymmetry between each playthrough. However, computer games would soon feature asymmetry between the experiences of two players concurrently interacting with the game – much like analogue games, from *Tafl* to *Dungeons & Dragons*, had done.

Nautilus (1982) was perhaps the earliest example of this. One player controls the titular *Nautilus*, a submarine, while the other controls *Colossus*, a destroyer. Each player's unit appears in different halves of a split-screen display. Each player respectively has the goal of either destroying or rebuilding an underwater city. Even though the player's goals are simply diametrically opposed, the means they use to achieve them are specific to their ship. The *Nautilus* player can shoot at the buildings and capture the energy cores inside in order to power their ship, while the *Colossus* player can ferry repair crews from one shore to the other, so as to repair the destroyed buildings, while also dropping depth charges in an attempt to damage the *Nautilus* directly.



Figure 2.5: *Nautilus* (1982).⁹

Games have since strived to provide their players with different gameplay experiences not only by allowing them to execute different sets of actions within the game, but also by observing the manner in which a player plays and responding to it accordingly. *Castlevania II: Simon's Quest* (1987) presents the players with one of three different endings depending on how long they took to beat the game. A playthrough concludes with a colloquially called *bad*, *normal*, or *good* ending, which also determines whether the main character survives in the game's storyline. In *Silent Hill 2* (2001), the ending is dictated by some very specific player actions,¹⁰ as well as which events the player witnesses during the game. In a similar fashion, *Metal Gear Solid*'s (1998) character Psycho Mantis breaks the fourth wall, taunting the player by commenting not only on their playstyle¹¹ but also in regards to which other games the player has played in the past, by reading the player's save data on the console's memory card. These moments stand out not because of the technical expertise required to craft them, but because the system is responding to that specific player's

⁹Source: https://www.youtube.com/watch?v=_BWLuhjk5FU. Retrieved January 10, 2024.

¹¹Psycho Mantis's dialogue is built from a sequence of lines that are dependent on: a) the number of times the player has triggered an alert; b) the number of times the player died; and c) the number of times the player has died to pitfalls.

experience with the game. These personalised game experiences can only exist if asymmetry is present.



Figure 2.6: In *Metal Gear Solid* (1998), Psycho Mantis's dialogue incorporates assessments regarding the games the player has played in the past by accessing their save files.¹²

At the turn of the millennium, Massively Multiplayer Online Role-Playing Games (MMORPGs) became increasingly popular. Games such as *Everquest II* (2004) and *World of Warcraft* (2004) rose to success, the latter accruing nearly 6 million players¹³ during its first year. Like its single-player RPG predecessors, these games had a great emphasis on character progression, featuring different classes that were able to perform different actions. However, the multiplayer nature of these games, combined with the fact that levelling a new character was a considerable time investment, meant that players had to rely on one another in order to successfully overcome the games' challenges.

World of Warcraft, in particular, had players join one of the two conflicting factions: the *Alliance* and the *Horde*. Players from opposing factions had access to different zones of the game world and were restricted to the social dynamics of competition. They could not form a party together, or even communicate with one another through the in-game chat, as their messages would appear distorted to members of the opposite faction. Through its story and lore, the game would demonise the faction that was opposite to the player's, in the same way their faction was painted in a bad light by the NPCs belonging to the opposite faction. Through this schism, the

¹¹These actions were not explicit choices that the player knowingly engaged with, but acted more as a reflection of how the player acted within the game, from keeping the main character's health topped up, to not bumping into one of the non-player characters.

¹²Source: https://www.youtube.com/watch?v=t0oHnGM_iQw. Retrieved January 10, 2024.

¹³(Tipper, 2017).

¹⁴Source: <https://blizzardwatch.com/2018/01/11/remembering-wow-classic-paladin-classes-vanilla/>. Retrieved January 10, 2024.



Figure 2.7: An Alliance player encounters a hostile Horde NPC in *World of Warcraft* (2004)¹⁴

game created an environment ripe with rivalry, where the conflict was not black or white – at least to those who had access to both perspectives. This made it a fascinating example of asymmetry being used to provide perspectives on the same conflict.

Other later games did the same, even in the single-player space. One such example is *Pathologic* (2005), a role-playing game in which the player is tasked with uncovering the source of a mysterious disease that has befallen a small, remote town. Depending on which of the three playable characters the player selects at the start of the game, they will have different goals and a unique perspective on the game’s storyline. The different characters’ personal backgrounds and philosophies lead them through very different paths across the game’s events, effectively providing the player with an alternative frame of mind, a new lens through which they can interpret the game’s events. In some instances, the player can even interact with the characters that they didn’t choose, getting to know them from an alternate point of view.

Around this time, games that allowed players to act as game designers became more popular, as well as more accessible. While some previous examples existed – such as the map editor function in *Warcraft III: Reign of Chaos* [2002], or even early commercial mod-making tools such as *Boulder Dash Construction Kit* (1986) –, it was perhaps *LittleBigPlanet* (2008) that brought the concept of user-generated content in games into mainstream popularity. The accessibility of its level creation tools inspired players to create and share millions of levels. These levels, unlike those already included in the game by the developers, would even occasionally stray from the platforming genre: for instance, some levels had mechanics akin to those of fighting games, and others were built as Rube Goldberg machines that the player could interact with (Treese, 2018).

Needless to say, the creators of these levels would engage with the game in a way very different from a regular player. They would step into the shoes of a game designer, and be prompted to think about that game – or maybe even games in general¹⁶ – through a new perspective: one that

¹⁵Source: <https://www.youtube.com/watch?v=FK0951jMLZc>. Retrieved January 10, 2024.



Figure 2.8: A player adds objects to the level they are creating in *LittleBigPlanet* (2008).¹⁵

undoubtedly influenced their gameplay experiences while engaging with other creator's levels.

Of course, *LittleBigPlanet* – and the games it inspired¹⁷ – does not require all players to engage with its suite of level-creation tools. Players can engage with the game as they would with a traditional platformer, and enjoy its immensity of user-generated content. However, for players who wish to act as creators, the game allows them to explore not only the role of a game designer but also the relationship between designer and player. We argue that these games offer what most others don't: they allow players to access a greater level of game literacy.

As described by Zagal (2008), game literacy can be defined through three different components:

- Having the ability to play games;
- Having the ability to understand meanings with respect to games;
- Having the ability to make games.

As such, games that feature level creation tools can advance players' game literacy by allowing them to develop their skills in all three of these components.

One prevalent trend in asymmetric gameplay across the last decade relates to competitive games with an 'All vs. One' social player dynamic. There are older examples in board games,¹⁸ but video games that feature such dynamics seem to be experiencing a rise in popularity. The trend seems to have been pioneered by *Evolve* (2015), a game in which four players take control of the Hunters, while the fifth player controls the Monster.

¹⁶In the case of Matthew Compher (aka 'comphermc'), the popularity of his *LittleBigPlanet* (2008) levels led him to become a level designer for *Tarsier Studios*, the developer behind *LittleBigPlanet PS Vita* (2012).

¹⁷Such as the *Super Mario Maker* series (2015-2019), and *Dreams* (2020).

¹⁸The oldest example we were able to find was *Scotland Yard* (1983) in which one player would take on the role of Mr. X, covertly travelling from point to point on a map of London, while the other players – the Detectives – aimed to find and capture Mr. X by landing on the same space as them.



Figure 2.9: The first-person perspective of a Hunter player in *Evolve* (2015) as they engage the Monster player in combat.¹⁹

As widespread as this dynamic is currently, at the time it represented a break from the norm that team competitions presuppose teams of equal size. A natural consequence of reducing one of the teams to a single player is that that player must have a higher power level, so as to be able to match that of all the opposing team members combined. A task easier said than done, when the game's asymmetric starting options are taken into account: there are a variety of Hunters and Monsters the players can choose from, each with their unique abilities and traits. Not only that, the Hunter team faces a challenge that the Monster does not: that of achieving efficient cooperation amongst themselves.

These games can be seen as contests of the individual versus the collective. The Monster, strong as they may be, cannot be in two places at once. The Hunters can support each other through their abilities, but are easily defeated when alone. Whereas in other games it would feel 'cheap' to win in a scenario where the players outnumber their opponents, the power differential at play here negates that: when the Hunters *win*, it is because they were able to cooperate with their team efficiently to defeat a single, but very powerful opponent; when the Monster wins, it is because they were able to prevail as individuals against a team of four human players.

The power differential required by this dynamic seems particularly suited for games with horror themes,²⁰ which benefit from the feeling of powerlessness that one may feel when faced with an apparently insurmountable adversary. This dynamic also has a foothold in VR experiences, such as *Nemesis Realms* (2018) and *Acron: Attack of the Squirrels!* (2019), in which a team of players play using controllers/phones, competing against one single player with a VR headset.

From *tafl* games, to the budding field of virtual reality games, asymmetry seems to be a timeless feature in games. It exists in a variety of forms, and seems to have the potential to foster

¹⁹Source: <https://www.readingeagle.com/2015/02/19/game-review-four-humans-vs-one-monster-in-tense-evolve/>. Retrieved January 10, 2024.

²⁰*Propnight* (2021), *Dead by Daylight* (2015), *Secret Neighbor* (2018), *Identity V* (2018) are some of the examples of the prevalence of this dynamic in the horror genre.

experiences that would not be achievable through symmetry. Furthermore, it would be premature to say that asymmetry has exhausted its possibilities: as games explore new approaches, we are likely to see asymmetry in new forms and different contexts.

2.2 Asymmetry in analogue vs. digital games

Although the focus of our analysis will be digital games, it is worthwhile to take a look at their analogue counterparts. While analysing both analogue and digital games in regards to their positions in the spectrum of asymmetry, we found that some analogue games venture into degrees of asymmetry that are yet unexplored by videogames.

An example of such games is *Vast: The Crystal Caverns* (2016), in which player roles are so dissimilar, each gets their own rules leaflet explaining at length their character's abilities and goals. In this five-player game, three players control a single character, one controls multiple, and one controls the Cave, the location all the other characters are in. The result is a game in which interesting dynamics emerge, as each player's goals interact with another's in specific ways.

Some asymmetric roles in videogames share this level of dissimilarity between one another, but in videogames, the number of different, deeply asymmetric roles, seems to almost always be limited to two.²¹ For instance, in *Natural Selection 2* (2012), two teams (Aliens and Humans) are competing against one another. In addition to the bulk of the players who are engaging with the game through first-person, each team has a Commander player that issues orders, places structures and deploys abilities through Real Time Strategy mechanics.

Why are videogames restricting the number of deeply asymmetrical roles to two? Given the fact that their analogue counterparts have already taken their first steps into this kind of experience, we can speculate that this can be largely attributed to challenges in regards to implementation. It is no easy task to implement multiple different gameplay systems in video games. Current AAA games have multi-million dollar budgets and are developed for years, and featuring deeply asymmetric roles would inevitably further increase these costs. We hope that, in the future, videogames start exploring these kinds of complex dynamics of player interaction through asymmetric goals and mechanics, as they may result in interesting emergent gameplay narratives that stray from the usual "us versus them" pattern that so many games use.

Another noteworthy example from analogue games relates to Tabletop Role-Playing Games (TTRPGs). They typically boast another interesting dynamic of player interaction: the Game Master that mediates the players' experiences. The Game Master is the game participant in charge of authoring and organising the challenges and storylines of the game (La Farge, 2006). They control all the non-player characters that the players interact with, as well as all other aspects

²¹The few games feature three deeply asymmetric roles, don't go as far as to give the players different gameplay objectives, or genre-bendingly different gameplay loops. E.g. *Aliens vs. Predator* (2010), in which players can play as Marines, Predators, or Aliens. Each class has different abilities, but all have the same goal of eliminating one another. Another example would be *StarCraft II: Wings of Liberty* (2010), with its Terran-Zerg-Protoss triad of factions, each very different from one another. Nevertheless, all the players are playing through Real Time Strategy mechanics, striving to eliminate one another.

pertaining to the fictional setting the game takes place in. Environments and events are described verbally by the Game Master, and the game can take place fully within the theatre of the mind – that is to say, no miniatures or visual aids are required.

The Game Master is not competing against the players, nor are they necessarily cooperating with them. Instead, their goal is to create interesting gameplay narratives that take the players' actions into account.

This ability for the players to shape the narrative through their actions greatly fosters asymmetry. Even if two different groups of players are playing through the same pre-written campaign, their choices will result in very different experiences for each group. This is largely magnified by the fact that content in TTRPGs is highly flexible. Whereas in videogames, player action and its consequences are limited by the mechanics implemented by the developers, a Game Master in a TTRPG can easily create new game elements or manipulate existing ones in order to more react to player action in a way that maintains the verisimilitude of the simulated world in which players' characters exist.

A Game Master can act through preemptive action before the game takes place, and/or through intervenient action during the game (Neto, 2016). Some videogames allow players to create content for other players to experience,²² restricting their influence to the scope of preemptive action. Thankfully, other examples have succeeded in more closely emulating the role of a TTRPG Game Master, allowing them to not only create original campaigns but also to moderate the other players' experiences during runtime. *Sword Coast Legends* (2015), *Arma 3 Zeus* (2014), as well as *Sleep is Death* (2010) prove that it is feasible to transfer the role of Game Master onto the medium of videogames, across different games genres and themes.

Although, as mentioned, our focus will be in videogames, it is clear that a lot of insight can be gained by looking at the kinds of experiences analogue games can provide and contrasting them with those of videogames. Some analogue game designers have done the opposite to great effect, adapting experiences that were initially designed for videogames into the medium of board games.²³ The comparatively low cost of implementation that analogue games benefit from can foster experimentation and allow the design of new and interesting gameplay dynamics. It is up to videogame designers to analyse and learn from those experiments, so that they may pave the way for advances in the design of videogames.

2.3 Layered Asymmetry

Asymmetry is so prevalent in games that it can sometimes be described to exist in a number of different layers. Each layer represents a variable or set of variables that can be configured either by the players or the system, and overall contributes to a game's potential for asymmetry to emerge.

²² As in *Super Mario Maker* (2015), *Meet Your Maker* (2023), and *Game Builder Garage* (2021).

²³ *XCOM: The Board Game* (2015), *Civilization: A New Dawn* (2017), *SUPERHOT: The Card Game* (2017), and *This War of Mine: The Board Game* (2017) are all examples of board game adaptations that capture not only the themes of the original games, but also their gameplay dynamics and intended player experiences.

Let us look at the layers of endogenous asymmetry from the perspective of a single player in *League of Legends* (2009) for a concrete example.



Figure 2.10: Two opposing characters facing off in *League of Legends* (2009).²⁴

In this Multiplayer online battle arena (MOBA) game, two teams of five players compete with the goal of destroying the other team's Nexus, a structure located within that team's base. Each of the ten players controls a character with unique abilities and playstyles. During a match, characters can collect experience points, earn gold, and purchase items to become stronger. We may see this game's layers of asymmetry as follows:

- **Layer 1:** The player selects which role they want to fulfil during the course of the match. Each of the five different roles is responsible for protecting a specific structure or area of the map. Some lean more towards Player vs. Environment combat, while others are expected to engage in direct conflict against members of the opposing team, either individually or in pairs. Each role has specific responsibilities and challenges at different times during the match, and professional players will often specialise in just one of these roles.
- **Layer 2:** At the time of writing, the game has a roster of 163 characters, each with five different abilities. The players' choice of character will greatly impact not only their gameplay experience, but also those of the other players.
- **Layer 3:** In addition to the character's five exclusive abilities, the player can choose two additional abilities from a pool of ten different *Summoner Spells*. These abilities allow the player character to perform different actions, from teleporting across the map to healing themselves and nearby allies.
- **Layer 4:** The player can configure their *Runes*, enhancements that provide benefits to the player character. *Runes* are divided into five different paths, each with around 12 different

²⁴Source: https://www.youtube.com/watch?v=s4PCn_iPlt8. Retrieved January 10, 2024.

options. The player selects 4 *Runes* across one main path, and two additional ones across a secondary path. These choices will be informed by the player's selected character and role.

- **Layer 5:** After the game starts, the player can accrue gold and use it to purchase items. They can have a total of 6 items, typically one being a *Mythic* item (from a pool of 27 options), four being *Legendary* items (from a pool of 75 options), and one *Boots* item (from a pool of seven options).²⁵ A player's choice of items – as well as the order they are purchased in – will be informed by not only their character, but also by the other players', and may also be impacted by the current game state.²⁶

Each of these layers represents a set of choices that the player can perform during the game. Although one might be tempted to look at the totality of different permutations allowed by these choices, we find that it is more useful to perceive these sets of choices through the metaphor of layers. The choices the player made in one layer will often impact ones in other layers. No choice is made in a vacuum. Step by step – or layer by layer – the players are building a specific configuration of variables that will greatly affect their gameplay experience. In fact, each of these configurations is commonly referred to by players as a *build*.²⁷

Note that this list is restricted to the perspective of a single player, and does not even cover the moment-to-moment actions that the player performs in the context of the game, and is restricted to the more overarching strategic choices the player made both before and during the game. Given this, it is easy to conclude that asymmetry can add not only a considerable amount of complexity to a game, but also a lot of variety in the options that players can explore – and thus, replayability.

Games that feature asymmetry will sometimes feature this strategic metagame²⁸ component, which makes it so that asymmetry is configured and shaped by the players even before the game takes place. Players can engage in these pre-match preparations with different goals, from pursuing their own preferred playstyle to exploiting current trends in how that particular game is played. Nevertheless, games that successfully promote metagaming allow players to explore different layers of asymmetry and experience different perspectives in regards to the same game.

2.4 Competitive and cooperative approaches to asymmetry

2.4.1 Defining competitive and cooperative games

Zagal and Rick (2006) divide games into three different categories: *competitive*, *collaborative*, and *cooperative*. In competitive games, the player's goals are diametrically opposed. In collabor-

²⁵Not all items are strategically sound for a given character. We are also excluding all the lower-tier items from which these finalized items are built, for the sake of simplicity.

²⁶For instance, a player may be more inclined to purchase items that will better protect them from the currently strongest member of the opposing team.

²⁷This nomenclature is more popular within role-playing games, but not exclusive to them. Other game genres may opt for different terminology, such as *loadout* for first-person shooter games, e.g. *Call of Duty: Warzone 2.0* (2022).

²⁸As defined by Carter et al. (2012), metagaming refers to play acts that are beyond the scope of what players consider to be the main game, which players often participate in order to better their odds of winning the game.

rative games, all the participants work together as a team, sharing the outcomes: either the entire team wins, or no one wins. Cooperative games, on the other hand, can almost be regarded as a combination of these two opposites. In these games, the participants' interests are "neither completely opposed nor completely coincident" (Nash, 1953). That is to say, cooperative players may have different goals and payoffs Zagal et al. (2006).

While a lot of games seem to fit neatly within these definitions, we find that, for our purposes, it may be more adequate to use these terms to describe the relationships between different players or groups of players. As illustrated by Fullerton (2018), games can have a number of player interaction patterns that cannot be adequately described using Zagal and Rick's terminology. The list presented by the author includes:

- Single Player versus game;
- Multiple individual players versus game;
- Player versus player;
- Unilateral competition;
- Multilateral competition;
- Cooperative play;
- Team competition.

Take, for instance, the pattern of Team competition. A game in which two teams compete against one another may also be rife with collaborative interactions between members of the same team. As such, instead of attempting to describe a game based on the kinds of interactions it promotes between players, we will instead be analysing the interactions themselves, as well as the mechanics that promote them.

We also find it problematic that Zagal and Rick's nomenclature utilises the term *collaborative* whereas most authors we have been able to find seem to favour the term *cooperative* to describe interactions where players work as a team. Game design industry professionals and players alike also seem to favour the term *cooperative*. As such, for our purposes, we will be utilising the terms *competition* and *cooperation* throughout this text.

2.4.2 Cooperative games

2.4.2.1 Design Patterns

Rocha et al. (2008) analysed a number of design patterns for cooperative gameplay. These are:

- Complementarity;
- Synergies between abilities;

- Abilities that can only be used on another player;
- Shared goals;
- Synergies between goals;
- Special Rules for Players of the same Team.²⁹

Complementarity is described as the ability for player characters with different affordances and abilities to complement each other. This, of course, necessitates some form of asymmetry between the players. Game designers can employ asymmetry for the purpose of fostering cooperative interactions among players.

For instance, the *League of Legends* (2009) character Yasuo can only use their ultimate ability on an enemy character that has been knocked up into the air. During the character select phase of the game, players will often try to complement a Yasuo on their team by choosing a character that is able to knock enemies up into the air. This occurs because it is a strategically sound choice that might enhance the team's odds of winning.

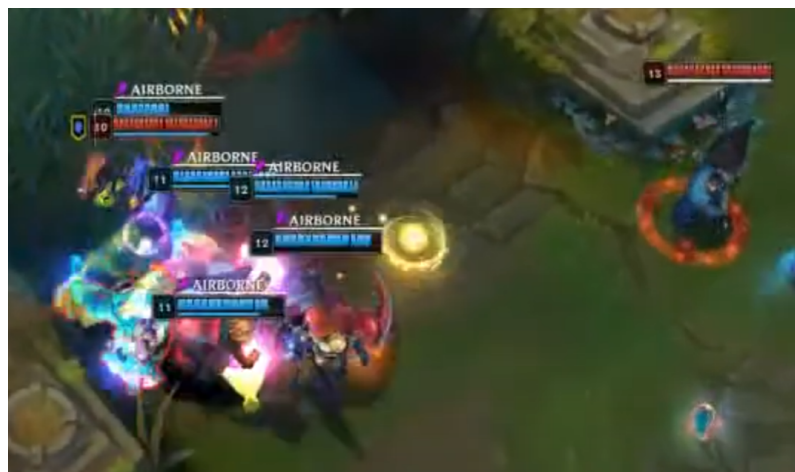


Figure 2.11: *League of Legends* (2009). Alistar (left-side, red healthbar), has used one of their abilities to apply the Airborne condition to all five members of the opposing team (blue healthbars), allowing Yasuo (right-side) to cast their Ultimate Ability on them.³⁰

However, these kinds of complementarities must be consciously and carefully designed by game designers. It is possible to make a game in which the asymmetric characters do not complement each other in interesting ways, or to make a game full of unexpected interactions that create unintended consequences.

If complementarity promotes cooperative play, it can be said that some implementations of asymmetry enforce it. For instance, some cooperative games have instances in which one of the

²⁹The authors describe these as rules that make it so “an action will have a different effect when done on a friendly player”, as a way to promote and facilitate cooperation. They provide the example of first-person shooter games that do not have friendly fire – i.e. shooting your own teammates does not damage them.

³⁰Source: <https://www.youtube.com/watch?v=PNZkxAOpQCc>. Retrieved January 10, 2024.

players must use actions exclusive to them in order for the game state to advance. This happens often in *It Takes Two* (2021). Players have to use their respective character's asymmetric abilities in order to successfully surpass the game's challenges.

2.4.2.2 Challenge Archetypes in Cooperative Games

Rollings and Adams (2003) state that “gameplay consists of the challenges the player faces, plus the actions she can take to overcome them” (2003). These authors divide gameplay challenges into *pure challenges* – the archetypal challenges from which most gameplay challenges derive – and *applied challenges* – the application and use of those archetypal challenges.

Rocha et al. (2008) analysed these challenges in regards to their capacity for enabling cooperative play. Pure challenges, as grouped by Rocha et al. include:

- Physical Challenges;
- Logic and Inference, Lateral-Thinking, Memory, Intelligence, Knowledge-based and Pattern-recognition Challenges;
- Coordination, Reflex/Reaction, and Spatial-Awareness Time Challenges.

Each of these challenges can promote cooperative play by being an arduous task for a single player. They also enable the expression of exogenous asymmetries. To use physical challenges as an example, players will often have different levels of physical fitness and coordination. Unless they are tailored to each player's capabilities, cooperative challenges may lead to a power imbalance in which some players have more agency than others. This applies to the other types of challenges as well.

This isn't necessarily detrimental, as it may result in a gameplay dynamic where the more capable player has an adequately increased challenge due to having to compensate for the less capable player. Mace et al. created a game for patient-expert dyads, where the patients were hemiparetic stroke survivors using their impaired arms to grab force-sensing handgrips (2017). The authors found that the performance of the less-able subjects was enhanced by their more able partners. Healthy subjects felt more challenged, and patients felt more skilled than when they played the game by themselves.

So long as both players need to exert non-trivial effort in order for the group to succeed, this emergent dynamic can act as a balancing tool, making it so everyone feels adequately challenged. If it were the case that only one of the participants needed to engage with the game for the group to succeed, the aforementioned may not always occur: the less skilled player may find their input to be ineffective, abdicate their agency, and not engage with the game in any meaningful way.

2.4.2.3 Interdependence and communication in cooperative play

Depping et al. created four variations on the same game, each of them a part of a two-by-two matrix: crossing competition or cooperation with independence or interdependence (2017). In

these two-player games, players had to collect gems in a labyrinth within a time limit. If a gem was unattainable in the current labyrinth configuration, players could rearrange the maze by pushing the walls. In the interdependent variations of the game, players played on the same labyrinth, and had complementary roles: one player was able to move walls, the other was able to collect the gems. In the independent counterparts, players were set on different boards and both had the same abilities. In the cooperative versions of the game, players worked together to collect as many gems as possible as a team. In competitive versions, players were rivals competing for the gems.

Their results showed that cooperative mechanics seemed to increase the feeling of relatedness experienced by players and that interdependence had an effect on interpersonal trust between players, as interdependent tasks increase the need for communication. They concluded that games that strive to strengthen social bonds between players should have a high level of interdependence. This is corroborated by research from the field of sports psychology, in which positive interdependence³¹ between athletes is demonstrated to lead to not only enhanced group cohesion and closer relationships but also better team performance altogether (Evans & Eys, 2015).

However, to design a game that features a high level of interdependence is easier said than done. Harris and Hancock argue that “the tension between thoughtful interdependence and frustrating tedium is one of the most important challenges in the design of asymmetric cooperative games” (2019). The authors contrast games that allow players to tailor their available actions – and subsequently, their interdependence – with games in which this is not an option. They state that the former approach may appeal to a wider range of player tastes, while the latter allows designers to very deliberately configure the interdependence present in their games. To design interdependence is to play with a multitude of variables, from challenge, to player aptitude and autonomy, in search of a sweet spot that adequately balances these variables in an interesting way (Harris & Hancock, 2019).

While the effects of imbalances in interdependence on player experience are unclear and require further study, interdependence seems to be a desirable property in cooperative games. As Depping et al. suggest, “any mechanic implemented to induce dependency between players (e.g. synergies between abilities, complementary knowledge) should be in service of increasing interaction between players” (2017). Designers wishing to maximise interdependence should make sure that their game’s endogenous asymmetries are implemented in such a way that promotes interaction and cooperation between players. It’s also recommended that interdependence be accompanied by a way for players to communicate and coordinate their efforts (Depping & Mandryk, 2017).

In competitive games communication is impaired by the fact that players recognize that they cannot trust one another to be honest or informative (Deutsch, 1949). In contrast, communication has a very important role in cooperative games. We argue that this is not directly caused by the fact that a game is cooperative, but by the fact that cooperative games usually challenge players to

³¹As colloquially described by Deutsch, in positive interdependence, “you sink or swim together”, whereas in negative interdependence, “if the other sinks, you swim” and vice-versa (1949).

perform interdependent tasks. This is corroborated by Depping et al., who found that interdependent tasks increase the need for communication, and that an increase in interaction between group members results in stronger social bonds between the group (2017).

Cooperative games that feature a high degree of asymmetry – through the aforementioned complementarity pattern they often inject in gameplay – can foster a greater level of interdependence between their players, greatly increasing the opportunities for communication to occur. Here are some examples:

- Player A asks Player B to perform an action that they themselves cannot.
- Player A and Player B agree to trade their different resources in a way that is beneficial to both of them.
- Player A and Player B share information that they individually uncovered, so that they can solve a puzzle together.

If more communication is the key to achieving stronger social bonds through gameplay, games that feature asymmetry seem to be exceptionally equipped for this purpose. However, it should be taken into consideration that this occurs due to asymmetry's propensity to generate complementarity. A game can be deeply asymmetric and have no complementarity, and therefore, little to no interdependence.

For instance, to borrow from a previous example by Depping et al., two players can cooperate towards the same goal (say, score the maximum number of points before the time expires), have very asymmetric gameplay experiences, but have their avatars in separate environments and not be allowed to interact with one another at all – i.e. zero complementarity. In this example, there is some residual interdependence between the players: their final score will depend on the other player's performance. However, the fact that there are no opportunities for interaction and for the asymmetry to express itself in the form of complementarity, players will not be compelled to communicate with one another. While they are working towards the same goal, each is in their own bubble, largely unaffected by the actions of the other.

Of course, this is not a common occurrence in commercial games. Nevertheless, it's important to realise how asymmetry, complementarity, and communication are interlinked in games so that designers can more effectively achieve the ultimate goal of fostering social bonds between players.

2.4.3 Competitive games

2.4.3.1 Design Patterns

Björk and Holopainen describe a number of game design patterns related to competition (2005). The authors state that competition can occur not only through *Conflict*, but also when players have *Incompatible Goals*, *Excluding Goals*, or the game urges them to clash by enticing them with *Rewards*.

Conflict is a part of all games, not just competitive ones (Bjork & Holopainen, 2005). It most often expresses itself through situations in which a player must remove game elements that hinder their actions or prevent them from reaching their goals: e.g. a fighting game in which a player strives to defeat the other in combat. It can also occur in design patterns such as *Races*, in which players compete to be the first to reach their goals.

Conflict is closely intertwined with the *Incompatible Goals* pattern – in which two or more goals cannot be fulfilled simultaneously due to their end conditions being mutually exclusive – as well as the *Excluding Goals* pattern – in which the completion of one goal precludes the completion of others by making them meaningless or impossible.

Games with asymmetries often make use of different, incompatible goals for different players in order to promote competition. In *Left 4 Dead 2*'s (2009) *Versus* mode, four players take control of zombies trying to prevent the four other players from completing the stage.

Some games with incompatible goals also feature asymmetric maps. For instance, in *Counter-Strike: Global Offensive* (2012), the defending team spawns closer to the locations they must defend from the attacking team. This is, of course, an intended asymmetry that ends up being mostly cancelled out by the fact that the two teams switch sides after a set number of rounds.

Especially in games with a greater degree of asymmetry, a design pattern that seems to occur often is asymmetry in the size of the competing teams. *Evolve* (2015), *Dead by Daylight* (2016), *Acron: Attack of the Squirrels!* (2019), *Deceit* (2017) and *Among Us* (2018) are all examples of competitive games in which the two opposing teams have different numbers of players.

A concept that is highly prevalent in games that allow players to choose from a roster of different characters is the existence of *matchups*. When two characters are engaged in competition, that specific combination of characters is referred to as a matchup. Matchups may or may not be favourable to one side, but knowledge regarding a certain matchup typically encourages players to adapt their playstyle in order to improve their chances of winning. For instance, in a fighting game such as *Street Fighter V* (2016), when facing a character that is better suited to perform ranged attacks, a player might be encouraged to close the distance in order to gain an advantage. Conversely, the other player may be motivated to maintain a safe distance between them and their opponent. Due to the emergent dynamics at play in these scenarios, it can be said that each matchup can be seen as “a distinct ‘inherently asymmetrical game’” (Burgun, 2013).

2.4.3.2 Game Balance

While in cooperative games it is not so imperative to strike a perfect balance of power for all players, competitive games must achieve this or risk frustrating their players. Schreiber and Romero (2021) point out two categories of game balance that are more pertinent when designing competitive games. They are *Balanced Initial Conditions*, and *Balance between Multiple Strategies*. They state that a game is balanced if “all players have a similar chance to win when the game starts”, and if “each strategy can be viable and competitive with other strategies”, assuming equal player skill” (2021, p. 8).

Games can become unbalanced when one player gets an unfair advantage based on aspects such as turn order, starting position, or choice of class or character. In a game that features asymmetric characters, balance in starting conditions is hard to achieve. Each matchup between two different characters in a fighting game will have its own properties and needs to be examined in regards to its balance. In a game such as *Tekken 7* (2015), with 52 different characters, that means 1.326 different³² matchups must be accounted for during the design process. Not only that, but any changes made to the characters to improve the fairness of a particular matchup may have detrimental ramifications on other matchups.

It's really tricky to adjust anything in an asymmetric game though. How can we help Guile in just the Dhalsim match without affecting all the other matches? (Sirlin, n.d.a)

Competitive games must account not only for imbalances in the options the players can select, but also in the players themselves, namely their skill levels. Most games employ a matchmaking system that prevents players with very dissimilar skill levels from competing with one another. In some cases, this may result in other imbalances to emerge. For instance, a character may be considered too powerful only at lower skill levels. This can occur if they are easy to play effectively, or if an understanding of less intuitive game mechanics is required to counter them (Still, 2021). Since lowering the power of that character would have adverse effects in high-skill matches, the solution is not always clear-cut.

Games with persistent character development face the issue of having characters with very asymmetric power levels coexisting in the same environment. This is the case, for instance, with Massively Multiplayer Online games, in which players with stronger characters can repeatedly engage in grief play through power imposition (Foo & Koivisto, 2004), repeatedly attacking new players even though there is little to no direct benefit to doing so. Some games, such as *Rust* (2018) make no effort to restrain this practice, allowing it to freely contribute to the overall feel of the game: a highly competitive, 'survival of the fittest' kind of gameplay experience. Other games, such as *OGame* (2002), have methods of measuring a player's power level and preventing them from attacking or being attacked by a player with a sufficiently different power level score.

Measures such as these are ways through which games can prevent some asymmetric aspects from negatively impacting the players' experiences. As we will see in the next chapter, asymmetry brings with it a number of benefits, but also its fair share of challenges that must be overcome in order for us to take full advantage of its potential.

³²Excluding mirror matchups, where both players play using the same character.

Chapter 3

The Discourse Surrounding Asymmetry

In Chapter 1, we explored criticisms regarding how asymmetric gameplay is discussed and how the term *asymmetric game* is utilised. However, this is not to say that there is no insight to be gained by delving into how game designers and players perceive and discuss asymmetry, as their points of view can help us understand what asymmetry entails, both from the perspective of those who design it, and that of those who experience it.

We set out to analyse patterns in how asymmetry is discussed in relation to other topics. We conducted a netnography into gamer and game designer communities online. The topics detailed in this chapter were chosen due to the fact that, throughout our research on the topic of asymmetry, we saw them commonly discussed in relation to asymmetric play. We used combinations of the keyword ‘asymmetric gameplay’ with search terms pertaining to each topic,¹ and finally a keyword to restrict the search results to certain platforms (such as *Reddit*, or *Youtube*). In order to find the opinions of game designers, we looked at online forums that were targeted towards those audiences (such as *Gamasutra*, or *Reddit’s* */r/gamedesign*).

Our findings are coloured by the narrow way in which asymmetric gameplay is discussed online. That is to say, online discussion focuses on games where asymmetry is very pronounced, and neglects games where it is used in more nuanced ways. Therefore, the perspectives presented in this chapter will pertain to games that feature very marked degrees of asymmetry. This is an unfortunate consequence of the way our categorization defies current discourse. Due to the discrepancies in how the nomenclature is used colloquially, it would be beyond the scope of this chapter to attempt to depict the discourse surrounding the full scope of asymmetry as we define it.

In this chapter, we included the perspectives that were representative of a given topic, and excluded those that were redundant rephrasings of those perspectives. We will refer to academic sources whenever appropriate, but this chapter will have its focus on the opinions of designers and players, as we believe they can adequately portray the advantages and challenges related to asymmetry.

¹E.g., for the topic of replayability, we used terms such as ‘replayability’, ‘variety’, and ‘replay value’. Some search terms were added when they seemed sufficiently prevalent in discussions regarding a certain topic.

3.1 Replayability

Games that provide reasons for players to experience them repeatedly are said to have high replayability. As Shafer states, replayability is positively influenced by the degree to which a game can provide its players with new experiences. The author goes as far as to claim that games that fully embrace asymmetry “make experiencing the unique aspects of each side *the* game” (2013).

In games that feature asymmetry, players are able to “experience a variety of gameplay” (Bortolaso et al., 2019, p. 252). When players experience variances in the configurations of a game’s layers of endogenous asymmetry – regardless of whether they were brought upon by the players themselves or by the system – they are engaging with that game on different terms, with sometimes very distinct challenges and opportunities. When players are faced with different variations of gameplay elements, they are building upon their previous knowledge of the game. Their motivations, expectations, and curiosity regarding this new configuration shape what Upton describes as non-interactive play, “the moments during a game when the player is engaged in either anticipation or interpretation instead of interaction” (2017, p. 9).

Asymmetry brings opportunities for emergent interactive gameplay dynamics to develop in new, compelling – and observable – ways in each play session. However, we shouldn’t discount its influence in the moments where the player isn’t necessarily interacting with asymmetry, but is nevertheless exploring it in their mind. In fact, non-interactive asymmetric play may be an important component as to why some games that feature asymmetry can manage to keep players engaged and coming back for more, sometimes for years on end. As players engage repeatedly with the same game, they construct their own personal mental model of that game, as informed by their experiences with it. They get to experience and influence the same game through different perspectives. As Snyder put it:

Symmetrical multiplayer only provides one point of view, one set of circumstances, and although each player can interpret those differently, they are still interpreting the same thing. Asymmetry allows players to see all sides of any game. (Snyder, 2014)

3.1.1 The discourse

Most discussions we were able to find online seem to favour the perspective that asymmetry leads to more variety, and therefore greater replayability. In an online game design forum,² in response to a post discussing what asymmetry brings to games (keith-burgun., 2014), several users mention variety and replayability in their responses.

Shortround- (in keith-burgun., 2014)

First and foremost asymmetry brings more complexity and options for play to a game. It increases the replayability by altering the main gameplay experience in some way. This is mainly what keeps competitive multiplayer online games going for so long.

²[/r/gamedesign/](#) is a *Reddit* forum dedicated to game design discussions concerning both analogue and digital games.

[deleted user] (in [keith-burgun](#), 2014)

Asymmetry can also add fun/replayability to single-player games as well, for example, games where you can play different factions, like *Brigandine*. For a strategy/rpg game with the same exact scenario, the game had lots of replayability for me as a teenager.

Even in forums that enjoy a wider variety of less specialised users, such as */r/boardgames*, discussions of replayability can lead to asymmetric gameplay being mentioned.

SnareSpectre (in [R0cketsauce](#), 2019)

I personally find games to be more replayable if they feel different to play each time, and for me that comes from setup variability, asymmetrical player powers, and the possibility of multiple viable strategic options.

jedifromlamancha (in [JK47_ji](#), 2011)

Most of my favourite games are asymmetrical [sic] ones as well (*Star Wars Rebellion*, *Fury of Dracula*, *Labyrinth: the War on Terror*, *War of the Ring*). To me, it is like having 2 games and increases the replayability.

This association between variety and asymmetry can also be seen in discussions pertaining to digital games.

PlayMp1 (in [QWOPscotch](#), 2022)

One of the best things about Paradox games compared to *Total War* is that Paradox games have asymmetric starts: the Ottomans are way easier in *EU4* than basically anyone else, and the far east Siberian tribes are way harder. It offers up more variety in gameplay to have asymmetry than total balance.³

However, opposing perspectives can be found. Burgun⁴ states that asymmetry is not required to achieve variety in gameplay (2015). His statements seem to correlate a game's replayability with the depth of its rules:

We already have non-asymmetric games that are interesting for years – look to designer boardgames like *Puerto Rico* or *Through the Desert* or even ancient abstracts like *Chess* and *Go* for examples. Many of these games are interesting and have plenty of variety purely as a result of having relatively strong rulesets. ([Burgun](#), 2015)

Users opposed this perspective in the article's comment section. User [jeremyhoffman](#) affirms that asymmetry is one of different approaches when striving to achieve variety and depth:

³To clarify: the user is talking about *Paradox Interactive*, the developer that made *Europa Universalis IV* (2013), and is comparing that game with *Total War: Warhammer III - Immortal Empires* (2022).

⁴Burgun is a designer whose perspectives we will touch on multiple times during this chapter. His enthusiastic opposition to the use of asymmetry in games is a rare sight in online discourse, and his perspective can often be found clashing with those of other designers. If nothing else, his texts on the matter serve to incite discussion amongst designers, which is valuable in itself.

jeremyhoffman (in Burgun, 2015)

I cannot understand your rebuttal of the variety that asymmetry [sic] provides. The existence of good games without asymmetry, like Puerto Rico, doesn't prove that asymmetry doesn't improve any games ever. ... I think you might be seeking some kind of Platonic ideal of frantically [sic] complex depth of a game. More power to you. I enjoy reading your study of gaming. But I feel like most of us just want to shuffle up two different decks of Magic and see what happens when they face off.

3.1.2 Our analysis

In online discussions we can see replayability being tied to other concepts. The most commonly associated concept seems to be variety. However, we have also seen replayability being discussed as something that can result from the depth of a game's rules. Frattesi et al. (2011) have pointed to a number of other factors that can incite replayability. Take for instance, how a game's difficulty can motivate players to practise over and over in order to beat the hardest challenges.

Perhaps Thygesen put it more eloquently: "replayability is to experience the same content differently" (2014, p. 16). To offer a more pragmatic example, it is, for instance, to pursue the same goals through different strategies. Familiarity mixed with novelty.

By now, any mention of the word *different* is sure to be closely associated with asymmetric gameplay – after all, differences and how they impact the player's experience are what is at the root of this phenomenon. However, we should also note that asymmetry – even in its most extreme expressions – is accompanied by some degree of familiarity. In *Keep Talking and Nobody Explodes* (2015), as different as the two player roles may be, they are perspectives into the *same* conflict.

We do not mean to say that asymmetry alone will ensure that a game has high replayability. Replayability can be dependent on a multitude of other factors, such as those outlined by Frattesi et al. (2011).⁵ At the very least, it is something heavily reliant on a player's gameplay preferences. We do, however, wish to establish that replayability and asymmetry seem to be very closely tied to the same kind of gameplay experiences: those that combine familiarity and novelty in interesting ways.

It can even be said that until a player has engaged with the same game multiple times, they have not experienced its asymmetry. They have only experienced one perspective, and navigated through just one of the possible paths. Although each choice the game allowed them to make acts as an axis through which asymmetry can emerge, it is only through a shift in perspective that asymmetry can be realised in the scope of the player's experience.⁶

⁵To briefly name them, these are *Difficulty*, *Completion*, *Social aspects*, *Randomization*, and finally "*The Experience*", which relates to how unique a game is and how difficult it is for players to find others like it (Frattesi et al., 2011).

⁶From a holistic perspective that encompasses all of the players' experiences in its scope, asymmetry continues to exist between multiple players' gameplay experiences even in singular play sessions, regardless of whether or not the players as individuals experience it or not.

Culturally, replayability is seen as a valuable metric for some purposes. For example, it might be an important factor for players looking for a better value for the money spent on a game. However, replayability is not an essential feature that all games must – or even should – strive for. A game can have a short runtime and still adequately fulfil its goals, be they related to education, social change, or simply entertainment. Conversely, some games can trap players for inordinate amounts of time, to the point of having adverse effects on their lifestyle. We are discussing replayability as an opportunity because of its potential to heighten gameplay experiences by allowing a certain theme, conflict, or scenario to be analysed from multiple perspectives. As we stated, asymmetry can only be experienced when players are willing and motivated to engage with the same problem from different points of view. For that purpose, a game’s measure of replayability can be a powerful tool.

3.2 Player Heterogeneity

As we stated,⁷ the player’s profile influences the game’s dynamics and aesthetics. Players with different gameplay preferences might gravitate towards different games, and in cases where there is no overlap of interests at all, they might never get the opportunity – or even the inclination – to engage in play together. For instance, action and simulation games seem to have a demographic mostly composed of men, while women gravitate more towards logic and skill training games (Quaiser-Pohl et al., 2006). We find this homogeneity to run counter to our increasingly heterogeneous society, in which everyone stands to mutually benefit from interacting with one another.

Asymmetry could potentially ameliorate this divide by making games appealing to a greater variety of players by catering to their differences (Harris et al., 2016). Designers have already put forth games that do this even to a high degree. Games like *Natural Selection 2* (2012) have already implemented roles that fit different game genres. Other games, with less pronounced asymmetry (such as MMORPGs), have also allowed players to find their niche, and have effectively created gameplay environments where heterogeneity is not just beneficial, but instrumental to the players’ success.

3.2.1 The discourse

In a *YouTube* video where he addresses the topic of asymmetric gameplay, game designer James Portnow noted how what he describes as “strong asymmetry” – e.g. when players are engaging with mechanics belonging to different game genres – can allow players with different preferences to engage with the same game:

It’s giving us gameplay variety within the same shared space. This is the kind of thing games like *Fable Legends*, *DungeonLand*, and *ZombiU* multiplayer are attempting to achieve. By

⁷See Section 1.3.

using strong asymmetry in this way, you can create a game where all of a sudden, one doesn't have to like the same type of game to play with their friends. If you've got a buddy who doesn't really like action RPGs, but loves RTSs, they can still hang out and share the game with you. (Portnow, 2015)

In the comments, some users launched into enthusiastic speculation, imagining how games could potentially use asymmetry for the purpose of catering to vastly different audiences:

Fakjbf⁸ (in Portnow, 2015)

Imagine your grand MMO idea for a game like Europa Universalis. You could have one level of players forming a kind of committee to run the country, decide on policies, declare war, etc. A second level of players live in the cities, managing the economy and running businesses and such. Another level of players might be generals, they take care of engaging in battles, moving troops around the battlefield and giving them orders. A last level of players are the soldiers, engaging in a FPS against other players and bots to fight the actual battles themselves. ... There are so many ways such a game could be terrible, but imagine the glory and wonder if it was done well. That kind of game would be to our current games what Call of Duty is to Pong.

Other users kept a more pragmatic view, and were more conservative in their expectations:

Danjal Veskandar (in Portnow, 2015)

Can one game cater to multiple playstyles? Yes.

Can one game cater to MANY playstyles effectively? Only if you budget accordingly.

The reality is that in most cases through trying to reach a too wide audience they dilute the gameplay quality and the game will suffer for it. You'll have a game that caters to many different playstyles, but thats so poorly made that its not worth your time.

Like with all the other subjects regarding game development and design questions its a matter of picking the right things for 'your game'.

However, not all users were discussing what future implications these kinds of games might have. Some wrote about current games that already use strong asymmetry to cater to different players:

MoxBagel (in Portnow, 2015)

My favorite strong asymmetry is the type that allows 2 players of vastly differing skill levels to play the same game and contribute more or less equally. The best candidates here and Rayman Legends for the Wii U (which allows the player with the screen-pad to manipulate the environment like a phone game while the other player is involved in hardcore platforming) and the Mario Galaxy games (which allow someone to assist with the wii-mote).

Jordan Simerly (in Portnow, 2015)

A great newer asymmetrical experience was Resident Evil Revelations 2. This episodic adventure had one player controlling a classic gun-toting grenade-lobbing RE protagonist and

⁸We slightly edited this comment's spelling for clarity.

the other (through couch co-op or online) running a support character that could spot enemy weaknesses or provide melee finishers.

My wife, who is a long-time fan of classic RE but sometimes struggles with modern shooter mechanics, was incredible support and it was exciting to play an RE game together that we weren't just trading off on.

In general, users confirmed that asymmetry can be used to bring different types of players together within the same game. Not only that, commenters showed enthusiasm for future possibilities, jumping at the chance to describe potential game concepts that would implement high degrees of asymmetry for this purpose.

3.2.2 Our analysis

As we have discussed, asymmetry can add variety to a game. The greater the number of meaningfully different options the player can choose from, the broader a game's appeal will be.

A game like *Thief: The Dark Project* (1998), where the focus lies in stealth gameplay and direct combat is almost prohibitively discouraged, will almost certainly appeal to a lesser variety of players compared to a game such as *Deus Ex: Mankind Divided* (2016), where both stealth and combat are strategically viable ways of playing the game. This is not to say that this makes *Deus Ex* the *better* game in this regard. In fact, this comparison is tenable only under an 'all else being equal' approach. That is to say, a game with more variety will appeal to a wider audience only if the different options are individually compelling.⁹ As user Danjal Veskandar pointed out in the discussion above,¹⁰ there are obstacles to this during a game's development process, as we will discuss in a later section of this chapter.¹¹

It should also be kept in mind that not all games would even benefit from using asymmetry in this way. Some games aim to provide very specific types of gameplay experiences, that could otherwise become diluted were the player allowed to approach conflicts in a greater variety of ways. For instance, *Dark Souls* (2011) could be an interesting game for some if it allowed players to talk their way out of a boss fight – but it would become a different game altogether. Games are created with certain design goals in mind, and player heterogeneity may not be one of them.

Asymmetry can go beyond making games appealing to more people: it can also make them more accessible. For instance, as we mentioned while discussing asymmetry of ability, a game could accommodate older players with slower reaction times by allowing them to perform roles where their agency is not compromised by that limitation.

¹⁰See section 3.2.1.

¹¹See section 3.4.

¹¹In games that require the participation of different roles, if one of the roles is not compelling to players, that can negatively impact the experience of the other roles as well. For instance, in *World of Warcraft* (2004), players in the *Damage Dealer* role will often have to wait long periods of time to be matched with a *Healer* or a *Tank*. This is due to the fact that there's a scarcity of *Healer* and *Tank* players, even when taking into account that a 5-player party requires three *Damage Dealers*, and only one *Tank* and one *Healer*.

Players with disabilities may sometimes find their agency to be severely limited (or even impeded) due to their impairments. Through asymmetry, games for mixed-visual-ability participants¹² can allow these players to act in the same environment as a sighted person.

From slight variations in gameplay, to completely distinct sets of mechanics, games that feature asymmetry often provide players some degree of freedom in configuring their experience with the game. As Burgun states, asymmetric choices allow players to “zoom in” on one aspect of the system and explore it deeply (2021). They can focus on a smaller subset of playstyles that appeal to them,¹³ while also being able to contrast their perspective with those of others. Because a larger number of people will be able to discover a configuration that is valuable to them as individuals, asymmetry is, in effect, not only widening the potential audience for the game (Burgun, 2021), but also making it more diverse and heterogeneous.

3.3 Progressive onboarding

As an interactive medium, games require some kind of onboarding process through which players can become acquainted with the gameplay mechanics. In games, this process is often facilitated through in-game tutorials. Tutorials can range from being very explicitly signalled by the game and offering very little freedom to the player – e.g. *Candy Crush Saga* (2012) –, to being more seamlessly embedded in the game’s runtime and allowing players to freely experiment with the concepts they are being taught – e.g. *The Legend of Zelda: Tears of the Kingdom* (2023). Tutorials often make use of progressive onboarding. That is, they “progressively teach the user new things, by building on previous experiences and knowledge, paying attention to the order and the context of each piece of information” (Alonso, 2017).

As players explore a game’s asymmetry, they are engaging in progressive onboarding. Depending on the game, this gradual onboarding can cover a great span of time and play sessions, introducing new elements long after the player has concluded the formal tutorials.¹⁴

3.3.1 The discourse

Some game designers state that asymmetry can ease a game’s learning curve:

While it sounds like something that makes a game more complex, asymmetry can make a game simpler **from any particular player’s perspective**.¹⁵ This is especially true in games that have asymmetrical rules. In this case, each player only has to learn a small subset of rules for themselves while a complex set of events arises as a result of different players interacting.

¹²Such as those designed by Gonçalves et al. (2021).

¹³In discourse surrounding some game genres, the term *main* is used by players to describe the asymmetric character or role that the player is more experienced or proficient in. For example, a *Dead by Daylight* (2016) player who in the overwhelmingly majority of matches plays the role of Killer, might describe themselves to be a *Killer main*.

¹⁴Some games offer additional assistance when players encounter these new elements. In *Marvel Snap* (2022), whenever an opponent plays a card the player hasn’t encountered yet, the game focuses on it, allowing the player to carefully read the card’s text and attributes. In *Dead by Daylight* (2016), the first time a Survivor player encounters a new Killer, the loading screen will display tips on how to play against them.

[The] complexity is hidden up front by putting it into a combination of asymmetric results and abilities. (Knox, 2017)

However, this can be a topic for heated discussion amongst designers:

Keith Burgun (in Burgun, 2013)

It's great that you kinda only have to learn to play as one character to get into a game, but to really play a game you do ultimately need to learn *all* of its rules – not just your character, and most of these games have a lot of characters. So in practice, this might mean an easier on-ramp, but a much longer road.

Sirlin¹⁶ (in Burgun, 2013)

[Y]ou really failed on understanding the HUGE difference between learning to play a character, something that could take months in Guilty Gear, and learning the basics of what an opponent's character does, something that takes like a day. Evidence: it's extremely hard to switch who your main character is yet very easy to go up against many different opponent characters and do reasonably well.

In the same discussion, designer Naomi Clark posits that asymmetry is a more direct route to gameplay experiences with a “very complex combinatorial possibility space arising from the interplay of many elements”. Clark concedes that this kind of spaces, which she colloquially refers to as “crunchy”, tend to have a higher barrier to entry. However, she claims that the complex nature of these spaces can motivate new players to explore it. This is because crunchy spaces require a different kind of skill than the one simpler games require: the players have to consider a greater number of moving parts as they engage with the game. She also notes that the real world is fraught with these complex spaces, which may explain why game designers gravitate towards modelling them in games.

Asymmetry is pointed out as sometimes being problematic when it comes to more social learning processes in which players learn the game by observing one another:

PharmSuki (in PharmSuki., 2019)

As you play the game, you see other people taking actions or making mistakes that can very much apply to yourself. You learn the game more and more as you play... but this can't apply when everyone is doing something completely different.

This was stated in an online forum focusing on board games, but arguably it can also occur in video games as well, whenever asymmetries prevent a player from having another player's behaviour inform their own actions. That is to say, gameplay roles can be sufficiently different that it would be impossible or undesirable for a player in role A to learn how to play by mimicking a role B player.

¹⁵Emphasis is the original author's.

¹⁶Presumably David Sirlin, the lead designer behind *Super Street Fighter II Turbo HD Remix* (2008), a game with asymmetric characters.

Overall, online discourse on this topic paints an unclear picture of whether or not asymmetry eases a game's learning curve or steepens it. In an online forum discussing *League of Legends* (2009), more experienced players can be seen consoling a new player who is expressing frustration over the game's learning curve:

sauron3579¹⁷ (in sauron3579., 2022)

I just don't understand how In the world this game is supposed to be approached by a new player at this point. There's like 160 heroes, who all have a minimum of 4 abilities, a variety of stats, 5 different positions they can play, multiple different builds within each position, their role in a team, their own power curve, playstyle, how my champ¹⁸ plays against them. . . It's just an obscene amount of information. I just don't understand how I'm supposed to learn it.

RedAftermath (in sauron3579., 2022)

One at a time. Find a champ you like and play them over and over. Find out who you counter and who you don't by paying [sic] games. If you get bored try out new Champs and learn their role and opponents. Repeat.

tawapes4 (in sauron3579., 2022)

Over time, like all things. It helps to stick to only one role as only a select group of champs tend to be picked there 90% of the time, and those are the ones most important to understand anyway. Most people don't know exactly what every champ does either, nor is it necessary to in order to even be good at the game. I'd say understanding the limits of your own champ is much more useful than knowing what the enemy does as a new player.

3.3.2 Our analysis

Let us start by making a distinction between what we believe to be two different types of complexity in regards to this topic. Firstly, we have the complexity related to the totality of a game's potential asymmetric elements – let's call it *total potential complexity*. This complexity is what we refer to when we are talking about the total number of different configurations that the game can adopt – or, to give a more specific example, how many different asymmetric characters a game has.

In games with a smaller number of different characters or roles, it is possible that all of them are present in any given match. For instance, *It Takes Two* (2021), much like the name implies, requires its two characters for the game to take place; in *TEAM3 GREEN's* (2019) it is mandatory for all three different player roles to be present. However, in games with a larger variety of options, this is almost never the case. *Mortal Kombat 11* (2019) has a 37 different characters,¹⁹ but only up to two²⁰ different ones are in any given match. When the two players are competing in a match, all other characters, with their different movesets and peculiarities, are irrelevant to that match and its outcomes.²¹ This is not to say that the interplay between those two characters as well as

¹⁸ *Champ*, in this context, is short for *Champion*, the term the game uses to refer to its characters.

¹⁸ Comment slightly edited for spelling.

¹⁹ At the time of writing.

²⁰ In this game, it is possible for mirror matches to occur, with both players controlling mechanically identical avatars.

other more static elements of the game (such as environmental hazards), cannot have a fair degree of complexity. However, this complexity can be described as a small fraction of a game's total potential complexity. When referring to complexity pertaining to a specific configuration of the game and its asymmetric elements, we'll use the term *immediate complexity*, as it is the complexity that the player must contend with at any given moment in play.

Another concept that comes into play is what we might call *configurational stability*. In a typical single player game's tutorial, new elements are gradually introduced to the player. One by one, the player gets access to these new elements, while also keeping the previous ones: the game's configuration is relatively stable.

Asymmetric options can cause a game to have less configurational stability. We can see this in games that pit two teams of asymmetric characters against one another. As a new player engages in multiple matches, they are introduced to new characters, much like in a traditional tutorial. However, these characters are replacing the ones the player found in the previous game. The player isn't simply layering new information on top of what they already knew about the game, they are switching to an entirely new game configuration, where their previous understanding of the game may or may not be accurate, or even relevant: it doesn't matter that they learned about one character during the previous match if that character won't be present in this one. Of course, that knowledge will be relevant whenever they encounter that character again, but we find that the constant replacement of asymmetric gameplay elements can lead to configurational instability in a way that is detrimental to a game's learning curve.

Configurational instability is linked to gameplay variety, which we discussed previously in this chapter, and it might be contributing to the higher barrier of entry that Clark mentions in the discussion. We argue that this issue is not related to a game's total potential complexity, but to the immediate complexity that players have to contend with, and how it evolves over time. To a level 1 Rogue player in *World of Warcraft* (2004), the fact that they will have upwards of twenty abilities when they get to level 60 won't usually be intimidating in a way that hinders their learning process – right now, they have only four simple abilities to learn.

Knowing this, It could be beneficial for more games to exert some control over the variety of gameplay elements new players encounter. In *Marvel Snap* (2022), cards are separated into different *Pools*, and are unlocked as players increase their *Collection Level*. New players gradually unlock the cards in *Pool 1*, before being able to get cards from *Pool 2*. Additionally, due to the fact that matchmaking takes *Collection Level* into account, both players in a match will mostly have the same cards unlocked. In doing this, the game ensures that the player encounters new cards at a controlled pace.

Overall, we believe asymmetry can affect a game's learning curve in complex ways, which may be the reason why different designers will have contradicting opinions on whether or not it

²¹This may not be true for some instances: for instance, in digital card games where players don't know what cards their opponent has in hand. In these games, it is often strategically advantageous to consider which cards the opponent might have included in their deck, and act accordingly. In doing this, the players are contending with some asymmetric elements that may not actually be present in that given match.

can be beneficial in this regard. We've discussed some implementations where asymmetry may add too much complexity and instability to the learning process, and others that seemed to very deliberately attempt to ameliorate those aspects. It might be the case that games are still in the early stages of searching for optimal ways to regulate the pace at which asymmetry is delivered to the players. Hopefully, in time, we will see these challenges tackled by designers in ways that allow new players an easier path to engaging with these games.

3.4 Development challenges

Lastly, let us tackle what seems to be the least contested characteristic of asymmetry: how difficult it can be for developers to adequately implement it. This is a topic of utmost importance to us, given the fact that we seek to understand the challenges of asymmetric gameplay design, with the goal of ameliorating them in any way we can.

3.4.1 The discourse

Designers describe asymmetry as being a balancing challenge. Burgun claims that asymmetry causes gameplay systems to be so complex that they cannot be adequately balanced, and can only strive to reach “an acceptable tier list”, in which no character is so strong that players can only justify playing them, nor weak to the point where players can never justify playing them” (2013). This goes in line with the practical approaches some designers use when tackling balance in games with asymmetric options. For instance, Sirlin has playtesters rank each asymmetric character according to a tier list, so as to determine whether or not some characters stand out as being too weak or too strong (n.d.b).

Sirlin adds that the task of balancing a game becomes exponentially more difficult as more asymmetric options are added to the game.

You can fail before you even start by having way too many characters or way too much customization. (...) Yomi has 20 characters, which means it has 190 matchups in the 1v1 mode, not counting mirror matchups. Imagine if it had 100 characters though. Five times as hard to balance? Actually that's over 26 times the number of matchups. The difficulty in balancing isn't linear though, so it's probably 100x as hard to balance. (Sirlin, n.d.a)

Players, too, seem aware of the difficulties associated with balancing asymmetric options.

arendjr(in Durzo_Blint90., 2014)

Failure is easy in [the development of asymmetric games], because balancing the gameplay is hard, but if done well I think it's one of the more intriguing and possibly most satisfying kinds of multiplayer.

KatakiY (in Durzo_Blint90., 2014)

It's hard to balance and very few games do it well.

Azuvector (in [Durzo_Blint90., 2014](#))

Asymmetric gameplay is a lot of fun both to play and to design, because it allows for a lot of creativity and interactions between factions. It's definitely tough to balance well, however.

Additionally, designers point to other, more generalised issues that may arise during development:

It's pretty clear that the more asymmetry you do, the more time, money, whatever, that's gonna cost, and that's gonna take away from other areas of the game. ([Green, 2019](#))

In his talk regarding the pros and cons of different degrees of asymmetry, Green added that opting for less asymmetry can be a way to mitigate risks during development. He states that even in games that benefit from having asymmetry, too much asymmetry can incur diminishing returns on those benefits, with the investment of development resources no longer resulting in appreciable improvements on a game's quality.

3.4.2 Our analysis

Delving into this topic, we had expected to find a wider variety of challenges to the development of asymmetric gameplay.²² Instead, we found the discussion to be extremely focused on game balancing issues, and not much else. Why does the topic of game balance completely dominate this discussion?

In Chapter 2, we touched on the topic of game balance while discussing competitive games that make use of asymmetry. Mostly, we discussed how important it is for these games to achieve some measure of equilibrium between the power levels of the different characters. However, game balance can go beyond simply making sure each character has a fair shot at victory. As Felder puts it:

This may surprise you, but while the whole industry talks about “balancing games” there is surprisingly little consensus on what that actually means. ([Felder, 2015](#))

Game balance can pertain to how much fun players experience while engaging with each asymmetric option. It can deal with matters of risk vs. reward – ‘does the reward match the risk the player is taking in selecting this option?’. It can even be related to the matching of a game's challenges to its player's skill level, such as through systems of dynamic difficulty adjustment. This may explain why the topic of game balance is so prevalent when discussing the challenges of asymmetric game design. Game balance encompasses a lot of different aspects related to a game's design, which is why the fact that asymmetry presents game balance difficulties should not be taken lightly.

²²Some other challenges can be found, though they are discussed by designers as being case-specific, and not as prevalent pitfalls of asymmetry. For instance, Patric Leder, game designer of *Vast: The Crystal Caverns* (2016), recounts how a change to the playable *Goblins* role had unexpectedly and completely ruined the gameplay experience for the player controlling the *Dragon* ([Barret, 2017](#)). However, to collect these very specific discussions and attempt to extract broader trends from them would be outside the scope of this chapter.

Symmetric characters are, by definition, perfectly balanced. Asymmetric characters, on the other hand, each have their specific advantages and disadvantages, and therefore defy – or perhaps even prevent – perfect balance. The fact that some games add more and more characters to their rosters as time goes on serves only to exacerbate this issue.

As Green mentioned, asymmetry represents a financial cost to the developers who wish to implement it in their games. Depending on how different two gameplay options are, they may even require the development of entirely distinct sets of mechanics – each of which must be carefully planned, developed, and tested before release.

While we cannot hope to directly impact these technical and logistical obstacles to the development of asymmetry in games, we can work to facilitate their design. Through our framework, we hope to support and guide the way asymmetry is discussed amongst designers, and to create design tools that will aid in the ideation of novel and engaging game concepts.

3.5 Discussion

By looking into how asymmetry is discussed online by gamers and game designers, we saw that the topic sparks some controversy and disagreement, especially amongst designers. Even aspects that we expected to be agreed-upon characteristics of asymmetry in games (such as its capacity for fostering replayability) saw some level of pushback by designers that take issue with the way current games utilise asymmetry. This difference of opinion could be a symptom of a lack of theoretical understanding of asymmetry as a whole. If even a concrete definition of asymmetry couldn't be found in the literature (as discussed in Chapter 1), it seems natural for designers to struggle to find agreement in what the characteristics of asymmetry – a very multifaceted feature – might be.

One thing seems clear in the discourse surrounding asymmetry: it carries with it challenges to a game's development. Even players, who do not deal with these challenges as directly as a designer might, can observe their effects manifesting during gameplay, for instance, through unintentional imbalances in different characters' power levels, or through some gameplay roles feeling less interesting to play. At this early stage of our understanding of asymmetry, we cannot hope to reach any overarching solutions to these challenges.²³ We can, however, offer designers a lens through which they can analyse and communicate ideas regarding gameplay asymmetry. The next chapters will strive to do just so: to construct categorisations that describe in what ways asymmetry can exist in games – as well as how it can emerge during play. It is our hope that through this level of structure, we can not only improve the way asymmetry is discussed, but also create the tools for designers to explore it in new and engaging ways.

²³However, some designers have written guidelines – such as those written by Sirlin (n.d.a) – detailing some design practices they have found to be useful for designing asymmetry into specific genres of games.

Chapter 4

Types of Asymmetry

In the previous chapters, we proposed a definition of asymmetry and exemplified how it can exist in games. Let us now expand on that by further analysing and categorising different ways players' gameplay experiences can be differentiated by a game's mechanics: the *types of endogenous asymmetry*.

These are all the different expressions of endogenous asymmetry we were able to discern both from the literature as well as throughout our research. Some of these are easily recognizable, as they are commonly seen in current games; others, however, are less prevalent and may merit further exploration by designers. We will start by analysing the literature we found regarding the topic and then expand on it by adding other types of asymmetry we were able to discover.

4.1 Literature Review

Harris et al.'s work features a brief discussion regarding what they call mechanics of asymmetry: "potential mechanical manipulations that designers can utilize in order to give rise to asymmetric player experiences" (2016). We find this description to be an inaccurate representation of what the authors are presenting in the article: the categorisation brought forth by the authors does not describe game mechanics, per se; instead, it describes a number of different aspects that asymmetry can assume as it is generated by a game's mechanics.

The list featured in the authors' discussion is, as acknowledged by them, not a complete account of all the types of asymmetry. Nevertheless, it served as an excellent starting point for our purposes of developing a categorisation of different expressions of asymmetry that can be generated by a game's mechanics.

What follows is our analysis of Harris et al.'s (2016) classification. We present their formulation of each type of asymmetry, followed by our examples, as well as additional considerations and potential repercussions of each type of asymmetry. Unless otherwise noted, we maintained the original nomenclature.

4.1.1 Ability

Asymmetry of Ability occurs in games in which one player can do things that another player cannot (Harris et al., 2016). That is to say, each player has their own unique repertoire of actions they can perform within the game.¹ This is a prevalent type of asymmetry, allowing each player to engage with different tools in order to complete their goals. It can be present at the beginning of the game or develop as the game progresses as a result of player action.

Differences between how players act occur when they are allowed to explore different horizons of action (Upton, 2015). As players make different choices and are faced with their outcomes, their available choices mutate over time. Even in a game of *Chess*, which apart from the first-move advantage could be largely regarded as a symmetric game in which players have access to the same resources, the choices players make during the game can lead to wildly different experiences. A less experienced player could neglect to develop their pieces, subsequently hindering their ability to act with their stronger pieces. Another player could lose a valuable piece through a careless mistake, forcing them into a position from which they have to play catch-up. While their horizons of action may be similar at the start of the game, they soon become divergent just a few moves later.

In some games, *Asymmetry of Ability* results in sets of mechanics so dissimilar that they might be seen as belonging to different game genres – only they exist within the context of a single game. This is the case with *Resident Evil Resistance* (2020), in which four Survivor players face a Mastermind player. The Survivor players experience the game through mechanics from the survival genre, while the Mastermind is acting through strategy and resource management game mechanics.



Figure 4.1: The first-person perspective of a Mastermind player in *Resident Evil Resistance* (2020). This player observes the game map through security cameras and spends a regenerating in-game resource to place enemies and traps.²

¹This does not mean that each action is exclusive to one player. In most games, there is some overlap between the different player's sets of actions they can perform. For instance, even in games where each playable character has different abilities, all of them are often given the shared ability of moving in 3D space.

When games take this approach, they are in effect appealing to players with different gameplay preferences. This could result in different types of players engaging with the same game, whereas otherwise they would be engaging only with players with the same preferences.

This type of asymmetry also brings opportunities for more inclusive game designs with greater accessibility by diversifying the game mechanics the players engage with. For instance, a round-based first-person shooter akin to *Valorant* (2020) could accommodate old players with slower reaction times by allowing them to participate through the role of a strategist in charge of devising the strategy for their teammates to follow.

By allowing different kinds of players to act differently, games could become more accessible, and therefore more attractive, to demographics that are typically underrepresented in gaming spaces.

4.1.2 Challenge

Asymmetry of Challenge occurs when players face different kinds of challenges. It does not refer to instances where players face different degrees of the same challenges, e.g. by opting for different difficulty settings (Harris et al., 2016).

An example of this asymmetry would be a game in which one player engages with puzzles while the other engages in combat. Different challenges are usually coupled with different abilities in order to adequately equip players with the tools to face those challenges. However, this does not always have to be the case. Players may have access to the same mechanics and yet be prompted to tackle different challenges using them.

Take, for instance, a game in which two players have access to the same ability set, one typical of a first-person shooter game. If one player faces the challenge of defeating enemies while the other must shoot at targets in the correct sequence in order to solve a puzzle, these players are engaging with asymmetric challenges, despite interacting with the game through the same set of actions.

An example of Asymmetry of Challenge occurs in *Panoptic* (2020), where the Challenger player must stealthily sneak through the level while avoiding the gaze of the Overseer player. The types of challenges present in this game are *Stealth* for the Challenger and *Finding Hidden Object* for the Overseer.³

Different demographics of players may be more inclined to face different kinds of challenges. As such, games that allow players with different preferences to coexist in a multiplayer environment may result in a greater level of heterogeneity in their communities.

²Source: <https://www.residentevil.com/resistance/uk/>. Retrieved January 10, 2024.

³The terminology used to describe these challenges is the one delineated in Adams (2014).

⁴Source: <https://www.youtube.com/watch?v=Ly7v9dKbB6c>. Retrieved January 10, 2024.

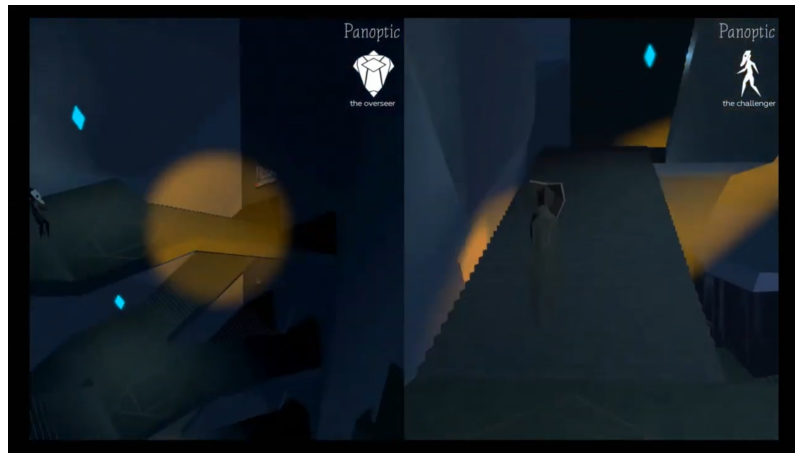


Figure 4.2: In *Panoptic* (2020), the Overseer player (left-hand side) attempts to locate and eliminate the Challenger player (right-hand side), who attempts to stealthily avoid being discovered by blending in with other NPCs.⁴

4.1.3 Goal

Asymmetry of Goal exists whenever players seek to achieve different outcomes (Harris et al., 2016). This does not include instances where players have similar but diametrically opposed goals, as would happen, for example, in a game with two players playing opposite sides in a virtual football match, trying to score in the opposite goal. We make this distinction due to the fact that, from the perspective of the players, their goals are the same: “I must score more goals than my opponent”.

Vast: The Crystal Caverns (2016) presents a prime example of this asymmetry as each one of up to five players is chasing a different goal. The *Knight* must kill the *Dragon*, the *Goblins* must kill the *Knight*, the *Dragon* must wake up and escape the *Cave*, the *Cave* must fully expand and then collapse to bury everyone, and the *Thief* must collect and stash treasures.

Different goals are often coupled with different sets of available actions, so as to allow players to pursue those unique objectives. Furthermore, different goals often entail different perspectives of the same game. Once players switch roles, they gain a new perspective over the game, gaining insight into each other’s roles’ strengths and difficulties, as well as how it feels to enact that role. This approach may entice players to experience the same game in new ways, increasing its replayability and longevity.

Asymmetry of Goal does not always entail Asymmetry of Ability. In *Counter-Strike: Global Offensive* (2012), one team must plant a bomb while the other team attempts to stop them.

Despite those asymmetric goals, players engage with the game through the same mechanics (those of a first-person shooter), with only minimal Asymmetry of Ability.⁶ This means that the

⁵Source: <https://www.cs gobetting.net/blog/the-best-hidden-plant-spots-for-bombs-in-csgo-for-competitive-matches/>. Retrieved January 10, 2024.



Figure 4.3: In *Counter-Strike: Global Offensive* (2012), a member of the Terrorist team is planting a bomb at a bombsite. After this happens, the Counter-Terrorists have a limited amount of time to defuse the bomb and win the round.⁵

skillset that players build during play will easily transfer from role to role.

4.1.4 Responsibility

*Asymmetry of Responsibility*⁷ exists whenever players are tasked with different responsibilities (Harris et al., 2016). In this context, the term *responsibility* refers to a player's perceived role to play in the pursuit of their in-game objectives. Naturally, this type of asymmetry can sometimes overlap with Asymmetry of Goal. That is to say, it is often the case that players with different goals will also be tasked with different in-game responsibilities.

This isn't always the case, however, as players can share a single overarching goal while having different responsibilities. This often occurs as a consequence of the existence of Asymmetry of Ability: each player's responsibility is informed not only by their goals but also by the actions they can execute in pursuit of those goals. In *Keep Talking and Nobody Explodes* (2015), the two players share the goal of defusing the bomb. However, the tasks they must perform in order to reach this objective are different, as one is allowed to see and interact with the bomb, while the other has access to instructions on how to defuse said bomb. In this example, players have a shared goal but asymmetric responsibilities.

In some games, players can have the same abilities and goals and yet be encouraged to adopt asymmetric responsibilities. This is the case with *Overcooked* (2016), a game in which players act as cooks. They share the same abilities and the goal of cooking meals within a short amount of time. However, the game's tight time constraints make it so that players are encouraged to delegate responsibilities. For instance, one player might be in charge of chopping and cooking meat while the other serves the finished meals and washes the dishes. Therefore, even though

⁶The asymmetry is minimal and not inexistent due to the fact that some of the weapons each team has access to are team exclusive. For instance, only members of the attacking team may purchase an AK-47.

⁷In the literature, this type of asymmetry was originally bundled together with Asymmetry of Goal, as "asymmetry of goal/responsibility". However, we believe these to be sufficiently different types of asymmetry to warrant separate discussions.

the game doesn't always force this asymmetry in responsibilities to occur, its mechanics greatly encourage the players to delegate tasks and undertake different responsibilities in order to achieve success.



Figure 4.4: In this particular level in *Overcooked* (2016), the two players are separated and have access to different cooking stations. Therefore, they must forcibly undertake different responsibilities, passing items to one another through the conveyor belt that circles the room.⁸

4.1.5 Information

Asymmetry of Information exists when one player knows something other players do not (Harris et al., 2016). This type of asymmetry is present in games in which players are given different information regarding the game state, be that information in accordance with reality or not.

Games in the social deduction genre would simply not work if players were all given the same information. In games such as *Spyfall* (2014), players are assigned hidden roles that are not meant to be revealed to other players. This allows players to bluff and deceive other players, adding a lot of uncertainty and suspense to an intended gameplay experience that requires it.

Cooperative games often give one of the players exclusive information, while disallowing them from directly acting on it. Instead, they must relay that information to another player so that it can be interpreted and acted upon. In *We Were Here* (2017), this relationship is bidirectional, as each player frequently requires information that the game presents to the other player. This approach makes it so that players must rely on one another in order to better tackle the game's challenges.

We argue that in cooperative games, it is important to ensure that each player does not act only as a conveyor of information. Instead, they should also be in charge of processing and filtering that information. If not, games run the risk of nullifying their *Asymmetry of Information* and allowing themselves to be solved by the most proficient player in the group, which reduces the other player's agency. Features such as strict time limits¹⁰ can be used to limit the amount of

⁸Source: <https://www.youtube.com/watch?v=HxNxYDhBRrw>. Retrieved January 10, 2024.

⁹Source: <https://www.youtube.com/watch?v=roe3bIeFrGM>. Retrieved January 10, 2024.



Figure 4.5: The different perspectives of two players in *We Were Here* (2017). During this section, one player (left-hand side) must communicate a series of numbers to the other (right-hand side), who must press buttons featuring those symbols in the correct order.⁹

information shared, so that players can still retain their own agency, while also relying on others to reach the overarching goal.

4.1.6 Interface

Asymmetry of Interface exists when the means by which players engage with the game differs; both in terms of input and output (Harris et al., 2016). Different interfaces will have their own advantages and pitfalls and be more suited for some kinds of experiences and gameplay mechanics than others.

An example of this asymmetry occurs in *Acron: Attack of the Squirrels!* (2019), in which one player is equipped with a virtual reality (VR) headset and acts as a giant tree that must protect its acorns. In contrast, the other one to eight players interact with the game through their phones, controlling squirrels that aim to steal the acorns.



Figure 4.6: Footage from the trailer of *Acron: Attack of the Squirrels!* (2019), showing four players using their phones to control the Squirrels, while a single player plays as the Tree in VR.¹¹

¹⁰E.g., as implemented in *Keep Talking and Nobody Explodes* (2015), *Captain Sonar* (2016).

¹¹Source: <https://www.youtube.com/watch?v=roe3bIeFrGM>. Retrieved January 10, 2024.

Other VR games follow this same structure, with one VR player interacting with multiple players on their phones. *Reiko's Fragments* (2019) is a horror game in which the VR player must escape a haunted house while the other players trigger game events using their phones. These games would be fundamentally different if this asymmetry were to be inverted (one phone player versus eight VR players). The immersive nature of VR is better suited for a horror experience, while the phones are an interface that's comparatively cheap and ubiquitous enough that the players will already have access to one and can play the game with no added monetary investment.

Some games allow players to participate in the same in-game roles through different differences. For instance, in *Phasmophobia* (2020), players can either play using a typical keyboard, mouse, and monitor setup, or they can play through a VR headset. Likewise, *Marvel Snap* (2022) players can play on their computer or through the mobile app. Despite the fact that these different interfaces will affect the way players perceive and interact with the game, developers often take steps to guarantee that no particular interface brings competitive advantages to those who use one or the other.

This type of asymmetry can also take place when the behaviour of the player's interface can be altered by the game system. Although there are currently few examples of this in practice, we believe that this is an area that beckons further exploration. In *Death Stranding* (2019), if the player is playing the game with a *DualSense* controller:¹² the more weight the player's avatar is carrying on their back, the harder the controller's triggers are to press. As the triggers are used to shift the weight of the avatar's backpack to the sides, this creates a correlation between the physical effort both the player and their character are exerting. Thus, players who choose to travel lightly have an easier time handling the controller, while those who run with heavy cargo will feel more resistance to their input from the controller. This can exacerbate the asymmetry in players' gameplay experiences, by having the different ways they might engage with the game reflect in the behaviour of the interfaces they are using. In this specific example, the differences in player experience caused by the behaviour of the interface are not so pronounced, but as new control interfaces emerge, we could see them inject asymmetry into play in interesting ways.

In conclusion, Asymmetry of Interface can have a great impact on how the game is experienced, as well as how logistically feasible a game is. However, it may also bring about some design challenges for developers trying to make a game equitable despite each interface's idiosyncrasies. Designers must be aware of factors such as these when deciding which interface to design in order to arrive at their intended gameplay experiences.

4.2 Our contributions

Harris et al. state that their list of types of asymmetry is not exhaustive (2016). We analysed current games¹³ in search of more types of endogenous asymmetry. As a result, we have found four more

¹²These are the controllers used by the *PlayStation 5* console. They feature some unique features, such as haptic feedback as well as adaptive triggers that can modulate the force required for the player to press them.

types of endogenous asymmetry: *Environment*, *Interdependence*, *Outcomes*, and *Feedback*. We describe each of them in the following sections while also providing examples of how they occur in games and additional considerations in regard to how they may interact with one another.

4.2.1 Environment

This type of asymmetry occurs when different players have different gameplay elements in their surrounding environment within the game. These elements can range from NPCs, power-ups, or any other object or entity the player can interact with. This may allow certain players to access different resources and might bring specific gameplay advantages and disadvantages to each player.

A common expression of Asymmetry of Environment occurs when player characters occupy different in-game locations. In games with a *Battle Royale* game mode, such as *Fortnite* (2017), players can choose which location they want to move to during the start of the game. Different locations provide different opportunities and challenges, as locations that offer more chances of finding good equipment are sought after and thus will have more players competing for the resources.

However, Asymmetry of Environment can occur even when two players are in the same location. For instance, in *Lethal Company* (2023), one particular enemy type will only spawn in one player's environment, attempting to eliminate that player while being harmless, invisible, and inaudible to the other players. Hence, two players may be side by side and yet contend with different environments.



Figure 4.7: The Ghost Girl enemy in *Lethal Company* (2023) can only be seen and heard by one player at a time and will periodically chase them until they exit the level.¹⁴

¹³The process that we used to analyse games in regards to their capacity to foster asymmetric gameplay is described in the Methodological Approach section in the Introduction to this document.

¹⁴Source: <https://www.betasetup.com/little-girl-lethal-company/>. Retrieved January 10, 2024.

In *Payday 2* (2013), players can face different NPC spawns or even blocked pathways in repeat playthroughs of the same level, forcing them to adapt to these new circumstances. These variations in the play environment make it so that any single level can be highly replayable and remain engaging, even though it features the same location every time.

4.2.2 Interdependence

In multiplayer games, the player is inevitably reliant on other players to play the role of a supporting character to aid them in achieving cooperative goals or that of an antagonist that opposes their progress. Sometimes these relationships can become asymmetrical, meaning that this reliance on other players isn't reciprocal (Harris et al., 2016).

Interdependence is usually designed to be bidirectional, that is to say, the players depend on each other. However, this doesn't always need to be the case: one player may be greatly affected by the actions of another, while the opposite isn't true. This can occur, for example, when there is a great power differential between the cooperating players. In *World of Warcraft* (2004), some players engage in *carrying*, meaning they will use their superior proficiency and in-game power to assist weaker players in clearing dungeons and raids, often in exchange for in-game or even real-life currency. The weaker, carried players are often not expected – or capable, at that point in time – of significantly contributing towards the shared goal. That is to say, they are highly reliant on the carry provider's input, while the opposite isn't true.

In the aforementioned example, this asymmetry in regards to interdependence is acknowledged by the players and agreed upon from the start of their interactions. However, these imbalances in interdependence often occur dynamically as the game progresses. This mostly occurs in games in which the players can accrue power at different rates. For instance, a proficient *League of Legends* (2009) player may quickly accrue stat-increasing items with the increased gold amounts they earn from in-game actions, such as kills or the destruction of enemy structures. That player will have a greater impact on the match's outcome than the rest of their team, thus creating an emergent imbalance of interdependence.

Game designers have tried to diminish this phenomenon by making each individual player's power level proportional to that of their whole team. For an example within the same game genre as the previous, take *Heroes of the Storm*, in which the player's only metric of power is their character's experience level. Due to the fact that the game equally divides experience among all teammates, even the least proficient player will be comparable in power to the most proficient, preserving the balance in interdependence.

The Isle (2015) is an example of a game where this asymmetry in interdependence results from the real-life dynamics the game emulates. In it, players can play either as carnivorous or as herbivorous dinosaurs. The herbivorous dinosaurs can subsist by feeding on the world's vegetation, while carnivorous dinosaurs must feed on herbivorous dinosaurs to survive. This means that the relationship of dependence between these players isn't reciprocal: herbivorous dinosaurs can survive without the presence of carnivorous ones, while the opposite isn't true.

In other games, in particular those where one player competes against multiple players, the solo player is less dependent on others in order to accomplish their goals, while the rest of the players must be efficient in their cooperation in order to win.

In *Secret Neighbor* (2018), up to six players play as *Kids* sneaking into their neighbour's house, trying to collect six keys in order to gain access to the basement. However, one of the players is secretly the titular Neighbor, who must catch and eliminate the Kids in order to prevent them from reaching their goal. Both the Neighbor and the Kids necessitate each other's input in the game in order for the competition to take place. However, the Kids have the added interdependence of needing to rely on one another in order to win, while the Neighbor acts more independently.

Games featuring audience participation reveal a more extreme example of Asymmetry of Interdependence. In *Warhammer: Vermintide 2* (2018), Twitch audience members can influence the game through a voting system. They can elect to provide support or hinder the players' progress. However, the nature of the voting system means that audience members that did not vote for the same option as the majority of the audience are prevented from acting in the game world. Since only the most voted option choice is put into effect, the members of the audience are extremely interdependent on one another, as they cannot even act in the game without a consensus.

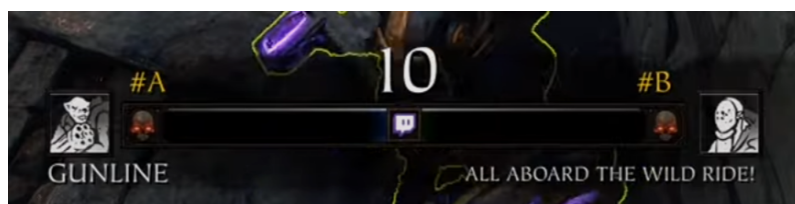


Figure 4.8: In *Warhammer: Vermintide 2* (2018), Twitch audience members can periodically vote in one of two different in-game events, with the majority deciding which event will occur.¹⁵

Some games make use of unstable interdependence to create meaningful moments in gameplay. One such example occurs in *Tetris Effect: Connected* (2020), more specifically in its *Connected* game mode. In this mode, three players, each with their own game board, must battle as a team against an A.I.-controlled boss.¹⁶ As players clear lines individually, they fill a shared *Zone* meter. When this happens, their playfields merge together, allowing them to place blocks anywhere – including columns that initially belonged to a different player's board – for the duration of the *Zone* phase. Additionally, they also take turns dropping blocks during this time, further coupling each player's actions – and the timing of those actions – to those of other players.

When the player's boards are disconnected, they have a lower degree of interdependence. They are still working towards the same objective and depend on each other's performance, but they cannot directly interact with one another's board and the timing of their actions is completely

¹⁵Source: <https://www.youtube.com/watch?v=tsC-1a7r2P4>. Retrieved January 10, 2024.

¹⁶The game also has a variant where a fourth player acts as the boss, called *Connected VS*.

¹⁷Source: <https://www.youtube.com/watch?v=7Q1j4iOHib8>. Retrieved January 10, 2024.



Figure 4.9: In *Tetris Effect: Connected* (2020), the three players on the left-hand side have their boards connected during the Zone phase, during which they attack the Boss (right-hand side).¹⁷

decoupled. The stark contrast between this and the dynamics of direct cooperation and interdependence that emerge during the *Zone* phase creates meaningful gameplay moments that feed into the game’s core theme of social connectedness.¹⁸

4.2.3 Outcomes

Some games present players with different outcomes even when they perform the same action. This can occur in games that have some randomness to them, such that the players are not given full assurance of the consequences of their actions. This can be used in a purposeful way to increase a game’s uncertainty or to simulate the complexity that is present in real-life scenarios. For instance, in *Dungeons and Dragons* (1974), players roll dice in order to determine the outcome of their actions. This, among other things, allows the game to simulate combat scenarios in which attacks may hit their target or be successfully defended against. Whereas in a real setting this would depend on a multitude of factors, in this game it is simplified and abstracted through a simple roll of the dice. The uncertainty encourages players to adapt to changing circumstances and heightens the tension of playing the game. Two different groups of players engaging with the same combat scenario may have very different experiences, caused by this Asymmetry in outcomes.

The difference in outcomes does not need to originate from randomness. Outcomes triggered by the same action can be deliberately decided by the game’s internal rules. For instance, the *Handicap* system in *Super Smash Bros. Melee* (2001) aims to balance matches between players by giving the less-skilled player’s attacks more knockback, as well as making them more resistant to getting knocked back. Players can adjust the level of *Handicap* themselves or set the system to

¹⁸The soundtrack to these boss battles transitions to the chorus when players enter the Zone phase. The song that players encounter in their first boss battle conveys through its lyrics: “It’s all connected (...) We’re all connected in this”, further establishing a connection between the game’s moments of interdependence and its themes of social connectedness.

Auto mode and have it dynamically change in response to the matches' results. In this sense, this endogenous asymmetry can assist in diminishing the impact of exogenous asymmetries relating to each player's individual skill. This results in closer matches, even if players have different proficiency levels in the game.

4.2.4 Feedback

Asymmetry of Feedback exists when games provide different types of feedback to their players. This can occur, for instance, when one player experiences the game exclusively through visual feedback, while another experiences it through audio cues.

Despite being exceedingly rare, this type of asymmetry has a great impact on how players perceive the game world. Furthermore, it may be the only way how some pairings of players are able to participate in the same game together. For instance, in the case of games for mixed-visual-ability pairs, this type of asymmetry allows a visually impaired person to participate in the same game as a sighted person. Gonçalves et al. (2021) designed games for mixed-visual-ability pairs, with one role dependent on visual abilities while the other relied on auditory cues. This resulted in balanced cooperative play, with both types of participants feeling they played an important role in the game.

This type of asymmetry may also be used simply to create different experiences and challenges for each player. Although we weren't able to find any commercial videogames that do this, there are some examples specific to board games. In *Nyctophobia* (2018), up to four Hunted players wear black-out glasses that deprive them of sight during the game. Thus, in order to navigate the game board, they must rely on touch and memory in order to escape the Hunter player, who can freely look at the board during the game.



Figure 4.10: *Nyctophobia* (2018). The two Hunted players wear blindfolds and obtain information about the game board through touch.¹⁹

¹⁹Source: <https://www.youtube.com/watch?v=QJGetEraLrs>. Retrieved January 10, 2024.

In *Team3 Green* (2019), a team of three players must transfer information from one to the next through different means. The first communicates by gestures, the second by speech, and the third, who wears a blindfold, through their in-game actions.

In both of these examples, Asymmetry of Feedback is paired with Asymmetry of Information: the flow of information is heavily informed by the means through which each player perceives the game state. We believe it would be interesting to see Asymmetry of Feedback take on a bigger role in videogames, as their board game counterparts have proven that there are interesting ways to implement this type of asymmetry in gameplay.

Chapter 5

Vehicles of Asymmetry: Beyond “Asymmetric Games”

In some games, asymmetry is very present from the start. Players may immediately start the game having unique gameplay goals or boasting a repertoire of abilities that differentiate them from other players. Typically, these are the games that are typically seen as *asymmetric* – a nomenclature that we have already seen to be flawed.

However, as we’ve seen in Chapter 1, asymmetry does not need to be static and present in a game’s starting conditions. Instead, it can evolve during play, either as a result of player action, or following some predetermined schedule set by the game designers.

Throughout this chapter, we look at the different methods that can be used to generate asymmetry during runtime. We have called these *vehicles of endogenous asymmetry*. That is to say, systems of mechanics that enable, configure, or create opportunities for the different types of asymmetry – the ones we discussed in the previous Chapter – to emerge during runtime.

5.1 Operation

Operation takes place whenever players’ gameplay experience is affected by their own actions and choices within the context of the game. For this to take place, a game’s mechanics must be designed in a way that allows these differences in input to be translated into meaningfully different gameplay experiences. So long as asymmetry is emerging as a direct consequence of player action, we can say that its vehicle was *Operation*, i.e. the way the player acted within the game. This may be one of the most common vehicles of asymmetry, as games are an inherently interactive medium in which player agency often results in gameplay variations. As such, this vehicle can present itself in numerous different ways. This section describes different expressions that this vehicle of asymmetry may take.

In *Kingdom Come: Deliverance* (2018), the player character’s *Skills* improve over time according to player action. The more the player performs an action associated with a *Skill*, the more

proficient their character will become at all actions related to that *Skill*. Thus, the game’s systems of character progression take the player’s input into account.

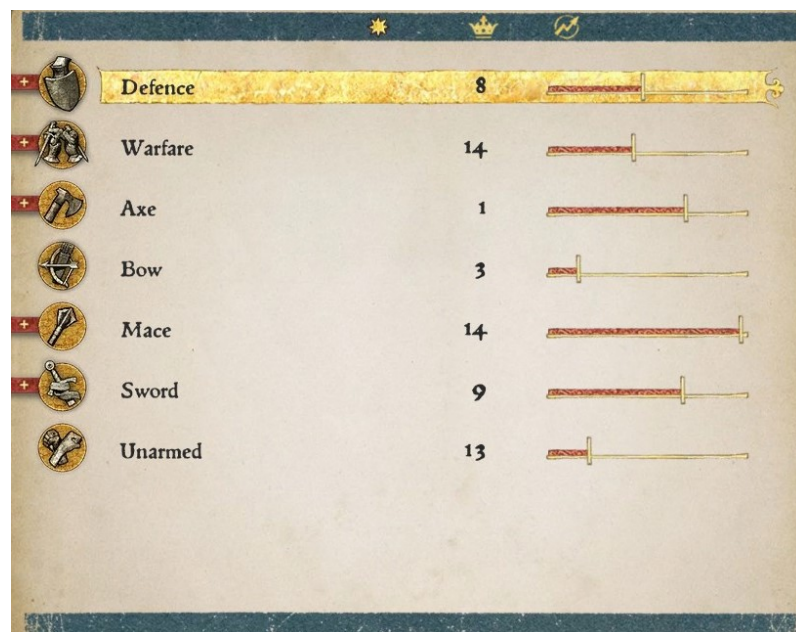


Figure 5.1: The combat skills in *Kingdom Come: Deliverance* (2018). If a player repeatedly uses a sword to damage their enemies, their Sword skill will be levelled up, further increasing the damage they deal with swords.¹

Differences in player proficiency with the game can also foster asymmetry, so long as the game’s formal rules allow for those differences in proficiency to express themselves during play. This is often the case with games, but in some game genres, such as Visual Novel² games, skill expression³ is not as prevalent.

Games in which skill expression is highly prevalent exacerbate the differences in player skill level. For instance, a more skilled player can more easily access specific content within the game, while less skilled players may even be faced with an obstacle that prevents them from progressing past a certain point in the game.

Operation as a vehicle for asymmetry can also exist in games in which the amount of time players dedicate to the game differs. This is particularly prevalent in Massively Multiplayer Online Role-Playing Games, such as *World of Warcraft* (2004), which rewards players for completing daily missions and participating in weekly raids.

¹Source: https://eip.gg/kcd/news/___trashed-2/. Retrieved January 10, 2024.

²Games in the Visual Novel genre are usually characterised by a textual narrative accompanied by illustrations, in which players decide which dialogue option or action to perform by interacting with a UI menu. These games generally do not make use of the types of challenges games in other genres pose to the player, such as having to react quickly or requiring precise combinations of inputs.

³By *skill expression*, we are referring to the ability for a player’s skill level to be reflected in their in-game actions. Games that require precise inputs from the player can be said to have more skill expression than games where skill does not play such a big role.

Player investment does not have to be related only to time. It may also be monetary investment in the form of microtransactions through which players can acquire in-game advantages. These microtransactions influence the player's expectation of how the game should play out, as they may feel entitled to having better in-game outcomes. They also often allow players who engage in microtransactions access to privileged game mechanics, thus causing asymmetry to emerge. For instance, they may allow players to craft special items or gain access to exclusive equipment, thus generating Asymmetry of Ability.

Another way that games can include *Operation* is by allowing players to customise their experience with the game. This can happen very explicitly through a settings menu,⁴ but also through other in-game systems that allow players to make decisions regarding their gameplay experience. For instance, in *Cyberpunk 2077* (2020), most missions can be played either stealthily or by going in with guns blazing, and some players might be more proficient at one of those strategies – or simply more inclined to execute that play style. Regardless of their choice, the player is, in a sense, adjusting the game's difficulty and/or choosing to play the game in a way that they find more interesting, effectively customising their gameplay experience.

5.2 Profiling

When discussing asymmetry, we keep returning to one of its core characteristics: it allows players to develop personal and unique playstyles that will help them achieve the kinds of gameplay experiences they desire. Usually, this process is managed entirely by the player. They try one playstyle, observe its repercussions in their experience of the game, and repeatedly make adjustments that they believe will lead to outcomes that better fit their personal goals. In some games, however, the game itself is able to analyse the player's behaviour, interpret it, and adjust its various systems in a way that will influence their gameplay experience. Yannakakis et al. describe player modelling as such:

Player modeling is, primarily, the study and use of artificial and computational intelligence (AI and CI) techniques for the construction of computational models of player behavior, cognition and emotion, as well as other aspects beyond their interaction with a game (such as their personality and cultural background). (Yannakakis et al., 2013)

Player modelling techniques are used in some games with the goal of analysing the players' characteristics and behaviours during the game (Machado et al., 2011). Through the detection of patterns in that data, a game can arrive at its interpretation of the player's profile and react to it. We will refer to the entirety of this process of data collection, interpretation, and subsequent reaction,

⁴Games like *Fell Seal: Arbiter's Mark* (2018) even give players the option to change how the game's systems work. In this turn-based tactical RPG, players can, for instance, configure how the game handles random number generation in combat calculations, or how likely enemies are to revive their fallen comrades.

as *profiling*.⁵ Profiling acts as a vehicle for asymmetry by modifying the functioning of a game’s mechanics according to a particular player’s profile.

As a note, take into account that this vehicle of asymmetry differs from *Operation*, in that it entails a process through which the system interprets the player’s actions, a process whose internal functioning is typically obscured from the player, even if they can inductively reason some aspects of it through prolonged play. *Operation*, however, shapes asymmetry in a more direct and explicit fashion: the player fails a quest, thus they miss out on its rewards; they choose to side with one faction, thus losing their standing with another.

By analysing a player’s behaviour within the game, games can deliver gameplay experiences specifically tailored to that player, in a way that inevitably causes asymmetry to emerge across different playthroughs. Let us look at different implementations of profiling and how they differentiate player experience.

5.2.1 Dynamic difficulty adjustment

Games that use *dynamic difficulty adjustment* (DDA) utilise profiling to assess the player’s skill. *Resident Evil 4* (2005) had a hidden *Difficulty Scale* system that would evaluate the player’s performance (e.g. how many times they have died, how often they perform critical attacks, etc.) and adjust enemy behaviour and attributes according to it (Glaser et al., 2005). In doing this, the game aims to keep the player within the bounds of a certain level of difficulty, fostering an experience in which the player is kept in a state of *flow*.⁶

DDA is seen as a controversial feature,⁷ as it can lead to players feeling patronised when they become aware that the game is tuning down its difficulty whenever they are struggling (Adams, 2008). We see DDA as a tool for diminishing the influence of exogenous asymmetries – in particular, relating to player skill – in players’ gameplay experiences, by ensuring that each player will face a level of challenge that is tailored to them.

5.2.2 Modulation of narrative tension

Profiling also occurs when a game seeks to modulate its narrative tension in dynamic and unpredictable ways. To tackle this subject, we must first touch on some notions regarding narrative

⁵This terminology is also used by Cardoso (2016), albeit in slightly different contexts. Cardoso presents profiling as a type of *traversal*, the player’s journey through the game, shaped by their relationship with the game system. For our purposes, we are only concerned with profiling as a process of analysing the player’s behaviour and responding to it.

⁶As defined by Csikszentmihalyi (1990), flow is a state of concentration or complete immersion in the task at hand. Flow is induced when the difficulty of challenges matches the skills of a player. Low difficulty can lead to apathy and boredom, while high difficulty can cause anxiety and frustration (Lemmens & von Münchhausen, 2023).

⁷This can be especially true for multiplayer games. *Electronic Arts*, a major developer, went as far as to state that it “would not use DDA technology to give players an advantage or disadvantage in online multiplayer modes in any of our games” (Fair Play & Dynamic Difficulty Adjustment., n.d.). The statement came in the aftermath of a class action lawsuit that alleged that the company was using DDA to push players into engaging in microtransactions (Chalk, 2021).

structure. There are many ways to structure a narrative, but the most well-known might be the *three-act structure*. As Field (1979), who popularised the term, described them:

- **Act 1: Setup** – in which the inciting incident occurs, setting the narrative in motion.
- **Act 2: Confrontation** – in which the characters encounter new challenges, friends, and enemies.
- **Act 3: Resolution** – in which the climax of the narrative occurs, followed by *denouement*, which offers resolution and concludes the narrative.

Yorke (2020) builds on this structure, presenting the notion that narrative structures can be *fractal*: overarching constructs composed of structures that recur at progressively smaller scales.

Stories are built from acts, acts are built from scenes and scenes are built from even smaller units called beats. All these units are constructed in three parts: fractal versions of the three-act whole. Just as a story will contain a set-up, an inciting incident, a crisis, a climax and a resolution, so will acts and so will scenes. (Yorke, 2020)

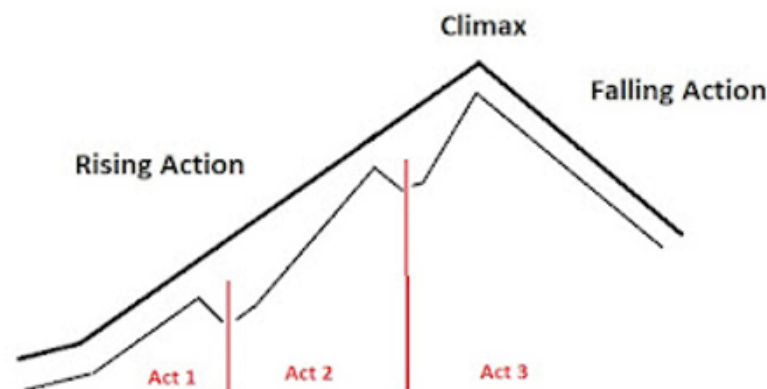


Figure 5.2: An example of how a three-act narrative structure might replicate itself at a lower scale for each Act. The black line represents tension over the course of the narrative (Fawkes, 2022).⁸

Although Field and Yorke wrote about these concepts for the purposes of screenwriting for films and television shows, we argue that games also exhibit these structures, even at smaller scales as Yorke described. We can describe, for instance, a boss fight in *Elden Ring* (2022), to be divided as such:

- **Act 1: Setup** – The player enters the boss arena, where a powerful enemy is awaiting them. Through a cutscene, the enemy asserts his motivations and sets up the conflict that is about to take place.

⁸Source: <https://www.septembercfawkes.com/2022/03/pacing-within-narrative-arc.htm>
1. Retrieved January 10, 2024.

- **Act 2: Confrontation** – The player engages the enemy in combat. They must react to the opponent’s attacks and find their own opportunities to strike. Upon reaching a certain life threshold, the boss transitions to a new, more dangerous form.
- **Act 3: Resolution** – The player finds an opportunity to critically strike their opponent, finally defeating them. As the dust settles, the player is rewarded with a new item, and a new path opens before them.

Traditionally, games have modulated narrative tension through authored content. As with the example above, the events that create and resolve narrative tension are crafted by the developers beforehand, and the conditions that trigger those events are static: when the player enters the boss arena, the cutscene that introduces the boss is always triggered.

Profiling systems offer a different approach. Some games offer what is referred to as a *Director AI*, a system that manages a game’s tension, as well as its pacing and difficulty. In *Left 4 Dead* (2008), the Director AI handles enemy and item placement in a way that takes into consideration each player’s performance, as well as their current location and status. In addition, the Director AI cycles between *Build-up* phase, a *Peak*, and a *Relax* phase, creating an ebb-and-flow dynamic akin to those found in the aforementioned static three-act narrative structures – only, in this case, the player’s input is taken into account.⁹

5.2.3 Personalisation

A player’s personal experience with a game emerges from their interactions with the system. It is often influenced by unpredictable circumstances in the game world, and the specific ways that the player reacts to those circumstances. Profiling can take this one step further: the player’s behaviour itself is a variable – or multitude of variables – that can be used by the system to provide that individual player with a gameplay experience that is particular to them.

One way to do this is to heighten the fidelity of the simulated environment a game aims to emulate by ensuring that the player’s actions have fitting consequences. In *Metal Gear Solid V: The Phantom Pain* (2015), the enemies adapt to the strategies the player uses most often. For instance, if the player is proficient at achieving headshots, the enemies will start wearing ballistic helmets that make them near-impervious to these attacks. If the player chooses to infiltrate enemy bases at night, the enemies will start carrying flashlights, or even night-vision goggles.

The player is not made aware in advance that these systems are in place: they are simply tackling the game’s challenges in their preferred way. More interestingly, when the player is eventually made aware that the enemies are able to recognise their preferred methods of approach and adapt to them, this is something that makes sense in the context of the simulation: the same would conceivably happen in a real-world scenario. Depending on who’s playing the game, the

⁹For a contrasting example of a Director AI system being used to manipulate the behavior of a single entity for the same purposes, see *Alien: Isolation* (2014). For a game that allows players to choose between different Director AI systems – presented to the player as having different ‘personalities’ –, see *RimWorld* (2013).

enemies will adapt in a different way, but always one that is congruent with that individual player's traversal through the game. The game's configuration is *personalised* to that particular player and their behaviour.

Undeniably, this leads to asymmetry. When a game analyses and models the player's behaviour and feeds it back into its systems, the resulting gameplay experience is not only informed by how the player behaves when interacting with those systems, but also by how that behaviour will shape the configuration of the systems. Depending on how sophisticated the system of profiling is and the breadth and depth of its repercussions, this may even lead to very distinct gameplay experiences for each player.

5.3 Location

In some games, the players' location can become the input through which a game's systems generate asymmetry. When different players inhabit different locations within the game, they might get access to different gameplay elements that will differentiate their gameplay experience.

An interesting way in which this can occur is when *player space*, the physical space where the player resides, overlaps with *game space*, which relates to the actual game world¹⁰(Cardoso, 2016). In *Pokémon GO* (2016), players must visit local real-world landmarks and monuments in order to get useful in-game resources. Depending on whether a player lived in an urban or rural area, they could have access to an abundance of game resources, or face scarcity, respectively (Weinberger, 2019).

Another example would be when a player is perched on a tall building in a shooter game, therefore having access to a wider view of the game map, which enables them to acquire information regarding the game state – and maybe even act on it – more effectively.

A player's location can even affect their gameplay goals, as is the case in MMORPGs, in which some game events and questlines might occur in select locations and thus are only available to players in those locations.

A player might also get access to different abilities in certain locations. This is the case in *Jak and Daxter: The Precursor Legacy* (2001), in which there are *Eco Vents* located in select locations in the game world.

Depending on the colour of the *Eco* in a particular vent, the player temporarily acquires different abilities by walking on top of it. For instance, the blue vent allows them to move faster and interact with certain objects, while the yellow vent allows them to shoot projectiles. Thus, the player has access to different abilities depending on their location in the game world.

¹⁰These categories are based on Juul's *3D space*, *screen space*, and *player space* (2012). However, the term *game space* is agnostic of whether the game is two- or three-dimensional, or whether it is viewed through a large or small screen, or even if it is entirely represented through the use of audio. Game space is "where the game actually happens" (Cardoso, 2016).

¹¹Source: https://jakdaxter.neoseeker.com/wiki/Green_Eco. Retrieved January 10, 2024.



Figure 5.3: A green Eco Vent in *Jak and Daxter: The Precursor Legacy* (2001).¹¹

5.4 Time Frame

Some games offer different gameplay experiences depending on when players engage with the game. A prime example of this occurs in *Death Stranding* (2019), a game in which players can build structures to assist themselves and other players in overcoming challenges. These structures decay over time and must be maintained by other players. One of the most helpful structures are roads, which help players traverse the world map faster and more easily. However, roads are expensive to build, which means that at launch, they were a rare sight, but eventually became more common as more players finalised their construction. The availability of the structures fluctuates over time, which means that a player may or may not find those structures depending on when they are engaging with the game. The fact that these structures heavily affect gameplay and the difficulty of the game, means that the time frame in which the player is interacting with the game can have a great impact on their experience. Games that strive to explore this vehicle of asymmetry may be able to create the conditions for players with different schedules to interact asynchronously in meaningful ways, creating interesting gameplay narratives.

Players can also have their gameplay experiences affected by the sequence in which different players interact with the game. Turn-based advantages are a phenomenon that is very prevalent in board games. We have already discussed that Chess’s turn advantage for White has very pronounced and observable consequences that shape how the match will unfold. Similar dynamics can be observed in certain video games.

Unsurprisingly, digital collectible card games are usually structured by turns and often have some form of turn-based advantages. In *Hearthstone* (2014), two players take turns playing cards with the goal of destroying their opponent’s hero. These cards cost *Mana*, a resource that is incremented for each player at the start of each turn. The first player gets a head start in setting

up his board by playing cards, and, as a result, will often be the first to attack their opponent. To counteract this, at the start of the game, the second player draws one more card from their deck. Additionally, they get a *Coin* card that, when played, grants them one more *Mana* for the current turn. Thus, both players can be said to start the game with Asymmetry of Ability:¹² the first player will get to attack first, while the second will have more options to choose from during their turn.

Unlike in Chess, turn-based advantages in games with asymmetric choices don't always represent an unambiguous advantage for, say, the player who goes first. In the *Hearthstone* example, whether or not a player is better off going first or second depends on the cards in their deck (Orland, 2014).

The same happens in *Marvel Snap* (2022), in which turn-based advantages are dynamic and highly contextual. In this card game, players win by having more Power than their opponent in at least two of the board's three Locations. Each turn, players plan and prepare simultaneously by playing cards on a board, with the goal of adding Power to three different Locations. Afterwards, those cards are revealed, starting with one player's cards and then moving on to the other's. Specific cards, in specific game states, can be more effective when revealed last, while others are more beneficial when revealed first.

Additionally, this game's turn structure differs from *Chess* and *Hearthstone*, due to the fact that it can be manipulated by the players: each turn, the player who is ahead in the majority of locations is the one whose cards will be revealed first. This makes it so that the game's turn structure itself can be a vehicle through which asymmetry can arise, by preventing some plays and enabling others.

However, asymmetries arising from which player acts first are not restricted to turn-based games. We can see it in games such as *Teamfight Tactics* (2019). During a match, players will occasionally enter a shared draft where they can recruit characters. To do this, they must move their avatar to collect their desired character. Movement controls are progressively unlocked for the player, with the bottom players being allowed to move and make their choice first.

In a sense, it also occurs in games with *Battle Royale* modes, such as *Call of Duty: Warzone* (2020). In these games, players can choose to start in a variety of locations around the map. However, the playzone — indicated by a circle on the map — gradually shrinks, as a cloud of poisonous gas encroaches on the players. The unpredictability of where the new centre of the circle will be makes it so that some players will already be at a safe location, while others must travel to get to it. It can be said that the players already in the centre of the playzone have the initiative, and can adequately prepare to defend their location from the other players. Conversely, the travelling players are faced with the challenge of defeating the defending players and stake

¹²Of course, since players will often be playing decks composed of different cards, and draw them in a randomly determined order, there would already be a decent level of Asymmetry of Ability in play. However, the turn-based advantages in the game will further differentiate the tools that each player has at their disposal.

¹³Source: <https://www.shacknews.com/article/133779/marvel-snap-deck-tracker-untapped>. Retrieved January 10, 2024.



Figure 5.4: *Marvel Snap* (2022). The player *Bnmin*, whose cards are on the top portion of the screen, has more cumulative points across the three locations, therefore their cards will be revealed first (as indicated by the golden border around their username).¹³

their claim to a spot inside the circle. These are two different experiences, leveraged in part by the fact that players will arrive at the playzone at different points in time.

5.5 Randomness

Costikyan states that “uncertainty is a key element of games” (2015). It keeps games enjoyable by preventing them from becoming predictable. There are many ways in which games can create uncertainty in the player’s experience. From those Costikyan presents, we find the following sources of uncertainty to be the most pertinent to our discussion of endogenous asymmetry:¹⁴

- **Analytic Complexity** – related to how a game’s complex possibility space can defy conclusive player analysis.
- **Randomness** – related to aspects governed by chance.

Analytic Complexity, as we have discussed, can be strongly boosted by a game’s asymmetries, which often create intricate combinatorial possibility spaces. These spaces are often subject

¹⁴To those wishing to explore the topic of exogenous asymmetry in-depth, we recommend reviewing these sources of uncertainty in Costikyan’s book: *performative uncertainty*, *solver’s uncertainty*, *player unpredictability*, and Malaby’s *semiotic contingency*.

to change, especially in online multiplayer games, enticing players to explore those games in different ways. For the purpose of examining different vehicles of asymmetry, we will not be delving into the topic of uncertainty caused by Analytic Complexity. This is due to the fact that we see this complexity as a consequence of asymmetry, and not as a mechanism that can be used to inject asymmetry into play. With this in mind, let us turn our attention to randomness and how games can utilize it to generate asymmetry.

We will make use of the *input* and *output randomness* nomenclature that is already employed in some game design discussions.¹⁵ As summarized by Zhang et al., input randomness is “the random information or element brought into the game before players make a decision”, while output randomness is “the random element brought into the game after players make a decision” (2021).

Input randomness happens, for instance, when a player draws a card from a deck. They receive a random card, which they will then incorporate into their strategy and planning. Output randomness can be exemplified by how a player in *Dungeon & Dragons* (1974) decides to attack an enemy, and then rolls a dice to determine if that attack hits the target.

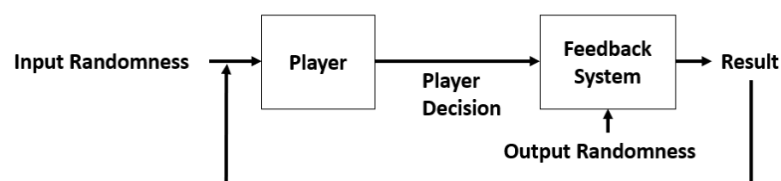


Figure 5.5: An illustration of the continuous input-output randomness feedback loop in turn-based games (Zhang et al., 2021).¹⁶

With these concepts in mind, let us move on to the different ways randomness can act as a vehicle for asymmetry.

5.5.1 Starting conditions

Randomness can play a part in setting up the parameters and game elements that will be present at the start of the game. This can be done to different degrees: a game might randomly determine a single element of the game by selecting from a pool of options, while another might randomly determine a multitude of parameters in more complex ways.

Some games randomly select which map the players will be competing in, as might happen in a game such as *StarCraft II: Wings of Liberty* (2010). This makes it so that the game space itself – and the challenges and opportunities it may provide for each player – changes from match to match. Although players still get to select which faction they will be controlling, the fact that they will be doing so within a variety of different contexts promotes the players’ ability to use the same toolset in distinct circumstances.

¹⁵E.g., Burgun (2014), Concha (2022), and Engelstein (2018).

¹⁶Source: Zhang et al. (2021).

In other cases, the game can randomly determine aspects not related to the game space, but to the avatar that the player will be controlling. This happens in *Rogue Legacy* (2013), in which the player’s character, class, traits, and spells they can cast, are all randomly determined at the start of each playthrough. In one playthrough, they might be *Sir Linebeck II*, a *Paladin* with no traits and the *Blade Wall* spell, and in the next, *Lady FutureFran III*, a *Barbarian Queen* with *O.C.D.*, *Hypergonadism*, and the *Dagger* spell.

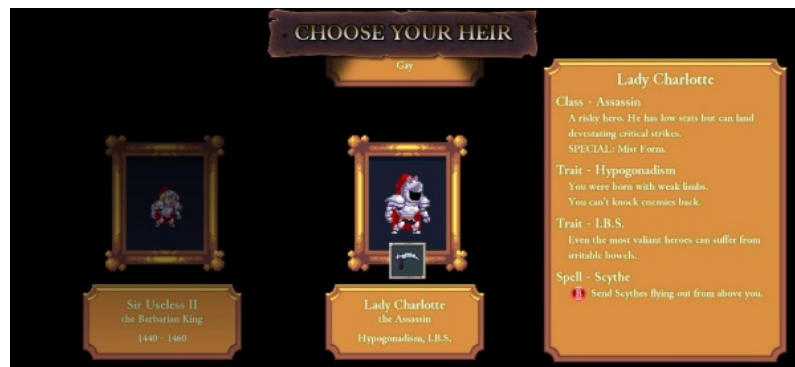


Figure 5.6: A character selection screen in *Rogue Legacy* (2013).¹⁷

Players are given only a small degree of agency in this process: they have three different characters to choose from, and they may re-roll these characters once, to get new ones. In doing this, the game creates Asymmetry of Ability between each playthrough, and the player must face the game’s challenges using an ever-changing set of tools.¹⁸

While these simple processes are effective in increasing a game’s variety, there are other, more complex methods of generating a game’s starting conditions. For instance, some games make use of procedural generation to create the game world the player characters will inhabit.

Minecraft (2011) uses procedural generation to create the game environment. Its algorithm is sophisticated enough to produce a variety of biomes and underground cave systems that the players may encounter while exploring different regions of the map. Each biome will contain its own set of fauna and flora, as well as other resources that the player can make use of during their playthrough. A player that spawned in a mountainous region might not have easy access to sand, and therefore will not be able to make glass blocks – at least not until they explore more of the map.¹⁹ The game is, for one, creating Asymmetry of Environment, but also offering players the

¹⁷Source: <https://www.rockpapershotgun.com/hands-on-rogue-legacy>. Retrieved January 10, 2024.

¹⁸This has the potential to create a steep learning curve for new players: after all, they are repeatedly forced to learn how to play with a different character. However, in this case, the different classes all play very similarly, and traits offer only small variations to the core rules (e.g., they might hide the player’s healthbar, or cause the game world to be in grayscale). Thus, these forced variations do not have a drastic effect on the game’s learning curve.

experience of exploring a world that is unique to them.

In *Dwarf Fortress* (2022), the player controls a group of dwarves and attempts to build a prosperous fortress. The game is lauded for the complexity of its simulation,²⁰ and the way it generates a playthrough's starting conditions is no exception. As Tarn Adams, one of its creators describes it:

Dwarf Fortress procedurally generates the entire world from scratch. The process begins with an elevation map, generated based on a randomized fractal. Next, it creates several map layers, which include temperature, rainfall, drainage, vegetation, and salinity. With the raw components of the map defined, the next step classifies each tract of land into different biomes (plant and climate types, such as woodlands or savannas). In the next phase of the simulation, temporary rivers wear down the mountains, followed by permanent rivers that flow from high ground to low ground. Plant and animal populations are then introduced, followed by world-specific fantasy creatures. At this point, the world creation is complete and the simulation of civilization begins. Through this process settlements are raised, trade routes are formed, and wars are waged. At a designated point in time, the simulation stops and the player begins the game in a unique living world. (Adams, 2015)

To create the starting conditions for the player's experience, the game not only generates the game world and its inhabitants with remarkable detail: it simulates the effects of the passage of time in that world throughout decades of in-game time, creating the historical and geopolitical context in which the player characters exist. In games with this degree of complexity, the uncertain starting conditions can also instil a sense that a player's experience will be singular, by facing them with starting conditions that, in all probability, no one else has ever encountered, and no one else ever will.

In essence, systems that add uncertainty to a game's starting conditions, be they straightforward or extraordinarily complex, have a shared purpose: they present novel configurations of a game's elements. Thus, they allow games to continually challenge players to play in different ways, in different conditions, for different purposes.

5.5.2 Runtime contingencies

Randomness can also play a part in determining the behaviour of certain gameplay systems. While discussing Asymmetry of Outcomes, we have already analysed how the same action can have different randomly determined outcomes: launch an attack in *Dungeons & Dragons* (1974), and it might hit or miss depending on the roll of the die; defeat a raid boss in *World of Warcraft* (2004), and chance determines whether or not you receive the piece of gear you have been pursuing. In

¹⁹As a note, whenever players are close to the edge of the world, the map is dynamically expanded. When an update changes the procedural generation algorithm, some discontinuities in the world's topography can be observed where newly discovered regions border with older ones. Furthermore, these newly discovered regions may contain new biomes that were hitherto not in the game. In a way, the history of a player's traversal across different versions of the game can become embedded in the game world – a 3D representation of asymmetries across time.

²⁰For instance, every living creature in the game is modeled down to its individual body parts and organs. They have their own personalities, preferences, and even long and short term memories that can affect their emotional states.

these instances, the outcomes, despite their degree of randomness, have strong links to actions or decisions made by the player. Thus, they can be described as output randomness.

Output randomness can be used for a number of purposes. Young (2016b; 2016a) listed a number of them:²¹

- **Texture** – Output randomness can add moment-to-moment variation in games that would become predictable otherwise.²²
- **Balance** – Output randomness can make matches more unpredictable, in a way that allows new players to occasionally beat more proficient opponents. This ensures a certain level of tension even in matches between players of different skill levels.
- **Depth** – Games can make players choose between different degrees of output randomness. For instance, they could be made to choose between a weapon with reliable damage, and a weapon that has a chance to critical strike their targets. These different degrees of variance may be better suited for some characters, in some circumstances. Thus, output randomness can be used to add depth to the player’s strategic decisions.
- **Skinner Boxing** – Here, Young is referring to the concept of operant conditioning, or as it is more popularly known as, *Skinner Box*.²³ In essence, random rewards create a variable ratio schedule of reinforcement for the player’s engagement with the game.

As a vehicle for the injection of asymmetry, output randomness acts as a vector for divergence in players’ experiences. The same decision, even when made in the exact same context, will result in different responses from the system. Depending on how different those responses are, their effect on gameplay can range from small variations to very distinct divergences. Additionally, these divergences cannot be regarded as simply a response to a previous player’s decision: they also influence the game state that will serve as the context for future decisions. As we saw in Figure 5.5, output randomness becomes embedded in a loop, both informing a player’s decisions, and also the responses the system will give to those decisions.

In the turn-based tactical game *XCOM: Enemy Unknown* (2012), players painstakingly improve their troops by repeatedly taking them on missions across the span of the single-player campaign. When one of the player characters misses a crucial shot that they had an 80% chance to

²¹While Young does not use the term *output randomness*, his examples are all pertaining to that type of randomness. With this in mind, we believe that at least some of his reasons for randomness could also ring true for *input randomness* as well, even if in slightly different ways.

²²Young states that games that are not very action-oriented, often don’t have a lot of moment-to-moment variation, and lack surprises for the player. He gives the example of an MMORPG in which the player character must repeatedly fight the same type of enemy. If their weapon deals a flat amount of damage, they will always defeat the enemy in the same amount of hits. Conversely, if their weapon’s damage is partly determined by chance, these combat encounters will begin to have variations: the player might defeat the enemies in more or less attacks, or even land a critical hit that will down their foe in a single strike (Young, 2016b).

²³Named after psychologist B. F. Skinner, who invented the operant conditioning chamber (a.k.a. the Skinner box), in order to study operant conditioning (Schacter et al., 2011, p. 17).

hit, consequences can be dire. That random outcome can be the difference between eliminating an enemy combatant and emerging victorious, or having them survive one more turn. The persistent threat of *permadeath* looms over the player's mind: to lose one of their strongest characters would be a disastrous blow to their chances of success not only in the present mission, but also the entire campaign. Facing these dire conditions, the player reconfigures their other troops' positions in a way that will better prepare them for the enemy's turn.



Figure 5.7: *XCOM: Enemy Unknown* (2012). If the player decides to try to shoot this enemy, they have a 25% chance to successfully hit them.²⁴

Input randomness can also play an important part in adding uncertainty to a player's experience with the game. We discussed how card games do whenever a player draws a card from their deck. Their hand of cards will inform their available actions at any given time in the game. It limits the number of options that players can choose from. As players play cards and draw new ones at the start of their turn, their available options evolve throughout the game in unique ways, prompting players to adapt to ever-shifting, unpredictable circumstances.

Some game genres lean heavily into this type of randomness. One example is *roguelike* games. Inspired by the 1980 game *Rogue*, these games feature *permadeath* mechanics and randomly generated levels that the player can explore to find randomly determined items.

For instance, in *The Binding of Isaac: Rebirth* (2014), players traverse a number of levels while fighting enemies and collecting items. These items are instrumental to the progression of the player character, and change various aspects, from their attributes, to the behaviour of their projectiles. These items are randomly determined: in any given *Treasure Room*, the player may find a very strong item, or one that is almost completely useless. Moreover, items can synergise – or anti-synergise – with other items, and players are not forced to take them.

²⁴Source: <https://sinepost.wordpress.com/2012/10/26/probability-in-games-xcom/>. Retrieved January 10, 2024.

The random items encountered by the player in a given playthrough will heavily influence what they can or cannot do, their strengths and their weaknesses, and ultimately, their experience in that playthrough. Different games allow for different degrees of player agency regarding this process. For instance, in *Vampire Survivors* (2022), every time the player levels up, they can choose what item to get from a pool of three different options. As such, the player can often pursue a preferred set of items, or even avoid the ones they perceive as detrimental. In absolute terms, the less agency the player has in this process, the more asymmetric their individual experiences will be, as the player will be prevented from falling back into the playstyles they know best and prefer. However, we argue that some degree of agency may be desirable for some applications, as it allows for different players to procure different types of gameplay experiences.

Randomness, be it input or output, can be a great vehicle for asymmetry. In a sense, random elements exert control over the player’s experience, sending them down paths that they wouldn’t have explored otherwise. They instil variety in gameplay, offering some novelty in every playthrough, play session, or even in a game’s moment-to-moment events. Uncertainty plays a very important role in players’ experiences, and its dynamic nature makes it a powerful vehicle for asymmetry.

5.6 Progression

Character progression is a prevalent feature in games. Its origins date back to tabletop role-playing games such as *Dungeons and Dragons* (1974). However, modern implementations of this feature are seen across diverse game genres, which can be seen as a testament to its popularity.

In MMORPGs, “players build up their commitment to the game as the level of their character increases” (Ducheneaut et al., 2006). Zagal and Altizer state that there can be a “nurturing effect”, in which the player develops an emotional attachment to their character, developing curiosity and expectations regarding the abilities they’ll gain access to in the future (2014). From a more practical, game designer’s perspective, systems of character progression can also help ease new players into the game by gating mechanics and systems behind a progression curve (Bycer, 2016).

Elsewhere, we defined character progression as follows:

Character progression refers to the development of a character’s set of abilities and parameters that affect how they interact with the game world and the remaining characters. (Neto et al., 2021b)

We understand that character progression is not just restricted to characters. For instance, the player’s faction in *Sid Meier’s Civilization VI* (2016) might be what is progressing, as opposed to a single character in a game. As such, we will be preferring the more agnostic term *progression* when discussing this feature.

From card games like *Slay the Spire* (2019), to action-adventure games like *Metroid* (1986), or even Real Time Strategy games such as *Age of Empires* (1997), systems of progression have

been used to allow players to experience a journey in which the available actions and attributes of their avatar evolve in interesting ways.

Progression can be divided into two major categories: *effective progression*, and *potential progression*. Let us analyse each of these and their respective potential for asymmetry.

5.6.1 Effective progression

Effective progression relates to “changes to the character that directly affect their actions within the game”. In a very direct sense, effective progression will make an avatar better or worse at specific tasks. Effective progression can take two forms:

- **Attribute changes** – changes to the numeric parameters that affect the way a character interacts with the game world.
- **Toolset changes** – the addition or removal of actions from the avatar’s repertoire.

Attribute changes, sometimes described as *vertical progression*, often create differences in how an avatar behaves and/or how it affects the other elements in the game world. To give a very combat-centric example that is prevalent in RPGs, a character’s *Attack* attribute will determine how much damage they deal, while their *Defense* attribute will determine how much damage they can withstand.

In some games, attributes and the aspects they relate to can become more complex and abstract. In *Disco Elysium* (2019), the player’s character has 24 attributes, called *Skills*, divided into 4 *Skill Trees*: *Intellect*, *Psyche*, *Physique*, and *Motorics*. For instance, *Conceptualization* is a skill under the *Intellect* skill tree that allows the character to “understand creativity” and to “see Art in the world”. Each attribute will determine the likelihood of success for tasks related to that attribute. The way these attributes change, is, at times, interesting. Game events – e.g. failing a specific task – can trigger *Thoughts*. A *Thought* represents an inner struggle the character is faced with, and they are often coupled with a debuff to one of the character’s attributes. When the player activates a *Thought*, the player character researches it for a period of time during normal gameplay, after which it comes up with a *Solution* that resolves the inner conflict, removes the debuff, and adds a new attribute change to the character. For instance, the player character might be doubting his masculinity after failing a physical task, be encumbered by a -2 *Encyclopedia*²⁵ debuff as they struggle with the *Thought* that, once resolved, gives them a +2 *Physical Instrument*²⁶ buff when shirtless. Through this approach, the game establishes links between the player’s actions, the outcomes of those actions – both successes and failures –, and the way those experiences affect the character’s psyche and change his attributes.

This injects asymmetry in players’ experiences. The player’s avatar and their attributes become a reflection of what the character – and the player – has experienced up to that point. Different

²⁵The *Encyclopedia* skill relates to the character’s knowledge, and his ability to “produce fascinating trivia”.

²⁶The *Physical Instrument* skill relates to the character’s physical prowess.

choices would have led to a different set of attributes, which in turn would lead to the character becoming more proficient in certain tasks – which might even influence which tasks the player will choose to engage with.

Toolset changes, sometimes referred to as *horizontal progression*, are different in nature. If attribute changes are about the player becoming better at performing certain actions, toolset changes are about allowing players to perform new actions altogether. In *Legend of Zelda: Breath of the Wild* (2017), the player unlocks a paraglider that allows them to leave the starting area by making it possible to safely descend from the cliffs that surround it. A new action is being added to the player’s repertoire to be used to tackle the game’s challenges. In some games, this can lead to players unlocking abilities in different orders, or even different abilities altogether.

Even progression systems where the progression follows a very linear and predictable path may cause a player to experience asymmetry between two different game sessions. For example, in *It Takes Two* (2021), the player controlling *Cody* might be wielding a stopwatch that allows them to control the flow of time for some game elements in one game session, while in another they may have a magnet that allows them to push and pull magnetic objects in the environment. However, it is when progression becomes non-linear and unpredictable that a higher degree of asymmetry can arise between two different players. For instance, an avatar’s progression might be determined by random factors, as is the case with games in the *roguelike* genre. Alternatively, a very common approach is to allow the player to make decisions regarding the progress of their avatar, as we’ll discuss in the next section.

5.6.2 Potential progression

Potential progression allows the player to attain effective progression without directly affecting how their avatar acts in the game world. This includes in-game currencies, experience points, and reputation the player accrues, increasing her potential for progression, or social status in the game world.

In-game currencies gathered through completing the game’s objectives can usually be spent in order to acquire attribute or toolset changes in the form of items or pieces of equipment that grant those changes. In the same fashion, experience points (XP) are often accumulated during the player’s traversal through some games. Upon reaching a certain threshold, the character levels up and is either rewarded with immediate effective progression, or another form of currency (commonly called Skill Points) that the player can spend to improve her character in the way they choose.

This allows for a higher degree of asymmetry to occur, as different players adopt different strategies as to how to spend their in-game currencies, and which advancements to pursue. Additionally, these systems of progression are usually designed such that purchasing one advancement

²⁷Source: <https://www.gamespot.com/articles/cyberpunk-2077-phantom-liberty-best-s-kills-perks-attributes/1100-6517920/>. Retrieved January 10, 2024.

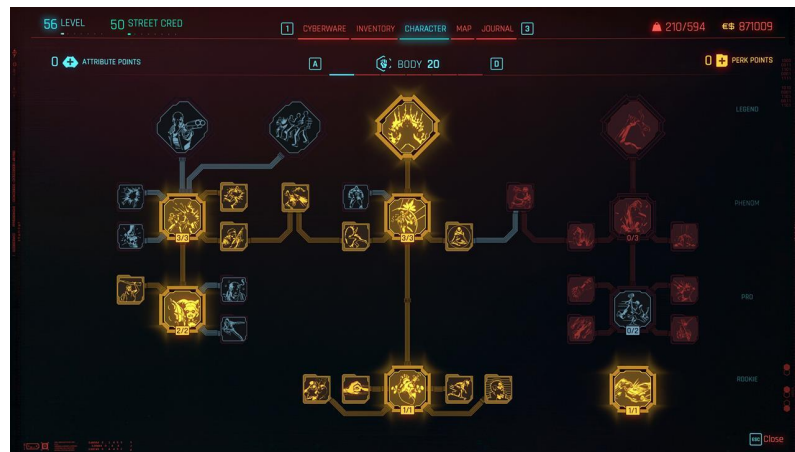


Figure 5.8: The skill tree for the *Body* attribute in *Cyberpunk 2077* (2020). The players receive attribute points and perk points upon levelling up, which they can spend to improve their character in a variety of ways.²⁷

precludes others from being unlocked. This can occur when players have a finite maximum number of Skill Points they can invest, or when certain advancements are mutually exclusive: the player has to choose one or the other.

In multiplayer games, this can foster cooperation between players whose avatars complement one another. A clear example would be the *Tank/Healer/Damage Dealer* triad that is ever present in MMORPGs. Each of the three roles depends on the others to succeed, precisely because the actions available to them are limited to a certain scope. A player's choice of how to advance their character will inform the roles they will be able to perform, but the opposite can also be true: the player can advance their character in a way that makes them effective at the role they want to perform.²⁸

5.7 Reprising

Asymmetry can be a great motivator of reprising. That is, the repeated traversal of the same or similar passages, moments, or – for our purposes – even entire games (Cardoso & Carvalhais, 2017). Take for instance *Resident Evil 4* (2023), a horror third-person shooter game that can be completed in a comparatively short amount of time. A typical first playthrough will take 15 hours to complete, a fraction of what current AAA games usually boast. But, there's a catch. Upon finishing the game, the player is ranked according to how long it took them to beat it, and is met with a message that states:

²⁸Players can pursue alternate roles even games that do not promote this triad. An example of this is *Path of Exile* (2013), an action RPG in which some players progress their characters to become *aurabots*. An *aurabot* abstains from having any direct damage dealing capabilities, and instead focuses on providing a number of beneficial auras that boost the power of the other characters in their party.

When loading main story saved data from a completed playthrough, you can carry over the data and start a new game. You will be able to purchase new weapons from the Merchant, but you cannot achieve an S+ rank.

At this point, the player has an arsenal of upgraded weapons at their disposal, a far cry from the non-upgraded pistol the player character had at the beginning of the first playthrough. This alone might be enough to motivate them to start a second playthrough, even if for no other reason than to test the might of their overpowered late-game weapons against the weak early-game enemies. The second playthrough starts and the player makes it to the first *Merchant*, which now sells the *Infinite Rocket Launcher*. The price is exorbitant, but at this point the player has little need to spend money during this playthrough, as their weapons are already upgraded.

The player decides to continue playing, in order to accumulate the money required to purchase the weapon. By this point, their in-game behaviour may have already shifted significantly. They learned the sequence of events they must traverse on their first playthrough, and enemies are a lot easier to defeat. Plus, not only does the game rank the players by completion speed, but also rewards them for attaining certain ranks by unlocking stronger weapons and an assortment of cosmetics for the game characters. Speed becomes the new goal for the player. Not only that, what was initially a scary experience might have shifted to something different, now that the player has knowledge of the challenges they will face during this second playthrough.

We just described how a game can encourage a player to engage in reprising through endogenous asymmetry.²⁹ More interestingly, we also saw how the player’s motivations, goals, and playstyle may change in subsequent runs of the same game, resulting in a very different gameplay experience for the player. Even in a relatively linear singleplayer game, asymmetry can promote replayability.

In fact, it can be said that this relationship is reciprocal: as we’ve discussed in Chapter 3, only through multiple playthroughs can the player experience a game’s asymmetry. In our *Resident Evil 4* example, the game informs the player that their next playthrough will be endogenously asymmetric from their first one, and they will be able to access new gameplay elements. Then, by engaging with the game a second time, the player enjoys a gameplay experience that is different from that of their first playthrough.

Some games introduce asymmetry by means of reprising in very deliberate and distinguishing ways. Some games, like *Hades* (2020) and *NieR:Automata* (2017), have their storylines built into their reprising gameplay loop. On each subsequent playthrough, the player will encounter new events, talk with different NPCs, and in the case of *NieR*, even control a different character and obtain a new perspective over certain in-game events.

²⁹Players can engage in reprising even in games that don’t reward players for subsequent completions in any way. An example of this lies in the practice of *speedrunning*, in which players engage with a game with the goal of completing it in the least amount of time.

³⁰Source: <https://www.ign.com/wikis/the-binding-of-isaac-rebirth/Achievements>. Retrieved January 10, 2024.



Figure 5.9: Upon completing certain requirements during a playthrough, a player unlocks the character *Magdalene* in *The Binding of Isaac: Rebirth* (2014). The player will now be able to use this character in future playthroughs.³⁰

Other games offer alternative paths that the player can access through reprising. *Undertale* (2015) has three different possible routes through the game: *Neutral*, *Pacifist*, and *Genocide*. A player that is not aware of this will likely experience the *Neutral* route, as it is the one that is enabled by default. However, by either never defeating an enemy through violent means, or by deliberately hunting down and killing every last monster in the game, the player will enter a *Pacifist* or a *Genocide* route, respectively. The different routes offer quite different perspectives over the game world and its characters. For instance, the *Pacifist* route will have the player befriend and go on dates with characters that they would otherwise only know as enemies, getting to know those characters on a personal level. Conversely, the *Genocide* route has the player embody a ruthless villain on a path of destruction. Most NPCs are absent, having evacuated the towns they usually inhabit, and some otherwise friendly characters attempt to fight the player in a last-ditch attempt to protect their friends and the world they inhabit from destruction.

As we saw, games already make great use of reprising to generate asymmetry. Reprising can go beyond adding some small degree of variety to gameplay in order to keep players engaged. It can also offer players the opportunity to observe the game world and the themes it depicts through different lenses each time. This could make this vehicle of asymmetry a powerful tool for the creation of gameplay experiences that encourage players to grapple with a complex subject by tackling it from different perspectives.

Chapter 6

A Conceptual Framework and Design Tool for Asymmetric Gameplay: Asymmetry Bricks

In this chapter, we propose a new conceptual framework for the design of asymmetric gameplay mechanics, as well as a tool for its operationalisation. Our goals are twofold: firstly, we wish to provide scholars and designers with a synthesised and structured overview of how asymmetry exists or may exist in games. By doing this, we hope to reduce some of the complexity associated with analysing and understanding asymmetry. Secondly, we wish to give game designers a design tool through which they can use the concepts featured in the framework in a more practical setting. Since game designers are both leading the discourse and pushing the boundaries of asymmetry in games, we find that our research ought to provide them with the tools to expand on their understanding of asymmetry, and to further explore new and interesting possibilities.

Given the fact that our framework and design tool are closely linked in purpose and were built with one another in mind, they are both discussed in this section, in a way that reflects their close association. We start by describing the basic components that make up our framework and then discuss how these components can be utilised in a method for ideation.

6.1 A Conceptual Framework for Asymmetric Gameplay

The last two chapters were dedicated to two different ways we can categorise asymmetry in game mechanics. The Types of asymmetry relate to which elements are dissimilar between two gameplay experiences (e.g. the avatar's abilities), while the Vehicles relate to how those elements come to be dissimilar (e.g. through character progression). We believe the two categorisations we described can act as lenses through which we can analyse endogenous asymmetry in games. They loosely describe the functioning of asymmetric mechanics. An alternative way we can look at them is to say that the Vehicles of asymmetry act as an *input*, while the Types of asymmetry are

the resulting *output*. To give a concrete example, we can say that random elements¹ can be used by the system to give different abilities to each player.²

In this chapter, we describe a framework for analysing endogenous asymmetry. It is built upon the notion that asymmetry Vehicles and Types are interlinked in a way that invites us to explore them in tandem. We look at how these two elements can be coupled and used for the analysis and design of endogenous asymmetry.

Our approach was inspired by Djaouti et al.’s *Gameplay Bricks*, a collection of “‘fundamental elements’ whose different combinations seem to be able to cover the gameplay of videogames” (2008). While their objective was to create a criterion for the classification of video games, we find the combinatorial potential of the bricks to be a great tool for the purpose of exploring new and interesting asymmetric gameplay mechanics.

Our collection of components comprises our Types and Vehicles of asymmetry. Figure 6.1 presents an overview of all the Vehicles and Types of asymmetry.

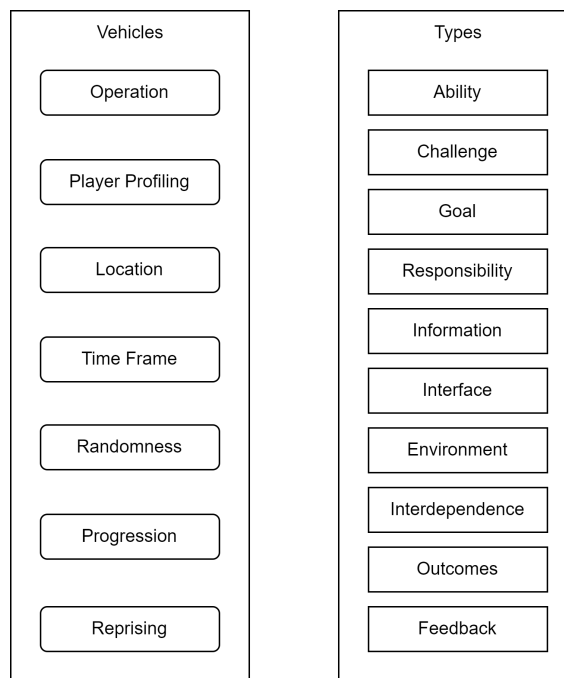


Figure 6.1: Overview of the Vehicles and Types of Asymmetry.

By combining one element of each category, we can arrive at an overarching outline of a gameplay mechanic for asymmetry. For instance, we can combine the Vehicle *Progression* with the Type *Ability* (Fig. 6.2).

Thus, we arrive at a complete Asymmetry Brick (AB) that is very common in RPGs, where the players’ avatars become dissimilar as players make different choices during character progression. However, our framework’s goal is not the classification of existing game mechanics but to offer

¹See section 5.5, *Randomness*.

²See section 4.1.1, *Ability*.

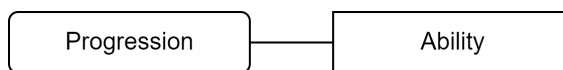


Figure 6.2: Progression—Ability Asymmetry Brick.

prompts for the design of unexplored ones. For instance, let us combine the Vehicle Profiling with the Type Interface (Fig. 6.3).

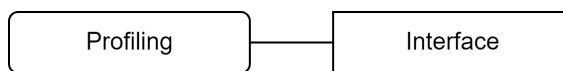


Figure 6.3: Profiling—Interface Asymmetry Brick.

With our knowledge of the Vehicles and Types of asymmetry, we can try to envision what form this AB could take as a game mechanic: the player’s behaviour is monitored by the system, resulting in changes in the interface the player uses to interact with the game. This, of course, is simply a general and vague description of the functioning of such a gameplay mechanic, not a detailed description of how it operates in the context of a given game. It is a *prompt*, not an end result. From here, we may begin to postulate what a concrete design of this mechanic might look like. Here is one possibility, as an example:

The controller adjusts its triggers’ tension in response to the players’ avatar repeatedly engaging in combat (i.e., the buttons become easier for the player to press as their avatar becomes stronger).

We did not uncover any example of this AB in our case studies, which signals to us the possibility that a significant number of these couplings have not yet been explored thoroughly – or even at all! – in videogames. As such, our framework can be used to map out uncharted territory for analysis, as we seek a more complete understanding of asymmetry.

Even though the AB described above could not be found in current games, the combination of the two elements – Vehicle and Type – facilitated the ideation of such a game mechanic. Furthermore, the prompt is sufficiently open-ended to allow us to envision various implementations of the same AB. We find this to be a desirable feature for our design tool, as it allows designers to use ABs as prompts for the creation of original gameplay mechanics.

That is not to say that our framework focuses entirely on practical applications. It functions also as a lens through which we can analyse endogenous asymmetry, by examining both the Vehicle and Type of asymmetry present in any particular implementation. This allows us to consider asymmetric gameplay mechanics as combinations of two more easily understandable components, allowing us to break down complex systems of mechanics for ease of analysis and categorisation.

Our framework also aims to offer designers structure and nomenclature that they can use while discussing asymmetry. Although designers are aware of a variety of ways to differentiate players’ experiences, they lack the nomenclature to communicate ideas regarding asymmetry among themselves. We believe our framework can ameliorate this issue. If our findings don’t find the traction

required to affect discourse among designers, we believe it still can be beneficial as a way to inform individual designers' perspectives and thought processes regarding asymmetry.

6.2 Preliminary application

In order to test the application of our framework, we listed all the possible couplings of our current Types and Vehicles of asymmetry and attempted to find an expression of them in our case studies.³ We found that depending on the specific coupling, our findings can be grouped as:

- **Existent** – We were able to find the asymmetry brick in at least one videogame.
- **Plausible** – We were unable to find the asymmetry brick in the games we analysed, but its implementation is plausible given current trends in game design.
- **Tentative** – The asymmetry brick could not be found in current games, and its implementation seems far-fetched or highly experimental.

Most ABs fall under the Existent category, which, on a first analysis, might indicate that our framework has the potential to adequately describe a number of different case studies. Nevertheless, because it is based on our Types and Vehicles categorisations, our framework's robustness derives from the comprehensiveness of those categorisations. That is to say, it might become apparent in the future that the framework fails to describe a certain asymmetric gameplay mechanic. This would be because there is a missing link in our foundational categorisations, which would then require a revision. We believe, however, that adding or modifying the components in our categorisations would not impact the overall functioning of the framework: it would still revolve around the combination of Vehicles and Types to describe asymmetric gameplay mechanics. We find this ability to adapt desirable, as game designers are sure to explore asymmetry in novel ways in the future and an adaptable framework would be better suited to continually reflect the ways asymmetry occurs in videogames.

Some ABs were categorised as Plausible. This should not be taken to mean that we are certain that these ABs cannot be found in current games – they might exist in lesser-known games, or simply games that we didn't have the opportunity to analyse. What distinguishes the ABs in this category from those in the Tentative category is: a) the degree to which their implementation would constitute a defiance of current game design trends; and b) how difficult it is for us to conceptualize what such a game mechanic would entail.

For instance, we can look at the Randomness—Feedback AB and envision a game where the method through which the player is given information about the game world is governed by random factors. This could be done in a game where one player can only see, while the other can only listen, by randomly determining which player gets each role at the start of each round of gameplay. Contrast this with a Time Frame—Interdependence AB, which we can envision to

³See Appendix A for a compilation of our findings.

involve the modulation of a player's dependence on other players depending on when that player is interacting with the game. We find a concrete implementation of this pairing to be more elusive to describe – which perhaps makes it an even more interesting prompt for designers to explore.

The purpose of our tentative and somewhat subjective Existent/Plausible/Tentative categorisation is simply to help us guide users engaging with our design tool. An inexperienced designer might have an easier time – and find more utility – in engaging only with more prevalent and easy-to-understand ABs. Thus, it might be beneficial for them to gain a solid understanding of the basics of our framework before gradually moving on to more complex pairings.

For scholars, this categorisation is also meant to guide future work on the topic: can they uncover the presence of our more esoteric ABs in current games where we were unable to do so? Or might it be found that, upon closer study, some of those Type—Vehicle pairings may indeed be impossible to reconcile, calling for a revision to our framework? Either way, we find that our pairings, obscure as some of them may be, can create fertile ground for the exploration of asymmetry in games, a feature that we believe is valuable at our current level of understanding.

6.3 Design tool

6.3.1 Goals

Our application, which can be accessed online,⁴ was designed with two main goals: 1) allowing users to learn about the different Types and Vehicles of asymmetry; and 2) combine them to arrive at Asymmetry Bricks. It was developed with the goal of acting as a standalone tool that doesn't require users to engage with our literature before they can utilise its features. In order to achieve this, we made it possible to navigate information regarding our categorisations within the tool itself. Upon creating an AB by combining two components, users can click either of those components to open a menu exposing a brief description of that component, as well as some practical examples of how it can exist in games.

Regarding the examples, we felt it could be beneficial to avoid references to already existing games, as this might discourage users from arriving at their own interpretation of how a particular Vehicle/Type of asymmetry might be designed into a game. Instead, we used more agnostic examples. For instance, to clarify how Asymmetry of Goal might be implemented, we offer the following examples:

- Games where each player has a different victory condition;
- Games where players decide which goals they wish to work towards.

These examples are purposely vague so as to allow the user to interpret them in a more flexible manner that we believe can be conducive to a more productive ideation session. Furthermore, they do not require prior knowledge of existing games in order to be understood.

⁴The tool can be accessed at <https://noiseminded.itch.io/asymmetrybricks>.

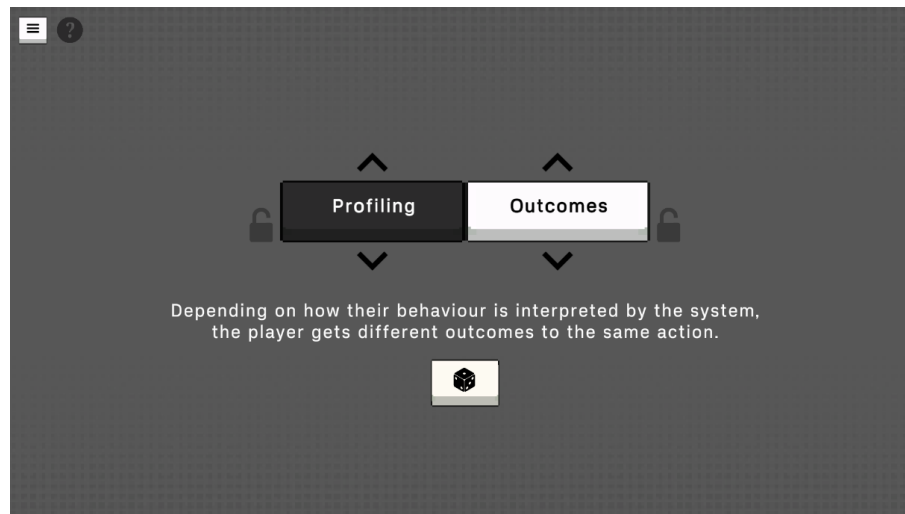


Figure 6.4: The Asymmetry Bricks design tool, displaying the Profiling—Outcomes Asymmetry Brick.

6.3.2 Technical considerations

Our application was developed using the *Unity* game engine.⁵ This was done due to practical reasons: firstly, *Unity* is our preferred tool for development, and we have a considerable level of experience with it; and secondly, *Unity* allows for easy deployment across a number of platforms. In our case, its capability to generate a WebGL build of our application is particularly appealing, as it allows us to make the tool available for use through a web browser, on a website with an already established user base of game developers and gamers: for this, we chose *Itch.io*.⁶ For a more detailed explanation of the features in the design tool, see Appendix B.

Our tool could also be implemented in an analogue format, such as a deck of cards. In fact, this format could potentially be more appealing to users meaning to participate in in-person group ideation sessions. However, we find that this approach would probably require inexperienced users to consult a paper manual in order to learn new information regarding each component, disrupting the flow of the experience. For the purposes of our research, we settled on the aforementioned digital alternative, as it can be more easily disseminated and accessible worldwide.

6.3.3 Intended use cases

We intend for our design tool to be employed by game designers during ideation sessions. Within this broad description, we find two different approaches: a) an exploration approach; and b) a problem-solving approach.

⁵*Unity* (<https://unity.com/>) is a cross-platform game engine developed by *Unity Technologies*.

⁶*Itch.io* (<https://itch.io/>) is a website where users can host, sell and download video games and other game-related software.

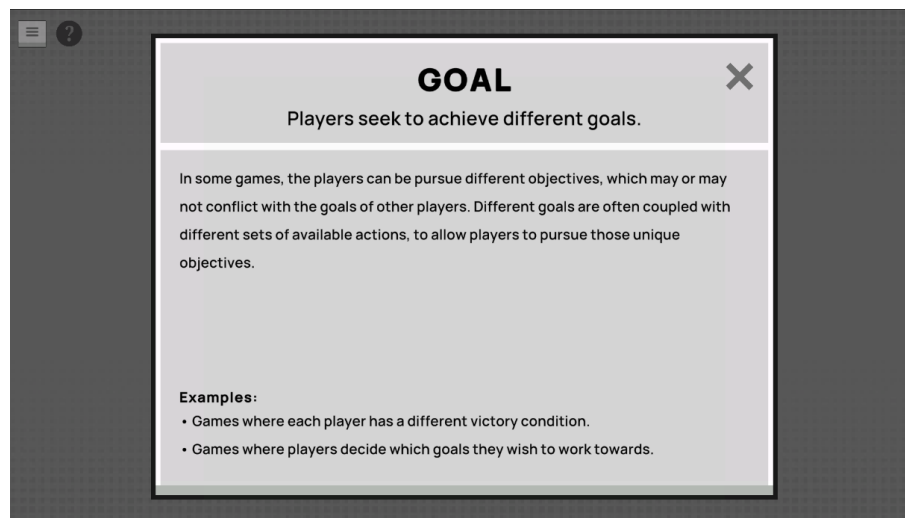


Figure 6.5: The Asymmetry Bricks design tool, displaying the component description for the Goal Type.

The exploration approach refers to cases in which game designers are freely ideating on a game concept, with the possibility of later expanding it into a working prototype or even a fully-fledged game. From our own experience analysing ABs, it was clear that a number of them posed a significant departure from current game design trends, in a way that could potentially allow those mechanics of asymmetry to become a distinguishing feature in a game’s design. Through this, we see our tool’s potential to allow designers to explore new implementations of asymmetry in ways that haven’t been done before.

Additionally, designers might also engage in what we may call remixing: start from an AB that is already prevalent, and change one of their components. For instance, the Progression—Ability⁷ AB has been thoroughly explored in games and has even become a staple of any game that boasts RPG elements in its features. But were we to modify this AB into a Progression—Information AB, we have suddenly arrived at fertile ground for exploration: what if the player had gradually more restricted access to information about the game state the more the game progressed? By modifying just one of the two components of the original AB, we have arrived at something that is both familiar and novel. We believe that this method of ideation can guide designers in a way that is valuable to their ideation processes.

In the problem-solving approach, the designer is attempting to address a specific design problem or to achieve an intended design goal. In pursuing this, the designer engages with our tool in a more constrained, targeted manner that serves their specific needs. For instance, a designer wishing to design a player profiling system for their game might start looking at the different ABs that can be constructed using the Profiling Vehicle. Three of them can be seen in Figure 6.6.

Conversely, the designer might decide they want to use Asymmetry of Ability between players and wish to explore different ways through which it may emerge during gameplay (Fig. 6.7).

⁷E.g., a player’s avatar’s abilities change over time as their character attains experience levels.

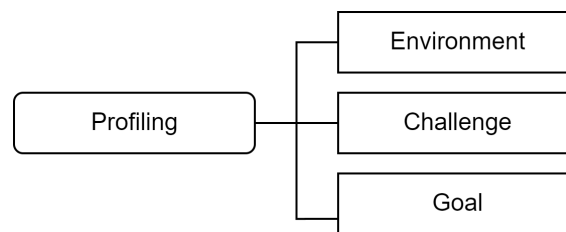


Figure 6.6: Some of the possible combinations using the Profiling component.

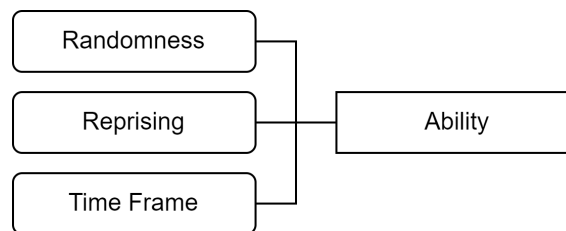


Figure 6.7: Some of the possible combinations using the Ability component.

From here, the designer can start to develop their ideas further, using the ABs as a prompt. We believe the variety of combinations that can be achieved – as well as the open-ended nature of each of those combinations – are valuable characteristics of an ideation tool.

Additionally, our framework aims to offer a structure that supports the ideation process by guiding designers through constraints. That is to say, instead of allowing for the full breadth of ideas that are typically allowed in brainstorming sessions, we aim to provide concrete constraints to foster creativity. The design processes we have proposed so far all begin at a macro level: the AB. Only after settling on an AB are designers tasked with ideating the specific practical implementation they want to pursue *within* that AB. This unburdens designers from attempting to ideate on a practical implementation from the start without any constraints and skipping the macro level entirely. We believe our approach will lead to focused – and thus, productive – ideation sessions.

Chapter 7

Evaluating the Design Tool

In order to evaluate our design tool – as well as its underlying framework – we exposed it to game designers. We wished to understand whether or not our target audience found our proposed ideation process to be understandable, easy to use, and, most of all, whether or not it would be useful to them in their game design practice. We achieved this through a series of workshops where users interacted with our design tool, followed by interviews where we collected their feedback. The following sections detail our methodologies, the results we arrived at, as well as a discussion of our findings.

7.1 Methodology

7.1.1 Workshops

In order to evaluate our design tool, we wanted to observe how game designers interacted with it and perceived it from a practical standpoint. Thus, we organised workshop sessions where participants were invited to exercise their brainstorming skills by participating in the iteration of a design tool by using it in practical exercises. Additionally, participants could potentially gain insight into asymmetry, which might be useful to the participants in future game design exercises.

As for our objectives, we wished to:

1. Ascertain the robustness of our framework of endogenous asymmetry;
2. Validate the effectiveness of our design tool;
3. Receive direct feedback from game designers, the target audience for our tool.

We will revisit these objectives in more detail when we address the interview process in the next section. For now, let us look at the workshops themselves, our participants, and the ways they were asked to interact with our framework and design tool.

In total, we had 12 participants in 11 workshops.¹ These were all game designers, ranging from students from higher education game development courses, to industry professionals as well as game design teachers. Most were reached via a call to action post in a game development online community,² with some being referrals from other participants.³

The workshops occurred remotely through *Discord*⁴ calls, with the goal of facilitating our access to industry professionals who might be more limited in time availability or geographically distant. We decided that one-on-one workshops would be our preferred approach, as it prevented any potential scheduling conflicts among participants and allowed us to delve deeper into the perspective of each participant while avoiding the disproportionate speaking times or the potential for bias that could arise in group sessions. Each session had its audio recorded for subsequent analysis.

Each workshop session had a duration of 90 minutes, distributed as such:

1. 10 minutes - Presentation;
2. 50 minutes - Practical Exercises;
3. 30 minutes - Interview.

Our presentation aimed to inform participants of our study of asymmetry. We started by presenting our definition of asymmetry and describing the difference between endogenous and exogenous asymmetry, informing participants that our focus would be the former. Afterwards, we gave an overview of our underlying categorisations: Types and Vehicles of asymmetry, offering some examples of practical applications of some components within those categories. Then, we introduced participants to our Asymmetry Bricks framework, explaining how Types and Vehicles can be combined in order to ideate on game mechanics.

The participants were not instructed regarding the individual Types and Vehicles of asymmetry aside from the brief oral descriptions given when offering examples of Asymmetry Bricks. This allowed us to later evaluate whether or not the tool was adequately prepared to teach users about the individual components of the Types and Vehicles categorisations.

Finally, we asked participants to open a link to the design tool application in their browser and to enable screen-sharing, so that we may better observe their usage of the tool. Users were then prompted to perform two game design exercises, which we will now describe.

¹We ran ten workshops with a single participant, and one with two participants. This was due to an unexpected opportunity to have one more participant in one of the sessions. In this workshop, each participant performed the exercises individually, only comparing their choices afterwards.

²*Game Developers PT* is a Portuguese game development online community on *Discord*.

³For instance, two game design teachers we contacted were interested in having their students participate in our workshops, and arranged for them to contact us in order to do so.

⁴*Discord* (<https://discord.com/>) is an instant messaging and VoIP social platform popular among gaming communities.

Exercise 1 – Recognizing Asymmetry Bricks

Through this exercise, we aimed to evaluate the participant's understanding of the framework. The participants were asked to have the design tool generate a random Asymmetry Brick for them, and then name a game with a game mechanic that corresponds to that Asymmetry Brick. The participants performed this exercise a total of three times.

Example:⁵

Participant presses the Roll button and the design tool presented them with a random Asymmetry Brick: Randomness—Ability.

Participant: “So, a game where the player can get access to different, randomly determined abilities? I think Mario Kart does this. It has power-ups that the player can pick up and get access to a random ability, like the Banana or the Green Shell.”

Aside from easing the participant into performing simple actions within the design tool, this simple exercise also allowed us to ascertain whether or not the participant understood the overall structure of the framework, as well as whether or not they were able to conceptualise practical implementations of different Asymmetry Bricks.

During this first exercise, the participants also started learning about the different components in the underlying categorisations by reading their text descriptions. Throughout this exercise and the next, if the participant seemed stuck, was misinterpreting the descriptions of a component, or described practical implementations that did not correspond to the Asymmetry Brick they were targeting, we took note of the incident and offered additional clarifications. We did this to maintain the flow of the workshop, while also observing which aspects of the framework and design tool had not been made clear, as they could be a result of, for instance, unclear text descriptions or overlap between different categories. After participants finished this exercise, they moved on to the next one.

Exercise 2 – Applying Asymmetry Bricks

In this more advanced exercise, we tasked participants with engaging with the design tool in a way that would be more akin to its intended practical use. Participants were given a series of design prompts and were asked to use the design tool to ideate on game mechanics that corresponded to those prompts. Here is the list of prompts used:

1. A strategy game in which players are slowly introduced to new gameplay elements, creating a steady stream of novelty;
2. A cooperative puzzle game in which two players of different skill levels can both feel like their contributions are valuable;

⁵Exercise examples are dramatised and not based on an actual workshop session.

3. A stealth game in which the player is motivated to repeatedly engage with the same levels;
4. An RPG where the players feel like their choices are meaningfully reflected in the game world.
5. An experimental multiplayer game that can be experienced in very unconventional ways.

To complete this exercise, the participants had to build their own Asymmetry Bricks with an intended goal in mind, and then ideate on a practical implementation of that Asymmetry Brick.

Example:⁶

The prompt is: “A strategy game in which players are slowly introduced to new gameplay elements, creating a steady stream of novelty.”

Participant: “Slowly introduced to new gameplay elements? This could be done with Progression. What Type of Asymmetry should I combine with it?” Participant locks the Progression Vehicle so that it stays in place, and presses the Roll button until they get a random combination they believe fits with the prompt: Progression-Challenge.

Participant: “My choice is Progression-Challenge. For instance, this could occur by having the player face new enemies as they progress their character, gradually presenting them with new types of challenges and maybe even encouraging the player to adapt their strategy.”

During this exercise, participants had to develop a more intimate knowledge of the different Types and Vehicles of asymmetry, reading multiple descriptions as they strived to find the best match for the given prompt. In performing this exercise, the participants engaged with the design tool in a practical way, which later allowed us to collect their feedback on the tool’s usability and potential benefits and pitfalls. Having performed both exercises, the participants were instructed to turn off screen-sharing and the interview process began.

7.1.2 Interview

In order to maintain a flexible approach and to better collect feedback on the participants’ experience with the design tool, we conducted semi-structured interviews. Our goal was to evaluate our framework and design tool regarding two main criteria: Intuitiveness and End-use. We divided these into several sub-criteria:

- **Intuitiveness:** Are the framework and our proposed ideation process easy to grasp?
 - **Comprehensibility:** Is the framework easy to understand?
 - **Discoverability:** Does the design tool allow users to discover new information regarding the framework?

- **Affordance:** Can users differentiate between the purpose of different elements of our framework?
- **Predictability:** Are users able to effortlessly interpret the tool’s output and use it to conceptualise practical mechanical implementations?
- **End-use:** Would our framework and design tool be useful to game designers?
 - **Utility:** Do designers see any benefit in using our framework and design tool?
 - **Usability:** Was our implementation of the design tool easy to use and appealing to game designers?

With these goals in mind, we developed a questionnaire⁷ composed of 18 questions that targeted each of the sub-criteria. Participants often provided answers that went beyond the original scope of the questions, which prompted unscripted follow-up questions in order to capture any feedback relevant to the criteria.

7.1.3 Content analysis

We conducted a conceptual content analysis of the interviews, which allowed us to interpret the participants’ feedback and translate that into themes relevant to our goals. We searched the interviews’ audio for phrases that were explicitly or implicitly related to our evaluation criteria and coded them referencing the timestamp in which they occurred. New codes were added throughout the coding process so as to flexibly capture the participants’ feedback. Occasionally, we revised the list of codes, with multiple codes with significant overlap being merged into a single one. The codes were numbered and grouped by the sub-criteria they related to and further separated into three categories:

- Pros – The code denotes a positive relationship with the sub-criteria it belongs to.
- Cons – The code denotes a negative relationship with the sub-criteria it belongs to.
- Other – The code refers to miscellaneous feedback that defies classification as positive or negative (i.e., suggesting new features, or offering considerations regarding a deck of cards version of the tool).

For instance:

The code “The framework’s functioning is clear” was classified to be a Pro in regards to the sub-criterion Comprehensibility, whereas the code “The framework’s functioning was not entirely clear” was classified as a Con. Codes such as “If available, the

⁷See Appendix C.

participant would like to use a deck of cards version of the design tool” were classified under Other. Note that not all sub-criteria have themes relating to the Other category.

Each code was then analysed according to the number of interviews it was present in (hereby referred to as the number of occurrences), and grouped into themes within the Pros and Cons of each sub-criterion. The themes represent our interpretation of the codes they contain, and are informed by the number of occurrences. For instance, a theme with a large number of code occurrences may make inferences regarding most participants, whereas a theme with a small number of code occurrences may describe something that only affected some participants. Ultimately, our code categorisation was structured as in Table 7.1.

Table 7.1: The structure of our code categorisation

Criterion	Sub-Criterion A	Pros	Theme 1	Code 1
				Code 2
			Theme 2	Code 3
				Code 4
		Cons	Theme 3	Code 5
				Code 6
			Theme 4	Code 7
				Code 8

Different themes ended up having a highly disparate number of codes, which we may attribute to differences in the number of questions we dedicated to each sub-criteria, but potentially also to the participants’ proclivity towards certain themes.

7.2 Results

We will now go over our results for the different sub-criteria, presenting the themes we were able to interpret from the data we collected. For a more comprehensive look into the individual codes, and their number of occurrences, see Appendix D.

7.2.1 Comprehensibility

Pros:

- The framework and the ideation process it entails are easy to understand.

Overall, the framework and the ideation process it entails were easy for participants to understand. As we will discuss when we address the Cons related to this sub-criteria, this does not mean that becoming proficient with the framework has no challenges. However, despite those challenges, participants were optimistic regarding their ability to become proficient with its ideation

process, if given more time to practise. A significant number of participants⁸ also expressed that the initial learning curve was easy to overcome, with some mentioning that our design tool facilitated the understanding of the tool by allowing them to use it in practical exercises.

Cons:

- To employ the framework, game designers need to become familiarised with the categorisations it hinges on. This makes it so the tool is harder to use at first.

In 8 out of 11 workshops, participants expressed that employing the framework necessitates familiarity with the underlying Types and Vehicles categorisations. This presented an obstacle when the participants began interacting with the design tool, as they had to learn the nomenclature by reading the text descriptions of each new component they encountered. Furthermore, participants expressed that conceptualising practical implementations of the different Asymmetry Bricks was not a trivial task, even if they understood the Asymmetry Brick itself. Some participants also felt that they would not be able to employ the framework independently without the aid of the interviewer, which leads us to believe that steps should be taken to improve the tool's onboarding process if we expect it to be easily comprehensible on its own.

7.2.2 Discoverability**Pros:**

- The design tool, through its component descriptions and accompanying examples, can adequately teach game designers new information regarding Types and Vehicles.

In 10 out of 11 workshops, it was expressed that the design tool was capable of teaching them about the underlying Types and Vehicles categorisations. We find this to be valuable, as our tool presents potential users with what could be a more appealing alternative to reading about the categorisations in academic publications or some other format external to the design tool application. By allowing game designers to learn the different Types and Vehicles of asymmetry while they engage with the design tool in a practical manner, we hope to facilitate their initial contact with the framework, after which they may choose to further delve into it.

Cons:

- The lengthy descriptions on some components can be off-putting to some users.

In 2 out of 11 workshops, participants noted that some component descriptions were too lengthy, and one even confessed that this made them rely more on the brief Asymmetry Brick description, and shy away from engaging with the individual component descriptions. We believe

⁸This feeling was expressed in 5 out of 11 workshops.

that this is not ideal, as it may prevent the users from obtaining more nuance and insight into our framework. This feedback signals to us that it is important to review the text descriptions within the design tool, so as to make them more accessible to users.

Other:

- Providing examples to describe the different components can be a double-edged sword: it may make it easier for users to visualise practical applications of the framework, but it may also condition their ideation process, as they may gravitate towards implementations similar to those examples.

Some participants made observations regarding the utility of including concrete examples – that is to say, examples that reference existing games – in the component text descriptions. Most commonly, they showed concern over the potential for the users to be conditioned by those examples, therefore leading to a more constrained ideation session. A participant also noted that concrete examples can have varying usefulness depending on whether or not the game designer is familiar with the games they reference. Even despite these hurdles, some participants still suggested having concrete examples available in order to facilitate the process of discovering and understanding the different components as they appeared.

7.2.3 Affordance**Pros:**

- Vehicles and Types, the blocks that constitute an Asymmetry Brick, are, to most participants, easily distinguishable from one another.

In 10 out of 11 workshops, participants were easily able to distinguish between Types and Vehicles, understanding the way they relate to one another within the context of an Asymmetry Brick. This is very positive feedback, as these broad categories are the cornerstones of our framework.

Cons:

- Some designers struggle to differentiate between Vehicles and Types, and also between some components within those two categorisations.

The distinction between Types and Vehicles was not so clear to some participants, with some even mentioning they had trouble delineating between components within the Types and Vehicles categorisations. This signals to us that it may be worth revising the component text descriptions within the tool, so as to reduce ambiguity.

7.2.4 Predictability

Pros:

- Eventually during the session, the participant became proficient enough with the process that they were able to combine different components with ease.

In 8 out of 11 workshops, participants expressed that at some point during the exercises, they were able to predict the implications of at least some Asymmetry Bricks as they appeared on the screen, without resorting to the component or Asymmetry Brick descriptions. This signals to us that those participants were reaching a point where they were capable of interacting with the tool and conceptualising Asymmetry Bricks without much effort. We believe this to be important as it can help maintain the flow of the ideation session, with the user not needing to stop to analyse the individual components, and instead shifting their focus towards each Asymmetry Brick as a whole and the game mechanics it may inspire.

Cons:

- Some designers took longer to envision the outcome of at least certain combinations.

In 2 out of 11 workshops, participants expressed some level of dependence on the text description in order to interpret at least some Asymmetry Bricks. One participant expressed that throughout the entirety of the session, they were unable to quickly interpret the Asymmetry Bricks as they appeared, and took more time to ascertain their implications. We can postulate some potential causes for this, based on the Cons themes of the sub-criteria we have already discussed. For instance, perhaps the length of the text descriptions prevented the participant from clearly understanding each component, or perhaps the distinction between Types and Vehicles was left unclear. For now, we can simply note that for some designers our proposed ideation process may be difficult to use proficiently.

7.2.5 Utility

Pros:

- The framework and design tool can be effectively used to guide ideation sessions.
- The framework provides nomenclature that game designers can use to both organise their thoughts and to better communicate them with other designers.
- The ideation process facilitated by the design tool is flexible enough to be used in different scenarios.
- The framework provides a new lens with which to analyse games and better understand asymmetry.

In 10 out of 11 workshops, participants expressed that our design tool and framework paved the way for a fruitful ideation process, and felt that they were able to adequately use it to arrive at solutions during the second practical exercise. The tool was seen as being advantageous in comparison to traditional brainstorming sessions, with some participants expressing that the two strategies could be used in tandem with one another. Our results also suggest that designers viewed the constraints posed by our design tool as a way to accelerate the ideation process.

We also see a significant number of code occurrences (6 in 11 workshops) relating to the framework's nomenclature as a potential facilitator of communication among designers. Some participants also mentioned that the framework helped them organise concepts that they were already familiar with from a practical standpoint (5 in 11 workshops).

Participants also saw value in our framework as a new way to analyse and understand asymmetry, and, in 6 out of 11 workshops, expressed that interacting with the framework offered them new insights regarding asymmetric gameplay.

Cons:

- For some designers, the tool is either too constraining or too vague. Furthermore, the tool relies on some prior knowledge of the game genre the designer is designing for.

In 3 out of 11 workshops,⁹ participants felt that the ideation process was too restrictive – or, contrarily, too open-ended – for some applications. We are unsure what to interpret from these contradicting perspectives, but it could be the case that variations on our ideation process with more or less constraints might be preferable to some designers. For instance, some designers might also benefit from being provided prompts for the theme or genre of the game, while others might prefer to ideate upon the different Types of asymmetry, and not full Asymmetry Bricks. We believe both of these options to be perfectly viable, and encourage future experimentation regarding this topic.

7.2.6 Usability

Pros:

- The design tool has useful features that allow the game designer to ideate with little friction.
- Most participants saw the design tool as a valuable tool for game designers.

Our results suggest that the participants saw our digital implementation of the design tool as having valuable features that responded well to their needs, with some participants even describing the tool as being fun to use. Also, in 9 out of 11 workshops, participants described our framework to be a valuable addition to their game design toolbox.

⁹This number represents a sum of the occurrences of the three codes that make up this theme (see codes B8, B16, and B20 in Appendix D).

Cons:

- Some participants had trouble adapting to a new workflow and/or found the workflow unappealing.
- Some designers may think of asymmetry as a feature exclusive to multiplayer games and thought the tool targeted those types of games.
- Some designers may not require the additional explanation provided by the Asymmetry Brick text description.

In 3 out of 11 workshops, participants expressed difficulty in utilising the design tool without reverting to their usual ideation process. These difficulties occurred in the second exercise, when those participants would first arrive at a solution to the prompts instinctively, and only then would create an Asymmetry Brick that would match that solution. We find this to be a difficult phenomenon to avoid, but it may be the case that with more familiarity with the framework, users would be able to more easily think in terms of the different Vehicles and Types, starting the ideation process at a more macro level, instead of immediately concerning themselves with a specific practical implementation. In any case, we do not believe that this phenomenon is necessarily problematic. After all, if we wish our design tool to be flexible in complementing the ideation process of game designers, we must be comfortable with the notion that it may be used in unexpected ways, or even combined with other methods of ideation. Thus, we encourage both designers and scholars to experiment with variations of our suggested ideation process, so that we may improve its usefulness and make it appealing to more game designers.

One participant felt that our design tool and framework targeted the design of multiplayer games. We find this to be potentially caused by the fact that asymmetry tends to be discussed only in relation to multiplayer games. In fact, that same participant had used the tool to conceptualise mechanics for single-player games in the second exercise of the workshop.

Finally, one participant felt that the Asymmetry Brick text description was a superfluous feature that they did not feel was necessary. However, the fact that a significant number of other participants valued or even heavily relied on this feature to interpret Asymmetry Bricks, signals to us that it may indeed be an overall beneficial feature to have.

Other:

- Some participants were interested in using the tool in other formats, namely a deck of cards and a mobile app.
- Some participants saw other ways to use our framework to ideate on game mechanics and suggested adding features that allowed for that.
- Some participants wished for features that could facilitate user onboarding.

Participants offered a number of suggestions regarding the design tool's usability. Most notably, a significant number of them expressed interest in using a deck of cards version of the tool, especially for in-person group ideation. Others preferred the accessibility of a digital format, with some suggesting the tool be implemented as a mobile app.

Other suggestions signalled to us that some participants were eager to modify and experiment with variations of our proposed ideation process. For instance, some suggested allowing users to work with multiple Asymmetry Bricks simultaneously, or being able to use multiple Types and Vehicles for a single Asymmetry Brick. One participant suggested allowing the addition of more Types and Vehicles of Asymmetry, should they discover them. Although these features seem like they would be valuable only to more advanced users, and would be premature to implement at this current stage, these may be interesting suggestions to consider for future work.

Finally, some other suggestions are related to the tool's user onboarding process, from adding a tutorial panel, to having toggleable game examples in the component descriptions, as well as attributing a name to the different Asymmetry Bricks, so as to make them more immediately recognizable. Overall, these suggestions seem to reflect the participants' need for an easier initial learning curve and motivate us to search for solutions to that challenge.

7.3 Discussion, limitations, and feedback implementation

By allowing designers to interact with our tool, we were able to extract valuable feedback regarding its utility for game design. Our results showed us that, overall, we have hit our goals: the framework and design tool allow designers to analyse and ideate on game mechanics in regards to their ability to promote asymmetry; and it does so in a way that is easy to understand and that designers see as being valuable to their practice.

We found the fact that some designers posited new and interesting ways of using the tool and the framework to be a testament of its potential for flexibility beyond the specific digital implementation we developed. Perhaps due to the fact that our proposed ideation process is so simple – combining two different items to create a third one – some of our participants were able to conceive of ways they could expand or modify that process (e.g., adding new components, or combining more than two at once). We find this to be highly desirable, as it allows different designers to use our framework to reach a method of ideation that works best for their preferences or the context in which they are working.

The tool is, however, not without its challenges. Its usage is highly dependent on the user's knowledge of the underlying categorisations. Although the tool allows users to learn about these categorisations gradually and in a practical manner, the initial learning curve may be discouraging to some users, as they attempt to understand and delineate the different Vehicles and Types. The ideation process facilitated by the tool may also present a departure from some designers' preferred methods of ideation, which in itself can be a compounding factor that further increases the complexity of learning and interacting with the new nomenclature.

In order to improve our tool's usability and better meet the needs of our target audience, we implemented some of our participant's suggestions, prioritising those that were repeatedly mentioned by different participants. Throughout the process of running workshops, the tool underwent several changes.¹⁰ Some were minor and related to specific ways the user interface behaved, while others consisted of new features that aided the participant in operating the tool (e.g., a glossary in which the participant could consult the different Types and Vehicles of Asymmetry).

A major change that was in part prompted by our interactions with workshop participants was a shift in the underlying categorisations. Before we arrived at the categorisations as we have described then in chapters 4 and 5, some components were misplaced within those categories. That is to say, some of what are now considered Vehicles were being thought of as Types. This was a result of the Vehicles categorisation being a later development in our research, which caused some features of asymmetry to be incorrectly identified as Types.

We ultimately moved Operation, Location, and Time Frame to the Vehicles categorisation, as those components describe ways through which asymmetry can emerge. Furthermore, we added the Environment Type, so as to reflect the ways that a player's location on the game world can more directly influence a player's gameplay experience, such as changes to their available in-game resources, NPCs, or any other surrounding gameplay elements. We believe the distinction between Location and Environment can lead to interesting gameplay mechanics in which the player's location and their surrounding environment are not predictably linked together. We believe these alterations to be marked improvements to the categorisations, and that may potentially ameliorate the difficulties some participants had in distinguishing between the different components.

Our iterative process of collecting feedback and converting it into positive changes to the tool added some ambiguity to our data. Since participants interacted with slightly different versions of the tool, their remarks concerning usability may have been influenced by these changes. Whenever possible, we attempted to reconcile their pre- and post-changes observations. For instance, one early participant suggested the addition of the glossary feature, and after that was implemented, later participants praised the feature. We coded both of these types of claims as "The glossary is a valuable feature".

Ideally, we would have multiple rounds of workshops, each with a different version of the design tool, so that we may have a more reliable perspective into the effect those changes had on the users' experiences. However, we found that it would be impractical to do this, as it would have meant that we would either have to:

- (a) run multiple workshops with each participant, which would have severely increased the time investment required for the participants. This would further limit the number of interested participants, especially those that are industry professionals and have less time availability;
- (b) greatly reduce the number of participants per iteration phase, which would lead to its own problems regarding the reliability of the data; or

¹⁰For a full version history of our digital tool, see Appendix B.

- (c) greatly reduce the number of iteration phases, which would limit our ability to make improvements to our tool and framework.

We are ultimately satisfied with our more flexible approach, considering that we are in the early exploratory stages of our framework and the ways it can be useful to game designers. Nevertheless, a more sophisticated and thorough analysis with a greater number of participants is an enticing avenue for further work regarding this topic.

Our interview and data analysis methodology was also challenged by the fact that the number of code occurrences for each theme does not tell the whole story. Codes that relate to answers to the scripted questions that were explicitly and consistently asked to our participants have, inevitably, a greater number of occurrences. Contrarily, topics of discussion that we did not anticipate while developing the questionnaire, and that were therefore unprompted, had a smaller number of occurrences. These codes ended up not being indicative of the opinions of the totality of participants. That is to say, we cannot be sure of whether or not the participants who didn't touch on those topics would have expressed similar or contrasting perspectives.

This, in conjunction with our small sample size, meant that our analysis of the interviews and our interpretation of its results had to be undertaken with a more conservative outlook. A code mentioned by the vast majority of participants was surely indicative of a trend in their opinions, but this was not always the case with codes that had a smaller number of occurrences. This was especially the case for codes that were unprompted and/or were not accompanied by a code that expressed the opposite opinion. An example of a pair of codes that we believe to be indicative of a trend in participants' opinions is:

- A1: It is easy to distinguish Types of Asymmetry from Vehicles of Asymmetry (expressed in 9 out of 11 workshops); and
- A2: It is challenging to distinguish Types of Asymmetry from Vehicles of Asymmetry (expressed in 2 out of 11 workshops).

Our results, while promising, are tentative in nature. A more sophisticated interview process would be advantageous in asserting with more confidence the opinions of game designers in regards to our framework and design tool. Nevertheless, and as stated, our findings fed into the development of our framework in a positive way by allowing us to identify and correct problems within the categorisations.

Conclusion

Summary

Through this research, we aimed to expand the understanding of asymmetry in games. Despite its considerable prevalence in games, we found that asymmetry is an insufficiently and inadequately discussed subject. It is acknowledged only in its most pronounced expressions and, prior to our contributions, even lacked a concrete definition.

When discourse regarding asymmetry is confined to what are commonly called “asymmetric games”, both scholars and game designers miss the full picture, because asymmetry exists as a spectrum. By discarding our subjective and arbitrary cutoff point that decides whether a game can be called asymmetric or not, we may broaden our perspectives and become free to analyse asymmetry in gameplay experiences in a more holistic way.

In our work, this allowed us to reach a concrete definition – one that doesn’t limit itself to only rigidly listing a number of different ways asymmetry can exist. It allowed us to analyse the way asymmetry can exist across a wider variety of games, as well as the methods through which it can be fostered during play. The end result was the development of our Types and Vehicles categorisations, which offer a lens through which asymmetry can be analysed.

From these categorisations, we built our Asymmetry Bricks framework, as a way to create the means to observe not only the different Types and Vehicles in isolation but also how games may use combinations of these two elements in order to give rise to asymmetry in gameplay experiences. Each of these combinations, the titular Asymmetry Bricks, concretely describes an expression of asymmetry: the type of asymmetry it fosters, and the mechanism through which it does so.

In order to bring game designers into the fold regarding our findings, we developed our framework in a way that allows it to also be used as a tool for ideation. We proposed an ideation process in which Asymmetry Bricks were used as prompts for the design of gameplay mechanics. In order to test it, we developed a digital application that participants could use to create and manipulate Asymmetry Bricks, while also learning about the underlying categorisations in a practical way.

Having tested this tool in a series of workshops, we realised its potential for aiding designers in the conceptualisation of game mechanics that foster asymmetry. The nomenclature and structure provided by the framework were described by our participants as having the potential to facilitate communication among designers. The ideation process we proposed allowed game designers to

reach solutions to design prompts, and was largely seen as a valuable tool for them to use in their game design practice. Moreover, the design tool is flexible, easy to understand, and its simplicity seems to encourage the development of new ways to expand upon our proposed ideation process, or even use it in conjunction with other tools.

Limitations and future work

Our research was challenged by the scarcity of literature surrounding the topic. As stated, asymmetric gameplay is currently regarded in a very restrictive way. This prompted us to examine asymmetry from a broader perspective. This means that while the research created the basis for future explorations regarding the topic, it could not hone in on more specific topics. To name a few examples:

- The gameplay dynamics that can arise from the different types of asymmetry and how they might influence the players' experiences;
- How players perceive and experience asymmetry in competitive vs. cooperative games;
- How the different types of asymmetry might influence the player's sense of agency.

These topics stem from our broader approach, diving into more specificity within our findings. We hope that our categorisations pave the way for future work so that we may gain further insight into asymmetry and the ways it influences gameplay.

Our broader approach also called for a great diversity of case studies. While we did search for and examine games that were categorised as being “asymmetric”, we had to examine other games as well. Our backgrounds as gamers were instrumental in the process of uncovering new Vehicles and Types of asymmetry. It was often the case that our experience playing a game – or our memories of playing it – would bring to our attention the existence of a new expression of asymmetry we hadn't yet uncovered. Only after that initial glimpse were we able to pursue more information by searching for games with similar features.

Our personal experiences as gamers, while valuable in this context, are informed by our own preferences and the games we have access to. Knowing this, it may very well be the case that we have failed to uncover some components that we would have recognised if we played different games. Fortunately, our categorisations should be able to adequately accommodate new Types and Vehicles of asymmetry, should they be uncovered in the future. Likewise, our framework, due to the fact that it hinges on those categorisations, is likely to be able to flexibly support the addition of new components.

Should our framework be further explored in the future by, for instance, attempting to relate different Asymmetry Bricks to the types of gameplay experiences they engender, our framework could be a useful tool for arriving at a specific intended experience. Designers would be able to use specific pairings to reach an intended design goal. However, to reach such an understanding

of the intricacies of how each of the pairings affects players' experiences would be a massive undertaking, especially since a lot of those pairings haven't yet been explored to a satisfactory degree. As such, this is a possibility that lies beyond the scope of our work, albeit one that we hope can be explored in the future.

As for our design tool, we have already touched on the limitations of our evaluation methodology.¹¹ While we have uncovered the potential of our framework as a tool for ideation, we acknowledge that it would be valuable to continue the development and testing of different variations of our proposed ideation process, so that we may understand its usefulness in different contexts.

We also see potential in the adaptation of our tool to an analogue format. In particular, some of our participants showed interest in a deck of cards version of the tool. For some designers, this approach might be more appealing, especially for in-person collaborative ideation sessions. Other participants suggested the tool be available as a mobile application. While this would entail a redesign of the tool's user interface, it would make it more practical to use in scenarios where our current implementation would be unsuitable.

Unexplored avenues for asymmetry

To conclude, we will discuss a number of opportunities for the development of our understanding of asymmetry in the design of games. These are applications of asymmetric gameplay that we believe merit additional exploration by game designers. We list these possibilities while acknowledging that their potential for practical implementation is currently hindered by the inherent difficulties associated with the development of asymmetric game mechanics. Nevertheless, we hope that these uncharted paths may one day be traversed by game designers in their explorations of asymmetry.

A game for everyone: Diversification of player roles

We have previously¹² touched the topic of player heterogeneity and how asymmetry can make a game appealing and accessible to a wider variety of players. Were we keen on maximizing this characteristic of asymmetric gameplay, the way to do it would be to emphasize the asymmetries present in a game by providing players with vastly different sets of gameplay mechanics. Of course, as we also discussed, this would entail a number of challenges to that game's development, exponentially increasing the resources required to design, implement and test its mechanics. As stated by Green, it is usually sensible not to strive for extreme degrees of asymmetry, and to instead attempt to reach a "sweet spot" (2019).

Putting these concerns aside, could it be valuable for some games to encompass a greater variety of unique sets of mechanics? In a sense, some games already do this but shy away from having more than two deeply asymmetric roles. Three asymmetric roles would exponentially

¹¹See section 7.3.

¹²See section 3.2.

increase the challenges related to developing such a game, but we argue that it may also result in a playground for even more interesting and complex player interactions. But how could this be feasible?

The first-person shooter *Dust 514* (2013), although a commercial failure,¹³ was an interesting approach to adding a second asymmetric role to its MMORPG predecessor *Eve Online* (2003), that was developed and released as a separate game. The two game worlds were interconnected: in-game battles in *Dust 514* would influence the *EVE Online* world and, in turn, *EVE Online* players were able to purchase orbital strike weapons to take part in *Dust 514* battles (Phillips, 2013). In effect, the two audiences were engaging with completely different sets of mechanics, and yet their actions would affect one another.

Perhaps game developers will yet explore the further diversification of player roles, and create game worlds that are richly complex and foster gameplay interactions between different demographics. What could a game where both elderly citizens and their grandchildren interact with one another look like? How would each of these groups interact with the game world in a way that caters to their capabilities and interests? Hopefully, game designers will start to explore these questions and strive for more inclusive game designs that appeal to a wider variety of people.

Reverse Entropy: From asymmetric to symmetric

In section 1.4, *Asymmetry beyond starting conditions*, we discussed how asymmetry can evolve over time. In particular, we discussed its tendency to increase as players make choices that differentiate their experience from others. To our knowledge, games haven't yet explored the opposite: going from endogenously asymmetric to symmetric.

Given that asymmetry often arises from the specificities of player action, this is not surprising. Players expect their choices to have an impact on their experience, and choices tend to result in some degree of branching in their experiences. For example, the more moves players are into a game of chess, the more likely they are to find themselves in a game state never before encountered.

We argue that it could be interesting to subvert this tendency when looking to convey some types of gameplay experiences. Something similar was achieved when some games¹⁴ sought to subvert the trope of character progression, by making the player character not stronger, but weaker as the player progressed through the game. By doing this, these games found ways to convey the experience of a struggling hero through their gameplay mechanics. Likewise, games that use a gradual progression from asymmetry to symmetry may provide gameplay experiences that deal with themes of, for instance, social inequality – e.g. a game that tasks players with resolving imbalances between them. We believe there is potential value in exploring these types of experiences that utilize asymmetry in a novel approach by reversing the way it typically evolves over time.

¹³The game was shut down on 2016 due to low player counts (Phillips, 2016).

¹⁴E.g., *Superbrothers: Sword & Sworcery EP* (2011) and *Resin* (2016).

Games for Social Change

Asymmetry is synonymous with inequality. Games with asymmetry can place players in a position where their gameplay experiences are distinctive in a way that emulates inequalities present in real life. Games that relate to topics such as income gap, gender inequality, or health disparities can lead the player to experience both sides of any particular issue. This, we believe, may add a level of contrast that better conveys a sense of disparity and motivates the player to seek solutions to those problems.

Furthermore, we argue that gamers can be acutely aware and critical of imbalances in power in games, often valuing fair gameplay experiences in which each player has an equal opportunity to succeed. A game in which this is not the case — and one in which real-life social dynamics are depicted in a convincing way for the player — may be a powerful way to convey the need for social change in a compelling way.

However, asymmetry can also be used to demonstrate that differences can be advantageous in our daily lives. Many games have already portrayed settings where a group of individuals can succeed only by cooperating, with each member contributing in unique ways. A Tank character in an MMORPG may be able to withstand unparalleled amounts of damage, but they will inevitably be defeated unless they have a Healer to replenish their health, and a Damage Dealer to defeat the enemies before the group's resources run out and they are eliminated. Interaction dynamics such as this can be analogous to those we find in real life, and much like in games, diversity can be a boon to society. Through asymmetric gameplay mechanics that foster collaboration between players with different toolsets, game designers may convey themes relating to diversity, which will surely be valuable in our heterogeneous society.

Games for the promotion of empathy

Asymmetry allows players to experience different roles and responsibilities. When players have the opportunity to engage with these different roles, they are granted the ability to better understand them, their strengths, and their weaknesses, through first-hand experience. In a sense, this is helpful to players from a strategic point-of-view: the better they understand the various roles available in a game, the more they can align their expectations of what to expect when interacting with players who perform those roles. For instance, in a competitive match of *StarCraft* (1998), a player who has experienced playing with the Zerg faction might be more aware of how to take advantage of that faction's weaknesses. In cooperative games, players who are aware of the intricacies of roles other than their own are better equipped to rely on those roles and cooperate more efficiently.

This sort of strategic form of empathy in which players seek to understand the affordances and struggles of other roles could motivate players to explore perspectives other than their own and be faced with a variety of challenges they may not have been aware of. In games such as those we described in the previous section, this could be used to foster empathy towards, for

instance, disadvantaged groups by having the player embody those roles and become aware of their struggles as well as their value to society.

Game Master-Player Dynamics

The role of the Game Master, as it exists in Tabletop RPGs, allows a game participant to mediate the experience of other players, both preemptively — by creating the content the player will be interacting with — as well as during run-time — by adjusting gameplay elements in response to the in-game actions of the players. Elsewhere, we referred to these as the preemptive and the intervention phases (Neto, 2016).

Rarely do games ever allow a game participant to mediate other players' experiences in both these phases.¹⁵ We find this to be an oversight, as the inclusion of a Game Master role could add a human element to the way games react to their players' actions, preferences, and needs. For instance, a Game Master could be able to identify that a group of players in a collaborative adventure game are exceedingly reliant on the choices and direction of one of their teammates and create the conditions for that player to be separated from the others, prompting the group to act with a greater sense of agency as they seek to rescue their friend. By allowing the Game Master to manipulate the course of the game flexibly, we could arrive at bespoke gameplay narratives that are less predictable and more aligned with the specific wants and needs of the players.

The implementation of this role – one that is usually deeply asymmetric to those of the other players – is no easy task. It would entail the design, development, and testing of systems that allow the user to craft gameplay experiences, manage in-game actors,¹⁶ and flexibly react to the players' actions – all of this in a way that is not too burdensome to learn and operate. Nevertheless, should this be accomplished successfully, we will have an opportunity to analyse how Game Master-Player interaction dynamics play out in the context of computer games, how they complement the automated systems designers employ to craft gameplay experiences, and whether or not they can be a valuable feature in other game genres beyond RPGs.

¹⁵ An example of a game that does allow this is *Sword Coast Legends* (2015).

¹⁶ Cardoso (2016, p. 93) defines actors as “entities that have the ability to act in, on, or within the game world”.

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Appendix A

Asymmetry Bricks in current games

The following pages contain a compilation of examples of games that feature an expression of the Asymmetry Bricks. They are classified as:

- **Existent** – We were able to find the asymmetry brick in at least one videogame.
- **Plausible** – We were unable to find the asymmetry brick in the games we analysed, but its implementation is plausible given current trends in game design.
- **Tentative** – The asymmetry brick could not be found in current games, and its implementation seems far-fetched or highly experimental.

Table A.1: Examples for the different Operation Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Operation	Ability	Depending on the actions they take, the player has access to different abilities.	<i>Cult of the Lamb</i> (2022)	In this game, the player is occasionally presented with the choice of adopting one of two Doctrines. Depending on the one they choose, they get access to different abilities. For instance, they may unlock the ability to perform a ritual that prevents their followers from eating or going hungry for three in-game days, or one that allows them to have a grand feast that refills their hunger and gives them some in-game currency.	EXISTENT
Operation	Challenge	Depending on the actions they take, the player faces different challenges.	<i>Hades</i> (2020)	Through the game's Heat system, the player can configure the difficulty of their game by enabling/disabling different conditions. For instance, Extreme Measures, when active, allows some enemies to perform a greater variety of attacks.	EXISTENT
Operation	Goal	Depending on the actions they take, the player pursues different goals.	<i>The Witcher 3: Wild Hunt</i> (2015)	Depending on the player's choices regarding how to act while pursuing this game's many questlines, they may be tasked with achieving different goals in order to complete one given quest.	EXISTENT
Operation	Responsibility	Depending on the actions they take, the player undertakes different responsibilities.	<i>Portal 2</i> (2011)	In this game Co-op mode., the two players often have to decide which responsibilities each one will undertake. For instance, in Course 1, Level 4, one player must enter a vertical maze, while the other controls the movement of platforms from the outside.	EXISTENT
Operation	Information	Depending on the actions they take, the player gets access to different information.	<i>StarCraft II: Wings of Liberty</i> (2010)	In this game, the information players have regarding the state of the game world is dependent on how frequently and effectively they send scouting units to explore the map and keep track of their enemy's actions.	EXISTENT
Operation	Interface	Depending on the actions they take, the player plays through different interfaces.	<i>Death Stranding</i> (2019)	When players are playing using a DualSense controller, the more weight a player chooses to carry on their back, the more resistant the controller's triggers will be to being pressed. Thus, the player's choice of carrying more or less weight influences the behaviour the interface they are using.	EXISTENT
Operation	Environment	Depending on the actions they take, the player has different gameplay elements on their environment.	<i>SCP – Containment Breach</i> (2012)	When the player equips an item called SCP-178, a pair of white stereoscopic 3D glasses, they will begin seeing enemies that were previously invisible and inactive. Upon unequipping the item, the enemies return to their invisible and inactive state.	EXISTENT
Operation	Interdependence	Depending on the actions they take, the player is more or less dependent on other players.	<i>Dota 2</i> (2013)	In this game, skilled players are capable of accruing large amounts of currency and increasing their power by eliminating less-skilled opponents. When the power differential between players increases to a large degree, more powerful players will be less dependent on the other elements of their team in order to accomplish their objectives.	EXISTENT
Operation	Outcomes	Depending on the actions they take, the player gets different outcomes to the same action.	<i>World of Warcraft: Wrath of the Lich King</i> (2008)	In some instances, the actions you take influence the outcome of other actions in the future. For instance, a Shaman player can guarantee a critical hit on a Lava Burst spell by casting Flame Shock on the same enemy beforehand.	EXISTENT
Operation	Feedback	Depending on the actions they take, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.2: Examples for the different Randomness Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Randomness	Ability	Depending on random factors, the player has access to different abilities.	<i>The Binding of Isaac</i> (2011)	In each playthrough, the items that the player can retrieve are randomly determined. These items greatly impact how the character, their projectiles, and even the enemies behave.	EXISTENT
Randomness	Challenge	Depending on random factors, the player faces different challenges.	<i>Tiny Tina's Wonderlands</i> (2022)	In the Chaos Chamber game mode, players must occasionally choose between two different randomly debuffs being applied to them. For instance, one might increase the number of traps in combat encounters, while another might decrease the player's damage.	EXISTENT
Randomness	Goal	Depending on random factors, the player pursues different goals.	<i>Xenoblade Chronicles X</i> (2015)	The game features a mission board where the player can accept jobs. The list of available job is randomly constructed from a large pool of pre-determined quests that tasks the player with gathering certain materials or defeating certain enemies.	EXISTENT
Randomness	Responsibility	Depending on random factors, the player undertakes different responsibilities.	<i>Throne of Lies: Medieval Politics</i> (2017)	At the start of the game, players are randomly assigned a class. Depending on their class, the responsibilities a player is expected to perform may vary greatly.	EXISTENT
Randomness	Information	Depending on random factors, the player gets access to different information.	<i>First Class Trouble</i> (2021)	In each round of this social deduction game, each player can retrieve Logs that grant them information regarding the other player's roles. At the end of each game round, the game will randomly select one of the Logs that was picked up by the players and make that information public. This means that some players will acquire new information, while others will not, creating situations where players have access to different information and have to either piece it together, or lie about it to other players.	EXISTENT
Randomness	Interface	Depending on random factors, the player plays through different interfaces.	N/A	N/A	TENTATIVE
Randomness	Environment	Depending on random factors, the player has different gameplay elements on their environment.	<i>Payday 2</i> (2013)	In the game, players must perform heists. The maps the heists take place in are mostly static, but have some random elements that will affect a player's experience. For instance, the item that they want to acquire might be in a different random location each time, or there may be surveillance cameras in randomly determined spots.	EXISTENT
Randomness	Interdependence	Depending on random factors, the player is more or less dependent on other players.	<i>Super Mario Party</i> (2018)	In some minigames, one player faces off against the other three players in tandem. The teams are randomly determined.	EXISTENT
Randomness	Outcomes	Depending on random factors, the player gets different outcomes to the same action.	<i>Borderlands 3</i> (2019)	Since the game randomly determines which rewards the players get for completing goals like defeating enemies, two players may have very different outcomes for the same action.	EXISTENT
Randomness	Feedback	Depending on random factors, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.3: Examples for the different Profiling Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Profiling	Ability	Depending on how their behaviour is interpreted by the system, the player has access to different abilities.	N/A	N/A	EXISTING
Profiling	Challenge	Depending on how their behaviour is interpreted by the system, the player faces different challenges.	<i>Metal Gear Solid V: The Phantom Pain</i> (2015)	The enemies adapt to the strategies the player uses most often. For instance, if the player is proficient at achieving headshots, the enemies will start wearing ballistic helmets that make them near-impervious to these attacks. If the player chooses to infiltrate enemy bases at night, the enemies will start carrying flashlights, or even night-vision goggles.	EXISTING
Profiling	Goal	Depending on how their behaviour is interpreted by the system, the player pursues different goals.	N/A	N/A	PLAUSIBLE
Profiling	Responsibility	Depending on how their behaviour is interpreted by the system, the player undertakes different responsibilities.	N/A	N/A	PLAUSIBLE
Profiling	Information	Depending on how their behaviour is interpreted by the system, the player gets access to different information.	N/A	N/A	PLAUSIBLE
Profiling	Interface	Depending on how their behaviour is interpreted by the system, the player plays through different interfaces.	N/A	N/A	TENTATIVE
Profiling	Environment	Depending on how their behaviour is interpreted by the system, the player has different gameplay elements on their environment.	<i>Silent Hill: Shattered Memories</i> (2009)	The game alternates between two different settings: a psychoanalyst's consultation where the main character is discussing their life and personality; and the town of Silent Hill, where the main character is searching for their lost daughter. The answers given during the consultation (which the player is likely to interpret as regarding them and not the main character) affect the locations in game world in various ways. For example, if the player has stated that they like to drink alcohol when they are nervous, they are likely to encounter a bar, whereas those who answer in the negative will encounter a diner instead.	EXISTING
Profiling	Interdependence	Depending on how their behaviour is interpreted by the system, the player is more or less dependent on other players.	<i>Elsword</i> (2007)	The game automatically marks players who don't contribute much in dungeons for a kick vote in order to prevent playering from being AFK or too reliant on the others' contribution. Should that player be kicked from the party, this means that the interdependence between current members of the party will become less asymmetric, since no player is entirely dependent on the others for the dungeon to be completed.	EXISTING
Profiling	Outcomes	Depending on how their behaviour is interpreted by the system, the player gets different outcomes to the same action.	<i>Silent Hill 2</i> (2001)	Upon completing the game, the player will be rewarded with different endings depending on their behaviour throughout the game.	EXISTING
Profiling	Feedback	Depending on how their behaviour is interpreted by the system, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.4: Examples for the different Location Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Location	Ability	Depending on their location in the game world, the player has access to different abilities.	<i>Jak and Daxter: The Precursor Legacy</i> (2001).	In this game, there are Eco Vents located in select locations in the game world. Depending on the colour of the Eco in a particular vent, the player temporarily acquires different abilities by walking on top of it. Thus, the player has access to different abilities depending on their location in the game world.	EXISTING
Location	Challenge	Depending on their location in the game world, the player faces different challenges.	<i>Call of Duty: Warzone</i> (2020)	In this game, players can land in different locations in the game world. Depending on where they choose to do so, they may find varying quantities of items, and encounter more or less players competing for those same resources.	EXISTING
Location	Goal	Depending on their location in the game world, the player pursues different goals.	<i>World of Warcraft</i> (2004)	In this game, different regions of the map will have different quests available to the players, therefore influencing the goals a player might be pursuing in a given gameplay session.	EXISTING
Location	Responsibility	Depending on their location in the game world, the player undertakes different responsibilities.	<i>Battlefield 4</i> (2013)	In multiplayer gamemodes, players are grouped in squads, and can be issued orders by another player. These orders are typically associated with the position the squad is currently holding on the map. For instance: they may be tasked with defending a nearby location from an enemy attack.	EXISTING
Location	Information	Depending on their location in the game world, the player gets access to different information.	<i>StarCraft II: Wings of Liberty</i> (2010)	Some maps have Xel'naga towers, structures that grant a wider viewing area to units that are near the tower's location.	EXISTING
Location	Interface	Depending on their location in the game world, the player plays through different interfaces.	N/A	N/A	TENTATIVE
Location	Environment	Depending on their location in the game world, the player has different gameplay elements on their environment.	<i>Minecraft</i> (2011)	As players explore the procedurally generated game world, they encounter different biomes, each having their local fauna and flora.	EXISTING
Location	Interdependence	Depending on their location in the game world, the player is more or less dependent on other players.	N/A	N/A	PLAUSIBLE
Location	Outcomes	Depending on their location in the game world, the player gets different outcomes to the same action.	N/A	N/A	PLAUSIBLE
Location	Feedback	Depending on their location in the game world, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.5: Examples for the different Time Frame Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Time Frame	Ability	Depending on when they are interacting with the game, the player has access to different abilities.	<i>Boktai: The Sun Is in Your Hand</i> (2003)	The game used a light sensor on the cartridge which encouraged playing parts of the game in direct sunlight. In order to charge their weapons, the player must take their Game Boy Advance outside in the daytime. If their gun's battery runs out at night, the player must wait until the next day in order to be able to recharge and use their weapons again.	EXISTING
Time Frame	Challenge	Depending on when they are interacting with the game, the player faces different challenges.	<i>Microsoft Flight Simulator</i> (2020)	The game simulates the current time and weather of the real world. In result, depending on when the player is playing the game, the same flight may occur during the day or at night, which brings its own set of challenges.	EXISTING
Time Frame	Goal	Depending on when they are interacting with the game, the player pursues different goals.	N/A	N/A	PLAUSIBLE
Time Frame	Responsibility	Depending on when they are interacting with the game, the player undertakes different responsibilities.	N/A	N/A	TENTATIVE
Time Frame	Information	Depending on when they are interacting with the game, the player gets access to different information.	<i>Dark Souls</i> (2011)	In this game, players can interact asynchronously by leaving messages in the game world to guide other players. The messages that appear in one player's game are those written by the players that played that interacted with the game before that player. Therefore, depending on when a player is interacting with the game, different messages can be seen, and the player can have more or less information to guide him during their playthrough.	EXISTING
Time Frame	Interface	Depending on when they are interacting with the game, the player plays through different interfaces.	N/A	N/A	TENTATIVE
Time Frame	Environment	Depending on when they are interacting with the game, the player has different gameplay elements on their environment.	<i>Pokémon GO</i> (2016)	Depending on the time when the player is playing the game, they will encounter different Pokémon.	EXISTING
Time Frame	Interdependence	Depending on when they are interacting with the game, the player is more or less dependent on other players.	N/A	N/A	TENTATIVE
Time Frame	Outcomes	Depending on when they are interacting with the game, the player gets different outcomes to the same action.	<i>1-2-Switch</i> (2017)	In the Quick Draw minigame, the first player to point the controller towards their opponent after a specific sound cue wins the duel.	EXISTING
Time Frame	Feedback	Depending on when they are interacting with the game, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.6: Examples for the different Progression Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Progression	Ability	Depending on their avatar's progression, the player has access to different abilities.	<i>Sekiro: Shadows Die Twice</i> (2019)	The player unlocks new combat techniques by spending Skill Points, that are acquired as they level up.	EXISTING
Progression	Challenge	Depending on their avatar's progression, the player faces different challenges.	<i>Darkest Dungeon</i> (2016)	In this game, the player-controlled don't always become stronger as time goes on. When exposed to the game world's dangers, the characters can also become afflicted with negative traits that hinder their abilities. For instance, a character with Phengophobia will be more susceptible to Stress whenever the party's torch is too bright, encouraging the player to have the party travel with less light, which itself can have some negative repercussions.	EXISTING
Progression	Goal	Depending on their avatar's progression, the player pursues different goals.	<i>The Elder Scrolls V: Skyrim</i> (2011)	As the player's avatar progresses, games often introduce new goals that the player can strive for. In Skyrim, the Pieces of the Past questline only triggers after the player character has reached level 20.	EXISTING
Progression	Responsibility	Depending on their avatar's progression, the player undertakes different responsibilities.	<i>World of Warcraft</i> (2004)	In most MMORPGs, choices that players make regarding the progress of their characters will often inform which responsibilities that player can undertake in the game. In World of Warcraft specifically, a Paladin character could be expected to perform all three roles of the Tank-Healer-Damage Dealer triad, depending on how the player chose to progress their character throughout the levelling process.	EXISTING
Progression	Information	Depending on their avatar's progression, the player gets access to different information.	<i>Agar.io</i> (2016)	In this game your avatar progresses by eating orbs and other players' avatars. This makes your avatar grow in size and expands its field of view. In result, players whose avatars are in advanced stages of progression can see further around them, and use that information to pursue or avoid other players.	EXISTING
Progression	Interface	Depending on their avatar's progression, the player plays through different interfaces.	<i>Death Stranding</i> (2015)	When the player character places cargo on their back, the PS5 controller's adaptive triggers (which are used to adjust the balance of the backpack) become harder to press, in order to simulate the effort the main character is exerting to move the added weight around. When the player unlocks and equips an exoskeleton system, the character becomes able to carry heavier weights, and the tension on the controller's triggers eases up.	EXISTING
Progression	Environment	Depending on their avatar's progression, the player has different gameplay elements on their environment.	<i>Bloodborne</i> (2015)	As players explore the world and defeat enemies, they gain a resource called Insight, which allows them to see and hear enemies when they previously wouldn't.	EXISTING
Progression	Interdependence	Depending on their avatar's progression, the player is more or less dependent on other players.	<i>League of Legends</i> (2009)	In this game, one skilled player can outpace the others, and evolve their character to become so strong that they are much less dependant on their teammates' performance to achieve their goals.	EXISTING
Progression	Outcomes	Depending on their avatar's progression, the player gets different outcomes to the same action.	<i>XCOM: Enemy Unknown</i> (2012)	Games in which random factors can help determine outcomes, often allow players to affect their odds through character progression. In XCOM, the player characters' class and rank determine their Aim score, which affects their odds to land attacks on enemies.	EXISTING
Progression	Feedback	Depending on their avatar's progression, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Table A.7: Examples for the different Reprising Asymmetry Bricks in current games.

Vehicle	Type	Description	Game	Example	Class.
Reprising	Ability	Through the repetition of similar sections of a game, the player has access to different abilities.	<i>The Binding of Isaac</i> (2011)	In this game, a lot of the items that change the player's abilities can only be found in subsequent playthroughs, after the player unlocks them at the end of a playthrough.	EXISTING
Reprising	Challenge	Through the repetition of similar sections of a game, the player faces different challenges.	<i>MicroWorks</i> (2023)	The game is played over a series of rounds in which up to 16 players compete against each other in a variety of challenges, from traversing a hedge maze, to quickly typing a word that appears on the screen.	EXISTING
Reprising	Goal	Through the repetition of similar sections of a game, the player pursues different goals.	<i>Diablo III</i> (2012)	In the game, player's can repeatedly complete Bounties in order to receive valuable items. These are short quests with random objectives, ranging from defeating a particular boss to completing a predeterminate in-game event.	EXISTING
Reprising	Responsibility	Through the repetition of similar sections of a game, the player undertakes different responsibilities.	<i>Throne of Lies: Medieval Politics</i> (2017)	In this social deduction game, each player gets a random secret role at the start of each match. Each of the roles, by nature of their specific abilities and goals, can have a very specific responsibility in the context of the game. For instance, the Prince player is a part of the Blue Dragon team, and is expected to use their exclusive Imprison ability to privately interrogate one player each round. This gives other Blue Dragon players with important information a chance to transmit that information to someone who is guaranteed to be a member of their team. By repeatedly engaging with the game, players undertake the different responsibilities associated with each role.	EXISTING
Reprising	Information	Through the repetition of similar sections of a game, the player gets access to different information.	<i>Final Fantasy X-2</i> (2003)	The AI Bhed, a tribe of NPCs spread across the game world, speak in a unique language that appears garbled to the player. As the player interacts with these NPCs, they receive AI Bhed Primers, a type of item that translates one letter from the alphabet from AI Bhed to English. Only by accruing these items will the player be able to understand the dialog from those NPCs. Moreover, these items are transferred to subsequent playthroughs of the game, allowing the player to continue working towards their collection and to better understand even the early-game NPCs whose speech was almost completely garbled on the first playthrough.	EXISTING
Reprising	Interface	Through the repetition of similar sections of a game, the player plays through different interfaces.	N/A	N/A	TENTATIVE
Reprising	Location	Through the repetition of similar sections of a game, the player has different gameplay elements on their environment.	<i>Remnant II</i> (2023)	Upon starting a new game, players are placed into a random location. In effect, this means that subsequent playthroughs may have players encountering in-game locations in different orders.	EXISTING
Reprising	Interdependence	Through the repetition of similar sections of a game, the player is more or less dependent on other players.	N/A	N/A	TENTATIVE
Reprising	Outcomes	Through the repetition of similar sections of a game, the player gets different outcomes to the same action.	<i>Super Smash Bros. Melee</i> (2001)	With the Handicap system set to Auto mode, the game will dynamically adjust the power of each player in local multiplayer based on the outcomes of the match. This means that if a player is winning repeatedly, their attacks will become less effective with each win, effectively modifying the outcomes of their actions.	EXISTING
Reprising	Feedback	Through the repetition of similar sections of a game, the player experiences the world through different kinds of feedback.	N/A	N/A	TENTATIVE

Appendix B

Technical Description of the Design Tool

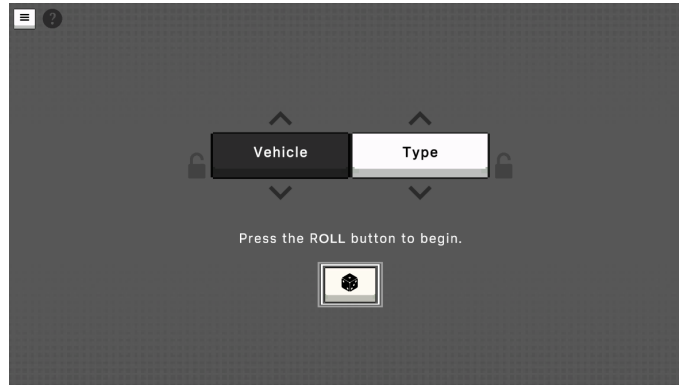
In the following pages, we will describe the features implemented in our design tool, presenting a detailed explanation of its functioning. We also include a version history of the changes made to the tool. The tool can be accessed online through its *Itch.io* page.¹

¹<https://noiseminded.itch.io/asymmetrybricks>.

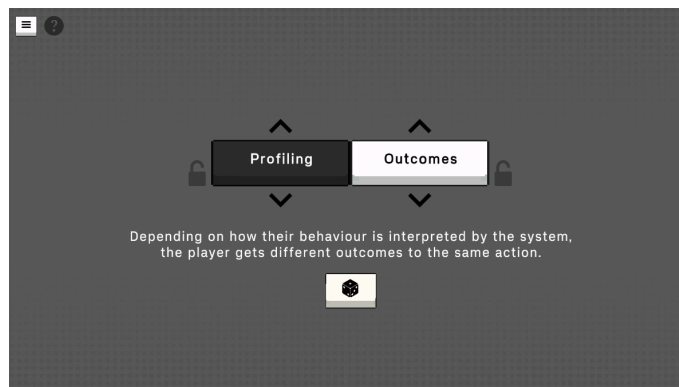
B.1 Features

B.1.1 Random Generation of Asymmetry Bricks

The main screen of the design tool has a *ROLL* button that, when pressed, provides the user with a randomly determined Asymmetry Brick (AB), by combining a Vehicle with a Type of Asymmetry.



(a)



(b)

Figure B.1: (a) The main screen of the design tool, as it is presented to the user upon startup. (b) After the user pushes the *ROLL* button, an animation plays and they are presented with a new Asymmetry Brick.

When an AB is being displayed on the screen, users are provided with a short description of the AB in question. They can also click either of the Vehicle or the Type buttons (in Figure B.1, these are the rectangles that say Profiling and Outcomes, respectively), to open a description of the component in question (Figure B.2).

By being able to access descriptions of the components they are working with, users can discover and learn about new components as they use the design tool.

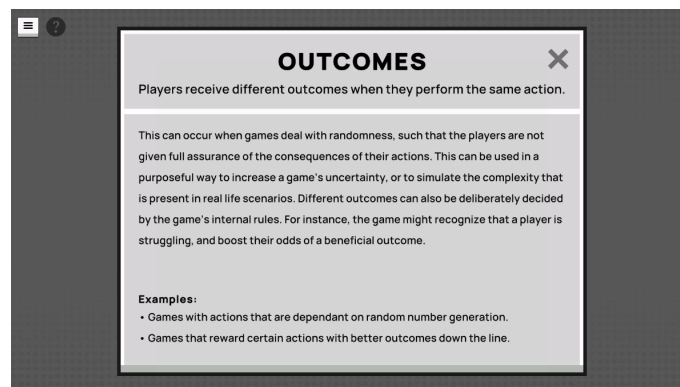


Figure B.2: The component description for the Outcomes Type.

B.1.2 Manipulation of Asymmetry Bricks

Aside from being able to generate ABs randomly, users can also manipulate them in more deliberate ways. One way of doing this is by using the Lock buttons on either of the components on the screen. Once one of the components is locked, only the other one will be randomised when the user presses the *ROLL* button again.

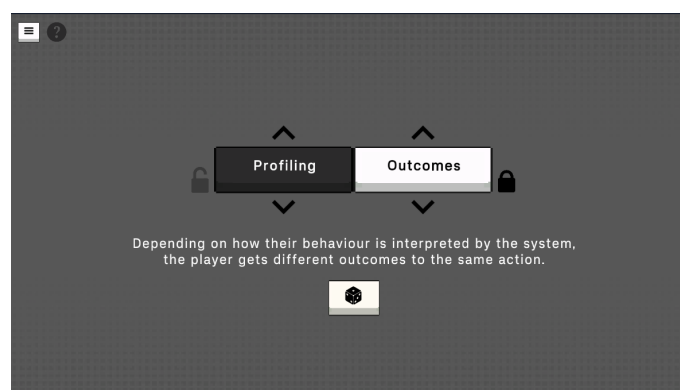


Figure B.3: The Outcomes component has been locked, as shown by the Lock icon next to it. Upon clicking the *ROLL* button, only the Profiling component will be substituted.

Users can also use the arrows above and below each component to change that component to a different one. By doing this, users can navigate different combinations one by one, without getting the unwanted repetition that they could get if they used the *ROLL* button.²

The final way that users can manipulate the active AB is by selecting components from the Glossary. We will describe this in greater detail in the next section.

²That is to say, by randomly rerolling the component, the result would sometimes be something the user had already encountered, which might hinder their navigation through all of the components.

B.1.3 Glossary

By clicking the top-left icon of the main screen, users can access the Glossary, which lists all of the Types and Vehicles that they can access (Figure B.4).

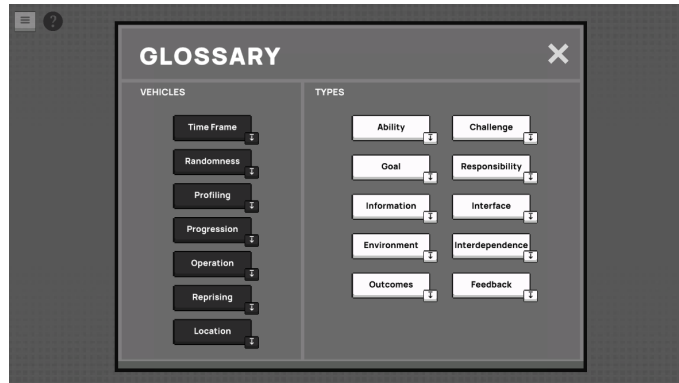


Figure B.4: The Glossary panel.

Each of the different items on this screen can be clicked to open a description of that component. By interacting with this screen, users can get an overview of our categorisations, which might help them reach their intended AB more easily. Should the user decide that they want to include one of the components on this screen in their AB, they can click a secondary button next to the component. This plays an animation of the component travelling to the AB on the main screen and changes the AB to include that component.

B.1.4 Help Panel

By placing the cursor over the '?' icon on the main screen, users can activate the Help panel, which presents an overview of the elements on the screen (Figure B.5). More concretely, it conveys to the user which of them is the Vehicle and which is the Type, and explains how these two relate to each other to form an AB.

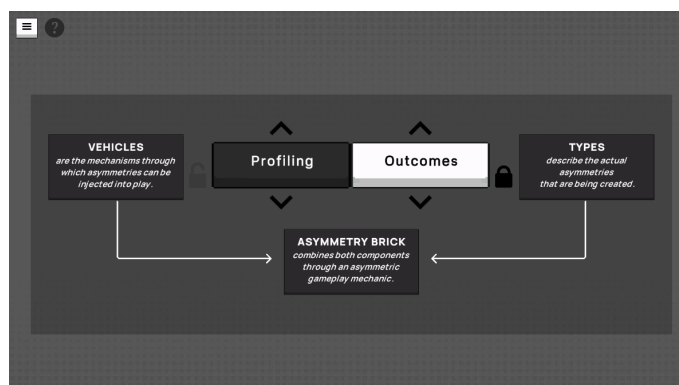


Figure B.5: The Help panel.

B.2 Version History

v1.0.0

First version. List of features:

- Random generation of ABs;
- Component description Panel;
- Lock button.

v1.1.0

Changes:

- Added buttons for cycling through the different components;
- Added Glossary;
- Visual changes.

v1.2.0

Changes:

- Updated the tool to match changes in categorisations;
- Added Help panel;
- Minor UI changes.

v1.3.0

Changes:

- Added the feature of selecting components directly from the glossary;
- Updated the tool to match changes in categorisations;
- Revised the texts in the component descriptions;
- Minor UI changes;

Appendix C

Workshop Interview Questionnaire

Table C.1: Workshop Interview Questionnaire.

Intuitiveness	Comprehensibility	What, if anything, were you uncertain about when it comes to the way the framework is structured?
		Were the goals of the framework easy to understand?
		Was the functioning of the framework easy to understand?
		How would you describe the framework's learning curve?
		What would you say is the most complicated part of the framework and the design tool?
	Discoverability	While using the design tool, did you feel like you were able to discover new information regarding the framework?
	Affordance	Was the purpose of each element of the framework clear?
		Can you differentiate between types and vehicles of asymmetry?
	Predictability	Were you able to predict the result of the different combinations of elements?
End-use	Utility	Was there any new kind of insight this framework gave you which you had not previously experienced? What was that?
		Did you feel like you were able to use Asymmetry Bricks to reach solutions for the proposed design goals?
		If you were asked to perform the exercises without the use of this framework, what would your process look like?
		When it comes to ideating on asymmetric gameplay mechanics, do you feel like this framework offers some advantages in comparison to a traditional brainstorming session?
	Usability	We decided to build this design tool in <i>Unity</i> , so as to have it available online and accessible through a browser. Do you wish we had chosen another format for this?
		What changes, if any, would you suggest to improve this tool?
		Which features do you believe would be important to add to this tool?
		Are there any features that seem superfluous and not useful?
		Do you see yourself using this framework during your game design process? Why?

Appendix D

Data collected from the Interviews

For a closer look into the data collected from the workshop interviews, see file "AppendixD_DataCollectedFromInterviews.xlsx" in attachments.