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AN ANALYSIS OF VERBS WITHIN VIDEO GAME STRUCTURES BASED ON A VIDEO GAME VERB THEORY AND *THE SECRET OF MONKEY ISLAND*

MA THESIS

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ABSTRACT

The aims of this thesis are as followes: to provide a review of the idea presented by three game designers – Chris Crawford, Raph Koster and Anna Anthropy – according to which, verbs should be used to describe the interactions and inner rule structures of video games; present these ideas as a unified theory of verbs within game structures; provide a method for analysing these verbs through syntactic theory presented by Bas Aarts and Van Valin and LaPolla; apply the combined theory of verbs in game structures and the methodology and concepts from syntax to analyse the verbs in the structure of the 1990 point and click adventure game *The Secret of Monkey Island* and its 2009 *Enhanced edition*.

The thesis consists of an introduction, three core chapters, and a conclusion. The introduction of the thesis presents the current situation of video game studies and what role linguistics play in studying video games.

Chapter 1 presents the theories of the three game designers in the context of video game studies. The three accounts are unified into a general theory of verbs within game structures. Chapter 2 presents the syntactic theory of Aarts, and Van Valin and LaPolla to support the combined theory of verbs within game structures with linguistic theory and terminology. Chapter 3 carries out a formal analysis of the interactive and core input verbs of *Monkey Island* to show how the idea of analysing game structures through verbs can be put to use with the combined theory of game design, game studies and linguistics.

The main findings of the thesis are provided in the conclusion

ABBREVIATIONS

2D – Two-dimensional

3D – Three-dimensional

FPS – First-Person Shooter

GUI – Graphical User Interface

NPC – Non-Player Character

RPG – Role Playing Game

INTRODUCTION

In the article *Digital Natives, Digital Immigrants*, Marc Prensky (2001) states "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach". Prensky builds his claim on the rapid technological improvements of the late 20th century, stating that the students of today represent the first generations to grow up with technology such as computers, video games, music players, video cameras, cell phones, the Internet, etc. The average student of today has spent less of their lives reading than playing video games or using digital media. This fundamental change has created a situation where the students of today think and process information differently, effectively making them "native speakers" of the digital language of computers, video games and the Internet, distinguishing them from the previous generations of digital immigrants who had to learn this skill later in their lives. As the generation of digital natives matures, they bring their way of thinking to the scholarly circles, ushering in new academic studies and forms of research that reflect these cultural and technological changes.

One such example would be the relatively new research field of video game studies that aims to analyse and explicate video games as a digital medium. Before the 21st century, the dominant form of researching video games was to use the methodology of narratology developed for researching narrative media such as literature or films. The pioneering text in this area is the 1997 book *Cybertext* by Espen Aarseth, who attempted to analyse digital texts such as hypertext fiction and text-based adventure games through the communication model of classical narrative (Ryan 2006: 122). His work showed that these new forms of "digital literature" can still be analysed with the methods of narratology when seen as dynamic texts where the reader must interact with the text to create a literary sequence.

The publishing of *Cybertext* sparked a controversy among a group of game theorists known as "ludologists" and gave rise to the so called "ludology vs narratology" controversy.

The ludologist camp maintained that video games are primarily games and not narratives (Ryan 2006: 183). The dominant ludologists – Gonzalo Frasca (1999), Jesper Juul (2001) and Markku Eskelinen (2002) – attempted to propose a new methodological approach to study games and game structures as a parallel discipline to or one that is at least connected to narratology (Aarseth 2014: 212). Due to this controversy, the early years of video game studies were focused on mapping video games as a separate cultural medium from literature and films and developing a ludic research methodology for these digital games.

The term ludology was coined by Gonzalo Frasca in his 1999 essay *Ludology Meets Narratology* after the Latin word for game, *ludus*. In the essay, Frasca maintains that *narratology* was developed to unify the studies that scholars from different disciplines were conducting on narratives and that video games are also being studied by broadly different disciplines such as psychology, sociology, anthropology, etc. The problem with this situation is that the scholars of different disciplines focus on minor or secondary characteristics of video games and do not study the essence or ontological nature of video games. Frasca's essay was ground-breaking in that it was one of the first to call for the study of video games as games and not as narratives. Frasca (1999) introduced the terms *paidea* (the Greek word for *play*) and *ludus* (the Latin word for *game*) with the former being a pleasure generating activity, which has no defined objective or goal and the latter being an activity organised under a system of rules with a result of victory or defeat. An act of *play* would, for example, be a child playing house or doctor. Any game with determined rules, be they sports games, board or video games, are *ludus* games. Video games are a mix of both game and play, as they are games with set rules and winning conditions, but unlike traditional games like checkers or chess, they also tend to employ elements of play by introducing narrative settings and characters into game situations. Due to elements of play, it is also possible to study games as narratives, but the narratives produced by games are

essentially different from narratives in films and literature. Therefore, the main interest of ludologists was to prove that video games were primarily games with any kind of narrative being a secondary element.

Regardless of the turn-of-the-century debate between ludologists and narratologists, video game studies have yet to develop a single unifying research methodology to call their own. Most video game scholars of today would agree that video games should be studied from a multidisciplinary perspective. Ludologists were successful in demonstrating that video games are different from other forms of narrative media, but these works have also had a somewhat stagnating effect on video game research. According to Anderson (2013: 291), the ludology vs narratology debate has brought along with it a certain "ludic anxiety", meaning that many academic works written on video games are still engaged in a struggle to define what makes video games different from other media. Anderson thinks that this anxiety is in the way of proper game research because most ludic works cannot discuss video games without getting stuck in attempting to define their nature, while narrative studies take the nature of video games for granted and investigate them without prejudice.

Despite the anxiety and focus on defining the nature of video game, there has been relatively little purely "ludic" video game research and most works studying video games are still written from interdisciplinary perspectives. Surdyk (2008: 265) states that it is difficult to see ludology as an independent academic discipline when at academic conferences, video game studies are mainly represented by literary scholars, educational scholars, historians, philosophers, cultural researchers, lawyers, economists, etc. This is further echoed by Aarseth (2014: 185; 186) who called the project of ludologists a failure, as they all used narrative theory in their approaches to games, proving that a monolithic discipline for game studies is unrealistic, as the object of game studies is not one, but consists of many aspects such as studying games as either aesthetic objects or texts, social processes

or technologically designed systems. These perspectives require different methodologies from different disciplines that would benefit from each other's findings. Therefore, as suggested by Anderson (2013), it is more beneficial for game studies to analyse games not only as games, but from as many academic perspectives as possible to formulate a natural basis for video game scholarship. Just like Prensky, Anderson (2013: 299) predicts that as more students who grew up with video games (born from 1980 onwards) receive their degrees, the more dissertations will be written on games from different disciplinary perspectives, helping alleviate the ludic anxiety through taking the cultural standing of video games for granted.

The present thesis aims to add to the multidisciplinary nature of video game research by attempting to provide a review of a relatively little-discussed theory of verbs as a core component of video game structures. Verbs are words that describe events like actions, states, processes, occurrences, and as such are a phenomenon tied to language, which is studied by the field of linguistics. Unlike ludic game structures or literary narratives, the elements of language in video games or formal language within game structures have not garnered as much attention from video game theorists as other aspects of games. This does not mean that video games have not piqued the attention of linguists as there are aspects of games that are analysed by the discipline of linguistics. Surdyk (2008: 266) claims that the largest professional groups of guests of Polskie Towarzystwo Badania Gier (PTBG; Eng. Games Research Association of Poland) annual conferences are linguists interested in the use of linguistic and communicative games as tools for teaching foreign languages or analysing communication channels in games from a pragmalinguistic perspective. Linguists interested in video games may also want to investigate the language of a game manual and session, the jargon of the players or the communication among the players or their characters (Surdyk 2008: 267). However, to the author's knowledge, the theory that verbs are the heart

of video game structures is one language related aspect that has not yet been properly analysed from a linguistic perspective.

The theory in question was developed by the game designer and founder of the GDC (Game Developer's Conference) Chris Crawford (2003; 2012) who has claimed that every piece of software, video game software included, is defined by the set of verbs available to the user, meaning that verbs are the structural basis of software. The verb theory of Crawford has been utilised by the game developer and game theorist Raph Koster, who proposed (but ultimately failed) to develop a formal grammar to illustrate video game structures at a 2005 GDC presentation titled *Grammar of Gameplay*. He developed Crawford's theory further in proposing that verbs should be the core atomic element of a formal notation for game design. The idea of verbs being a part of video game structures has also been voiced the game designer Anna Anthropy in the book *A Game Design Vocabulary* (co-written with designer Naomi Clarke), where she proposes that verbs understood as descriptions for the game rules should be a part of a unified game design vocabulary.

While these ideas of the three game designers have not garnered too much attention from video game scholars or linguists, their ideas are relatively actively discussed on social media channels tied to video gaming. For example, Crawford's verb theory has been presented and questioned in an article on Crawford published on a popular gaming blog *Kotaku* (Parkin 2013). Anna Anthropy's ideas to identify game rules through verbs as proposed in *A Game Design Vocabulary* is used to teach game design basics by various YouTube channels on game design (e.g. the Game Maker's Toolkit series on YouTube, hosted by Mark Brown, or the PBS Game Show). This situation is a problematic one, because the verb related ideas voiced by Crawford, Koster and Anthropy are by no means unified nor backed by actual video game research. Each of these authors has a different motivation, reasoning and method for tying verbs to video game structures and apart from Koster, their ideas are mainly based

on personal experience of designing games and not actual video game or linguistic research. For these reasons, it would be beneficial for the field of video game studies and video game media to review the verb theories of these three authors from a ludological and linguistic perspective to determine whether the idea of verbs taking part in video game structures has any relevance to these fields of research.

The primary aims of this thesis, then, would be to fill this research gap in video game studies by first performing a literature review of the three verb theories of Crawford, Koster and Anthropy backed up by the terminology and research of video game scholars, give a linguistic grounding for these verbs and put the reviewed verb theory into practice on a video game. The main research focus of the thesis is to compare the insights from the verb theory with insights from video game studies and linguistics to determine whether forming a unified theory of verbs in game structures is useful in studying the structures of video games. To achieve this goal, the first chapter of the thesis will provide a review of the three accounts on video game structures and how verbs take part in them. The combined ideas of Crawford, Koster and Anthropy should be able to provide a comprehensive theory for analysing verbs within video game structures from a video game research perspective.

Because verbs are a language-related phenomenon and the three accounts do not analyse the verbs of game structures from a linguistic perspective, then the second chapter of the thesis will focus on providing the unified verb theory with a linguistic framework for analysing the linguistic features of the proposed structural verbs of video games. This will be achieved by examining the different aspects of verbs from the perspective of syntax, semantics and formal logic (Aarts 2001, Van Valin 2001; Van Valin and LaPolla 2004; Miller 2007; Reghizzi 2013). By uniting the theory of the three game designers with research and terminology from both video game studies and linguistics, the present thesis hopes to

provide a comprehensive theory for, and a means of characterising and analysing the verbs within game structures and how these verbs influence game structures.

The third chapter of the thesis will present the verb-based 1990 graphical point and click adventure video game *The Secret of Monkey Island* and its 2009 remake *The Secret of Monkey Island: Enhanced Edition*, list the verbs taking part in the interactive structures of the game and attempt to analyse the listed verbs through the methodology from and shared perspectives of game studies and linguistics. This game is chosen for analysis because: (1) it is an original adventure video game and not an immediate adaptation of any narrative media; (2) the game explicitly features verbs in the interactive interface allowing for a simpler analysis; (3) for an early graphic adventure game, the game is mechanically simple enough to also warrant a thorough analysis of its structure underneath the interface; (4) the game is a software artefact of the English-speaking cultures and follows the formal sentence structure of English language syntax allowing for an analysis from the English language perspective; (5) the 2009 remake of the game modernised many aspects of the original, including the hiding of the verb interface, allowing for a comparison of the structure and the verbs involved in the two versions of the games.

By providing a formal lexical method for analysing game structures and putting the method to use on the verbs of *Monkey Island*, the thesis aims to test whether the verb theories of the three game designers can be unified with additions from game studies and linguistics to provide a formal method for analysing video game structures through analysing the verbs taking part in them. If the analysis of the verbs in *Monkey Island* were to give meaningful information about the structure and design of the video game, then it could be proven that the verb theory has a practical use for providing the disciplines of video game research, game design and linguistics with a novel methodology for analysing video games and their structures. With a proper backing from academic research, the verb theory could also be

presented to various game related media channels as an official reviewed version of the accounts to allow for a clearer method for communicating the idea of verbs being a structural component of video games.

CHAPTER 1. THE VERB THEORY OF CRAWFORD, KOSTER AND ANTHROPY

The present chapter will provide a review of the three accounts on how verbs are a part of video game structures. Before delving into the reasons of why and how verbs form a game's structure, the sections devoted for Crawford and Koster will first present a theoretical framework based on video game studies for their respective theories.

1.1 THE INTERACTIVE VERB THEORY OF CHRIS CRAWFORD

Crawford bases his theory of verbs as a part of video game structures on his own experiences of designing and making games. He constructs his theory by examining how video games differ from films and literature. He mainly focuses on the how video game designers usually tell stories in interactive games and how these stories fall short on many aspects that make up a good story. It should be noted that Crawford does not back up his verb theory with linguistic research or terminology and mostly uses the concept of verbs as a metaphor to better explain video game structures. His main motivation is not to provide a linguistic theory on verbs in video games, but rather to introduce game designers to some problems that emerge in interactive storytelling for video games and to provide a possible solution to these problems. The following review of Crawford's verb theory will focus on three sources where Crawford mentions verbs as an element of video games: his 2003 book *Chris Crawford on Game Design*, his 2012 book *On Interactive Storytelling* and a 2013 article based on an interview with Crawford written for a popular video game blog *Kotaku* by Simon Parker. The first part of this subchapter will review how Crawford defines and understands games as different from other media by examining the phenomenon of interactivity within video game structures backed up by the accounts of other video game scholars. The second part of the review of Crawford's theory will cover his argumentation for connecting verbs with interactivity in video games.

When explaining the role of verbs in video games in his 2012 book on interactive storytelling, Crawford (2012: 87) claims that the quality of interactivity in a video game increases with the number of choices between different interactions available to the player of a game; a player of a game chooses between verbs that describe interactions and verbs are what lie at the heart of choice, with choice, in turn, being the heart of interactivity. This statement connects verbs with two core aspects of video games: choice and interactivity. If a player of an interactive video game makes choices between verbs and choice is a fundamental component of interactivity, then the phenomenon of interactivity must also be connected to verbs. Crawford is one of the first game designers and theorists to champion the idea of verbs being a part of video game structures and as such, the idea is a relatively novel one. However, the phenomenon of interactivity has been widely studied by game scholars. Therefore, a theoretical background for Crawford's verb theory will first be provided by explicating the phenomenon of interactivity in video games as understood by Crawford and other game scholars.

1.1.1 Theoretical framework for the verb theory: interactivity

Interactivity is perhaps the most important component of video games. Crawford (2012: 43) maintains that interaction is the basis of the competitive advantage of computers when compared to films, music or books. This is because for him, we do not *interact* with films, music or literature, but rather *react* to them. Lori Landay (2014: 181) also claims that interactivity may be the distinguishing element of video games that separates them from other media and cultural forms. She defines interaction as an action that occurs when two or more participants (be they people, artefacts, materials or machines) exchange information that has a reciprocal effect (Landay 2014: 173). In other words, interaction is a conversation between two entities where information is repeatedly exchanged and responded to, where

information from previous communications is also taken into account. She believes that the most common form of interaction is communication between two people, whereas when we talk about interactivity in video games or digital media, we refer to communication between a human and a computer. Through interacting with a computer, the user may perceive that they are taking part in a conversation with the computer system, while in fact they are merely operating a machine. This is the reason why Crawford distinguishes interactive media from traditional cinema, music and literature, because one cannot interact with a film, musical piece or a story, because they do not answer or react back to the experiencer's reactions (Crawford 2012: 29). Thus, one of the defining features of video games and computer software is that they communicate with the user or player of that game or software.

Interaction requires a back and forth between the participants of the communication, meaning that it cannot happen when the participants are not communicating with each other. Unlike films that are designed to progress naturally without any viewer input, video games do not progress if the player stops interacting with them. Sheila Murphy (2014: 19) claims that interactivity and the modes of input for interactivity are what drives all video gaming. Without any user input or interaction, a game is an inert set of codes. Landay (2014: 181) also states that interactivity is essential for video games, because if the player of a game does not act on and with the system, they are not playing a video game. Anthropy (2014: 15) suggests that without a dialogue between a game and a player, the game is merely a simulation. Therefore, if a video game cannot be interacted with, it is not a game, but something closer to a compound of imagery through a cut scene, a single or repeating soundtrack and unchanging text that will not progress into any further states.

Chris Crawford (2012: 28) defines interactivity as "a cyclic process between two or more active agents in which each agent alternately *listens*, *thinks*, and *speaks* – a conversation of sorts". There are two agents in interaction with a video game – the player and the computer

– who must be active in the process of interaction. Crawford explains that he uses the terms *listen*, *think* and *speak* metaphorically as a computer cannot perform these actions like a human would in the strict sense of the term, but it does perform similar operations during interaction. For example, the computer listens to the user's mouse and keyboard inputs, it thinks by processing or calculating the data that it acquires from these inputs and it talks to the user through displaying output on its screen. Crawford believes that films and other media only speak through text, sounds or display, but they do not think about or listen to the experiencer's reactions to them. To demonstrate how his definition applies to interaction, he brings a refrigerator light as an example of a low-interactivity phenomenon. When one opens the refrigerator door, the light turns on, when one closes the door, the light turns off. This is a case of interactivity as the refrigerator light "listens" to the door switch being opened, "thinks" with the logic of "if switch is open then turn light on" and "speaks" by turning on the light (Crawford 2012: 37).

Landay adds a few specifications to this approach. According to Landay (2012: 173), in interaction with software, the user controls a computer system to do something that is meaningful to them; the system changes because of, and responds to the user's input as one of the participants in the interaction, and there is a loop of information exchanged. This definition also includes the user of the software in an act of interaction, clarifying how the user "speaks" to the computer program by providing the input to be processed and reacted to by the system. The addition of an information loop is also meaningful, because it accounts for the fact that computer software is not operated on a single interaction, but rather on a string of back and forth exchanges of interaction between the user and the computer. After all, a computer program is an inert set of codes if it is not interacted with and to keep on running or creating meaningful content, the software also has to be actively interacted with. This phenomenon is often called the interactive loop. In the case of games, one instance of

an interaction would be a single turn where the player gives the program input via a game controller to make a move and play the game, the computer then checks the rules that are programmed into the software and responds to the input with an answer generated through the ruleset.

Coming back to Crawford's account of interactivity, he proposes more exact terms to explain the conversational aspects of listening, thinking and speaking when speaking of interacting with a computer software. In an instance of interaction, the computer software "*accesses input, processes input* and then *outputs the results"* (Crawford 2012: 28). These three elements of interacting with a computer software are all operated by different aspects of the video game software and should be explicated to give a better understanding of how interaction works in a computer program.

The first part of interactivity can be seen in providing a video game with input through the input controllers of a game that it can access and "listen" to. As the word implies, *input* is a notion to signify something that is *put in*, i.e. *given* or *fed* somewhere. In the case of video games, the physical medium that feeds data or instructions for the computer to process is the input controller. Controllers are not a unique element of video games as any computer software generally requires some sort of input device like a mouse and keyboard for personal computers, a remote for a television or a radio or other home devices or appliances or a gamepad or a joystick controller for video game consoles. The input controller is also an essential part of interactivity. Sheila Murphy (2014: 19) maintains that the controller of a game is the site of the physical interactivity that links the player of a game to their in-game representation or proxy, be it a humanoid avatar or a dot on the screen. Landay (2014: 175) claims that the physical movements of the player, be they mouse clicks, joystick movement or kinetic or haptic control, provide the input that affects the video game software. In addition, Gregersen and Grodal (2008: 67) argue that interaction with video games is an

embodied awareness in the moment of action where the player experiences both agency and ownership of the virtual entities and that the process of interactivity is a fusion of the intentions, perceptions and actions of the player. To convey these intentions, perceptions and actions to be carried out by the in-game proxy or avatar, the player makes use of the controller to "speak" or provide input for the software. According to Murphy (2014: 21), game controllers are the physical objects through which the agency or commands of a game player pass and are transformed into digital signals to be interpreted by software and hardware. Therefore, input controllers allow the user of a software to interact with that software by translating our physical motions into digital information as commands for the software to process. It can be then argued that if a software cannot run without any interactive input from the user, then without a controller to provide a game software with information or input, a game cannot be played. Thus, the controller of a game has two roles in interacting with a video game with the first being the player's way to speak to the game software with input and the other being a way for the player to embody and control an entity within a video game.

The *processing* of the input in interacting with a video game is handled by game software and the procedural rules that are programmed into that software. It should be noted here that video games are primarily software artefacts and as such, require hardware like a personal computer, a game console or a smartphone to be played. Ryan (2006: 181) claims that all video games are programmed as computer software and that their only defining feature is their dependency on the computer as a material support. While there are other defining features of video games (a game controller and the presence of interactivity to name a few already mentioned here), then the fact that a video game software requires hardware to be played on cannot be argued with. However, there have been debates on what kind of an artefact a video game is. According to Olli Sotamaa (2014: 3), who has researched the

ontological nature of video games, video games have been analysed as material, software and cultural artefacts. This thesis will follow Crawford's understanding of video games as software artefacts since interactivity is a phenomenon that is more intimately tied to software than the material or cultural components of games.

There are a few problems with viewing video games as material and cultural artefacts. Following Ryan's argument, video game software will always be rooted on the material hardware of game consoles and computers and can therefore always be understood as a material artefact with a physical form. This would have been the defining feature of a video game during the arcade game era, when new hardware was built for each video game in the form of an arcade cabinet. In the last decade, however, video games have moved away from being stored on physical media such as CDs, cartridges or arcade cabinets and are more commonly reached via cloud-based gaming services via the internet, meaning that usually there is no single defining platform or hardware that a game can be played on calling their status as a purely material artefact into question. Video games also carry cultural meanings through narratives, visuals and sounds and can be analysed as cultural artefacts. However, as the ludology vs. narratology debate has shown, there are many video game scholars believe that the cultural or narrative elements of video games are merely "dressing" for the underlying game structures (Koster 2013: 170; see section 1.2 for further discussion). Crawford (2012: 48) argues that the advances in computer generated graphics make high-detailed imagery possible in video games, but when it comes to story and gameplay, the cosmetics are a supporting element. He calls games with a focus on purely narrative, visual and auditory elements "interactivised movies" (*ibid.*), i.e. products that are essentially movies with some instances of interactivity tacked, which do not make very interesting or interactive games. The most important argument for understanding video games as software

and not cultural or material artefacts is the fact that software and video games both share the fundamental component of interactivity.

Viewing video games as software artefacts allows them to be analysed as rule-based procedurally generated interactive systems. It is the mathematical algorithms and the logically structured rules that derive from these algorithms that make up a software and the way how it processes the data that is entered by the user. Wolf (2014: 54) believes that the resolution or quality of interactivity in a game depends on the capabilities of the hardware and software, because the ability to interact with a game is limited by the number of functions or actions that a game software allows for at the same time. These aspects are dependent on processor speeds and loading times that are both aspects of the hardware that are used to run the game software. Therefore, interactivity is intimately tied to a software and the capabilities of the hardware behind it. Sotamaa proposes that games viewed as software artefacts can also be called *procedural artefacts* due to the unique nature of how the meaning of games is procedurally generated through interacting with it. He refers to Janet Murray who argues that the uniqueness of digital games is based on their procedural nature, meaning that digital games are always intimately tied to the ways in which computers operate (Sotamaa 2014: 5). Ian Bogost (2007: 2–3) describes procedurality as a way of creating, explaining or understanding processes that define the logic, which drives the operations of hardware systems. The logic of a game software is usually constructed from any of the formal programming languages giving the computer a way to create meaningful information by constructing sentences following the rules of that logical language. Sotamaa (2014: 5) claims that because of the procedural nature of game software, video game designers write the game program code that enforces the rules of a game, but they are not responsible for all the representations that these rules can procedurally generate. Crawford (2012: 54) makes a similar claim by stating that the game designer does not specify the

events that a player of a game experiences, but only the rules by which the player can attempt to get to the victory condition of a game. In other words, the game designer only designs the rules that determine the available processes that a game software can “listen”, “think” and “reply” with.

The rules of a procedural software, which the program uses to “think” or process input with and which the player interacts with, compose the ontological essence or the bulk of what a video game software is and therefore are an essential part of interactivity. Perron (2014: 74) mirrors the definition of *ludus* games presented by Frasca earlier by claiming that games are rule based because one is expected to follow strict principles of conduct in order to play a game and these principles are the permitting and prohibiting means and actions for the player to achieve specific goals in a game or a particular final result. Following this notion, video games are even more bound by their set of rules because the act of regulating rules in video games is enforced by a computer program that runs on mathematical algorithms. The programmed rules of a game are explicit and rigid and cannot be bypassed unless cheats are used (Perron 2014: 76). If the computer software is the one who regulates the rules of a video game, then in many ways, the primary opponent that a video game player plays against is also the software and its rules. Crawford (2012: 47) defines a game as a goal-oriented form of interactive entertainment in which one or more active opponents attempt to hinder the player’s attainment of his or her goal. In interacting with a video game, the goal of a player is to perform actions through the input to overcome the rules that are programmed into that game to prevent the player from achieving a victory condition or to force the condition of defeat on the player. Therefore, the player of a video game plays against and interacts with the game software that procedurally interacts with the player according to the rules that are explicitly programmed as the “intelligence” or opponent of that video game.

Finally, the aspect of *outputting* or "speaking" the results to the player interacting with the video game software is operated through the game interface. According to Mauger (2014: 32), the primary role of a game interface is to enable information to be provided, accessed and applied. If the input controller was the one translating physical actions of the player into digital information for the software rules to process through a formal and logical language, then the software uses the game interface to translate the digital information of the processed rules back into information understood by human senses through the interface. Every video game software that has a display screen also makes use of the visual graphical user interface (GUI) to convey information to the player, but that is not the only interface tool of a computer. Mauger (*ibid.*) claims that interaction happens through interface as the player wants to fulfil a certain task and to achieve this, they meet the game through game boards or playing pieces, screens, joysticks, keypads or controllers. It should be noted here that Mauger's account does not fully agree with the account of interactivity given by Murphy and Crawford, since when speaking of interaction with software, he lists game controllers as interface and not separate from interface. It is true that game controllers can be treated as a part of the interface of a computer because the design of the buttons on the controller can carry useful information to the player (a directional pad visually conveys how a player can make their in-game character move in different directions), or the controller can give feedback through sounds or rumbling. However, the primary purpose of an input controller is to provide the software with user input whereas the interface should be the part of a computer responsible for displaying information or results of an interaction as output. Modern hardware allows video game software to "speak" or "reply" or, in other words, to give feedback to the interactions of the player through imagery or text on the screen, audio from the speakers and as previously shown, even movements, rumbling or sounds from a game controller. The matter of translating software code into each of these sensory aspects

often requires a separate designer as each element of a video game has different mechanics or ways of conversing ideas to the player.

As can be seen from above, the three aspects of a game controller allowing the player to input information to the game software, the procedural rules that process the input information and the interface that is used to provide the player with the results of their processed actions are what constitute the phenomenon of interactivity in video games.

1.1.2 Verb theory: verbs as a part of choice, interactions and storytelling

This section will focus on the aspects of choice and the verbs that Crawford ties with the phenomenon of interactivity. The part choice plays in the quality of interactivity is quite thoroughly examined in video game studies. Crawford (2012: 41) maintains that "the ability to make choices, along with speed and depth, determines the degree of interactivity." He claims that the quality of interactivity improves with the functional significance of each choice and the number of choices in relation to the number of possibilities of each choice that a user of an interactive software can imagine.

Crawford does not examine this idea any further, but a similar concept of *interactive resolution* is introduced by Mark J.P. Wolf as a way of measuring the quality of a game's interactivity through the choices that the player can make in a game. Wolf's (2014: 53) interactive resolution consists of two dimensions, not dissimilar from the aspects that Crawford connects with the quality of interactivity, but is presented in a clearer manner. The dimensions of interactive resolution are the number of *choices per second* and the number of *options per choice*. Wolf demonstrates these dimensions through two completely different genres of video games. In fast-paced action games, the user has a high rate of choices per second with reaction being an important factor of gameplay. In these types of games, players have to react quickly and are not given much time to decide between options, meaning that

the number of choices is also lower. Adventure games that are focused on exploration and have more developed storylines and storyworlds also have a slower pacing, which means that players have more time to consider what they can or should do. Therefore, these types of games make a larger number of choices available to the player with the degree of choices per second being much lower than in an action game. Wolf (*ibid.*) thinks that for video games to be compelling for the player, they should either have a high number of choices per second or a high number of options per choice, but not both. This means that the quality of a game's interactivity will be lower if a player has too many choices to make in a very short interval of time, making a game too hard, or if a player has too little control over a game with very few choices over a longer period, likely making the game boring. The latter is a complaint often directed toward what Crawford called interactivised movies or games that heavily rely on video clips and cut-scenes to present their game. Crawford (2012: 41) believes that the quality of any interaction depends on the richness of the choices available to the user, meaning that there should be enough to interact with, but the interactions should also progress the game in meaningful ways. The main reason why Crawford chooses to direct his attention toward verbs in video games is to show how modern video games do not offer an interactive environment with a meaningful variety in choices.

Crawford believes that video games have a fundamental problem that is not discussed enough within the video game industry. He believes that, unlike films or literature, video game stories place too much emphasis on spatial relations and not enough emphasis on social relations. By neglecting social and emotional ties between characters, which he believes are required of an intriguing story, video games have hit a creative dead-end when it comes to storytelling (Parkin 2013). According to Crawford (2012: 40), video games confine themselves to a few simple modalities of human cognition such as hand-eye coordination, puzzle solving, spatial reasoning and resource management. These are the four primary

challenges of games. He thinks that proper interactive storytelling should primarily make use of the cognitive modality of social reasoning. He claims that the dynamics of human social relationships are infinitely complex and thus give a storyteller boundless resource material. The problem is that when one is trying to translate this modality into an interactive video game, one has to shape social machinations into mathematical algorithms that a video game software could play. Because of this, video game characters often act and perform like robots or artificial intelligence who follow strict rules of code, devoid of the emotional complexity of a human being or a good character.

The problem of poor storytelling in video games is essentially influenced by the nature of games and game design. Crawford (2003: 272) believes that the problem of a lack of social interactions in video games arises from the difference in how a game designer and a novelist build their fictional universes. According to him, when a game designer is programming a world for their video game in their computer, they first create the spatial coordinate system and a map for the world. When the physical environment and the laws that govern the game universe are set, the game designer populates the world with physical objects or entities[1] and gives them physical properties and attributes that obey the physical laws programmed into that virtual universe. The problem with such a design focus is that everything populating the game universe, including human characters, is treated as objects following determined rules or physics or programming code. Crawford (2012: 17–18) maintains that good stories are mostly about people, not things. A storyteller uses a completely different approach when building a fictional world. Crawford thinks (2003: 275) that the primary goal of a storyteller is not to set up the laws of physics of the fictional

[1] For the sake of clarity, the objects that fill a video game world will be called *entities* from here on out. The reason behind this is that in a video game program everything from simple physical objects and animate beings to the world geometry itself (e.g. the sky texture or the ground walked on) is an object for the rules that govern them. Therefore, to distinguish actual objects in the game universe from the objects of the game program, we propose to call the latter the *entities* of a game.

universe, but rather to create a set of characters with a focus on giving these characters dramatic traits. Once the inner worlds of the characters are set, the storyteller then focuses on their interactions with, and reflections on other characters and objects of the world. Crawford believes that for game designers to become good storytellers, they must place their primary focus on the social and emotional interactions of the characters of the storyworld and using the spatial interactions to complement these social interactions.

One way of introducing good storytelling into video games is to examine the components that interactive video games and stories have in common and whether these similarities could also point towards the problem. Crawford (2003: 275) claims that one such fundamental component shared by both stories and interactivity is choice and he believes that the vehicle of choice is a verb. Crawford (*ibid*.) refers to Aristotle who presented the idea that in stories, choice reveals character. The choices that a character makes in a story define the motivations of that character. In interactive video games, however, the player is the one making the choices with a keyboard and mouse or a game controller. As discussed earlier, choice in video games is deeply tied to interaction, as the player embodies the actions of their player-character and makes the choices via input controllers with the game software processing the input and answering to the choices through interface output.

The interactions of a player can be described through verbs. Crawford (2012: 82) believes that whenever the player of a video game makes a choice, they are choosing between verbs, not nouns. He claims that the two most fundamental components of all languages are nouns and verbs. He defines nouns as words that specify things and verbs as words that describe events, or in other words, for him, nouns describe existence, verbs action. He uses the noun-verb construction to explain how game software works. He claims that the data or input that is processed in an instance of interaction is the noun of the computer and the processes that work over the data are the verbs of computers. Crawford (2012: 46) believes that interaction

only happens through processes, not data, because data, including images, sounds, text and numbers, does not do anything in a software. It is the processes that are interacted with and that set things in motion. Likewise, he believes that a story of a computer game is not a process, but data, because it is fixed, permanent and unchanging. Storytelling, on the other hand, is a dynamic process that the player of a game can intervene in, change the way it operates and create an interactive loop with it. Therefore, the player interacts with the processes, i.e the events or "verbs" of the game, not the data, i.e. the entities or "nouns" of a game. Crawford (2003: 275) gives an example of a player of a game who has to choose between Door #1, #2 or #3. He states that the player of a game does not choose between the doors themselves, but they choose to *Go* through one of these doors. Similarly, the user of a computer software might make choices to either *Click* on a button or window in a GUI, or to *Scroll* up or down a window. Therefore, the choices that make up the interactions of a player can be described with verbs.

If verbs constitute the choices of the player of an interactive game and choices make interaction happen, then these interactive verbs[2] are tied to the core structure of video games. Crawford (2012: 42) maintains that every piece of software is defined by the set of verbs that are available to the user, with these verbs constituting the design skeleton of the software. He believes that the most important question that a game or software designer should ask themselves is what does the user *do* with their game software; what are the verbs of their game? If a designer can answer that question, they already have the skeleton of a game ready.

To prove that video game software is defined by the available interactive verbs of the player, Crawford describes two types of software through their available verbs. The first

[2] For the sake of clarity, we shall propose to call the verbs that describe the interactions of a video game software *interactive verbs*.

example is software that permits the user to *Enter* text, *Modify* its font characteristics and *Set* tabs and margins. Crawford believes that just by looking at the verbs and the available interactions, one can determine that this is a word processing software. The second example is a piece of software that permits the user to *Turn* right or left, *Move* forward or backward, *Run*, *Jump*, *Duck* and *Fire*. He claims that from these verbs, it can be inferred that he is describing an action video game. Therefore, verbs that describe the interactions of a software are the defining features of software and answer the question of "what does the user do" in a software.

Crawford's idea of the interactive verbs of a software defining that software is supported by other video game scholars. Lori Landay (2014: 181) claims that Crawford's theory of interactions defining a software is important, because looking at how the form of interactivity differs from video game to video game may give video game scholars a way of identifying different genres of video games. Perron (2014: 77) similarly claims that video game rules, mechanics, and controls, i.e. the means of interacting with a software, become conventions when they are used in many video games, ultimately forming differing game genres. He follows Kücklich (2006: 101) who claims that a genre is nothing but a general term for a number of texts with similar characteristics. Crawford's examples of inferring a text-editing software and an action game software from a collection of interactive verbs present in the software proves that the type of available interactions in a software also determine the genre or type of the software. This means that when a player is playing a game from the action game genre, they can already assume the game to follow the conventions and interactions of a conventional action game.

Following the idea of interactive verbs being the defining feature of an interactive video game, we can return to Crawford's account of the storytelling problem of video games. Crawford intends to explicate how video game stories fall short to stories in films and

literature by looking at the verbs present in the stories of these forms of media (Parkin 2013). For him, as shown above, the problem of video game stories is that they make too much use of spatial reasoning and too little use of social reasoning. This is reflected from the primary verbs that are found in video games. He (*ibid.*) explains that primary verbs of games are the verbs that describe the main or dominant actions that the player or their player-character can perform in a game.

Crawford uses a traditional first-person shooter[3] (FPS) game as an example where the primary verbs of the game that can be listed are *Turn*, *Run*, *Jump*, *Aim* and *Shoot* with only a few secondary verbs such as *Pick Up* and *Drop*. He does not specify on how he distinguishes primary video game verbs from secondary verbs, but based on his examples, one can assume that primary verbs describe the actions that are essential in traversing or progressing in the game universe (movement and elimination of targets are the dominant actions of FPS games), whereas secondary verbs describe the actions that are of lesser importance to the game (*Pick Up* and *Drop* are actions that are generally used to gather or exchange items in the game world, but are often not required to beat the game). For Crawford, the problem with these verbs is that they are verbs connected to spatial reasoning and as has been discussed, many intriguing stories focus on social, not spatial relations. He explains that video game stories should make more use of verbs tied to social reasoning, such as *Think, Like* or *Feel*, which carry meaningful information about a person's emotional condition or inner views. However, these are not the type of verbs that a player of a video game often encounters (Parkin 2013). Crawford believes that the small number of verbs and the small variety of different types of verbs is why video games do not tell good stories, as

[3] First-person shooter (FPS) is a subgenre of Action video games, where the player is given control of a character from the first-person (as opposed to third-person) perspective in a three-dimensional (3D) space. The primary focus of FPS games is to defeat opposing targets or enemies by taking aim and shooting at them while avoiding getting shot by them.

a literary work can make use of virtually all kinds and types of verbs in each sentence and that is literature can be used to tell better stories than video games.

Crawford's (2012: 54) solution to the problem is that when a designer has to ask "what does the user do?" then the answer should be that "the user should be able to make dramatically, i.e. socially or emotionally significant decisions." Decisions involving spatial reasoning, resource allocation and puzzles are not dramatically significant and therefore add nothing to the storyworld. This means that video game designers need to look into integrating social verbs into interacting with video game software, as without these types of verbs, video games will not be able to reach the emotional complexity of stories in other forms of media.

To conclude, Crawford believes that in the current state, video games are incapable of producing stories that would rival film and literature, because they concern themselves only with a small handful of interactive verbs which are mostly tied to interacting with the space of a storyworld and not with the inner worlds and emotional complexities of its characters. Therefore, Crawford's theory of interactive verbs only points to the presence and importance of verbs in interactions with a video game software, but he generally uses the idea of verbs in game structures as a metaphor for or explaining factor of the processes that take place within the game software when interacted with. However, Crawford's ideas on interactivity and how verbs can be used to describe the interactive structure of a video game could be used as a foundation for a comprehensive theory on verbs in video game structures by listing the interactive verbs of a game software and analysing the verbs from the perspective of syntactic theory.

1.2 RAPH KOSTER AND VERBS IN A GRAMMAR FOR VIDEO GAME STRUCTURES

The second perspective on the role that verbs play in video games reviewed in this thesis is by Raph Koster, a game designer and video game theorist best known for his 2003 book *A Theory of Fun for Game Design* where he examined the phenomenon of fun and its manifestations in video games and their design. In his 2005 presentation at Game Developer's Conference (GDC) titled *A Grammar of Gameplay – game atoms: can games be diagrammed?* Koster introduced his idea of creating a formal notation or a grammar for game design that would mirror the notation of sheet music or dance choreography and provide game designers and scholars a means of diagramming the structures of video gmaes. Following the ideas of Crawford, he proposed that the core atomic elements of his formal grammar for video game structures would have to be the verbs that describe the processes taking place in games. Therefore, this section will provide a review of Koster's account on what the structures of games are like and how verbs can be used to diagram these structures.

1.2.1 Presenting a grammar for video game structures

Koster begins his 2005 presentation by calling for a formalised notation system for game design that would replace the often unclear and chaotic design documents that are made for video games. Koster (2005) claims that games are like dance in that there are many disciplines involved like lighting, casting, costuming, staging and music, but only one discipline is the critical one – choreography. He believes that there are also multiple disciplines that examine and describe different aspects of games, but unlike dance, the choreography for games has not been found yet. Therefore, Koster's perspective on video games can be related to the perspective of the ludologists, especially Gonzalo Frasca (1999), who also believed that games can be analysed from the perspectives of multiple research

disciplines, but there needs to be one that would analyse the ontology of games themselves. Koster (2005) suggests that if we were to follow the choreography or the formal notation systems of poetry or sheet music, it should also be possible to provide video games with a formal notation that would explicate their algorithmic structure. The primary aim of Koster's presentation is to construct such a formal language, or in his words, a grammar for analysing video game structures. He claims that such a model of game structures on the core level would give game designers a way of examining the logical links and loops of video game structures and it would also provide a vocabulary for talking about game design.

The grammar that Koster proposes is a formal notation system, meaning that it will only focus on the inner logical structures of games. Koster (2005) claims that all successful notation languages have been visual or iconic languages and not textual like natural human languages. Reghizzi (2013: 5) calls such languages for notation artificial languages. He explains that as long as there have been natural languages for human communication, there have also been artificial languages or communication systems intended for specific tasks (e.g. the propositional logic of Aristotle or any notation for music). Artificial languages can either be formalised or unformalised. For example, a computer programming language like Java is a formalised language, whereas the artificial language of Esperanto is not formalised. According to Reghizzi (*ibid.*), a formal language is a mathematical structure, defined through an alphabet, by means of certain axiomatic rules (grammar). For a language to be formal, their form of sentences (their syntax) and their meaning (semantics) must be precisely or algorithmically defined. Such precisely defined languages are useful as they are mathematical to the point that a computing system can determine the grammaticality of its sentences without problems.

The grammar proposed for analysing game structures will be a formal notation language, meaning that it will have to focus on the formal aspects of game structures. Because of this,

Koster mainly bases his grammar on the systemic rules of a game. For Koster (2013: 80), games are intentionally designed formal systems of rules. Every aspect outside of these rules is secondary to a game's ontological nature. He exemplifies this by using the example of chess. Chess is ultimately made up of the rules which determine the behaviour of each different type of chess piece and the final conditions for achieving victory and defeat. Koster (2013: 82) maintains that games are about teaching underlying patterns. This means that the main point of a game is to train the player to ignore the fiction that is wrapped around its algorithmic rule patterns and to learn how these patterns work through interaction. Juul (2005: 176) also claims that video game rules are essentially hidden from the player of a game meaning that that the player is likely to use the game world itself to make assumptions about the rules. The fiction of the game world that is wrapped around the rule patterns is what Koster calls "narrative dressing". Koster (2013: 80) believes that while most games utilise metaphors for what is going on within a game, they might as well be ignored by the player. In chess, the different types of pieces have different visual representations related to politics and war, with the board representing a battlefield. As far as the rule patterns of chess are concerned, the names of the pieces are irrelevant. Even if the pieces were represented by other figures, the game would still essentially be chess. This line of reasoning connects Koster with the ludologists, especially Frasca, who believed that games are primarily rule-based systems and any narrative elements of games are secondary features of a game's ontology.

Most games cannot do without metaphors or narrative dressing, as these are what provide the abstractions of game rules with meaning. Koster mentions that there are very few games that are pure unclothed abstractions. Juul (2005: 176) goes as far as to claim that the player of a game may in fact require a fictional game world to understand the rules of a game. Koster (2013: 168) states that if we were to consider games to be solely formal abstract

systems then we would only need one game designer, i.e. the system designer. However, as stated before, similarly to dance, video games require various tools to enhance the experience of the player of a game. Aside from system designers, games also have lead designers, creative directors, writers, level designers, world builders, sound designers, etc., who design a specific element surrounding the underlying formal structures of a game. The job of each of these designers is to translate the digital and formal computer programming language into semantic concepts that give the abstract rules a meaning that can be grasped by a human player. For example, point and click adventure games make heavy use of narrative elements to adorn the very simple systemic act of pointing and clicking. Like Crawford, Koster (2013: 170) believes that in order for games to develop as a medium, they also need to develop the internal systems of games and not just the dressing. The current game industry focuses too much on improving the dressing of games with better graphics, background stories, plots, sound effects or music, and a higher fidelity in environments and content. Although the number of systems that a single game contains has increased, the systems themselves see very little innovation. Therefore, Koster essentially shares the sentiments of Crawford that game designers focus too much on the visual or auditory wrapping of the game, while failing to improve the variety of the inner systems of the game.

The main aim of Koster's presentation is to redirect the focus of game studies from the secondary elements of a game to the formal systemic aspects of games. Koster (2005) mentions that there have been attempts at creating formal design tools for video games that can be used as a basis for his formal grammar of video game structures. One such example is the MDA system of Hunicke, LeBlanc and Zubek (2004). According to them, video games can be analysed on three levels: Mechanics (i.e. the rules of a game), Dynamics (i.e. the interactions of a player with the system) and Aesthetics (i.e. the emotional responses evoked). Koster states that a formal notation for video games would likely only tackle the

formal aspects of games, i.e. the mechanics or the rules. As a core element of games, the mechanical rules provide a grounding for the dynamic elements of interaction. The aspect of aesthetics is not important for his formal notation for video games as it merely provides the dressing for a video game that does not affect the core rules.

Comparing this focus with that of Crawford's theory on interactive verbs in the previous sub-chapter, we can see that Crawford focused more on dynamics and aesthetics, while acknowledging mechanics as a part of the interactive process. Crawford's primary interest lies in the dynamics or player's interactions with the game software in order to bring attention to the weak aesthetics of storytelling that the nature of game design and interactivity bring with them. Koster leaves these aspects to the background and focuses on the systemic elements of games instead.

Koster distinguishes between three types of rules presented by Katie Salen and Eric Zimmerman (2003): constitutive rules, operational rules and implicit rules. According to Salen and Zimmerman (2003: 138), constitutive rules are the rules that shape the abstract systemic patterns that underlie a game. These are the formal rules that Koster sees as the core elements of games. Operational rules are the verbal descriptions of constitutive rules. These are the rules that explain the operations of a computer in human terms and it is these types of rules that Crawford tied to interactions in his theory, by using interactive verbs as descriptions for the operations. Finally, implicit rules are the assumed restrictions of etiquette in a game, that is, the rules that appear so often as to become conventions. Koster's proposed notation for video games focuses on constitutive rules or the rules that make up the abstract systemic patterns, because these are the elements that form the core structure of a game. He explains that the operational rules of a game are meant to provide a verbal description of the underlying abstract patterns to the audience, whereas the designers of games should focus on the abstract systems themselves. Again, Koster's examination of

game structures diverges from Crawford's who did not use verbs to describe the abstract patterns of the game software, but the interactions of the player with the system, focusing more on the experiential aspects of games.

However, Koster does not completely ditch interaction from his theory on games. Like other game theorists, Koster (2005) agrees that a game cannot progress without interactions. He quotes Crawford's definition of interactivity to show that an interaction is a communication between the player and the game. If we follow Landay's (2014) explanation, interaction with a game software is a conversation between the player and the computer system where previously shared information, or in our case interactions, are taken into account. A single action does not yet constitute an interaction. As such, following Crawford's theory, Koster (2005) claims that a game must contain an interactive loop, meaning that the prior interactions made by a player must also influence the next interactions. He believes that all games must be perceived as iterative or looping processes. For example, making a single move in chess does not constitute as playing a chess game. A game of chess consists of turns made by opposing players with each turn constituting a single loop of interaction: a player makes a move by choosing a piece and making a move, giving the turn over to the opponent to process the made move. A single move in a game still has to follow the underlying ruleset of the game. It should be noted here that for Koster (2005), all games are turn-based. The primary question for a game is whether the opponent is playing according to the same rules as the player. Chess is a game with symmetrical turns in that each player follows the same ruleset. In the case of a single player video game, the player is playing against the computer and the rules are asymmetrical, meaning that the player's turn, which consists of presenting the game software with input by physically interacting with it, is different from the computer's turn, which consists of processing the input through the

games rules and answering based on these rules. Thus, in order for the systemic rules of a game to manifest themselves, a game still needs to be interacted with.

Analysing games as a collection of iterative processes makes it possible to diagram them as sequenced events that form a logical progression. Koster (2005) states that all games are sequences of challenges to be overcome. An interaction with a rule of a game presents overcoming a single challenge. This does not mean that all challenges in a game must be challenging as many interactions in video games involve no risk. For example moving a character from point A to point B is a challenge that is overcome by navigating game space through giving the software instructions for movement does not pose a risk for the game, but it is none the less a challenge of overcoming the rules of that game. Therefore, if games are sequences of challenges overcome by the player, then a single playthrough of a game can be diagrammed as a sequence of events, which could be interpreted as a narrative of the player's experiences. This is one type of narrative that the ludologists tried to avoid, as often, a single playthrough does not present the full complexity of the procedural possibility space of the game rules. Likewise, Koster (2005) is critical of such a linear way of diagramming games, because it does not take into account nested or parallel challenges or events. He states that a nested challenge is one that is a part of a broader challenge or includes other challenges nested into it. In a game, nested challenges could be overcome without exploring the smaller challenges that are a part of the broader challenge. Parallel challenges are multiple challenges that are undertaken at the same time in a game. These two types of challenges give game rules a possibility space that can be explored through many different ways. Koster (2005) claims that most video games contain parallel or nested challenges. For example, the player of a three-dimensional first-person shooter (FPS) game would have to overcome the challenge of navigating the 3D space through movement of the character while also undertaking the challenge of jumping, aiming or shooting at the same time. While this sort

of an event can be summarised by a single event of the player going to a room and shooting at an opponent, it does not explicate the actual complexity that is taking place in the system of a game and as such, a formal notation of a game will have to take into account the full possibility space of what a game's rules allow.

To effectively diagram the possibility space of the patterns that the rules of a game form, Koster (2005) introduces the concept of topology. He defines topology as "exposed information coupled to a game token." He adds that the topology of a game is the operational space for a given asset and does not refer to the space or the map of a game, but rather the space of possible events for a given token. Taking chess as an example, for Koster, the chessboard itself does not shape the topology of a chess game, but rather each different type of chess piece (token) has its own topology related to the squares on a chessboard that that piece's rules allow the piece to move to. This means that the topology of a pawn in a chess game does not consist of all the squares of a chessboard, but merely the squares immediately above or diagonal to it depending on the moves available for its current situation that are determined by the core rules for the pawn. Koster (2005) adds that topology does not only include spatial aspects of game tokens, because time can also be a valid dimension of the possible events available for a token. In video games, a certain span of time is allotted to most actions, meaning that the topology for a single shot of a gun in a FPS game not only takes into account the rule for the trajectory that a bullet will travel, but also the time that it takes and the time between separate shots. The time of a single action can either be determined by a single turn, i.e. by the user, determined by the opponent, or determined by a span in milliseconds if a turn is not specified. Therefore, each rule of a game can also be provided with its own topology that reflects the possibility space of the rule's functions.

1.2.2 Verbs as the atoms of a formal game notation

Having set up the spatial and temporal possibility space for the manifestation of a game's rules, Koster moves on to determine the core elements or the notes for a game's formal notation system. Koster (2013: 120) borrows game designer Ben Cousins' term *ludeme* to signify the atoms that constitute the basic units of gameplay. A ludeme, then, is the elementary particle of a game structure. Koster (2005) presents three elements that are considered the core atoms of video games by game scholars: verbs, (as proposed by Crawford), choices and conflict. Koster agrees with Crawford in understanding verbs as the nucleus of a game. Verbs have the descriptive power to present the essence of a single systemic rule of a game. Considering the requirements that he proposed for a formal notation for video games, Koster forms a list of verbs that would describe the majority of the systemic rules of game structures: *Remove all, Survive, Remove, Exist at, Intersect, Move to, Touch, Press button*. His proposed list of verbs descends from the higher level processes taking place in a game to lower level ones, showing how some rules are more substantive in games than others. Once again, giving chess as an example, the verbs describing the possible challenges of a chess piece token are *Move to* for making a move on the chessboard and *Remove* for claiming an opponent's piece if a movement of a token ends with *Intersecting* with an opponent's token. It can already be seen how the challenge of removing a piece has the challenge of moving and intersection nested into it. While chess is a turn-based game and there are no parallel challenges to the game, most video games not only make use of nested challenges, but various parallel nested challenges, making the structure of a game quite complex. The verbs provided by Koster would then be the core particles of games that refer to the different types of rules that are applied for game structures and, as such, these verbs would be the notes of a game's formal notation. From this, it can be surmised that

Koster's theory of verbs in video games is rule-centric as opposed to Crawford's theory that is more player-centric.

To demonstrate how game structures can be diagrammed using verbs as the core elements, Koster (2005) attemps to break down the ludeme verbs of the FPS action game *Quake* (1996, ID software). He gives an example situation from the game where the player has to kill an opponent via having to *Run* around a corner to locate the enemy and if the enemy is found they have to *Jump* (optional), *Aim* and *Shoot* until they manage to kill the opponent. As we can see the verbs that Koster lists here are practically identical to the list of interactive verbs that Crawford proposed to describe a generic game from the FPS genre. However, these descriptions of the interactions of a player are not enough to describe the rule patterns that underlie these actions. As such, each of these interactive verbs describing the operational rules of a game can also be broken down into verbs that describe the constitutive rules of a game. For example, the interaction of *Running* around the corner in *Quake* involves *Determining* a direction in a three-dimensional space with the *mouse cursor*, *Pointing* toward that direction through *Stopping* the *cursor* at the direction the player wants to move towards and *Applying* a vector of *force* through *Pressing* the *Run button*. The interaction of *Jumping* adds the element of timing to the mix by *Pressing* down on the *Jump button* for as long as the desired length of a jump is achieved (the rule for a *Jump* in most games has an intentionally designed maximum length and distance, meaning that if the maximum height of the jump is achieved, the player will begin falling down again, adding a strict end point for the interaction). The interaction of *Aiming* the gun involves *Determining* a position in two-dimensional space with the *Mouse cursor* (as unlike navigating directional space in a 3D environment space, the area for aiming on the screen is tied to the 2D space of the screen) and *Pointing* at that space. The interaction of *Shooting* with the gun involves *Timing* until the enemy is in the cross-hairs and *Pressing* the *Shoot*

button to take a shot. As we can see, the basic event of killing a single enemy in *Quake* involves various parallel and nested challenges that have to be overcome simultaneously to achieve the desired result. Following these examples, Koster (2005) notes that the most basic ludemes of a computer game involve a user interface action of either pressing a button or navigating space with the mouse cursor. It can also be noted that the verbs that describe the interactions of a player form interaction molecules that are composed of various verb atoms that in turn describe the underlying constitutive rules of these interactions.

As can be seen, Koster's model of verbs as core elements of game structures includes not only the interactive verbs that Crawford used to describe the interactions of a player, but also the core "ludeme" verbs that describe processes taking place in the software of a game, through which the complexity of a game's rule structure can be diagrammed. Therefore, Koster's analysis of the verbs in game structures not only goes deeper than Crawford's analysis, but it also provides a means of showing a game's rule structure in its full complexity. If a game were to be diagrammed by describing the iterative events of *Quake* through interactive verbs only, it would focus on the narrative dressing that is provided to explain the inner rules of the game in human terms and thus, it would ignore the actual inner processes taking place during the interaction.

The example provided for *Quake* also shows that in a three-dimensional FPS action game, the player does not only control the player-character, but also various entities connected to the player-character. An analysis of a game's interactive verbs would only take into account the verbs that refer to the actions undertaken by the character that the player of a game embodies, but it would ignore the individual processes taking place underneath the interaction that constitute the coherent experience of taking control of a character. Crawford's interactive verbs would be enough to describe the interactions of a game, where the player controls whole actions of a character by giving them single instructions to

perform, but as can be seen from the *Quake* example, a 3D game space also requires the player to navigate that space by performing multiple interactions at once. Such a 3D game not only requires the player to embody the movement of a character in that space, but also the movements of the camera that represent the player-character's first-person perspective and also the shooting and aiming of the gun that is being held by their player character. This means that in an FPS game, on the rule level, the player separately takes control of the feet, the view and the equipped weaponry of that character at the same time. Therefore, Koster's view on how verbs take part in game structures adds a layer of abstraction to the verb analysis of a game's structure showing that the way how a player perceives the events of a game is mostly different from the way how the player makes the software actually produce these events, because even the interactions of a game are coated with narrative dressing to make them seem more logical in navigating the abstract rule patterns of a game.

Similarly to Crawford, Koster distinguishes more word classes than just verbs as taking part of a game's structure, but these aspects of his grammar are not as refined as his investigations of the rule-related verbs. According to Koster (2005), when a player is making a choice in a game, they are choosing between their available abilities. He defines an ability of a player in his game notation as a verb embodied by an asset or token. This means that Koster agrees with Crawford's notion that a player is making choices between the verbs of a game, but as the two theorists define the role of verbs in game structures differently an essential difference arises. In the case of chess, Crawford would have treated the chess pieces as nouns for the interactive verbs that describe the actions performed with these pieces. For Koster (2005), each different type of a piece in chess is essentially a verb, because they each have a different behaviour that is influenced by their associated topology. Both the behaviour of the pieces and the topology for these behaviours are determined by the rules of chess, which Koster calls verbs. Therefore, for Koster, a chess player has a choice between which

verb to use, meaning that the player is choosing between the abilities of chess pieces. This does not mean that Koster does not differentiate between the processes of rules and the content that wraps these rules. Koster (2005) defines content as "descriptive characteristics of a challenge," meaning that he understands the content of a game to be the narrative dressing of a game. The content of a chess game would be formulated by the descriptive features of the squared chess board for the topography and the descriptive features that differentiate the chess pieces through shapes and iconography. This means that if verbs embody the tokens of a game, then the content that describes these tokens are not nouns but something closer to adjectives. As far as forming a game's formal notation is concerned, there is no clearly defined place for nouns. This is one reason why Koster's proposed formal grammar for game structures fails, as it seems to clearly define the place of the predicates headed by the verbs, but offer no arguments for these verbs. Moreover, adjectives constitute the word class that modifies nouns and not verbs in languages. As such, Koster's grammar only seems to properly succeed in identifying the verbs of video game structures but none of the other required aspects of a functional grammar.

Therefore, as Koster (2005) declares at the beginning and end of his presentation, he fails at creating a complete formal notation for diagramming game structures. None the less, Koster does manage to provide a basic method for capturing and analysing the verbs that describe both the interactions of a player and the abstract processes that take place in the inner structures of a game. Although he claims he cannot picture designing a game based on his notation himself, he believes that the part of his grammar that identifies the base atoms of a game's structure as verbs would give game designers a way of examining the logical links and loops of video game structures and it could also be used to provide a vocabulary for talking about designing the inner systems of games. Therefore, if the theory presented by Crawford provided the basis for distinguishing verbs as a structural component of video

games, then the additions and modifications made by Koster show how verbs not only describe the interactions and the content of a video game, but they can be also used to describe the ways how the inner patterns of rules are manifested in the structure of a game.

1.3 ANNA ANTHROPY AND VERBS AS THE RULES OF VIDEO GAMES

Anthropy and Clarke (2014) are mainly known for attempting to provide game designers with a unified vocabulary to discuss the essentials of game design. They wrote a book, in the first part of which, Anna Anthropy (2014: 7) states many words used to describe video games with, like *immersive*, *fluid* or *flow* are mostly meaningless buzzwords invented by the people who market video games and are useless in describing the fundamental elements of game design. It is because of this situation that she focuses on providing game designers with a language for discussing the design of video games. She feels that creating such a language would not only give game creators a proper terminology for describing their game design process, but also empower new game makers with a vocabulary to think about and to plan their designs with (Anthropy 2014: 9). Anthropy first focuses on the design of game rules, which she divides into the categories of "verbs" and "objects" that together form the dynamics of a game. As Anthropy does not mention Crawford or Koster in her account, it can be assumed that her theory is independent of their thinking. This sub-chapter will provide an overview and analysis of Anthropy's vision of the role of verbs and objects in video game design.

Anthropy understands rules to be the core element of every game. She maintains that "a game is made out of rules and the defining characteristics of a game are the rules that make up its gameplay" (Anthropy 2014: 15). Her examples of basic rules in games would be surrounding stones of the opposite colour with stones of your own colour to capture them in some tabletop games; completing a line of blocks to make them disappear like in *Tetris,* or reducing an opponent's health to zero to eliminate them as in action-oriented games. She believes that unlike in traditional stories, the main characters of games are not the people,

environments or the objects that might be categorised by nouns, but instead the rules that describe how the game is played, which she ties to verbs.

When Anthropy (2014: 22) refers to the "objects" of a game, she does not mean objects in the simple sense of what she calls "nouns, detritus or inanimate objects", but as objects that complete the sentences of the verbs. Oddly enough, it seems that when it comes to nouns, none of the verb theories discussed in the present thesis want to accept the objects or entities that are placed in a game as the nouns for the verbs that constitute the actions of a player or the procedural rules of the game. Crawford came close to this by distinguishing the data of a game software as the noun for the processes of verbs, but data is a term that can refer things much broader than the single objects in the game world. Similarly, the objects that Anthropy distinguishes for her verbs are too broad to be referred to by a single noun. Her example of one such object would be: "Jane digs through *a block of green clay*." It is correct that the object that the verb phrase *dig through* in this sentence is not just the noun *block*, but a phrase that specifies what type of a block is being dug through. This shows that the verb theorists covered in this thesis seem to understand that the arguments that verbs take can also consist of longer phrases, but they do not seem to have the terminology to describe this phenomenon of languages. Therefore, this is one aspect of the verb theory that could be improved by introducing terminology and concepts from linguistics.

Anthropy (2014: 11) claims that the rules of a video game are hidden in the programming code of the game. This means that it is normal for a player of a game to understand the game through its narrative elements instead of the rules that underlie these elements. These positions mirror Koster's idea that games are essentially abstract patterns of rules underlying narrative elements with the main goal of teaching the player the underlying patterns of the game. Anthropy (2014: 11) also believes that a game teaches a player through interactions. Hidden rules create a phenomenon unique to games where a player who starts playing the

game from the first level does not know what a later level of the game looks like or that in a later level their character might learn new abilities or be deprived of older abilities. Thus, a video game can give the player the freedom to discover the rules and complexities of the rules of that game at their own pace. This is what Koster would call learning the algorithmic possibility space of a given game's rules. To place this idea into the theory of Crawford, one could say that the player of a video game experiences the game primarily through the interface, available inputs and the narrative settings of the game, while the rules that shape the game's structure are hidden from the player and are opened up through the interactions of a player.

Anthropy (2014: 14) exemplifies her understanding of rules as verbs in games through the 1982 coin-operated arcade game *Joust*, where ostrich gladiators have to joust with spears in an arena. She brings out three rules of *Joust*: (1) when two gladiators collide, the one who is higher defeats the other gladiator; (2) when the player presses a button, their ostrich flaps and gains height; (3) the ostriches are influenced by the pull of gravity, falling downward after a flap. These rules are supported by the verbs of *Jump*, *Shoot*, *Fall* and *Flap*, which are used to interact with the other rules of the game (Anthropy 2014: 15). Here it can be noted that like Koster, Anthropy also differentiates between the constitutive rules that are tied to the inputs of the player and the operative rules that form the verbal descriptions of these underlying rules. However, unlike Koster, Anthropy does not provide specific verbs for the rules themselves and is satisfied by listing the interactive verbs that describe the underlying rules. Therefore, according to Anthropy (*ibid.*), verbs are the rules that allow the player to change the game state, or in other words, the rules that allow the player to interact with the game. Without these verbs and interactions, a game would be a simulation and not a collaborative story-telling system.

When Anthropy calls a game a collaborative story-telling system, she means that a game that is interacted with is essentially a dialogue between the player and the game. As has been shown in previous sections, understanding the process of interaction in video games as a communication between man and machine is a fairly common point. Anthropy's (2014: 15) reasons that just as a writer of a book cannot control the interpretations of the readers of their book, a game creator cannot design the game player or their behaviour, but they can design the rules that shape how the game is played, the choices that can be made in a game and the kind of performance allowed to the player. Unlike Koster, Anthropy does not base her account on how interactivity manifests in a game on Crawford's definition and ideas on interactivity. She believes that the game creator uses rules to allow the player and the game software to communicate with each other and verbs are what allow us to communicate through these rules. This position is problematic as it connects the rules of a system immediately with the process of interaction and does not take into account the processes of translating the player's intentions into data through physical inputs and the translation of the results of the rule-based processed inputs from data into sensory concepts through interface output, which all constitute the ultimate phenomenon of interaction. Therefore, Anthropy's understanding and explanation of interactivity lacks the descriptive power of Crawford's account of interactivity.

Anthropy further explicates her account of how the verbs describing interactions are connected to the rules of a game by constructing a fictional game. In this game, the player takes control of the character Janet who has to defend herself from attacking robots with only a laser pistol as her means for defence (Anthropy 2014: 16). In this game, the primary interaction would be described through the (interactive) verb *Shoot*. When the player of this game presses the *Shoot* button, the game follows a rule that the process of shooting is executed when the *Shoot* button is pressed. The player of the game can expect their player-

character to shoot with the laser pistol in the game once this sequence is completed as the game software always strictly follows the rules that are programmed into the game. So far, this account of a single interaction is quite close to the low-interactivity phenomenon of a refrigerator light that Crawford gave as an example. However, Anthropy explains that aside from making the player-character shoot a laser projectile, the *Shoot* verb also has various other rules programmed into it that are not immediately clear to the player.

First of all, the game designer can design the laser pistol to shoot a single laser at a time and determine that a single shot can be taken every half a second. Therefore, like Koster, Anthropy's theory ties the interactive verbs of a game not only to a single action but to a cluster of rules. The addition of the rule that determines the length of a single shot of the *Shoot* verb is also parallel to Koster's idea that the topological aspect of time is tied to a rule. Anthropy explains that the delay between shots can be creatively explained by a designer by making it known that firing the laser pistol generates heat and the pistol needs exactly half a second to cool down between every shot. This is the element of game design that Koster would call the narrative dressing that provides misdirection from the inner systems of the game. Anthropy believes that in the case of this game, if the player becomes skilled enough, they would no longer think about the reasoning of the delay between shots, but intuitively accept it as a core game mechanic or rule. This is yet another aspect connected Koster's understanding of games as he also believed that once players have learned the underlying patterns of a game, they no longer need to pay attention to the narrative dressing. Anthropy (2014: 16) explains that the duration of a shot is important and is intentionally designed, because it creates opportunities for the player to make choices. For example, when in this game, the player-character is surrounded by robots on each side at varying distances and the player has to take the duration between each shot into account, then they have to make a choice between which robot to *Shoot* first to overcome the challenge. Thus, like in the

previously presented accounts, Anthropy also sees choice as an important part of interaction in video games.

Anthropy believes that in most games, the verbs that describe different rules mostly also interact with each other, adding a meaningful layer of complexity to Crawford's ideas on interactive verbs. She gives the arcade action game *Space Invaders* (1978, Taito) as an example of a very simple game where the verbs interact with each other. In the game, the player controls a laser cannon on the bottom of the screen to fire at descending rows of aliens. The game only has two main interactions of shooting the cannon and moving the cannon left or right. These two interactions share a relationship with each other as when the player presses the *Shoot* button, the shot is fired in a straight line from their position, but for the player to be able to hit the moving UFO targets, they have to move to line up their shot and shoot, while at the same time they also have to use the movement in order to avoid the shots fired back by the aliens. Anthropy (2014: 17) explains that there is a dialogue between movement and firing shots and through this interaction the *Move* verb becomes more developed as it is used to both position shots and avoid being hit. This idea is also suggested by Fernàndez-Vara (2014: 235) who arrives at a similar conclusion by explicating the actions of a fighting game. She states the primary actions in a traditional fighting game are *Move, Punch, Kick, Dodge* and *Jump,* but these verbs carry different underlying nuances if the inputs are combined in meaningful ways. For example, depending on the direction of the *Move* button that is held down, be it left, right, up or down, and combining it with the *Punch* or *Kick* button, the player can execute either a high or low kick or a weak or strong punch. In both examples, we can see that it is possible for different actions to be executed at the same time to either interact with the combined systems of rules or perform new actions or rules altogether. Therefore, when analysing the verbs that constitute the interactions of a

game, one must consider the verbs or interactions that become available through combinations of these actions as well.

Well-designed games should utilise as many rules for a single verb as possible. Anthropy (2014: 18) holds that verbs in a game should be as developed as possible with as many rules nested under a single verb as possible. She compares this with making well-rounded characters for a story. She thinks that a game creator should avoid orphaned verbs, which have no relationship to other verbs. Her example of an orphaned verb would be *Open* in a game where the verb is only used to open a single door once a level. If there are only a handful of doors in the whole game, then the verb becomes orphaned as it has no practical use most of the game. The idea of a well-developed verb versus an orphaned verb could perhaps explain what Crawford meant when he differentiated the proposed verbs of a FPS game into primary (*Move*, *Jump*, *Shoot* and *Aim*) and secondary (*Pick up* and *Drop*) verbs. The verbs that Crawford listed as primary for the game can be seen as verbs that are well-developed, because the actions of movement, jumping, shooting and aiming see constant use in an FPS game and they can also be used in combination with each other to provide the player with new interactions. The secondary verbs that Crawford provided no explanation for can be understood to have a secondary importance for an FPS game because they are orphaned interactions that are only designated to fulfil one purpose – to pick up or drop a new weapon. This aspect could also be explained through Koster's method of analysing the core verbs of a game as the secondary verbs would have only one rule-based verb tied, whereas the primary verbs would have various rules nested into them.

Another component of Anthropy's theory that provides an important addition to Crawford's base verb theory is the differentiation between the physical and the digital layer. Anthropy (2014: 25) acknowledges that when we say that the player-character is shooting a laser pistol at robot enemies, what the player is really doing is tapping the button on the

controller that is designated for the *Shoot* verb. She finds it important to make the connection and distinction between the verb the player is acting upon and the physical action that the player is undertaking as it can be useful for designing interactive games. After all, as Murphy (2014: 19) stated, the input controllers are the site of physical interactivity that links the player with their in-game representation and therefore the rules of a single interaction could be made to reflect the physical input of the player. Anthropy's (2014: 26) example of the difference between the physical and digital layer is from her own game *Tombed*, where the player has to make the main character Jane dig down with the SHIFT key on the computer. She explains that a single, fast tap of the SHIFT key makes Jane merely *Poke* at the ground to give the player auditory and visual feedback of whether the material the player is standing on can be dug through or not. However, *holding* the SHIFT key down makes Jane *Jam* the shovel in the earth and *Lift* it over her shoulder connecting two different physical actions with the same button input for the verb *Dig*. In addition, both the physical actions of a light tap and holding the button down reflect the duration and density of the actions of the character in the game. The example from *Tombed* shows that the same button on the input controller can be utilised to make the player-character perform different actions depending on how the button is pressed. Some games also make use of toggling an action on and off by using a button input as an on/off switch. Therefore, when analysing the interactive verbs of a game, one should also keep in mind the fact that physical differences in how the same input is pressed can also call forth different implementations of a game's rules allowing for different interactions with the same input.

To add to the physical layer of interacting with a game, Anthropy also mentions that the input controller of a mouse should be further analysed. According to Mauger (2014: 33), Douglas Engelbart was the one responsible for presenting the mouse as the tool that would become the defining feature of the modern computer interface, which would allow the new

paradigm of “direct manipulation” through which the user could gain immediate control over the displayed text and windows for the first time. The mouse is what mostly serves as the user’s representative in dataspace and is still the tool that allows the user direct access to abstract information on the computer monitor. Anthropy (2014: 27) claims that the way how mouse input is used in interactions with a game is highly nuanced because it allows for both slow and fast movements along two axes simultaneously. The mouse is a powerful tool for interacting with a computer interface because it offers many more degrees of movement than a keyboard key or a controller buttons, which can either be in the *pressed* or *not pressed* position. For example, a player can move a mouse cursor up and to the left at rates that are independent of each other and as such the mouse cursor is often used independently from the keyboard, gamepad or mouse buttons to give the player a minute control over different aspects of the game. Anthropy claims that the most widely used verb for mouse interactions is to use the mouse for *Look* around the environment. However, to be more precise, as was mentioned with Koster’s verb model for *Quake*, while the action of looking around with the mouse cursor in an environment of a game that utilises the first-person perspective could be perceived as the player-character looking around the environment, then in fact, it is the camera lens that the player is moving with the mouse. The player of a three-dimensional game is not controlling the character’s field of view to look around but the camera. This becomes apparent in action games that utilise a third-person perspective as the mouse is still used to move the viewing field of the player, but the camera no longer acts as the player-characters field of view. This is an aspect that emerged with games that utilised three-dimensional space. Early two-dimensional games were designed like theatre stages, with the computer screen acting as the fourth wall that gives the player access to the action, with other environments being accessible via entering or exiting to the left or right edges of the “stage” (Perron 2014: 77). When games started utilising 3D spaces, they also needed a way

for the player to navigate their view within this space and therefore they ditched the fixed theatre stage perspective for the perspective of a live-action film camera controlled at will by the player and this has mostly been exclusively handled via mouse input in video games for PCs. Therefore, when analysing the input for the verbs of a game, then attention should be given to whether the interactions are performed with button presses or cursor movements.

To conclude, Anthropy's general ideas of how verbs manifest in video game structures seem to echo ideas presented by both Crawford and Koster in their respective theories. Despite general similarities, Anthropy also manages to call attention to a few important elements not covered by the other theorists. For example, she calls attention to the fact that different physical interactions with the same input can give different commands to the game software (a tap of a button vs holding down a button). Another valuable addition to the verb theory is to show that the input provided for the game software can also be combined to produce new rules and verbs, showing how most games make use of the interaction between rules. Therefore, a single verbs of describing the core input and interactions of video game can also interact with each other, allowing for complex clusters of interactions.

1.4 TOWARDS A UNIFIED THEORY FOR VERBS IN GAME STRUCTURES

Having looked at the three separate accounts on the roles that rules and interactivity play in the structural aspects of video game software and how verbs can be used to refer to and identify these elements, we can attempt to piece together a systematic theory of verbs in game structures. The main idea shared by all three accounts is that using verbs to describe and identify both the actions or processes taking place in video game software and the interactions with these processes is a reliable way of explaining the inner structural workings of games and should be placed as the base argument for the verb theory. While the goals and methods used to come to this conclusion are different, they could be unified to construct a theory for verbs in video games.

One thing that these accounts agree on is that games are built on algorithmic patterns of rules and these rules are made manifest through the player's interactions with the rules. Without interaction, a game is in a static state where nothing happens because the game rules or software have not been provided with any input to process. As such, interactivity is a necessary component of playing video games. The most comprehensive account of how interaction works was given by Crawford and it provides as a basis for the unified theory. Following the definition of Crawford and the additions of Koster and Anthropy, we can state that interactivity in a video game is an iterative process of turn-based back and forth communication between the player and the game rules. The player makes their move by providing the software with physical input via a controller and "speak" to the game. This constitutes the turn of the player. The rules available to the player are defined by the capabilities and combinations of input actions that the current state of the game allows the player to take. The game software will "listen" to the player's input and process it with its designed ruleset to "think" about the player's move. The game software will then make their

turn by "speaking" to the player with user interface output to show the results of the player's rule-processed actions. This single act of interactive communication will provide the basis for the next acts of interactions in the game and as such a game will be procedurally generated through these interactive loops.

Using verbs to describe the processes involved in interaction is an effective way of providing a descriptive means for diagramming the events taking place in a game. A single rule of a game that elicits a certain type of interaction from the player can be identified through a generalised concept of a verb. This means that the basic user interactions of a game can be summed up with verbs. The verbs that describe the interaction of a user will be referred to as interactive verbs. If we were to follow Crawford and his examples, listing the interactive verbs of a game software also defines the type or genre of that game software. A generic game belonging to the first-person shooter genre can be described with the interactive verbs of *Move, Turn, Jump, Crouch/Take cover, Aim, Shoot, Pick up, Drop*. Here we can use the further analysis of Koster, who claims that these verbs constitute the narrative dressing of a game's interactions, which are used to translate the inner rule-based patterns or processes of a game's software to general concepts understandable for the human player.

Following Anthropy's analysis, the primary meaningful interactions of a game are rarely orphaned, meaning that the main interactions of a user are clusters of rules that interact with each other and not just single verbs describing single interactions. Therefore, what Crawford described as the primary verbs of a game can be understood to be the interactive verbs that describe the general actions that are composed of a combination of interacting inner processes of a game. Koster proposed a separate set of verbs to describe the core processes that together form the clusters that can be described through interactive verbs. These verbs range from general processes like *Remove, Intersect, Move to, Time*, etc. to processes of input like *Navigate, Press button, Hold button, Release button*, etc. In the case of video

games, most of these core verbs are tied to input as in the case of an FPS game, the core verb clusters that shape the general interactive verbs are all tied to parallel combinations of input. For example, for the interactive verb *Move*, a player has to *Navigate* a direction in 3d and 2d space by determining the direction with the arrow keys or mouse cursor respectively and *Press/Hold button* to execute the movement towards a navigated direction. The interactive verbs that describe the actions that are only tied to a sole process can be described as secondary or orphaned interactive verbs with FPS examples of these being *Pick up* and *Drop* as they are only composed of the input verbs of *Press button*. Therefore, verbs can be used to describe two different levels of video game structures: the core input verbs that describe the processes that take place in the immediate interactions with the computer system through input and the interactive verbs that describe these combinations of input through a concept that fits the narrative setting of the game world.

A third type of narrative verb could also be distinguished in video games. These are the verbs that appear in the textual interface output that is programmed into the games to provide a narrative dressing for the game universe. Many video games are filled with expository sentences that describe the story world of the game. These are mainly used to either give a background story to the game universe that a player is traversing or to give the player hints on what to do next. As an example, when the player of a FPS game finds a friendly character in the game universe and is given the option to *Speak* to that character. The interactive verb *Speak* will trigger a process where the player-character will communicate with the friendly non-player character (NPC) by, e.g. asking them *What is the situation?* With the NPC answering *Thank god you are here! Please help, I am overwhelmed and, they nearly killed me!* The communication between these two characters is composed of sentences that also include verbs in them, but these are not immediately connected to the interactions of a player. Such sentences are most always pre-programmed to the game as data, content or

what Koster called narrative dressing to give the fictional world of a game a sense of story or to give the player motivations for or instructions on how to further progress in the game. As these verbs are part of the pre-defined narrative content of the game and mostly appear in the interface of a game as output to translate the computer processes into concepts understood by humans, then they are not strictly a part of the active interactions of the player or the processes of a game's rules and as such they are not important for the purposes of the proposed verb theory. These verbs and sentences might be of more interest to research the language that is used in the narratives of games. The present verb theory will only cover the verbs that describe the structural elements of interactions and the processes of a game and as such, any verbs that are part of the sentences appearing in the story world or interface of a game will not be analysed.

Although the three accounts of verbs in video games use a language-related concept to describe the processes of interactions with a game software, none of the theorists refer to, nor support their ideas with linguistic theory and concepts. The theorists seem to use verbs as the basis of their theories to explicate the inner structures of video games, because they think that verbs are a generally well-understood concept. Crawford is the only one of the three to provide a definition for verbs, describing them as words that describe events or action. Crawford (2012: 82) is also the only one who makes a reference to linguistics by stating that generally linguists make the claim that the two most fundamental components of all languages are nouns and verbs, because nouns specify things and are about existence, while verbs describe events and are about actions and the combination of these two word classes allows humans to talk about anything under the sun. The language universal of all languages including at least nouns and verbs has indeed been posited in linguistics and is known as one of Greenberg's universals, but this is one language universal that is not accepted by all linguists, as increasing evidence of languages that only use a single word

class have been found (Evans, Levinson 2009: 434). However, the possibility to use the relationships between nouns and verbs as metaphors for the relationships between data and the processes of computers is perfectly valid when coming to linguistics. Also, unlike Koster, Crawford's intention was not to provide a language for describing video game structures but rather to show how computing systems can also be described by distinguishing the objects of a computer as data and the actions of a computer as processes, which could be, in turn, likened to how the word classes of nouns and verbs act in languages and provide a good metaphor for understanding the complex nature of software.

One of the main weaknesses of the verb theories presented in this thesis is that they only provide an example list of verbs that could be seen as part of video game structures, but they do not carry out an in-depth analysis of these verbs. Crawford's account only shows that the variety of the verbs used in game structures is very small compared to that of literature and while he distinguishes between different types of verbs, he does not back his claims up with any actual theories on verb types. Thus, the first linguistic element that could be added to the verb theory is to present the different semantic types that verbs are categorised into and examine whether Crawford's claim of video games being largely incapable of producing social interactions has any merit.

Koster attempted to create a formal language for analysing the structures of video games that would mirror the formal notation languages of other forms of culture. Koster succeeded in showing how game rules can be described through verbs attributed to physical input interactions, which, in turn, form clusters that can be described through the interactive verbs presented by Crawford. However, the only clear elements of his formal notations for games were the actions described through verbs and the topology of each rule described through the interactive possibility space of any given rule token. Because verbs do not often appear alone and take arguments, then we can improve on Koster's basic grammar by distinguishing

the other arguments of the sentences that interactive and input verbs would require. Therefore, the second linguistic element to analyse in game structures is to determine what type of grammatical relations co-occur with the verbs of interaction.

Anthropy carries out the most detailed analysis of the various meanings and rule-structures that can be attributed to single interactive verbs, which is a valuable addition to the unified verb theory. Unlike Koster, Anthropy also points attention to the fact that verbs require objects that will complete their sentences, but she only brings an example of a full sentence, without identifying the objects themselves. This shows that Anthropy might not be comfortable with representing linguistics, as her book is written from the perspective of a game design expert and not a linguist. She does however briefly mention the phenomenon of objects being tied to verbs and as such, the type of phrases that form grammatical relations can be introduced. This would allow us to show how verbs tend to form phrases that do indeed also take phrases headed by nouns or other word classes.

The final and most valuable linguistic element that could benefit the verb theory is to provide a method for formalising the sentences that interactive and core input verbs appear in and therefore complete Koster's formal grammar project. As stated by Koster, such a formalised language for analysing the structural components of video games would give game designers a powerful tool and a vocabulary for creating design documents that could be read and analysed easily by both humans and computer programs. Such a method for analysing video game structures could be formed by combining the analysis of the grammatical relations tied to the structural game verbs, the analysis of the different semantic types of these verbs and the thematic roles that their arguments acquire and finally the analysis of the syntactic sentence structure of interactions. With these aspects in mind, the verb theory should have a method for not only distinguishing the interactive verbs of games, but also the entities that can be interacted with, the entities that are responsible for the

interactions, the type of sentences that interactions form and what kind of inherent meanings these verbs carry. Such a formal methodology would not only be useful for game designers, but also video game scholars and linguists who are interested in analysing the structures of video games.

CHAPTER 2. CREATING A SYNTAX FOR ANALYSING VERBS IN GAME STRUCTURES

This thesis has reviewed three accounts which claimed that verbs play a significant role in the interactivity of video game structures. However, these accounts only seem to show how verbs take part in game structures and provide example lists of these verbs, but they do not carry out a meaningful linguistic analysis of these verbs. Therefore, one way how this thesis can add to the disciplines of video game studies and linguistics is to provide the verb theory with a method and terminology for analysing the verbs in game structures. This can be achieved by making use of syntactic theory to provide a basic analysable sentence structure for the verbs that appear in games, as well as the arguments that these verbs take. With a basic syntax for the verbs set, semantic theory can be used to analyse what types of verbs appear in game structures and what kind of meanings these verbs carry.

As the field of video game studies does not often concern itself with the concepts from linguistics, some basic terminology will be introduced. Because this thesis mainly focuses on verbs, a basic grammatical definition of verbs should be provided. According to Van Valin (2001: 6), in traditional grammars, lexical categories or word classes are defined through their semantic content, i.e. what they refer to. He states that such a notional definition of a verb would simply be "action word." Interactions are a type of action and therefore describing interactions through verbs is acceptable. Additionally, Van Valin (*ibid.*) also provides a definition for a noun as "the name of a person, place or thing." As to whether nouns can be used to describe the entities of a game will be discussed below. It should be noted that in modern linguistics these lexical categories are defined in terms of their grammatical properties. Therefore, apart from being words that describe actions, verbs can also be defined or categorised through various grammatical dimensions (*ibid.*). The main

aim of the first section of this chapter will be to cover the grammatical dimensions of interactive verbs in detail.

The main aim of Koster's theory was to provide a grammar for gameplay structures helping designers and game researchers better communicate game design. It should be noted that a grammar generally constitutes of syntax and morphology, sometimes also referred as to morphosyntax (Van Valin 2001: 1–2). Syntax is the study of how sentences are constructed whereas morphology is the study of word formation and how these words may change their form. Syntax shows us that the way how the main elements of a sentence are ordered determines the way how languages differ from one another. In the English Language, the Subject comes before the verb and is in turn followed by Direct and Indirect Objects. However, as Koster's project was to provide a formal grammar for notating games, then our proposed grammar will only involve itself with analysing the formal syntactic features of game structures, Therefore, this chapter will only focus on formulating a basic formal grammar for interactive verbs and will not focus on the morphological features of these verbs.

2.1 THE SUBJECTS, VERBS AND OBJECTS OF A GAMEPLAY SYNTAX

The first goal of forming a syntax for interactive verbs is to determine the grammatical relations that take part in our sentence structures and the types of words that form these grammatical relations. Van Valin and LaPolla (2004: 82) claim that the main functions of language are reference and predication, meaning that a language should represent things that happen in the world and the participants involved in these happenings. The description of these happenings mostly fall unto verbs and other predicating elements, whereas noun phrases and other referring expressions denote the participants of these happenings. Thus, Crawford was technically correct in describing the processes and data as the nouns and verbs

of computing, because rule-based processes describe the happenings of software, whereas data is what takes part in these happening. Unlike Koster's grammar, our formal syntax should not only determine the verbs of video game structures, but also the arguments that these verbs take. The two primary grammatical relations that act as the arguments of sentences are Subjects and Objects. According to Van Valin (2001: 8), the term argument refers to any Noun Phrase (NP) or Prepositional Phrase (PP) that functions as the Subject, Direct Object or Indirect Object of the sentence. From this, it can be inferred that arguments are mostly composed of word phrases.

As a matter of fact, arguments rarely appear as a single word class and tend to form phrases instead. When talking about word classes, we generally accept that the Subject of a sentence, i.e. the agent responsible for the actions of a verb, is a noun, but it is not always so. A subject for a sentence with the verb *Sleep* could indeed be a single noun like *Children* in the sentence *Children sleep well*, but it can also be *The children who play all day* in the sentence *The children who play all day sleep well*. In the last sentence, the Subject would be a Noun Phrase with the noun *children* being the head of the phrase. The Objects of a sentence can also be composed of larger phrases. Therefore, the arguments of a sentence such as Subjects and Objects are mostly classified through phrases and not single word classes. This means that Anthropy was correct in claiming that the Objects of interactive verbs are not always single nouns or entities, but can refer to general phrases as well.

It should be noted that all the arguments tied to interactive verbs are entities of the video game world (e.g. Shoot *enemy*, Move *feet*, etc.). The arguments taken by input verbs are the input buttons or controllers (e.g. Drag/Navigate *mouse*, Press *button*). This follows the processing-data juxtaposition posited by Crawford. Anything in a game that has determined physical (or temporal if Koster and Anthropy were to be included) parameters forms a single entity and virtually anything that is an entity of a game system can be interacted with. This

means that the object of our interactions does not only have to be a simple inanimate object, or an animate object like a character, but can also be an entity surround all other entities, like the whole world geometry of a game world (This is the case in some ball balancing games where instead of taking control of a ball, the player takes control of the geometry surrounding the ball to influence its movements indirectly, e.g. *Super Monkey Ball* series). To some extent, even the physical laws or forces in a game can form entities to be interacted with (e.g. in *Flower* (2013, Sony Interactive), the player takes control of the wind to collect petals from flowers). To see the entities populating a game world as the objects for interactive verbs is a counter-argument against Koster, because even if a chess piece is characterised by the verbs that describe its possible movements, it is okay to designate the chess piece with nouns or noun phrases (i.e. as Objects), because it is a characteristic feature of a verb phrase to take Objects as complements. The data that shapes the game world is mediated through the interface as output and is thus a narrative element that coats the game's inner processes, but it should not be characterised through adjectives like Koster did. One can still use adjectives to describe the characteristic properties of in-game objects (or tokens in Koster's case). For example, in chess, the dominant piece can either be called the king (noun) or the king piece, showing how it is essentially both an adjective to describe a type of piece and a proper name given for that type of piece. Therefore, it seems that Koster's problem with the word classes for objects is not a problem at all.

Following the sentence structure of the English language, the two main components of all sentences are the Subject and the Predicate. To attempt to form a basic syntax for game structures, both of these grammatical relations have to be identified. Starting with the Subject, one way how Anthropy's ideas on the Objects of game structures can be developed is to state that not only do interactive verbs take Objects to complete their sentences, but also the Subjects that are responsible for carrying out the actions of these verbs. According

to Van Valin (2001: 41), a Subject is the most important grammatical relation of a sentence. Aarts (2001: 8) states that the Subject of a sentence is the constituent that shows who performs the action denoted by the verb and who or what the sentence is about. He adds that there are four elements that identify Subjects: Subjects are obligatory, as every action requires a doer of that action; Subjects are usually Noun Phrases (NP); in declarative sentences, the Subject is the first NP in that sentence; Subjects determine the form of the verb (Aarts 2001: 11). Looking at these aspects, if interactive verbs can be identified in video game structures, then it is also obligatory for these verbs to have a Subject that performs the actions described by the verbs.

In the case of video games, identifying the Subject of player interactions poses an interesting problem, because there are two ways of interpreting who is the agent undertaking the actions – is it the player or their embodied in-game proxy? Recalling Gregersen and Grodal (2008: 67), who argued that interaction with video games is a phenomenon where the player experiences both agency and ownership of the virtual entities, one could make the claim that the Subject of an interactive verb is both the player of the game and their character at the same time. However, this would mean that when the player of a FPS game wants to *Shoot* at opposing characters they would literally be the Subject of an act of murder, but this is not so. Instead, by following Koster's differentiation between interactive verbs and input verbs, it can be affirmed that the player of a game is the one who does not strictly embody their in-game character, but take control of them by giving them commands through button inputs (e.g. *Pressing* the *Shoot button*) with the virtual in-game character being the one who is the Subject of the interactive verbs (*Shoot*). However, this seems to be a phenomenon related to video game software as when interacting with, e.g. a word-processing software, it would be better to say that the Subject of the interaction of putting a word into the bold typeface is not the mouse cursor, but rather the user of that software. Therefore, in the case

of interactive software that are composed of fictional storyworlds, the Subject of interactive verbs is most likely the fictional in-game entity that is embodied through the control of the player of a game, but if a software lacks such an entity, then the Subject position will be taken by the software user.

Apart from distinguishing two separate Subjects that are involved with a single video game interaction, there is another way of representing interactive situations by removing the Subjects altogether. One unique sentence construction that universally targets Subjects is the imperative sentence formation which is used to convey commands or orders. Aarts (2001: 60) states that imperative sentences are normally interpreted as directives or commands from someone to someone else to do or not do something. Van Valin (2001: 41) claims that in the imperative construction, the second-person subject is omitted and interpreted as an addressee of the action, whereas the verb is in a special tenseless form (also called the *base form* which will be analysed below). An example of an imperative sentence would be *Open the door*, where the addressee of this directive is implicitly understood to be the subject of the verb. Recalling Murphy's (2014: 21) claim that input controllers are the physical objects through which the agency or commands of a player are passed to the game software, one could say that an interactive sentence structure could also be formed through an imperative sentence. For the player of a game, the Entity that they are currently controlling is mostly obvious and as such, interactive sentences can also be interpreted as the player giving their player-character commands. Therefore, interactive sentences can be represented in the imperative form by omitting the Subject. This approach has its own problems, because as Koster has shown, there are two levels of processes going on in a game software, with the player giving the software commands through separate input verbs, while the player themselves might be describing or understanding the combinations of these inputs as not giving commands to the software, but the fictional entity in the game world instead.

Either way, both ways of interpreting interactions can be described through imperative sentences.

Having determined the Subjects of the sentences that describe software interactions, we can move on to identify the second obligatory element in a sentence – Predicates. Aarts (2001: 8) defines a Predicate as the unit in a sentence whose function is to specify what the Subject is engaged in doing. It is important to note that in every given sentence the Predicate is everything in the sentence except the Subject. Therefore, as the Objects of a sentence are not a part of the Subject, they are categorised under the Predicate. According to Aarts (2001: 75), Predicates are traditionally headed by verbs, called the Predicators of the Predicates. The semantic function of a predicator is to predicate something, i.e. say something about something else. Just like with the arguments of a sentence, most Prediactes are composed of Verb Phrases (VP) instead of single verbs. Van Valin (2001: 5) defines a verb phrase as a verb followed by a constituent, e.g. a Noun Phrase. One of the main characteristics of a Predicate is that each verb or other predicator has a certain number of arguments that each have a distinct semantic role.

According to Van Valin (2001: 6), the most important grammatical dimension of a verb is how many arguments it takes. This phenomenon is called transitivity. A verb that only takes a Subject as its argument, is called an intransitive verb, whereas a verb that takes a Subject and a Direct Object is a (mono)transitive verb. A verb that takes a Subject, a Direct object and an Indirect Object is a ditransitive verb. Via the aspect of transitivity, one can see that the objects that a predicate takes can be separated into the categories of a Direct and Indirect Object. According to Aarts (2001: 18), the main function of a Direct Object is to be a Complement that completes the meaning of the verb that precedes. A Complement, in turn, is any constituent of a sentence whose presence is required by another element. Van Valin (2001: 59) adds that semantically, the Direct Object of a sentence always acts as the

undergoer of an action. The function of an Indirect Object is typically to be the recipient argument of a ditransitive verb (Van Valin 2001: 67). This means that when a ditransitive verb, e.g. *Give*, takes two arguments then the Direct Object represents the entity that is given something, whereas the Indirect Object represents the entity that is being given. Interactive verbs can be intransitive (*Move*), monotransitive (*Pick up Flower*) and ditransitive (*Give Flower to Woman*) and as such both Direct and Indirect Objects can be found in sentences describing interaction. As will be shown in the next sections, the sentences that represent interactions tend to favour transitive constructions over intransitive ones

Another important dimension of verbs is what kind of a situation is represented by the verb. Van Valin (*ibid.*) states that if a verb represents a situation where no one is actively doing anything like *Feel* in *Tom feels cold*, then it is a static verb. It is contrasted by dynamic verbs that symbolise actions like *move* in *Tom moved to the bridge.* Since a necessary component of video games is interacting with the game software, which is an action, then interactive verbs all represent dynamic verbs. The differentiation between static and dynamic verbs is an aspect of verbs that could provide an explanation for why Crawford was dissatisfied with the range of verbs that describe interactions. Crawford made the criticism that video games do not make use of social interactions that categorise the emotional or inner states of characters, but focus on spatial interactions instead. Crawford represented the verbs that describe the inner states of people as social verbs, but these types of verbs are mostly static verbs. Because interactions should be dynamic via their nature, it would also be difficult to represent the inner states of characters with interactive verbs. After all, a game designer can designate a specific button input for making the player-character *Feel sad*, but this would not reflect the inner emotional state of the character, but rather the character following the player's command to start feeling sad. Therefore, it might still be best for video game designers to try and utilise dynamic verbs for interactions and leave the

representation of a character's inner states for the visual and textual narrative design of a game's storyworld.

Verbs are used to represent the time and duration of a given sentence through the grammatical category of tense. The sentences that represent interactions with video games need only be concerned with the present tense, because interaction is a phenomenon that can only take place in the present. This is argued by Juul (2001), who maintains that the story time of a video game is always now and not in the past or future, because a game progresses only as the player interacts with it. This is one way how video game narratives are unique, because unlike literature, they cannot make use of grammatical tense to indicate temporal relations. While film and theatre also cannot make use of grammatical tense, they still carry a basic sense that even though the viewer is presently watching a movie , or the players are on stage performing in the present, the events told are not happening now (Juul 2001). Therefore, the sentences of our syntax that represent interactive verbs will always be in the present tense.

The two grammatical categories of verbs that are tied to time are agreement and aspect. First, verbs are in agreement with the Subject of a sentence meaning that the form that a verb takes depends on whether the Subject undertaking the action is in the first, second or third person. As has been shown above, interactions can be represented by imperative sentences, which always take the base form. According to Aarts (2001: 36), the base form of a verb is the form that does not involve a morphological ending. Thus, the verbs of our syntax for gameplay structures will not concern themselves with morphology and only appear in the tenseless, i.e. non-finite, base form. The second feature of verbs related to time is aspect, which refers to the way the meaning of the verb is viewed in time. According to Aarts (2001: 37), in English, the two main categories of aspect are the continuous progressive aspect represented by the morphological *-ing* ending showing the continuation of an activity in

time, and the perfective aspect represented by the *-ed* ending showing the termination of an activity in time. As stated above, because interaction time is always in the present, the grammatical category of aspect will not be relevant for the analysis of interactive verbs.

2.2 SEMANTICS AND VERB CLASSES

Having determined how the grammatical relations of Subjects and Predicates and Objects take part in our proposed syntax and the grammatical properties of interactive verbs, we can progress with examining the different types of meanings that verbs inherently carry. Van Valin and LaPolla (2004: 83) use the semantic term "state of affairs" to refer to the happenings in the world that are described by verbs. They (*ibid.*) follow Aristotle to distinguish four types of states of affairs: situations, events, processes and actions. Because video game interactions involve processes taking place in the software, then the only types of states of affairs that would be relevant for our sentences are actions and processes.

Actions are dynamic states of affairs where a participant does something. It would be obvious to claim that interactions are actions, as even the main question for interaction proposed by Crawford was "what does the user do?" Therefore, it would be logical to assume that interactive verbs should describe the action state of affairs. However, Van Valin and LaPolla (2004: 83) claim that actions are states of affairs that are inherently unbounded, meaning that they do not have an inherent terminal point that will bring them to a conclusion. If we talk about the action of *running*, there is nothing in the meaning of the concept that refers to an endpoint of the action. This means that most sentences containing interactive verbs cannot refer to actions, because every interaction with a software should have an inherent terminal point for the game software to progress. There are still a few instances of input, where an action does not have an inherent terminal point, such as *toggling* an in-game action like running on or off or *holding* a button down to represent the unbounded action of

running. In this case, the player character will continue the running animation for as long as the run action has been toggled by a button press and will not end until the button is either pressed once again or let go. Processes are the state of affairs that involve a change over time, like a change in a state or condition, and thus have an inherent terminal point, meaning that most interactions carried out by the player are processes instead of actions. Therefore, one could say that interactions are not strictly actions, but rather happenings that mirror the processes of game rules.

Van Valin and LaPolla (2004: 86) argue that states of affairs should be distinguished from lexical items. Lexical items differ in the meanings that they express, and therefore a speaker always has a number of options when it comes to choosing which lexical items they choose to express a state of affairs with. This is important for game design, because a designer should design a game in such a way that the happenings in the game code are represented through words that make their meanings as clear as possible. As presented in the previous chapter, Juul argues that sometimes, for a player to understand and navigate the algorithmic patterns of a game's rules, they require a clear fictional world that would explain the relations between the rules. As such, a syntax that would present the formal sentences of interactions with a game structure should also represent the lexical properties of verbs and not just the states of affairs.

Lexical verb classes were originally presented by Zeno Vendler (1957), who proposed to call the inherent temporal properties of verbs *Aktionsart*. There are four *Aktionsart* verb types of State, Achievement, Accomplishment and Activity that each correspond to the state of affairs of situations, events, processes and actions respectively. Van Valin and LaPolla (2004: 92) state that it is important to distinguish the properties of states of affairs from the properties of verbs and other predicates, because *Aktionsart* only refers to the properties of linguistic predicates, not to properties of states of affairs. Furthermore, it is necessary to

distinguish the lexical meaning of the verb from the meaning it has in the particular clause that it occurs in. Also, all verbs have a basic *Aktionsart* type, but with the addition of a prepositional phrase or adverbial, the *Aktionsart* interpretation of the verb in that clause might change. These are all aspects that should be considered in the analysis of verbs that describe the interactions and the core structures of video games.

Van Valin and LaPolla (Van Valin 2004: 92) represent the *Aktionsart* types as follows: Activities as dynamic and temporally unbounded verbs, e.g. the intransitive *march, walk, roll, swim, think* and transitive *read, eat*. Accomplishments are temporally extended (i.e. not instant) changes of state leading to a terminal point, e.g. *melt, freeze, dry, recover* or *learn*. States are non-dynamic and temporally unbounded verbs like *be sick, be tall, love, know, believe, have,* etc. Achievements code instantaneous changes of state or activities and have an inherent terminal point. These verbs are *pop, explode, shatter* and are all intransitive.

Like with state of affairs, the *Aktionsart* verb classes have a few fundamental distinctions with the primary one distinguishing between static and non-static verbs. Static verbs are verbs that code a non-happening, with non-static verbs doing the opposite. According to Van Valin and LaPolla (2004: 93) this can be tested by asking "what is happening?" or "what are you doing?". Non-static verbs give a grammatical answer, e.g. "I am singing", whereas static verbs give an ungrammatical answer, e.g. "I am knowing." It should be noted that the non-static verbs are different from dynamic verbs, because the dynamic verbs of Activity perform differently in sentences from Accomplishments and Achievements. Therefore, following Crawford's fundamental question for interactive games of "What does the user do?" we can infer that interactions should all be characterised by either dynamic or non-static verbs where something is actively being done. Theoretically then, interactions could be represented through all verb classes apart from States.

As with states of affairs, verb classes can be categorised by determining whether the verb depicts a state of affairs with an inherent terminal point or not. This is called the *telic* feature of verbs. States and Activities are atelic, because they lack an inherent terminal point, whereas Achievements and Accomplishments are inherently bounded. As discussed above, most interactions are telic, with the exception being an interaction that is toggled through a button press or hold. Therefore, when an interaction with a game works through a toggle input, then it should be characterised as an Activity.

The final feature of *Aktionsart* is punctuality, which distinguishes telic events with internal duration from telic events that lack duration. For example, the Accomplishment verb *melt* and Achievement verb *explode* can involve a change of state, but they differ in the time span that these events take place, with *explode* being instantaneous, whereas *melt* can happen over a long period of time, making Achievements punctual and Accomplishments unpunctual. States and Activites are atelic and as such, are always unpunctual (Van Valin; LaPolla 2004: 93). As shown by Anthropy, the duration of an interaction is an aspect that is always designed as a part of a rule. Taking the analysis of Koster into account, the duration of the interaction depends on the way of providing the software with input. For example, a single button press is mostly punctual, whereas holding a button down or dragging the mouse cursor is unpunctual.

Van Valin and LaPolla (2004: 97) modify Vendler's basic *Aktionsart* classes, by adding a corresponding causative class to each verb class that would correspond to an induced state of affairs. This causative aspect is important for our analysis, because every interaction with a computer software can be interpreted as the player causing the player-character or rules to execute certain actions. As such, apart from an imperative construction, interactions can also be represented as a causative sentence with two verbs and subjects. If we were to follow Anthropy's idea that an interaction consists of a physical and a digital layer, with the player

being the physical instigator of the actions of their digital proxy in-game, then we would have to form our interactive sentences as causative sentences. Therefore there are three ways of describing interactions: the descriptive narrative manner of *Jane shoots the laser pistol* where a clear Subject and Predicate is included, the imperative manner of *Shoot the laser pistol* that omits the Subject of our interaction, or *The user causes Jane to shoot the laser pistol*, where the primary Subject of the sentence becoming the player and the Predicate involving the player's interaction with the game software as well as the command issued by the player to the character in an infinitive clause. Because the player of a game is a constant in interaction, then the formal sentence constructions of our gameplay syntax should follow the descriptive or imperative sentence construction. Furthermore, since a single game might let a player control more than one character entity, then the descriptive sentence structure that includes a Subject and a Predicate should be preferred in analysing game structures. If a game only allows a player to take control of a single entity, then imperative structures can be used as the Subject will become a constant and can be omitted.

2.3 A LOGICAL FORMAL NOTATION FOR LANGUAGE STRUCTURES IN VIDEO GAMES

Keeping both the syntactic and semantic features of interactive verbs in mind, a formalised analysis model could be created to analyse these verbs and the sentences that they make. Such a syntax-based model could succeed in achieving Koster's ideal of giving a formal notation language to analyse the structures of games with. As Koster (2005) claimed, a formal notation for game structures would also have to be a logical formal language. Since both the rules of a game software and the sentences containing interactive verbs can be represented through such a formal language, analysing the formal syntactic and semantic features of interactive verbs would also provide a method for diagramming the interactive structure of video games. Such a formal model would also provide linguists with a method for not only analysing the language in the narrative structures of games, but also within their inner rule-structures. Because the syntax for interactive verbs would be logically formalised, it could also easily allow a computer program to read, reproduce and eventually create diagrams of logical game structures. Thus, the aim of this section is to attempt to finish Koster's project and provide video game structures with a formal notation language that is based on formal grammars.

According to Aarts (2001: 94), one field where predicates and their arguments are represented with a formal notation is formal predicate logic. Miller (2007: 2) states that logic is the study of argumentation where one of the tasks is to provide a method of determining whether a given argument is valid or invalid and in order to apply logical methods to natural language sentences, they first have to be translated from as they appear in natural language into a formal logical notation. Miller (2007: 4) also claims that instead of directly speaking of subjects and objects and verbs, predicate logic allows to represent these features as variables, allowing to present natural sentences like a mathematical formula. A monotransitive sentence in predicate logic can be represented as Q (x,y), a ditransitive

sentence as P (x,y,z), where the semantic predicate is represented by a single capital letter and the arguments are represented by lower-case letters. Aarts (2001: 94) claims that an alternative way of representing predicates and their arguments is used by linguists. An example of *eat* (verb) would be [1 <NP>, 2 <2NP>], where the number of arguments of the predicate is presented and where the external argument is underlined. This way of representing predicates is more accurate for natural languages, as predicates are not always verbs. For a formal gameplay grammar, the methods of predicate logic will suffice as the predicates of the formed sentences will be interactive verbs and therefore always represent a verb phrase.

According to Reghizzi (2013: 5), in order for a language to be formal, the form of sentences (their syntax) and their meaning (semantics) must be precisely or algorithmically defined. This means that it should be possible for a computer to check that sentences are grammatically correct and to determine their meaning. Van Valin and LaPolla (2004: 90) propose an approach to depict the lexical meaning of verbs in such a formalised manner by paraphrasing these verbs in terms of primitive elements in a well-defined semantic metalanguage. They give the lexical decomposition of the verb *kill* as an example. *Kill* can be paraphrased as *cause to die* and *die* can be decomposed into *become dead*. The lexical representation of the verb *kill* would then be "*x* causes [*y* become dead]" where *x* and *y* represent the arguments of the predicate (*ibid.*). This kind of a method for analysing verbs fits both the syntactic and semantic requirements of a formal language and would be a good basis for analysing the verbs in video game structures.

Van Valin and LaPolla (2004: 102) provide a basic logical structure for all *Aktionsart* verb classes that can also be used as a basis for analysing interactive verbs. States can be represented as "**predicate´** (x) or (x,y)," Activities as "**Do´** (x, [**predicate´** (x) or (x,y)])," Achievements as "INGR **predicate´**(x) or (x,y)," and Accomplishments as "BECOME

predicate´ (x) or (x,y)." These logical structures follow the conventions of formal semantics, where predicates are presented as constants in bold followed by a prime. The variables that constitute the Subjects and Objects that these predicates take are presented in normal typeface. The predicate constants of these logical structures form the vocabulary used for the semantic metalanguage and as such are not words of the human language (*ibid.*). This fits Koster's requirement for a formal game notation and allows us to create definite verb-based rules for game designers to follow.

In this logical system, State verbs are represented as simple predicates like BECOME **dead´**(x) for the English verb *die* (Van Valin; LaPolla 2004: 102–103). Accomplishment and Achievement verbs are a compound of a state predicate and the relevant symbol for how these verbs change. The symbols are represented as all capital INGR (ingressive) for instantaneous change (punctual) and BECOME for verbs that go through temporal change (telic) (Van Valin, LaPolla 2004: 104). In the case of causative sentences a logical structure should be followed by CAUSE. Following the structure for the decomposition of Accomplishment verbs we can represent the sentence *Janet walks to the bridge* as BECOME **arrive´**(Janet, bridge). The logical structures of Activity verbs all contain the generalised activity predicate **do´** as Activity predicates always co-occur with a predicate referring to the performance of the activities (Van Valin; LaPolla 2004: 103). According to Aarts (2001: 42), *Do* is an interesting auxiliary verb, which is also called the dummy verb, because it does not carry any meaning by itself, but is used to aid other verbs in forming either negative or interrogative sentences or allowing code and emphasis. These are called the NICE properties of *do*, but for the purposes of this thesis the verb will only be used as support for other activity verbs in logical sentences. An example of an Activity verb logical structure would be **do´** (*Sally*, [**eat´**(*Sally,piece of meat*)]) for the sentence *Sally eats a piece of meat*.

Using these logical structures to analyse interactive verbs have various benefits. Van Valin and LaPolla (2004: 110) claim that this system of lexical decomposition makes the task of representation of sentences more manageable, as only primitive predicates need to be provided with detailed definitions. They give an example of using the State verb *cool* as an Accomplishment verb. As *cool* already has an adequate semantic representation as a State verb, then it can be presented as an Accomplishment verb by just adding BECOME in front of it. Apart from manageability, these logical structures can also easily be fed as input for computer programs that excel at computing and analysing formal languages. This would, in turn, allow for the creation of a proper notation grammar for video game structures, which would make compiling and reading game design documents more unified and simpler. As such, if verbs can be used to describe the core components of game structures and interaction, then providing a logical structure for these verbs would be enough to form the "Grammar of Gameplay"desired by Raph Koster.

Apart from syntactic structures, the logical structures proposed by Van Valin and LaPolla, can also be used to analyse the semantic relations between a predicate and its arguments. These relations are called thematic roles and are presented in capitals to signify the role of the arguments of a predicate (Van Valin; LaPolla 2004: 113). Some of the most common examples of these would be AGENT for a living entity performing an action, PATIENT for an entity being on the receiving end of an action and THEME for any entity that is currently undergoing some process. Only State and Activity predicates define thematic relations with the other predicate types being composed of these two basic types. Van Valin and LaPolla (2004: 114) add that each of the argument positions in logical structures defines a thematic relation, whereas arguments are referred to as "first argument" (x) and "second argument" (y). A primary hypothesis would be that interactions will most likely not involve State verbs and as such the analys of the thematic roles of interactive verbs

would deal with the roles of Activity verbs.. Van Valin and LaPolla (2004: 115) give the following examples for the thematic roles of Activity verbs:

Motion **do´** (x, [**walk´**(x)]), x = MOVER

Consumption **do´** (x, [**eat´**(x, (y))]), x = CONSUMER, y = CONSUMED

Directed perception **do´**(x, [**see´**(x, (y))]), x = OBSERVER, y = STIMULUS

Use **do´** (x, [**use´** (x, y)]) x = USER, y = IMPLEMENT

One thing to take note of here is that the first argument is always the same, meaning that it is always doing something. This would be another reason to support the notion that interactive verbs are Activity verbs as these all of the presented verbs above describe general interactions in a video game. Van Valin and LaPolla (2004: 118) state that English has the generalised activity verb *do* in it with the first argument of this verb always being an EFFECTOR. AGENT is a type of EFFECTOR semantically, meaning that it is always associated with an activity logical structure and therefore only verbs that have an activity predicate in their logical structure can have AGENT as an argument. This fits with the previous discussion on the Subjects of interactive verb predicates. Every interaction has an original cause and as such, it does not matter whether the Subject of an interaction is understood to be the player or their in-game proxy; in both cases the Subject will take the thematic role of AGENT or instigator of an action.

All of the Activity verbs and the thematic roles connected to these verbs that were presented as examples above are found in video game interactions and can be utilised for analysing the thematic roles of interactive verbs. This would allow us to determine the exact roles that specific verbs take. A thematic analysis would be useful for game designers as it clearly defines the different meanings that a given interactive verb carries and thus gives them a method for choosing the verbs for interactions that would best convey the exact meaning of the actions they intend to allow the player to perform. Van Valin and LaPolla

(2004: 116) claim that deriving thematic relations from logical structures is important because thematic relations are a function of the logical structure of a verb, meaning that they determine the number and type of the arguments that a given verb takes. Thus, in order to determine the argument structure of a verb, it is necessary to ascertain its *Aktionsart* in the construction it occurs in and only then its logical structure should be created.

With a possible method for analysing the verbs that appear in video game structures the thesis can apply the method to analyse the interactive and input verbs of a video game to determine whether such a grammar would give any meaningful information regarding video game structures.

CHAPTER 3. ANALYSIS OF THE VERBS WITHIN THE SECRET OF MONKEY ISLAND

3.1 MONKEY ISLAND AS A POINT AND CLICK ADVENTURE GAME

This chapter of the thesis will attempt to make use of the insights from the combined theory of verbs in video game structures and utilise the methodology for analysing the semantic verb types and syntactic sentence structures to provide an analysis of the interactive and input verbs that manifest in the point and click graphical adventure game *The Secret of Monkey Island* (1990) and the 2009 enhanced remake of the game. First, a brief introduction to the adventure game genre and the game itself is given to show how the game rules operate and how they are interacted with.

3.1.1 The adventure game genre

The Secret of Monkey Island belongs to the broad genre of adventure video games, the history of which has been presented by Fernàndez-Vara (2014: 232). She claims that the genre got its name after the titular text game *Adventure* (1976–1977). The game was genre-defining in that it used text to represent the game world with entering textual verb commands being the main way of interacting with the game. Anthropy (2014: 32) states that text adventure games were inspired by role-playing board games like Dungeon and Dragons where one player takes the role of a game master whose main goal is to narrate an adventure for the players and respond to the actions or choices of the player's characters. Text adventure games would not have a human game master, but instead a computer that responds to the player input based on a list of permissible verbs defined by the game designer. The advent of graphical adventure games came with *King's Quest* (Sierra On-Line, 1983) that made use of the visual interface to allow players to move their characters on the graphic

representation of the screen directly. While the early graphical adventure games provided the players with a visual representation of their game world, the game was still interacted with by providing the game with textual verb commands (Fernàndez-Vara 2014: 232). In the late 80s, Lucasfilm started making graphical adventure games for personal computers, starting with *Maniac Mansion* (1987), which removed the interactable text box and replaced it with the innovative interactable on-screen menu. As a Lucasfilm game, *The Secret of Monkey Island* also makes use of the interactive verb menu. In these games, instead of the player having to guess the verbs that worked with the previous adventure games, the new interface menus allowed the player to interact with a clear list of possible verb commands and objects for these verbs. The verb list and the list of objects (also called the Inventory) had separate windows, usually taking the same amount of on-screen space. The way how these menus worked was to allow players to compose command sentences for the game software by clicking on verbs, objects or characters with the computer mouse. Because these games used the mouse cursor movements and clicks for interactions, they were called point and click adventure games. Mouse clicks remained as the main input for adventure games with later games of the genre transforming the verb lists into visual icons to provide more screen space to the graphic story world and allow for more interactions to be performed with a single interface button. For example, the icon for a mouth could represent both the actions of talking with a character, eating some object or even kissing. Later graphical adventure games also replaced the Inventory (possessions of the player-character) interface with visual lists so that objects could be dragged from the Inventory straight into the game world, further abstracting the sentence formation interaction of the earlier games (*ibid.*).

Fernàndez-Vara (2014: 233) defines the main characteristics of games in the adventure genre as follows: a story-driven nature; the presence of a player embodied character that carries out the commands of the player; encouragement of exploration; a puzzle-solving

gameplay focus; an interaction largely focused on object manipulation and spatial navigation. She asserts that the main player-character of an adventure game is generally pre-defined, as opposed to role-playing games where a player can often design their own character. The main goal of an adventure game is to advance the story by exploration, communication with the game characters and interaction with obtained key objects. Unlike action games, adventure games do not focus on constant action and quick thinking but rather to allow the players to explore the game world at their own pace (Fernàndez-Vara 2014: 234). This aspect of adventure games was also characterised by Wolf (2014: 53), who maintained that the interactive resolution of adventure games consists of few choices per second, but a high number of options per choice.

With a slow pacing, adventure games can allow to make use of an uncommonly ample list of specific actions that are able to be performed by the player character. If an FPS video game only makes use of the handful of verbs of *Move, Jump, Aim, Shoot, Run*, etc, then an adventure game can utilise the single verb *Use* to perform a large variety of actions with the meaning changing on the situation and context of the player character (Fernàndez-Vara 2014: 235). For example, when a player of an adventure game forms a formal sentence by clicking on the action verb *Use* on an object in the character's inventory *Pants* and then on the object *Torch* in the game world, then the sentence formulated will appear as *Set Pants on Fire*, not *Use Pants with* Torch, whereas clicking on the same verb in combination with a *Flower* and *Soil*, the sentence will become *Plant Flower in Soil* and not *Use Flower with Soil*. Therefore, graphical adventure games allow a single interactive verb to represent various actions that have a similar sentence structure to the primary verb. Anthropy (2014: 32–33) criticises the large number of verbs in graphical adventure games, because expanding the list of verbs of a game does not make the puzzles or obstacles of the game more challenging, but rather makes the solution more tedious to find with the game utilising too

many orphaned interactions. Because of this, players of adventure games tend to get stuck at certain parts of the game, trying to sift through all the possible options and combinations of using the objects with the environment through trial and error, trying to brute force the correct solution. Despite this, the large number of different verbs explicitly given to players in adventure games makes it a good genre for carrying out a comprehensive analysis of how different interactive verbs work in game structures.

Fernàndez-Vara (2014: 236) claims that adventure games are often called linear, because they have a pre-determined narrative that unravels as the player interacts with the game and correctly solves its puzzles. Due to a strong narrative component, adventure games are often considered interactive narratives instead of games. The kind of linearity that is common for adventure games might not appear in other genres like fighting, puzzle and action games where the series of events are procedurally generated by a dynamic set of rules, which can generate different event-chains and therefore a different game experience each time. Also, unlike the FPS games that were provided as examples by Koster and Crawford, graphical adventure games only utilise a single dimension that needs to be navigated at once and therefore adventure games provide a simple base for verb analysis, because most interactions are represented by a single core input action.

3.1.2 *The Secret of Monkey Island* and the *Enhanced Edition*

The Secret of Monkey Island is a 1990 point and click adventure game developed by Lucasfilm Games (later known as LucasArts) that has the player assume the role of Guybrush Threepwood, a would-be young pirate, who has to prove his worth as a pirate by completing various puzzles and tasks in a fictional version of the Caribbean islands during the age of piracy. The game is an original graphic adventure, which is a loose adaptation of the *Pirates of the Caribbean* theme park ride in Disneyland.

[1] An image from the original 1990 game

One of the main reasons why *Monkey Island* is picked for verb analysis is due to the explicit use of verbs in the graphical menu interface that immediately provides a list of interactive verbs for analysis. As can be seen in image [1], a single screenshot already presents the ten main interactive verbs of the game – *Give*, *Open*, *Close*, *Pick Up*, *Look at*, *Talk to*, *Use*, *Push*, *Pull* and the implicit *Walk to* that is executed upon clicking on any walkable terrain in the graphic representation of the game world. As is the norm for point and click adventure games, *Monkey Island* only makes use of a single primary input controller of the mouse, limiting its core player interactions to navigating the mouse cursor on the screen and clicking on the entities that are to be interacted with. Therefore, the second main reason for picking *Monkey Island* is its relative mechanical simplicity with there being only two core input verbs for analysis – *Navigate/Point* and *Click* in the case of the 1990 edition of the game. This means that the ten interactive verbs do not form complex parallel verb clusters, but are attributed only to the physical input interactions of pointing and clicking. As has been discussed in the previous section, the game is interacted with by

forming formal sentences for the game program by clicking on the verbs to pick the desired interaction and the objects that constitute the arguments for the verbs to interact with. The sentence formed via pointing and clicking is seen in the menu bar above the verbs and the Inventory of the player that keeps track of the Objects acquired by the player. Thus, *Monkey Island* not only makes its interactive verbs explicit, but also the arguments for the predicates headed by these verbs and a basic imperative sentence structure for the combinations of verbs and objects.

Another reason for picking this game is for its heavy reliance on narrative elements to compensate for the structural simplicity of the game. By only analysing the interactive and input verbs of the game, we can determine whether Koster was right in claiming that narrative elements are of a secondary importance for a game, or whether the narrative story world is a necessary component of game structures.

[2] The same scene as image [1] in the 2009 remake of the game

The final reason for picking *Monkey Island* for analysis is the fact that the game was remade and reworked for modern personal computers in 2009 titled as *The Secret of Monkey Island: Enhanced Edition*. This enhanced edition made many changes to the input and interface structures of the game, while essentially keeping the content of the game the same. As can be seen in image [2], the enhanced edition has reworked the visual interface of the game by hiding the verb and object menus to allow more room for the visual space of the game world, while still describing the expected action of a player's interaction as an imperative sentence in the left corner of the screen, with the current selected verb in the right corner of the screen. Although the enhanced edition allows for the player to turn the game to its classic visual interface and interact with it through the point & click construction, then it also included various other means of controlling the game (as seen in image [3]). The additions and changes of the 2009 remake allow us to determine whether hiding the interactive verbs and providing additional input verbs for controlling the game have a significant effect on the game itself.

[3] An image of the Controls menu of the 2009 remake presenting all the interactions available to the player

3.2 FORMAL ANALYSIS OF THE VERBS IN MONKEY ISLAND

This section will use the theory of lexical representation through logical structure constructions presented by Van Valin and LaPolla to carry out an analysis of the primary interactive and input verbs that are present in *The Secret of Monkey Island* and its *Enhanced Edition*. First, the ten interactive verbs of *Give, Open, Close, Pick up, Look at, Talk to, Use, Push, Pull* and *Walk to* are analysed followed by the analysis of the two input verbs of *Click* and *Move/Navigate* of the 1990 game.

As stated in the previous chapter, the Subject of all the interactive verb predicates is the player-character Guybrush Threepwood, who is the single controllable protagonist of the game. Because interactions are composed of commands for the player-character, the formal representations of our sentences will form the imperative mood, omitting the Subject that would be the constant of all these sentences. The core input verbs will follow a similar construction, but imply the player of the game, instead of the player-character, as the Subject as physical input is provided by the software user, not their digital proxy. The Objects of our sentences will be the physical or abstract Entities of the game universe in the case of interactive verbs and physical inputs in the case of input verbs.

The following analysis will provide each of the verbs with an example interaction from the game, a proposed logical structure for the sentence and for the thematic relations of the arguments. The proposed structures will be followed by a general commentary on the role of the verb in-game and what are its distinguishing features. The terminology presented here is acquired from Van Valin and LaPolla (2004: 102–138).

3.2.1 The analysis of verbs in *Monkey Island*

Give

Example interaction: *Give breath mints to Otis*

Proposed logical structures:

1. [**do**´(x, [**give**´(x,y)])] CAUSE [**have**´(z,y)] x = Guybrush, y = Otis, z = breath mints

2. IMP [CAUSE **have**´(x,y)] x = Otis, y = breath mints.

Thematic relations: Transferral of possession IMP [CAUSE **have**´(x,y)] x = RECIPIENT, y = THEME

Comments: Starting out with the first interactive verb in the menu interface, we have the ditransitive verb *Give* that requires a Direct and Indirect Object. The verb is used in the game quite often, and is required in completing all the puzzles or challenges where the solution of the particular puzzle is to give the correct living entity or non-player character (NPC) the correct item or Object from the Inventory of items. The interactive verb *Give* is an alternation of the *Use* verb, with the Direct Object of both instances being an item from the Inventory of Guybrush, but in the case of *Give* the Indirect Object signifies a living RECIPIENT, whereas with *Use* the Indirect Object signifies another Item or thing in the game world.

In the first proposed logical structure, we have included Guybrush as the Subject to show what the sentence structure would normally look like. As we can see, while the verb *Give* is an Activity verb, it requires a causative construction specified by CAUSE, which shows the full extent of how the Indirect Object *breath mints* is transferred to the Object *Otis*. Therefore, the second part of the construction will be represented with the State verb *Have*. This shows that when speaking about interactions, we do not strictly speak of Activity verbs, because an interaction requires a terminal point and therefore the Activities in interactions are used to show how the action of *Giving* will get a terminal point through a change of State in another Entity. Because of this, we represent Otis as being caused to have the breath mitns instead of being given the breath mints. In the second construction, we have proposed to reflect the imperative construction of interactive sentences by replacing the Activity verb with IMP to signify an undertaken Activity by an implicit Subject. Because we already know

that Guybrush is the Subject and AGENT responsible for all the actions represented by interactive verbs, from here on out the logical structures will be presented in the imperative form. As for the thematic relations of *Give*, Otis, being a living entity who is capable of receiving things is the RECIPIENT of the transferral of possession, whereas the breath mint is the THEME, which means that it is signified as an entity that is undergoing a change of state or possession.

Open

Example interaction: *Open lock*

Proposed logical structure: IMP [CAUSE [BECOME **open´** (x)]] x = lock

Thematic Relations: Opening x = PATIENT

Comments: *Open*, being the in-game cousin (and opposite) of the verb *Close*, is a verb that sees moderate use in-game. The main actions in the game involved with the interactive verb *Open* are related to the opening of containers. The *Open* verb can also be used to enter buildings through using the verb with a door entity. However, most doors in the game can also be opened with the *Use* verb, making *Open* a necessary verb only for opening containers.

Here we have a causative accomplishment, where the opened entity is caused to achieve an inherent terminal point. In the case of *Open*, the thematic role assumed by the Object entity is PATIENT, which refers to an entity that is undergoing a change in state (from locked/closed to open).

Close

Example interaction: *Close door*

Proposed logical structure: IMP [CAUSE [BECOME **shut´** (x)]] x = door

Thematic Relations: Closing x = PATIENT

Comments: Practically the same as *Open*. In the game, the verb *Close* acts the same way as the verb *Open*, with it requiring some sort of container or door to be interacted with. However, to the author's knowledge, apart from allowing the player to close the doors that they have opened, this verb is not used to solve a single puzzle in the game and as such is an orphaned verb with the mere purpose of adding more ways to interact with the game environment.

Pick up

Example interaction: *Pick up Manual of Style*

Proposed logical structure: IMP [CAUSE **have**´(x,y)] x = Guybrush, y = Manual of Style

Thematic Relations: Coming into possession x = RECIPIENT, y = THEME

Comments: Interestingly, the analysis of *Pick up* shows that it is a cousin of the verb *Give* and *Use* where the RECIPIENT or Indirect Object is the AGENT or instigator of the action. This means that the RECIPIENT of this construction is also a constant with Guybrush being the only Subject that the player can take control over in *Monkey Island*. *Pick up*, then, is also a reversion of the interaction *Give* as the Direct Object entity that is being interacted with is not a part of the player's Inventory menu, but a part of the narrative world, being the main means of acquiring objects from the narrative world for the Inventory. Because this interaction is obligatory for acquiring Objects for puzzle-solving, then it sees frequent use in the game.

Look at

Example interaction: *Look at tremendous yak*

Proposed logical structures:

1. IMP [CAUSE **see´**(x,y)] x = Guybrush, y = tremendous yak

2. IMP [CAUSE **comment/examine´**(x,y)] x = Guybrush, y = tremendous yak

3. IMP [CAUSE **see´**(x,y)] & CAUSE [**consider**' (y,(z))] z = (opinion)

Thematic Relations: Examination? IMP [CAUSE **see´**(x,y)] & CAUSE [**consider**' (y,(z))]

x = EXPERIENCER/OBSERVER, y = STIMULUS, z = JUDGEMENT

Comments: *Look at* is a unique interactive verb in that it is the only stative verb used in *Monkey Island* with the goal of the interaction not having Guybrush just look and stare at something, but rather to *Examine* a given Entity in the game world and then *Consider* or give his judgement, feelings or opinions regarding that Entity. Because the verb does not elicit literal looking at something from Guybrush, then the first proposed logical structure for the interactive verb of having Guybrush perceive something is not strictly correct. The verb itself is not used to directly solve any puzzles in the game, as it is intended to be used as a means for the player to understand the inner thoughts of Guybrush as the main character of this narrative, or to get suggestive hints on how to progress in the game through examining the objects and having Guybrush suggest a possible interaction that could be performed with the Entity that is being examined. Therefore, *Look at* is more of a tool for narrative exposition rather than making the character stare at something. Moreover, it can be assumed that even if the main character of Guybrush were to be in a dark room or blinded in the game, then they would still likely have use of the *Look at* verb to comment on the situation of not being able to see. Therefore, it would be better to use either the second construction with the predicate being either **comment´** or **examine´** to reflect the actual nature of the interaction, or the third construction that takes into account both the action of being able to perceive something and giving an opinion or judgement on the percept.

Look at is also one of the verbs that would perform the role of what Crawford called social verbs, because it gives the player the option to command Guybrush to rely thoughts

about his inner states and feelings on demand. While it is not necessarily ideal to make a character express their feelings on demand, it is none the less different from the other interactive verbs in this game in that it does not elicit a strictly spatial reaction from the game environment. This can be debated though, as the expository text that appears on the screen (look at the white line of text above Guybrush in Image [1] and [2]) is also an entity or a part of the physical game world and as such, it is not out of bounds from being able to be interacted with. There have been games that let the player interact with the speech bubbles or text boxes belonging to their player-character or other characters in the world. In the case of *Monkey Island*, however, the verb is primarily used to gather information about the entities that surround Guybrush and to show which Entities can be interacted with in general.

Talk to

Example interaction: *Talk to important-looking pirates*

Proposed logical structure: IMP [CAUSE **converse´**(x,y)] x = Guybrush, y = Important-looking pirates

Thematic Relations: Conversation IMP [CAUSE **converse´**(x,y)],

x = INTERLOCUTOR/SPEAKER, y = ADDRESSEE

Comments: *Talk to* is another verb that has a unique role in interacting with the environment of *Monkey Island*. The verb is used in combination with NPC entities to toggle a conversation with them. This verb is necessary for making progress in the game, as the solutions for many puzzles in the game are found in conversations with the many NPCs in the game. *Talk to* is a nested verb, as toggling a conversation with a character entity often triggers a sort of a mini-game where the verb and Inventory menu interface is replaced by another interface where the player can choose between different speech acts to use in conversing with the selected character. Like *Look at*, this verb is also used to acquire

narrative exposition, but instead of revealing the inner world of Guybrush, *Talk to* allows the player to enter into dialogue with other characters and receive information about their inner worlds. Other than that, the verb is fairly traditional transitive verb when it comes to interaction.

Use

Example interaction: *Use rubber chicken with pulley in the middle on cable*

Proposed logical structure: IMP [CAUSE **use**´(x,y)] x = rubber chicken with pulley in the middle, y = cable

Thematic Relations: Use IMP [CAUSE **use**´(x,y)], x = PATIENT/INSTRUMENT, y = THEME

Comments: As mentioned by Fernàndez-Vara and Anthropy, *Use* is an interactive verb that is used to perform a large variety of actions with the meaning of the action changing depending on the situation and context of the player character. The proposed logical structure for *Use* presented here represents the formal and traditional construction of how the verb is used in video games. It is simply used to represent using any *x* with *y*. Because *Use* forms a ditransitive construction, it is often used as the general verb for any ditransitive interactive formulations. If we were to form the sentence construction of *Use Meat* with *Pot o' Stew* in *Monkey Island*, then the interface area that shows the composed sentence will replace it by *Cook meat*. Despite the interactive verb of *Use* allowing the game to represent various different actions, we will only focus on the formal representation of the verb itself. Other than that, the verb is an alternation of the interactive verbs *Give* and *Pick up*. In the case of *Use*, both the Direct and Indirect Object of the verb are inanimate entities in the game world or player Inventory that are to be combined in any meaningful way. This is one of the primary problem-solving verbs of point and click adventure games and is the main

reason why these games often get bad publicity, as they tend to create situations where the player might not know how to progress in the game and will try to brute force their way ahead through blindly using every feasible object with every other entity until a solution is found.

Push

Example interaction: *Push cannon*

Proposed logical structure: IMP [CAUSE [BECOME **pushed´** (x)]] x = cannon

Thematic Relations: Pushing x = PATIENT

Comments: A cousin of the *Open* and *Close* verbs in that it also has an opposite interactive verb, is an Accomplishment verb and is used in very specific circumstances within the game.

Pull

Example interaction: *Pull the nose of a totem pole*

Proposed logical structure: IMP [CAUSE [BECOME **pulled´** (x)]] x = nose of a totem pole

Thematic Relations: Pulling x = PATIENT

Comments: Practically the same as above. Sees very little use in-game.

Walk to

Example interaction: *Walk to bell tower*

Proposed logical structure: IMP [CAUSE **walk´**(x,y)] x = Guybrush, y = bell tower

Thematic Relations: Motion IMP [CAUSE **walk´**(x,y)] x = MOVER, y = GOAL

Comments: *Walk to* is probably the most used interactive verb in *Monkey Island*, because it carries out the interaction of navigating the environment or exploring different locations. Because of this, to save the player time, one can see that *Walk to* is not a part of the verb

menu, but is rather the default interaction when a player clicks on any traversable terrain or coordinate point in the graphic representation of the game world. As with other verbs in *Monkey Island*, *Walk to* is bounded by an inherent terminal point and as such, consists of an Activity that transitions into an end-State.

Core input verbs: Point/Move/Navigate

Example interaction: *Move mouse cursor to Entity*.

Proposed logical structure: IMP [CAUSE **Be-**LOC´(x,y)] x = mouse cursor, y = Entity

Thematic Relations: Mouse cursor navigation IMP [CAUSE **Be-**LOC´(x,y)] x = THEME, y = GOAL/LOCATION

Comments: These structures should represent the user's core input interactions of navigating the digital space of the GUI in the game software. Because *Monkey Island* is a point and click adventure game, then the first part of performing in-game interactions is always constituted by the act of navigating the mouse to an entity on-screen that is to be interacted with. Therefore, this interaction is an underlying part of every interactive verb in *Monkey Island*. The predicate **Be-**LOC here represents the intended end-location for the mouse cursor to be at. Mouse cursor movements seem to mirror the general Activity -> State interactive construction of interactive verbs.

Click

Example interaction: *Click mouse button*

Proposed logical structure: IMP [CAUSE [INGR **click´** (x)]], x = mouse button

Thematic Relations: Click IMP [CAUSE [INGR **click´** (x)]], x = PATIENT

Comments: The input verb of *Click* can also be expressed as *Select* and is the second part of every interaction of *Monkey Island*. A click of the mouse button is instantaneous and

inherently bounded, meaning that unlike interactive verbs, it belongs to the Achievement class of verbs. It should be noted that while every interactive verb process requires the input of pointing and clicking to be provided, then unlike the core input verbs of a lot of faster-paced action games, pointing and clicking are not parallel interactions, but separate interactions that have to be performed in a chronological order.

Hold button

Example: *Hold move left button*

Proposed logical structure: IMP [CAUSE **do´** (x, [**hold** (x)])], x = *move left* button

Thematic Relations: Holding down IMP [CAUSE **hold´** (x)]], x = PATIENT

Comments: Apart from providing each interactive verb with a designated button on the computer input keyboard or video game input controller, the only meaningful addition or innovation that the 2009 remake of *Monkey Island* added to the core mechanics of the game was to allow the player to make Guybrush *Walk to* a direction for as long as they hold a directional button down. When a directional button is let go, Guybrush will also stop moving, providing the player with a more direct control over the movements of Guybrush. It is interesting to note that when it was initially presumed that interactions would involve Activity verbs, because interaction seemed to be a dynamic phenomenon, then our analysis has shown that the only really dynamic interaction presented by an Activity verb is the holding down of a button input. This is logical, because Activities are inherently unbounded processes and the interaction of holding down a button is in process for as long as the button is held down. Apart from the innovations to movement controls, the 2009 remake added a separate button input for each interaction, but these can be accounted for with the same input interaction as *Click*.

3.2.2 Discussion

Distinguishing and analysing the interactive verbs and the underlying core input verbs of *Monkey Island* by presenting them in a formal logical structure has provided a surprisingly effective method of identifying all the interactions that are available for the player of a game and how these interactions form concepts that describe the actions of the player-character in-universe. Additionally, the analysis also directs attention to the kind of Entities that different verbs take, and to the fact that not all interactive verbs are equal, with the verbs forming different groups based on differences and similarities.

The Secret of Monkey Island shows that virtually all types of verbs appear as interactive and input verbs. All of the interactive sentences are in the imperative mood and omit the Subject. What the analysis has shown however is that the imperative mood requires causative constructions. If interactive verbs were originally expected to be represented by Activity verbs, then forming logical structures for these verbs, it can be seen that the omitted Subject is indeed taking part in an Activity verb, but these Activities mostly become States through the causative construction. As a matter of fact, the interactive causative construction of Activity -> State that describes most of the primary interactive verbs of *Monkey Island* mirrors the process of interaction itself. The player provides the game input through performing an Activity, which will cause the computer to process the input and change its game state from state A to state B, which can then, in turn, be interacted with again, creating an interactive loop.

The ten primary interactive verbs of *Monkey Island* can be grouped into different interactive verb categories. The verbs that were of most use to progressing in the game all used the Activity -> State causative structure. The verbs that were most frequently used to solve puzzles in the game were the Object-related verbs of *Give*, *Pick up* and *Use*. The verb *Use* represents combining Objects with other Objects in the game, with *Give* and *Pick up*

representing the actions of an animate entity receiving an Object, be they a NPC or the player-character.

The second category of verbs can be formed from the relatively unique verbs of *Look at* and *Talk to* and *Walk to*, which are all related to allowing the player obtain information about the narrative elements of the game world. These verbs also followed the transitive sentence structure of Activity -> State. *Walk to* is the most used verb in the game, which allows Guybrush to explore the different environments of the story world. *Look at* allows Guybrush to express his thoughts, feelings and judgements regarding the different entities of the game world, therefore effectively providing the game with an interactive mean of calling forth the inner states of the main character. *Talk to* allows Guybrush to enter into a dialogue with other characters of the world and learn about their inner worlds. With two of the ten interactive verbs allowing the player to perform social interactions in the game world, it could be said that Crawford was not entirely correct in claiming that games cannot make use of verbs that describe the inner states of characters. Stative verbs are generally represented in intransitive constructions, with the social interactions of games being produced through transitive sentence structures. Therefore, while the process of achieving these emotions is not as genuine and can feel artificial when they are being presented on demand by the player, then it cannot be stated that games are all about spatial relations.

The third category of verbs that appeared were the filler verbs of *Push, Pull, Open* and *Close*, which were additions to present the user with an illusion of more choices, whereas these verbs rarely found a use in the game universe. These four verbs followed the causative structure of Activity -> Accomplishment.

As for the core input verbs of *Monkey Island*, the 1990 version of the game was unsurprisingly controlled through the input of navigating or pointing the mouse cursor on an entity on the game interface and clicking on it. By repeating the point and click process

one or two times, the player can form interactive sentences consisting of a selected verb and one to two arguments for the predicate of the verb. While the pointing part of the input mirrors the telic Activity -> Accomplishment causative structure, then the input verbs of *Clicking* or *Pressing* a button are unique in that they form an Activity -> Achievement sentence structure, which only appears with this type of interaction.

With the 2009 remake of the game, the visual overlay, audio and input options were all enhanced, but the game is mechanically the same, with the only real innovation coming from the ability to *Hold* down a directional button to gain precise controls over the movements of Guybrush. This mode of interaction introduced a full Activity interaction, with the duration of the held down input button being temporally unbounded. As such, based on this analysis one can see how interactions really could be interpreted to be the core structural components of video games, because despite the *Enhanced Edition* of the game making a lot of changes to the base game, the elements mostly affected features that are largely secondary to the nature of the point and click game. This supports both Crawford and Koster, who maintained that while the technological improvements of the recent decades have also enhanced all of the features and systems of video games, then they have not done too much to change up the way how video games operate on the base level.

Despite that, video game structures can make use of all four main types of *Aktionsart* verbs in causative constructions and as such, are much richer in diversity than Crawford gives games credit for. However, Crawford was right in stating that the genre and essence of a video game software can be determined through the available interactions. When we would claim that there is a game software that allows the player to use mouse cursor movements and clicks as the input to form formal syntactic sentences, then they would guess that one is referring to a game where the main interaction involves pointing and clicking. We would add that the primary interaction with the narrative setting can be described

through the ditransitive verb of *Walk to* for navigation and the verbs *Look at (Examine)* or *Talk to* for revealing personality. The game will also make use of Object-related ditransitive verbs like *Give*, *Pick up* (*Take*) and *Use*. It will also involve monotransitive secondary and orphaned filler verbs of of *Open*, *Close*, *Push* and *Pull*. By presenting these verbs and how they are made manifest in a game, it becomes very clear that the inner structure of the game in question mirrors the heavily narrative driven, but mechanically bare point and click adventure games. Therefore, we can conclude the thesis by claiming that an interdisciplinary combination of concepts and ideas from video game research, game design and linguistics provides all of these disciplines with a powerful method for analysing and diagramming the internal and external structure of video game design through interactive and input verbs.

CONCLUSION

The present thesis first provided a comprehensive review of the ideas of Chris Crawford, Raph Koster and Anna Anthropy who each maintained that the rule-based interactive structures of video games can be analysed through the verbs that are used to describe these rules and interactions. The common arguments from these accounts were collected to provide a unified theory of interactive verbs as structural components of video games, which was then combined with insights from syntactic theory to develop a formal method of analysis. This formal model for analysing interactive and core input verbs was then used to analyse the game structure of the point and click adventure game *The Secret of Monkey Island* from a linguistic perspective. The thesis was presented in three core chapters.

Chapter 1 provided a video game research background for the thesis. The chapter gave an overview of the ideas of three video game designers and theoreticians – Crawford, Koster and Anthropy – on the processes taking place in video games and how verbs might be involved in these processes. The first section focused on Crawford's account on the phenomenon of interactivity as compared to the theories of other video game scholars and presented his view that interactivity is an essential element of video games with verbs being the words that open up the essence of interactivity and choice, and how this knowledge can be used to describe the ways on how storytelling works in games. The second section introduced Raph Koster's attempt at formulating a formal grammar for video game structures by placing the verbs that describe the rules of input and interactivity of a game as the core elements of the proposed grammar. The third section was devoted to reviewing Anna Anthropy's ideas on using the language-related concepts of verbs and objects to refer to the rules of video games and how the different meanings of a single verb for a rule open up the possibilities of interactive design.

The fourth section of the first chapter gathered the shared points of all three accounts on the role of verbs in game structures on the one hand and research from video game studies on the other hand to form a coherent theory of interactive verbs as a means of communicating the essence of the algorithmic rule patterns underneath the narrative elements of a video game.

Chapter 2 provides a linguistic backing to the combined video game verb theory by introducing concepts and terminology from syntax following the works of Bas Aarts, Van Valin and Van Valin and LaPolla. The first section of this chapter introduces the concept of grammatical relations to determine the Subjects, Predicates and Objects of the formal sentences that would describe interactions in a video game. The second section introduces different semantic verb classes to add to the formal analysis of what meanings verbs can carry and how this would add to examining interactive verbs. The third section introduces the formal lexical structures of Van Valin and LaPolla to provide a method for analysing the formal aspects of interactive and input verbs.

Chapter 3 took the Lucasfilm 1990 point and click graphical adventure game *The Secret of Monkey Island* and its 2009 remake as a basis to analyse the formal lexical and semantic features of the interactive and core input verbs that form the interactive structure of these games. The first section of this chapter introduces the basic elements common to the adventure game genre with a special focus on how point and click adventure games are interacted with. The second section then applies the combined theory from linguistics and video game studies and the formal methodology presented in the second chapter to carry out an formal analysis of the lexical structures and the thematic roles of the narrative and core input verbs of both the 1990 and 2009 versions of the game. The third section presents the discussion of the results. The formal analysis proves that not only does breaking down a video game structure into the core verbs that describe the interactions of the player give a

good overview on the structural differences of the different interactive verbs, it also provides a method of determining all the possible entities that can be interacted with, who is the entity performing these actions and the various meanings and interactive situations that can be created or shaped within the algorithmic rules of the game through showing the different ways of providing input for the game.

Therefore, the thesis shows that the idea of Crawford, Koster and Anthropy that verbs can be used to describe the interactive and inner rule-structures of video games is a valid method of representing or diagramming video games, when the syntactic methodology of a formal lexical structure analysis is utilised on the interactive and input verbs of the games. Such a method of analysing video game structures combines the disciplines of game studies, game design and linguistics to provide each field with a comprehensive and clear method of distinguishing the interactions and input rules of a game, what kind of logical sentence structures the verbs of these interactions and input form and how these formalised sentences can be used to diagram the whole interactive structure of a game. The combined theory and method of analysis is valuable for game scholars and linguists for explicating the inner structure of video games, while giving game designers a way to examine how the inputs of a player influence the game world and what kind of different type of actions can be used to describe these interactions with.

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RESÜMEE

TARTU ÜLIKOOL
ANGLISTIKA OSAKOND

Karl Erik Saks

An Analysis of Verbs within Video Game Structures Based on a Video Game Verb Theory and The Secret of Monkey Island [videomängu struktuurides leiduvate verbide analüüs video mängu verbiteooria ja mängu The Secret of Monkey Island põhjal]

Magistritöö
2017
Lehekülgede arv: 10

Annotatsioon:
Käesoleva magistritöö eesmärk oli analüüsida kolme video mängu disaineri ideid, mille kohaselt verbid on videomängude elementaarsed struktuuriosakesed, kontrollida seda teooriat lingvistilisest perspektiivist ning üritada moodustada kombineeritud verbiteooria abil analüüsimudel, mille kaudu analüüsida video mängude struktuure verbide sisulise analüüsi kaudu. Käesolev töö võttis antud analüüsi baasiks 1990. aasta seiklusmängu *The Secret of Monkey Island* ja selle uuendatud 2009. Aasta versiooni.

Magistritöö koosneb sissejuhatusest, kolmest sisupeatükist ning kokkuvõttest. Esimeses sisupeatükis avaldatakse teoreetiline taust mängu-uuringute perspektiivist ning võetakse kolme teoreetiku – Crawfordi, Kosteri ja Anthropy – ideed eraldi vaatluse alla, et luua ühendatud videomängu verbide teooria.Teine peatükk analüüsib videomängu teoorias esitatud punke lingvistilise ja süntaktilise teooria kaudu, kasutades peamiselt Aartsi ja Van Valini teooriaid süntaksist. Kolmas peatükk viib läbi formaalse verbianalüüsi *Monkey Islandi* verbide peal. Analüüsi tulemused näitavad, et videomängude sisemist ja välimist struktuuri saab tõepoolest analüüsida verbivaatluse kaudu, ning et taoline analüüs pakub võimaluse mängustruktuuride kohta omandada väärtuslikku informatsiooni nii mängudisaineritele, mänguteoreetikutele kui ka lingvistidele.

Märksõnad: inglise keel, videomängud, mängu-uuringud, süntaks, formaalkeeled, verbid

Lihtlitsents lõputöö reprodutseerimiseks ja lõputöö üldsusele kättesaadavaks tegemiseks

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