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Analysing the player's involvement in video game character animation

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2021
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Analysing the Player's Involvement in Video Game Character Animation.

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Master's Dissertation

Department: Wits School of Arts

Ethics Clearance No: H22/01/27

Institution: University of the Witwatersrand

Abstract

This dissertation investigates the impact of animation on player interest in an existing video game character. There is high demand and expectation regarding character animation quality, yet understanding and achieving this standard is complex and challenging. The quality of a character's animation is often derived from its direct appeal to the audience and how its representation informs their impression. However, there is a gap in the literature where there is little on how style representation plays a role in character perception and identification in video games.

A practice-led approach was used to understand the relationship between player involvement and the player-character's appeal. The process involved the creation of an animation reel to demonstrate how a popular video game character's acceptance can change based on a player's perception of style in the character's animation. I used Link from the video game *Super Smash Brothers Ultimate* (Nintendo, 2018). The reel was presented to adults between 18 and 35 to review the animations.

Using the process of creative exegesis, the theories and concepts about character appeal, animation design, and player involvement were combined to analyse and critique the contributing factors that inform the perception of the creative work.

The results from this study indicate that a change in movement style impacted the perception of Link and the participant's demonstrated interest to play him. This study confirms that style representations are an important design consideration to improve a character's appeal. This topic may benefit the art and technique of character design and how to improve on it.

Keywords: Character animation, video games, appeal, involvement, identification, effort, principles of animation

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Acknowledgements

I want to express my deep gratitude to my supervisor Ray Whitcher, for his enthusiastic guidance throughout the process for his valuable and constructive suggestions during the planning and development of this research work.

I would like to express my great appreciation to the research participants for sharing their time and contributions to this study.

I would also like to acknowledge my classmates. You provided me with the tools to choose the right direction and complete my dissertation.

I want to thank my friends and family parents for their wise counsel and sympathetic ear. You were always there for me, and I could not have completed this dissertation without your support.

Finally, I would like to thank God for the opportunity and perseverance through all the difficulties. You are the one who let me finish this degree, and I will keep on trusting you for my future.

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1. Introduction

1.1. Background

We play video games for various reasons, and one of them is to play interesting characters. Characters are a way for players to get immersed as they are the interface that we use to engage with a video game (Isbister, 2006).

This research focuses on character animation and its effect on the player's involvement in a video game. Character animation involves making a particular character move in a two- or three-dimensional context to create the illusion of life. Animators breathe life into their characters by suggesting the thought, emotions, and personalities in their actions.

The rapid development of modern sciences and technology has facilitated animation's development in recent years (Dorsey, 2016). From the early ages of cell animation and current CGI animation, technology has driven forward the animation revolution (Dorsey, 2016).

Computer animation has been one of the most popular and prospering industries. Today animation plays a vital role in modern filmmaking or the design of interactive applications such as video games or virtual reality simulations because it communicates the exciting aspects of characters and the fictional world.

Video games provide a unique context as the animations need to be played in real-time under the player's control. Animation has been used for various aspects of gameplay: such as self-expression and communication, displaying grandiose finishing moves to eliminate an opponent, or re-creating popular references from media and real life.

The most critical role of animation is feedback to help the player's decision-making during gameplay. Mechanically, it can be understood as telegraphs of an enemy's attack or the frame data of an animation to help understand a character move set in competitive technical games such as *Mortal Kombat 11* (WarnerBros Interactive Entertainment, 2019).

Game developers also use more complicated tools to create characters that allow the gamer to connect with the gaming experience at a deeper level (Dorsey, 2016). However, animators and developers often face certain restrictions and must find a compromise between visual quality and performance during gameplay.

1.2. Problem Statement:

Various games feature characters that the player can control, yet little is known about players' perception of the characters in these games—especially the positive perceptions of successful character representations and how animation design plays a role.

The reason is that understanding the affinity toward a virtual character is a complex interaction between the player's perception and character representation (Engelberg, Melzer, 2016). Numerous studies have suggested correlations and concepts that influence character perceptions. Character design research, including body language, appeal, identification theory, and psychology, has established that character design promotes player engagement in video games. However, there are many conflicting views and a lack of data regarding how animation design affects the player's perception.

Another concern is the limitations of discussing animation design when describing the style of a character in video games. The term “style” is quite broad as it can be used to refer to various aspects of the movement, such as the animator’s technique and design choices, the movement structure and usability in the game, and the level of detail, theme, and the character’s gestures and expressions. The gap in the literature is a lack of knowledge on how specific style representations regarding animation design affect engagement, especially the affinity towards specific characters.

1.3. Research Question:

My research question is: does a change in an existing animation style influence a player's interest in an established video game character?

1.4. Aims

1. This research aims to clarify the relationship between character perception and appeal, and their effect on the player's involvement in video games.
2. To understand to what extent, we can push the appeal of a character through animation and possibly why certain characters' actions work for them.

1.5. Objectives:

The objective of this study was to investigate what players find appealing about a popular video game character and how animation design affects the player's inclination to assume their role in the video game.

This research focused on the animation of the video game character Link, from the multiplayer fighting game *Super Smash Brothers Ultimate* (Nintendo, 2018). I conducted an analysis to study how Link's actions are constrained in the game and how the character's animation style changes affect the player's impression.

This study involved a focus group of twenty-two adults between the ages of eighteen and thirty-five in South Africa and their engagement with the current and altered versions. They provided feedback on their opinions and specific experiences of a character's style changes. The results have suggested that a noticeable change in style does affect the player's involvement with the character.

This research addresses theories and concepts about character appeal, animation design, and player involvement which I used to guide the animation project's creative process and investigate the aspects in the design that influenced the player's impression. Understanding the nature of the relationship between player engagement and animation appeal may allow us to further understand the design aspects of player experience and how players become involved in games.

Research on this topic may add knowledge on identifying relevant considerations and methods that can be applied to designing and evaluating character animation in a game context. It may also help highlight the issues of decision-making and efficiency in the production and post-production process in a game project. In terms of the creative process, the approach and concepts demonstrated in this research may potentially indicate what works for an accepted game character to increase its acceptance in the video game and suggest how it can be replicated in production, especially for character-centred video games.

This paper first introduces the key concepts and discussions from studies and literature regarding character design, animation, and player engagement in video games. The paper will then cover the development process of the animations in the animation reel and the instruments used to collect data from the focus group. A presentation of the results from the playtest session. Finally, a discussion regarding the animation reel and the contributing factors regarding Link's reception and design.

2. Literature Review:

2.1. Introduction:

To investigate the relationship between character animation and its effect on the player's involvement in video games, we need to look at how these concepts have been defined in research. Although there is a lot of research on animation, there is little on how it plays a role in character perception and identification in video games.

In this literature review, I will discuss the aspects of character design in video games and its effect on the play experience, how character animation has been approached in research in terms of appeal and perception, the factors that affect character interpretation, and theories regarding movement and action in animation.

2.2. Player Immersion and Player

This section introduces the concept of immersion, its relationship with player enjoyment, and how characters play a role in defining the experience.

2.2.1. Immersion in Video games:

Immersion is a fundamental concept that forms the basis of game design and understanding player engagement. It has been researched in many fields such as literature, cinematography, visual art and even journalism. Although the definition in these various fields shares similar aspects, I will focus on immersion in video games and character design. Immersion is the desired quality for both players and designers as it is an essential factor that drives enjoyment and dedication to a game over a long period.

The experience results from interactions between the player and the game system. This interaction allows players to actively construct their play experiences, bringing their personal experiences, anticipations, and desires (Ermi & Mäyrä 2005). Immersion requires the player to suspend disbelief and play the game willingly. However, the definition is not straightforward, as Ludologists claimed, as several definitions are not universally agreed upon (Calleja, 2011).

Research on immersion has suggested three levels of immersion: engagement, engrossment, and total immersion, where the player is progressively more involved in the virtual world (Brown and Cairns, 2003, as cited in Christo, 2014).

In game design studies, immersion has been interpreted and described as a softening mental division between the player and the avatar, a feeling of participation, spatial presence, and deep task engagement Michailidis, L., Balaguer-Ballester, E. and He, X. (2018, pg 1-8).

Atkinson and Parsayi describe immersion as a feeling of presence that is achieved by enhancing the aspects of gameplay that allow the viewer to forget the interface and instead deal with the story world of the game (Atkinson & Parsayi, 2021). In most of these definitions, interactivity is a critical component in facilitating the immersive experiences within video games.

2.2.2 The Relationship between Appeal and Immersion in Video Games:

Immersion and appeal have been widely researched to understand player engagement. It has been discussed that these concepts are essential for attracting and maintaining the player's engagement with a game. However, defining these concepts is quite problematic as various perspectives and limitations may define how the topic is approached.

A study by Georgios Christou has shown a direct positive correlation between appeal and immersion (Christou, Georgios, 2014, *The interplay between immersion and appeal in video games.* Computers in Human Behaviour. pg. 92-100). Christou examined the relationship between these factors over the differences in perceived appeal and depth of immersion experienced between two successful games, *World of Warcraft* (Blizzard Entertainment, 2004) and *Half-Life* (Valve, 1998). The study involved 173 (one hundred and thirty males and forty-three females) video game players, and they reported their experience after a play session. Christou examined the differences between experienced and inexperienced players. The results showed that the game content and game type are essential factors to consider in the players' choice of game to play and the level of appeal experienced. Immersion was shown to vary with the game chosen, and this effect was exhibited in both experienced and inexperienced players (ibid: 94).

Christou also highlights the issue around the discussions of appeal in game studies and its treatment as an implicit quality. It is only mentioned incidentally in literature, with little examination of its impact on the other gameplay experience aspects, such as immersion (ibid: 94). The reason being is that appeal is considered a prerequisite for having any interest in the game experience. When examining video games from a player's perspective, the assumption is that players will not choose to play a game that does not appeal to them (ibid: 94).

Christou argues that this disregards the level of appeal's role in a game. For example, one may choose to play a game casually without finding it appealing. In contrast, someone else may feel that the same game is appealing and thus play it more.

Appeal in this study is a concept made up of seven elements from Marc Hassenzahl's AttrakDiff questionnaire (ibid: 94). The AttrakDiff is an evaluation model that helps designers understand how users personally rate the usability and design of their interactive product. The method records the perceived pragmatic quality, the hedonic quality, and the attractiveness of an interactive product (Hassenzahl, 2004).

The pragmatic qualities are the perceived usability of the product, which is connected to the user's need to achieve a goal (Hassenzahl, 2004). The hedonic qualities are primarily related to the users' self, which involves identification and stimulation (Hassenzahl, 2004). Identification addresses the user's need for self-expression through objects. Stimulation includes attributes of personal development (Hassenzahl, 2004).

General Appeal includes attributes that examine the beauty and goodness of the product (Hassenzahl, 2004). The elements were based on the following word pairs: Unpleasant - Pleasant, Ugly – Attractive, Disagreeable– Likeable, Rejecting – Inviting, Bad – Good, Repelling – Appealing, and Discouraging – Motivating. These were measured on a seven-point Likert scale (Hassenzahl, 2004).

The findings on appeal suggest that the player’s first impression of the game, established a level of appeal, which is the basis upon which the player experiences the rest of the game (ibid: 99). When the player's first impression is high, it leads to immersion (ibid: 99). As appeal grows, the players' willingness to suspend disbelief increases and become immersed in a game (ibid: 99). This finding is important because it shows that the attractiveness of a game is a valuable tool to promote player engagement, and the player's enjoyment can change as they grow more familiar with the game.

Therefore, game designers need to create games that have both short-term and long-term appeal, as immersion is crucial for the success of a game, and this depends on the game's ability to attract and retain players (ibid: 99). The studies from Christou and Hassenzahl help illustrate the relationship between the two concepts and introduces a few factors that affect the player's affinity toward video games.

However, the results from Christou's study are limited as they do not address the aspects that affected the player's interest. The appeal evaluation was used to rate and describe the player's overall experience rather than identify the design aspects that affect the player's perception. The lack of data

in this study suggested that the relationship between immersion and appeal needs to be studied further. Especially on how appeal changes over time and the specific variables that cause this effect (ibid: 99).

2.2.3 Player involvement: Alternative approach for player engagement

Although immersion has been used to describe the player's engagement, its definitions present a problem understanding the relationship with a game's appeal. To feel present with anything, we must first direct our attention and become involved with the media. Immersion requires us to know how we are conscious of our experience, which we do not (Calleja, 2011). This is because the experience results from attention and the player's involvement, and these prerequisites happen unconsciously (Calleja, 2011).

Gordon Calleja uses the player involvement model as an alternative for understanding player engagement. (Calleja, Gordon. *In-Game: From Immersion to Incorporation.* MIT Press. 2011. pp 1-224). Involvement is a condition for the experience of higher-order cognitive processes such as presence or immersion (Calleja, 2011). Likewise, attention is a condition of direct involvement (Calleja, 2011). Involvement in a video game is a continuum of attentional intensity rather than a binary condition or state (Calleja, 2011). For this experience to occur, it requires the player's attention, input, and cognitive effort when engaging with the game (Calleja, 2011). Attention deals with cognitive functions, while involvement deals with the nature and quality of the object that we direct our attention to and the emotional aspects of the game.

This model proposes a foundation on which immersion, or as he calls it, incorporation, is built. There are six dimensions of a game that influence the player's involvement: *kinaesthetic* (control and movement), *spatial* (the learning, navigation, and exploration of the game environment), *shared* (interaction with other agents in the game environment), *narrative* (formation and interaction with the narrative), *affective* (emotion generated during gameplay) and *ludic* (decision making in pursuit of goals). These dimensions are interconnected and influence how another is perceived (Calleja, 2011). The dimensions are experienced unconsciously during the interpretation and communication process between the player and the game (Calleja, 2011).

The six dimensions operate on two levels. Micro-involvement includes the aspects that involve the player in the moment of gameplay. Then macro-involvement consists of the factors that motivate the player to return to the game when they are not playing it (Calleja, 2011).

This theory is relevant as it suggests that the player's experience is primarily of the stimuli from the game environment and that the player's immersion is not an automatic experience that leads to

enjoyment. Instead, it is dependent on the player's involvement and how the game balances the player's attentional needs. I used this definition of involvement to understand its link to the appeal of a video game character based on how it is presented to players.

2.2.4. The Appeal of Player-Character in Video Games:

All forms of representational media require the investment of attention to interpreting them. Without attention, there can be no involvement. (Calleja, 2011). The character's appeal is linked to player involvement as they both require attention and interest, which promotes the player's enjoyment. However, defining character appeal in video games becomes challenging as the term is discussed concerning visual and interactive aspects of character design.

A. Visual Appeal in Character Design:

In animation, the appeal of a character is about creating a straightforward visual design that will capture the audience's interest (Johnston and Thomas, *The illusion of life: Disney animation. Abbeville Press*. 1981. pp 1-576). The appeal is the property that makes the character enjoyable to watch (ibid: 69). However, a character with appeal does not mean that they are beautiful; it is mostly about how elements of the design work together to communicate the idea about the character and maintain interest. The appeal comes from how a character moves in combination with how they are visually designed.

Thomas and Johnston suggest that appeal is a trait that directs our attention to characters. This suggestion comes from the idea that people enjoy looking at something appealing (ibid: 69). The viewer's eye is drawn to a figure that has appeal. When attention is held, viewers appreciate what they see (ibid: 69). Therefore, the character needs to be designed and performed to appeal (ibid: 69).

Therefore, appeal refers to anything that a person likes to see, quality of charm, pleasing design, effective communication, and attractiveness to animators (ibid: 69). For characters, it encourages the viewer to appreciate, empathise, and remember them even after the animation is over (ibid: 69). The appeal is important as this makes the audience see the character as charismatic or believable. A character lacks appeal when the design is too complicated to read (ibid: 69). This can be from poor visual design, awkward shapes, and awkward movement. Animators can achieve the appeal by pushing and adjusting elements of the character in various ways to get acceptable performance (ibid: 69).

B. The Four Layers of Player Character experience:

In terms of interactivity, player-characters can significantly affect player immersion and enjoyment, as they are the interface through which players experience both the physical and social landscape of the game world (Isbister, Katherine. *Better Game Characters By Design: A Psychological Approach. Morgan Kaufmann*. 2006. pp 1 -364). In the book, Katherine Isbister introduces psychological principles that directly improve game character design (Isbister, 2006).

Isbister introduces and explains key concepts heavily researched in psychology and social science, the empirical study of how people interact socially, emphasising the individual as the subject of study (Isbister, 2006). The book looks at how we form impressions of people, the biases that affect how we perceive others, the mechanisms of social interaction in general, and how these considerations can be applied in the design of characters (Isbister, 2006).

Isbister suggests that with this psychological approach to designing video game characters, making choices based on the player's social experience of characters will also help eliminate wasted development time spent on assets that the player is eager to ignore and create an engaging, memorable, and believable experience (Isbister, 2006). It may also broaden the game's audience by including players who care more about social interaction than the "hard-core" gamer might (Isbister, 2006).

According to Isbister, the player experiences player-characters in four psychological layers: visceral feedback, cognitive immersion, social affordance, and fantasy affordances (ibid: 204- 206). The way these layers are integrated can influence how well the character is integrated into the game.

Visceral feedback is the sensory experience a player has of that character, particularly in feedback from the character to the player as they act (ibid: 204). When a player controls a player-character, they take on the player-character's body in the game world and adapt their reactions to its affordances and capabilities (ibid: 204). Aspects of visceral feedback are based on the character's physical abilities, how it feels to control and move through the world, and the general effects on the senses (ibid: 204). The visceral qualities can produce higher player satisfaction (Isbister, 2006).

Cognitive immersion explains that the reaction to sensory input is not an automatic passive process (ibid: 205). It is a deliberate process that considers information from the outside world to inform our decisions. This means that problem solving and taking actions in the world require the player to inhabit the action possibilities of the player character (ibid: 205). Player-characters that players inhabit intuitively will feel this way because they can synchronise their problem-solving strategies with the

character's capabilities. This is important as it shows that cognitive effort is required to close the player and the character (ibid: 205).

Social affordance is how a player-character is part of a social world, giving context to the game (ibid: 205). This means that player-characters act as a bridge for the player into a game's social world. This is either between players or in-game in non-player characters (ibid: 205).

To some extent, the player's sense of the game world is constrained through the lens of the player-character's social capabilities and context (ibid: 205). Therefore, the player-characters should model the social role and emotions that the player should be inhabiting in a game through their actions and reactions toward the game world's elements (ibid: 205).

Fantasy affordances are the extent of the player's fantasy experience (ibid: 206). Player-characters are an essential component of the fantasy experience of a game (Isbister, 2006). It is about how the character offers players a chance to enact them and explore possibilities and whether the fantasy persona is well suited to the gameplay (ibid: 206).

When the four psychological layers of a player-character work together, they can improve their game experience (ibid: 206). When the layers do not line up, the player may feel dissociated and dissatisfied with what is happening. These concepts are relevant because it identifies aspects of gameplay that a character can influence based on their design.

C. Wishful Identification:

Wishful identification is a similar concept studied to describe the appeal aspects of this relationship between the player and the character. Identification is often discussed as a mechanism of player motivation and video game enjoyment, through wish fulfilment (Hefner, D., Klimmt, C., Vorderer, P. 2007. *Identification with the player character as a determinant of video game enjoyment*. Abbeville Press. In Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Bioinformatics). Vol. 4740 LNCS. Pg. 39–48).

Identification is explained as the player's altered self-perception during gameplay (Hefner et al., 2007). When a player identifies themselves with a character or role offered by the game, the player may change their self-concept by adopting traits of the character (Hefner et al., 2007). For example, when a player chooses Link in *Super Smash Bros Ultimate* (SSBU), the player may perceive themself

as more courageous, heroic, and powerful because the character's personality and moveset best represent these desired traits.

Identifying Link would lead to a higher self-assigned value of these traits, which reduces or even eliminates the disparity between the player's and character's traits. This reduction encourages positive experiences, which would become an essential part of the player's overall game enjoyment (Hefner et al., 2007).

D. Role Perception: Competence, Performance, and Interactivity

The factors that affect the appeal of a character's role are the perception of their competence, performance and interactivity in the game (Hefner et al., 2007). Video games provide an ideal area to experience this feeling of competence since their interactivity allows action solving problems, which may result in the experience of self-efficacy (Hefner et al., 2007).

However, suppose a player is attracted to the role of a character but does not feel the need to fulfil the role by completing the objectives attached to the role. The player will less likely identify with the character (Hefner et al., 2007). If the character's perception is negative and unattractive for players to like being that character, it will lower their temporary self-esteem, and identification will decrease (Hefner et al., 2007). The player's perceived competence and satisfactory performance will prompt the player to occupy the role continuously (Hefner et al., 2007).

Therefore, the attractiveness and the personal desirability of the role must appeal to the player for identification. Players should only identify with given characters if the identification will not harm them but raise their self-esteem (Hefner et al., 2007). When playing a video game, a player is argued to find identification with a game protagonist more enjoyable if the offered role is appealing to them. They can do an excellent job of playing out the character's actions (Hefner et al., 2007).

E. Goals and Habitus:

A character's goals and habitus are other factors that support character Identification. A paper by Lankoski discusses the importance of character-based writing in role-playing game design. It highlights some theories behind my approach (Lankoski, Petri. *Character Design Fundamentals for Role-Playing Games.* 2002. in Beyond Role and Play: Tools, Toys and Theory for Harnessing the Imagination (pp. 139–148). Ropecon RY). The aim was to provide evaluation and analysis tools on game design considerations to support acting as a character or character identification (Lankoski, 2002).

Lankoski argues that for understanding a gaming experience, it is crucial to understand how a player experiences a game and interprets events in it (Lankoski, 2002). Lankoski also agrees that an essential aspect of understanding the experience is emotion combined with goals (Lankoski, 2002).

Goals are the foundation of character immersion and emotional experience (Lankoski, 2002). When players evaluate the character's goals meaningfully and align with them, they can experience shared emotion by feeling what the character would feel in the situation (Lankoski, 2002). How willing the players are to adopt the character's goals depends on how reasonable they seem regarding the character (Lankoski, 2002). The character's goal needs to be clear and motivated as the goal provides the player with a link to his character and the game itself to achieve meaningful action (Lankoski, 2002).

A person’s habitus refers to their socially learned habits, skills and dispositions (Lankoski, 2002). It is the way that the person perceives the world around them and reacts to it. Habitus is a way to align the player to the character's goal. Bourdieu (1991) argues that human beings interpret their surroundings and act from the basis of their habitus, which is a framework for understanding events and decision-making. This is like the concepts presented by Hooks on character performance.

A person's habitus affects how they approach their goals and define their purposes (Lankoski, 2002). Every character has an individual behaviour and way of coping with the situation they are involved with, based on their habitus (Lankoski, 2002). When their goal is to overcome or exploit a situation, adopting a character's habitus means that the situation can only be meaningful if the player can understand their character's attitude towards the situation (Lankoski, 2002).

The habitus can be made through a dramatic persona. Lankoski uses Robert Berman's six essential aspects of dramatic personae, writing tips to make characters more interesting (Lankoski, 2002). Lankoski also presents Lajos Egri's methodology for writing dramatic personae, which describes the character as the sum of physical, psychological and sociological qualities (Lankoski, 2002). The researcher applied and assed these methods to Live Action Role Playing games (LARP) (Lankoski, 2002). This limits the applicability to role-playing as video game characters. The player has more agency and flexibility in live-action role-playing a character compared with video games. In video games, the players are separated by an interface that limits how they can act and express themselves (Lankoski, 2002).

Constructing and adopting a character's habitus is quite complex. It requires a player to consider different aspects of the character, even something foreign to their habitus (Lankoski, 2002).

Sometimes this can be problematic as the player's previous experiences heavily affect the interpretation of events in a game and its characters (Lankoski, 2002). The information about a character and game world does not guarantee that the player understands the events and formulations of emotions in a game (Lankoski, 2002).

Lankoski concludes that well-designed goals should be defined based on the character's nature and reactions to situations (Lankoski, 2002). The goals can describe a character to a player (Lankoski, 2002).

Without goals or ambitions, the player will have no means to interpret and evaluate situations as seen by the eyes of the character (Lankoski, 2002). This condition may result in players creating their own goals or agendas that are not derived from the nature of a character, or the game design goes wasted as the most intricately planned situations are judged as irrelevant by the players as they do not know what the character is supposed to strive for (Lankoski, 2002).

Therefore, meaningful action requires understanding the character a person is playing (Lankoski, 2002). The character needs to be presented clearly to understand the needs and ambitions behind the action (Lankoski, 2002).

In terms of relevance, the design guidelines presented are meant to be generic ideas, usable in both tabletop and live-action role-playing games (Lankoski, 2002). They are helpful considerations regarding how a character's behaviour and goals should align with the player and how their animations can integrate them into the context of the game.

Therefore, when this is applied to video game characters, the game design limits how these ideas describe the character to the players. The type of game and the purpose of characters also affect the way characters could be written.

Although the concepts regarding character experience and identification are limited, they are influential in understanding the appeal of characters through a non-linear and interactive experience. These concepts were written when there was a need for improved character design. They revealed the motivational aspects of engaging with a character and the levels of engagement they can provide during gameplay. These concepts highlight that the appeal of a video game character runs on various levels based on its design. Thomas Johnston highlighted that the visual aspects should attract attention. Lankoski, Isbister and Hefner et al. agree that assuming the role of a player-character is an active process that requires effort and interactivity. The combination of these approaches results in an

enjoyable experience. The enjoyment of a character depends not only on the player's preferences but also on the opportunities that its design offers before and during play.

This section discussed the concept of immersion, its relationship with player enjoyment, and how characters play a role in defining the experience. The findings suggested that there is a positive relationship between appeal and immersion. However, there are several ways to define the terms, depending on the context. Early research has shown that characters can enhance the player's experience. This is dependent on the player's perception, cognitive effort, social affordances, and level of interactivity. The appeal of a player-character may be driven by identification, interactivity, visual design, and the psychological affordances they promote. These aspects may help promote immersion.

In terms of character animation, these concepts suggest the considerations of how a character's concept is represented in video games and how it should contribute to the play experience. After reviewing early research, I considered how the animation operates in the identification aspects of video game characters in my approach.

2.3 Research on Virtual Characters and Animation:

This section covers how video game characters have been researched, specifically by their actions or movement, affecting perception and engagement. I will discuss the key topics that influence the player's character engagement regarding how character animation is studied.

In recent studies, the effects and concepts relating to the appeal of virtual characters have been focused on the character's representation. When it comes to the perception of a video game character's action or behaviour, it is commonly studied concerning perceptions of personality, appearance and other concepts that inform those perceptions.

2.3.1. Similarity and Gender:

A study by Melzer and Engelberg investigated character appeal and found that the perceived similarity between the player and character is a contributing factor in affecting character perceptions (Engelberg, Elisabeth, Melzer, André. *Game character appeal in the eye of the beholder: The role of gendered perceptions.* 66th ICA annual conference. 2016. pp 1-27). Melzer and Engelberg demonstrated how the appeal of a character had been measured to study the portrayal of gender (Engelberg, Melzer, 2016). Their argument is based on interpersonal research literature, media, fiction and the arts. The trend is that people expect similar individuals to provide a rewarding experience based on their interactions and exchanges.

This study examined the inclination to play characters of two genders (Engelberg, Melzer, 2016). The aim was to investigate how the perception of the main protagonist of a game differs when portrayed as a character of the female gender and, more importantly, whether such a character has the same appeal to men and women (Engelberg, Melzer, 2016). The study involved participants watching a cutscene of the main character performing a speech to their crew. The characters had the same personality and animation performance. The character's appeal and perceived gendered attributes were rated. The results of an online survey with 245 respondents strongly suggested that the actual gender of the game character may not necessarily be indicative of its appeal to players; instead, it is how the players perceive the character's gendered attributes (Engelberg, Melzer, 2016).

Both groups perceived the female heroine as more typical of video game heroes and less feminine than the male hero. However, the men and women differed in how the perception of femininity and masculinity determined what appeal they found the game character to have to them.

The women were more likely to find both game characters to have appeal when perceived with higher femininity. In contrast, when the men perceived the female hero to be of higher masculinity, they were more likely to find her appealing.

The study highlights inclusivity issues in character representation and how a person's gender biases affect characters' perceptions. However, the study has several issues regarding its applicability to identification and animation design.

In this study, gendered perceptions were based on stereotypical gendered attributes but not much on evaluating affinities to specific character attributes. The researchers did not address how the character's performance informed the perception of personality or how specific actions were associated with gendered perceptions.

Another issue is that it does not consider the interactivity and visceral qualities of the character. This approach for evaluation is an incomplete view as the character's abilities and actions in gameplay are also not addressed. They also did not address how the character's role was perceived and evaluated concerning the player’s preferences. This affects the role-playing desirability and evaluation of the character concept.

This study helps highlight inclusivity considerations for character design and analyse the influence of stereotypes in the design. However, more research is needed on how the characters demonstrated those genders through their actions, role and personality from the player's perspective.

2.3.2. Appearance, Personality, and Emotion:

Other studies on animation have looked at how the combination of appearance and behaviour of the character influence the perception of personality (Hyde et al., 2016; Zibrek et al., 2018). They have

tested how the perception of a character's behaviour and appearance can be affected based on how the motions work with the rendering styles (Hyde et al., 2016; Zibrek et al., 2018).

The study by Hyde et al. had a more evidence-based approach to the animation aspect of the study (Hyde, Jennifer. Carter, Elizabeth J. Kiesler, Sara. Hodgins, Jessica K. *Evaluating animated characters: Facial motion magnitude influences personality perceptions.* 66th ICA annual conference. 2016. pp 1-13). They were interested in how motion influences the perception of characters' personalities in virtual environments to improve animated characters that interact with people (Hyde et al., 2016).

The animation was a series of stories performed by actors, varying in motion and emotional valence, with their facial expressions, tracked onto characters in cartoon and realistic rendering styles (Hyde et al., 2016). They found that the magnitude and speed (i.e. level of exaggeration and dampness) of movement can affect the perception of personality traits of cartoon and realistic characters differently (Hyde et al., 2016). The participants were more sensitive to motion changes in the realistic characters than in the cartoon characters. The more realistic characters had more textural detail than the cartoon characters, making motion changes more apparent.

The findings in this study are relevant as it highlights the sensitivities that people have when perceiving motion in combination with appearance and how they directly influence the perception of a character's personality attributes.

In practice, this finding suggests that the considerations of the character's rendering style and affordability significantly influence how effectively the motion can communicate the idea or personality that the animator wants to convey through the character.

Another similar study by Zibrek et al. was concerned with how realism could induce a negative response from viewers when they engage with a character based on its render style (Zibrek, K., Kokkinara, E., & McDonnell, R. *The effect of the realistic appearance of virtual characters in immersive environments - Does the character's personality play a role?* IEEE Transactions on Visualization and Computer Graphics. 24(4). 2018 1681–1690.). This situation refers to the phenomenon known as the *uncanny valley*; this term is used to describe the relationship between the human-like appearance of a robotic object and the negative emotional response it evokes (Mori et al., 2012). When this happens, people feel a sense of unease or even revulsion in response to humanoid robots that are highly realistic (Mori et al., 2012). Motion, or the mismatch between realism and appearance and motion, is typically associated with the uncanny effect (Zibrek et al., 2018).

Zibrek et al. conducted a large-scale experiment where participants interacted with a character in a virtual reality game, depicted in various render styles considered appealing and unappealing (Zibrek et al., 2018). They were interested to know if the level of realism could induce a negative response in

virtual characters, similar to the uncanny valley effect with robots, or if the character's behaviour is more detrimental to the perceived affinity in an immersive environment. Their results showed a combination of both (Zibrek et al., 2018).

The research found a disconnect between participants' responses and the character's render style (Zibrek et al., 2018). The results showed that the rendering style only changed the character's appeal with a particular personality that was not suitable for its appearance (Zibrek et al., 2018). This finding is useful as it suggests that the expectations of the character representation play a role in shaping the audience's response.

Regarding character animation, the results from these studies have contributed helpful considerations about character presentation and their effect on a viewer's perception as they present concepts that are positively associated with a character's acceptability, explaining how the degree and clarity of motion and appearance can influence how a character is perceived by a player.

Unfortunately, due to the scope of the data, a common trend that forms these studies is that the conclusion regarding the mechanisms that could affect the appeal of a character was limited (Hyde et al., 2016; Zibrek et al., 2018). The reason may be due to their approach to defining the experience of appeal. Most of the researchers looked at appeal as a finite result based on a single interaction. They did not address the character's design and how its perception could change over time. Therefore, my solution involved repeated exposure to a single character with various versions of the same actions to base perception on different actions and test how character appeal can change based on its animation design.

2.3.3. Body Language and Culture:

Character animation was used to express body language and study cultural perceptions. A study by Lundqvist took a practice-based approach to improve the believability of a character's actions and body language (Lundqvist, K. *An Approach to Create Realistic Animations in Games.* 2016. the Luleå University of Technology). The objective of this project was to assess and present a method of adding emotions and human reactions to a playable game character during its movement to avoid robot-like behaviour, which could increase a game's realism, and make the character appear alive (Lundqvist, 2016).

This study animates a run cycle and adds animations representing feelings and reactions (Lundqvist, 2016). It was proven to be a simple method for increasing the character's realism and believability (Lundqvist, 2016).

The thesis discusses two different games and their approach to animations, some technical aspects regarding how to blend animations work, and how body language plays a role in the uncanny valley effect (Lundqvist, 2016).

The researcher claims that the method increased character believability; however, the validity of the results is questionable. The test focused only on the artistic aspects of the subject with no evidence of audience or player exposure. No implementation or more profound technical studies were done.

This study is limited in terms of animation and body language theory and how they inform the production aspect of the project. Body language expression was based on intuition rather than theory or observation. The animations were mostly notable reactions to convey mood. However, there was no evaluation of how it has been effectively communicated (Lundqvist, 2016).

On a positive note, this method is commonly used to add believability and variation to animation, especially for non-linear animations (Cooper, 2021).

However, this study is a case where animation evaluation becomes problematic when there is a lack of theory or audience to test. Although animation is an artistic medium with subjective responses, it is based on communication and can influence how people perceive it. Therefore, I suggest that to evaluate animation, it needs to be tested iteratively on the audience to understand how confident artistic choices are communicated and evaluated.

Another study by Dahle has a more defined approach to studying the effects of body language based on cultural perceptions (Dahle, T. *CULTURE AND 3D ANIMATION: A study of how culture and body language affects the perception of animated 3D characters.* 2019. the University of Skovde). This study examined the differences and similarities in how animated 3D characters were perceived by individuals from Sweden and China. The study also examined how cultural aspects affected the perception of the animations.

Dahle argues that by examining how body language is used and perceived across cultures, one will be able to create characters that behave in a way that corresponds to what an individual may expect based on their culture (Dahle, 2019).

To demonstrate this, Dahle conducted a game analysis of 6 Massively multiplayer online games(MMO), two developed in western countries and two developed in East Asian countries (Dahle, 2019). The analysis used terms from movement frameworks such as *Disney's 12 animation principles* (Johnston and Thomas, 1995) and *Laban's Movement Analysis* (Newlove and Dalby, 2003) to better distinguish the movements of the animations.

Various game animations were analysed, such as run, jump, attack and idle (Dahle, 2019). Based on the differences and similarities between the body language displayed by the different games, a total of

six animations were created. Each movement was animated with various attributes from the western developed games, and the other with attributes from the East Asian developed games (Dahle, 2019).

The critical finding from this study is that the Western-inspired animations were typically seen by participants from both cultures as more realistic but were also described as stiffer and less appealing (Dahle, 2019). In comparison, the western participants saw the East Asian-inspired animations as more dynamic and exaggerated. The Western participants more often commented that the East Asian-inspired animations could belong in fiction such as cartoons and anime.

The study partially answered the research question (Dahle, 2019). The results showed differences and similarities in how individuals from Western and East Asian cultures perceive the animated artefacts (Dahle, 2019).

Although this study highlights the importance of cultural awareness when considering the design of a character's movement, some limitations and issues are present regarding character representation and theory.

The first limitation is that this is a small-scale study (Dahle, 2019). Twenty-one participants were involved in the study. Fifteen were Swedish, and six were Chinese. The number of participants was insufficient to represent the population (Dahle, 2019). This study required more qualitative data to better understand the responses (Dahle, 2019). Therefore, the impact of the study is relatively tiny in terms of research. However, the study opens further discussion regarding cultural aspects and provides ample material for future studies.

Another issue is that the knowledge of gender and body language expression is still a limitation (Dahle, 2019). The character animation was designed to be a neutral representation of action (Dahle, 2019). The animations were just uncharacterised actions with no appearance and personality expression. It suggests an incomplete view of how other aspects of a character can affect their motion. These considerations of characterisation can affect the player's impression. Animation appeal was based on cultural association. Not so much on how and why certain representations appeal to specific cultures.

The application of animation theory and the Laban Movement Analysis (LMA) was problematic in this study (Dahle, 2019). The theories used in this study are relevant and used by animators today. Dahle explains the differences between the animation's styles through Disney's 12 principles (Dahle, 2019). Dahle presented that there is not much research on what moves are considered "realistic" or "cartoony". The study also revealed that the problem was due to familiarity with the framework. The LMA is quite a big topic for novice animators because it has many considerations in how people can understand movement. Gaining a complete understanding requires intensive studying and certification because of different schools of thought influence interpretation (Bishko, 2007; Hooks, 2017). Despite

the limitation in this paper, it has informed my process on how I approached the cultural considerations in animation analysis and production. South Africa has diverse cultures and languages, which can affect how the character's body language and the questionnaire are interpreted and evaluated. However, the effects of cultural perceptions were not in the scope of this research.

Although animation design has many limitations, these studies highlight the importance of representation style, believability, and its effect on cultural perception and acceptance. Using artefacts with cultural influences as reference points allows for studying how culture influences body language and animation in 3D characters (Dahle, 2019). It also allows for examining how individuals with distinct cultural backgrounds perceive these differences and whether the perception differs between cultures or if they are more similar (Dahle, 2019).

There has been a fair amount of research regarding the appeal of characters. Based on the literature presented in this section primarily focus on the social and affective aspects. The gap in the literature is that fewer studies address the components and principles that inform the impression of motion and action. For example, character animation in the presented studies was understood in a general sense, the overall movement of the character. There are various elements and concepts define the structure of action that can inform the viewer's impression. This highlighted that even more factors suggest the complexity of this topic.

Regarding video game animation, the applicability is not enough to understand video game characters as they did not address the interactivity aspect. When it comes to character-centred games, the player is repeatedly exposed to the same character during play, which can affect how the animations can be structured. The perceptions of the character and their animation may change based on how they are played and their context. These studies' animation cases were scripted encounters out of the player's control (Engelberg, Melzer, 2016, Hyde et al., 2016; Zibrek et al., 2018). The experience of watching a character is different from role-playing one. There are many considerations to address, which this paper will discuss later in this literature review.

2.4 Character Design and Audience Interpretation

This section covers the factors that influence how a video game character's action can be perceived.

2.4.1. Social Impressions, Body Language and Communication:

Body language is a non-verbal method of communication. It is any posture or gesture someone does with their body to assign its meaning. However, not all the signals a person sends are intentional, and sometimes they are either not received or misinterpreted.

We perceive characters' body language as we do with other people. Isbister talks about how social impressions emerge through cues from the character's faces, body, and voice and how these features create overall impressions when interpreting a character's behaviour (Isbister, 2006). This is informed by the cognitive and social biases, such as attractiveness, culture, roles, and stereotypes, that they experienced and by the appearance and behaviour interpreted by the character (Isbister, 2006, pg. 5). These first encounter principles will affect the later gameplay experience of the character and the level of overall social and emotional engagement with the game itself (Isbister, 2006, pg. 5).

For most people, nonverbal communication is an intuitive process. Goman argues that to decode the meaning of body language, it needs to be understood in context, viewed in clusters, evaluated for congruence with what is being said, assessed for consistency, and filtered for cultural influences (Goman, Carol Kinsey. *The Nonverbal Advantage: Secrets and Science of Body Language at Work. Berrett-Koehler Publishers*. 2008. pp 1- 202).

In her book, Goman explains how to decode the body language of others and its application in the workplace to help build trust and credibility with customers, colleagues and clients (Goman, 2008). Goman's analysis of interpersonal communication techniques, signals, and behaviours suggests that non-verbal signals are more important in understanding human behaviour than words alone (Goman, 2008).

Goman proposed a method of interpreting body language, which is called the 5 C's:

1. *Context* refers to the surrounding environment and a person's relationship with the people they interact with. We cannot understand someone's behaviour without first considering the circumstances under which the behaviour occurred. The meaning of nonverbal communication changes with the context, which means that the same action in a different environment will have a different meaning. Context should be considered as it can affect how a person behaves (Goman, 2008).

2. *Clusters* are a group of movements that contribute to overall behaviour. This means that nonverbal communication is displayed through several types of movements, gestures, and postures at the same time to reinforce a common point (Goman, 2008). The overall behaviour is more important than a single gesture, as a single gesture can have several meanings or mean nothing at all (Goman, 2008).

3. *Congruence* means the gestures and expressions that a person uses to match and verbally support what they say (Goman, 2008). Incongruency occurs when the two do not match, which is a sign of inner conflict between what someone is thinking and what they are saying (Goman, 2008).

4. *Consistency* means that a person's baseline behaviour, when not stressed, needs to be established to spot meaningful divergences in their behaviour when a more stressful situation occurs (Goman, 2008).

5. *Culture* influences how people use body language. It is essential to consider an individual's cultural background when looking at body language (Goman, 2008). The more you know about a person's background, hobbies, and interests, the more you can understand why certain gestures or postures are part of their unique repertoire and, more importantly, why deviation from these patterns is significant (Goman, 2008). When people get stressed, they are more likely to display culture-specific gestures (Goman, 2008).

This framework is beneficial for analysing a character's gestures and the overall acceptance of its behaviour. The framework considers the dynamic aspects that inform a viewer's interpretation. This consideration suggests that changes in these areas can affect the viewer's perception and the meaning constructed from the body language.

In terms of animation design, this is useful for identifying trends informing the player's perception of animation design. However, the definitions are limited in troubleshooting design, as the concepts suggest that the player needs to be familiar with the context of the character's actions and its concept to understand the meaning of its actions. The meaning may be affected without this knowledge. This informed my approach in the playtest session. The participant would need full context about the character's actions, concept and environment to ensure that meaning is not lost.

2.4.2. Acting: Animation, Personality, Emotion and Physical Action:

Another aspect of expression that affects how people or characters are perceived is acting. Animation is the simulation of movement created by a series of pictures, drawings, models or puppets to put life into characters and objects (Maio, 2020). It plays a role in expressing body language, emotion and personality. It is the movement of characters that allows them to act (Hooks, Ed. *Acting for Animators: 4th Edition.* 2017. Taylor & Francis. pp1- 228).

However, movement is intentional and motivated, as it results from thinking and emotion (Hooks, 2017). When animating a character, you express its thoughts and emotions through the illusion of movement and dramatic action (Hooks, 2017). Body language transmits a visual message that leads to conclusions about the character and creates the illusion of life (Hooks, 2017). Therefore, personality and action are not mutually exclusive, and it is the action that defines a character (Hooks, 2017). In the book, Hooks uses classical acting theory from philosophers such as Aristotle and Stanislavsky to

discuss everything from character analysis and physical movement in the context of the scene structure (Hooks, 2017). This book is intended for animators. His objective is to provide the tools needed to create a strong performance and storytelling in animation (Hooks, 2017).

Hooks Introduces the Nine Basic Principles of Acting:

1. *Thinking tends to lead to conclusions; emotions tend to lead to action.* This means that we think of things before the body does them (ibid: 26). Initially, we perform an automatic value response when we think about something, which is emotion. The emotional response tends to lead a character to action (ibid: 27).

2. *Action in pursuit of an objective while overcoming an Obstacle.* Characters need an objective (ibid: 26). An objective and purpose to a character's movement and emotions will affect their body movement (ibid: 39). Action without thought is impossible, and an action that has no objective is just a mechanical thing with moving parts (ibid: 39).

3. *We empathise only with emotion, not with thinking.* Character animation aims to create a sense of empathy to establish a connection with a character (ibid: 26). That is done by showing how the character feels about what they are doing (ibid: 31). Good animation depends on finding points of empathy. The goal is to get the audience to feel the character's emotions rather than understand them intellectually (ibid: 31).

4. *Theatrical reality is not the same thing as everyday reality*. To get a believable performance, it is not enough for the character to merely move (ibid: 26). Acting behaves in pretend circumstances for a theatrical purpose (ibid: 37). Behaving believably means the character's behaviour must strike the audience as believable on human terms (ibid: 37). They must be animated with theatrical intention and purpose (ibid: 37).

5. *Acting is doing. Acting also is reacting*. Acting is doing something and reacting to external or internal stimuli (ibid: 26). The character's actions and reactions should reflect their values and culture in response to their contextual situation (ibid: 43).

6. *Your character should play an action until something happens to make him play a different action* (ibid: 26). This rule of acting is that a character pursues an objective until they achieve it, or another objective takes its place and performs another action (ibid: 45).

7. *Scenes begin in the middle, not at the beginning* (ibid: 26). This is a way to make scenes enjoyable to pay attention to the character's context (ibid: 48).

8. *A scene is a negotiation.* In a scene, the character can conflict with their situation, status transactions between other characters, or their thoughts and emotions (ibid: 50).

9. *Relationships are a factor in how characters feel about one another.* What makes a character relationship interesting is not the relationship itself. It is the attitudes and feelings of the characters (ibid: 52).

The principles presented here provide a helpful introduction to acting for new animators (Hooks, 2017). It is beneficial for creating believable characters in most forms of animation as it provides considerations of how to move thematically based on the emotions and intention of the character (Hooks, 2017). Although this source is influential and has gone through various editions and has been taught and applied to many characters in the animation industry, it is limited to the performance of player characters in gameplay. Once the fundamentals are known, there is no theory to improve your character performance. This is because most of the theory is centred on creating empathy and storytelling.

For fighting games like *Super Smash Bros Ultimate* (Nintendo, 2019), the character's action is about mechanical representation and time efficiency for feedback and interaction, rather than achieving a narrative and empathetic reaction from the player. For player-characters, the character can express the intention and motivation of the action. However, the intention of the action is based on the player's discretion and the objective of the game. Empathetic reactions emerge from the narratives that emerged through gameplay.

2.4.3. Debate: Player-Character Distance and Identification

The distance between the player-character and the player is also a contributing factor that affects the interpretation of action. Video games present some unique challenges because the aesthetic experience of playing a game is different from watching a movie in a theatre.

When it comes to the discourse on the appeal of characters in video games and the identification process, the discussions are primarily on the physical distance between the player and character and the effect of experiences that contribute to immersion.

The first argument is the physical distance between the character and the player. Hooks explains identification from an empathy-driven view. He claims that empathy (identification) requires physical distance. He argues that players cannot empathise with their avatars to the degree that they can control the behaviour of the avatars (Hooks, 2017).

Hooks uses the example of cutscenes and gameplay to illustrate this. In a video game, the player is part of the action, making them the game's character (Hooks, 2017). The player can empathise with characters during a cutscene. Still, empathising during gameplay is difficult because the player cannot empathise with themselves, nor can they empathise with a character that responds directly to your command (ibid: 121).

Cutscenes work empathetically because the player has default physical distance. Cutscenes provide backstory exposition so that, after watching one, the player can return to gameplay with enhanced empathetic context and progress in the game (ibid: 121).

With this logic, the player cannot empathise with his avatar. His avatar is likely to be assessed with other characters in the game (ibid: 121). Hooks proposes only two primary ways to accomplish an empathetic connection (ibid: 122). The first is that the player's avatar needs to have a mind of its own. The second is that the non-player characters (NPCs) need to be used in more theatrically correct ways, such as their actions, obstacles, and objectives (ibid: 122).

Although the solutions presented are effective ways of increasing empathy, I cannot entirely agree with this argument regarding identification. This view is still based on a cinematic view of participation in linear mediums such as films and television. Regarding the player's experience, empathy is not the only source of identification in characters. Not all games that feature characters require cinematics to form empathetic game connections.

On the other hand, other researchers have argued and reported no distance between their game protagonists but identify with them through interactivity (Hefner et al., 2007). The identification processes within an interactive medium such as video games, which is interactivity-driven, differs from the non-interactive mediums, such as watching a film, which is empathy-driven (Hefner et al., 2007).

According to Isbister, player-character's personality and appeal come as much from their movement in response to the player's real-time controller actions as from watching elaborate cutscenes (Hefner et al., 2007).

The way players act and the role offered to them shape the events and progression in the game. This implies that players are not just observers of the media environment but actively participate in the story unfolding on-screen (Hefner et al., 2007). Therefore, interactivity in video games overrides the distance between the player and character (Hefner et al., 2007).

The study by Hefner et al best illustrates this argument (Hefner et al., 2007). They experimented to explore the theorised relevance of identification with a game character for video game enjoyment (Hefner et al., 2007). They explained that scholars had widely discussed identification in entertainment research, yet the definitions do not apply to games. Hefner et al. proposed a more appropriate definition applied to games.

The experiment compared interactive gameplay and non-interactive, passive game observation between thirty male participants with varying game experiences (Hefner et al., 2007). They were randomly assigned to play one level of *Battlefield 2* (Electronic Arts, Single-Player-Mode) or watch a video recording from the same game level. They assumed that identification with the game character was much more vital for those participants playing by themselves (Hefner et al., 2007).

The results supported their assumptions and revealed that the participants who played the game showed a significantly higher average score of identification than the participants assigned to the group who had only watched a recorded playthrough (Hefner et al., 2007). Therefore, the study demonstrated interactivity to facilitate identification with the game character (Hefner et al., 2007).

Another important finding was that the extent to which players perceived the character's attributes as valid and desirable for themselves was positively correlated with identification (Hefner et al., 2007).

In other words, the participants playing the game had more opportunities to act efficiently within the character role and, therefore, could identify with the game protagonist to a much larger extent than the participants who could not interact with the game (Hefner et al., 2007).

A limitation of this study is that it was concerned with the presence of interactivity rather than how a character or game design facilitates it. There was not much information on what aspects of animation or character design inform this. Hefner et al mostly focused on player perception. Nonetheless, this study is helpful as it shows the importance of identification with a game character and that interactivity and distance between the player and character play a significant role.

However, there is an issue of identification regarding the player's agency, and Lankoski's argument highlights this issue in role-playing. There is a conflict when identifying game characters during play

because the pleasure of role-playing has double logic (Lankoski, 2002). It requires character immersion, but it always requires knowledge that one is playing a game.

When control of the situations and knowledge of events in a game has no natural world consequence, it can make even unpleasant events and failures of a character pleasurable for a player (Hefner et al., 2007). However, players can play a game as they like or choose not to play. Therefore, their actions make it possible to break a game and ruin the illusion for both oneself and other players (Hefner et al., 2007).

I agree with most of these considerations. The arguments reveal that careful character design should be considered as it is a way to strengthen a role-playing game experience. Animation plays a role in establishing a level of identification of a character that the player may experience. Character animation in video games presents the opportunity to create empathy and drive interactivity. However, the limits of identification depend entirely on the medium, context of the gameplay and the opportunities it provides for character expression and representation. The depth of identification may also change depending on the player's discretion.

2.5. Animation Theory and Movement Interpretation

This section cover how movement is understood and discussed in animation and video games.

Although theories and concepts around character design show that characters can affect our engagement at various levels (appearance, emotions, personality traits and interactivity), it is not enough to explain how the animator can enhance this experience through the character's movement and actions. However, it is challenging to discuss movement in precise detail because it constantly changes and has various considerations when looking at its context (Bishko, 2007; Hooks, 2017). Therefore, I will present the frameworks commonly used to determine how animation can understand and express movement.

2.5.1. Disney’s 12 principles of Animation:

This framework has been an influential tool widely used in the industry today. The twelve principles are based on the work of Disney animators from the 1930s onwards to produce more realistic animations (Johnston & Thomas, 1981). These principles were to produce an illusion that cartoon characters adhered to the fundamental laws of physics (Johnston & Thomas, 1981). However, they also dealt with more abstract concerns, such as the timing of emotions and the character's appeal (Johnston & Thomas, 1981). These terms are related to the character's stages, shape, speed, trajectory,

and weight in their movement (Johnston & Thomas, 1981). Today, these principles are conventional terms used for creating a convincing, coherent, and appealing movement (Cooper, 2021).

The principles are as follows:

1. *Squash and stretch* - refer to an object's or character's elastic qualities and how force and gravity affect their shape.

2. *Staging* is the visual design of a pose or scene. The action of the pose should be readable in silhouette.

3. *Anticipation* is the way a character prepares for action.

4. *Straight ahead and pose to pose* refer to two different animation workflow methods used to create loose or controlled results.

5. *Follow-through and overlapping action.* Follow-through is the movement that indicates the end of the main action. In contrast, overlapping action is the staggering in the starting/stopping moments of complex actions, often related to inertia.

6. *Slow-in and Slow-out* refer to the acceleration and deceleration of the action.

7. *Arcs* describe how most organic action follows a curved motion pathway.

8. *Secondary action* occurs as the result of the direct action.

9. *Timing* is a general term referring to the speed, acceleration, deceleration, and duration of action.

10. *Exaggeration* is when a much broader range of motion is used than would typically occur.

12. *Solid Drawing* refers to the consistency and preservation of volume and shape in the drawing process.

12. *Appeal.* It combines the previous principles and creates an exciting and pleasing style in the character's action.

The development of these Animation Principles was a significant foundation in character animation and created the basis for believable character performances (Bishko, 2007). However, this approach to designing animations is limited in understanding the nuances of movement and some principles are not applicable enough regarding 3D and interactive characters (Bishko, 2007). The principles are intended to be applied to traditional, hand-drawn animation and viewed on linear mediums where the animator controls how the experience is driven. However, some principles are still relevant for today's more prevalent computer animation and other mediums.

2.5.2. The Laban Movement Analysis:

The Laban Movement Analysis (LMA) is a valuable tool for describing and interpreting human movement (Fagerberg et al. *Designing Gestures for Affective Input: An Analysis of Shape, Effort and Valence. ACM Publications*. 2003. pp 56-65). This was introduced by Rudolf Laban, a well-known dance researcher (Penfield & Steel. *Application of Laban Movement Analysis To a Movement for Actors Training Program*. 2005. pp 1-30). He created a system for analysing the qualities of any physical action (Penfield & Steel, 2005). He initially used it to describe the shapes the body makes in space (*Shape*) and the dynamic and energetic qualities of movement (*Effort*) (Fagerberg et al., 2003). It was later developed further and is now used for dancers, actors, musicians and athletes (Penfield & Steel, 2005).

Function and expression are among the core principles of the LMA system. According to the LMA, movement is a continuous change process (Tanenbaum, J., El-Nasr, M. S. and Nixon, M. *Nonverbal communication in virtual worlds : understanding and designing expressive characters*, *Nonverbal Communication in Virtual Worlds*. ETC Press. 2014. p361) Human movement is intentional, and the changes are patterned and orderly. Therefore, animators must view the movement at multiple levels to be understood (Tanenbaum et al., 2014).

The framework consists of five categories portrayed in a spectrum of movement parameters: *Phrasing, Body, Effort, Shape and Space* (Tanenbaum et al., 2014). Each category is quite extensive in terms of its theory and application. Therefore, the following is a broad introduction to the categories in the framework.

A. Phrasing:

Our uniqueness is expressed through our movement phrases (Tanenbaum et al., 2014). Phrasing describes the rhythmic changes in movement in a person or an animated character (Hooks, 2017). It is how movement components are sequenced, layered and combined over time. A movement phrase represents or communicates a complete idea or theme (Tanenbaum et al., 2014).

How one begins a phrase of movement organises intent and patterns the neuromuscular coordination of the action (Tanenbaum et al., 2014). Intention prepares us to move and pattern the following movements (Tanenbaum et al., 2014).

Five main stages characterise a movement phrase: *Preparation* (Intent), *Initiation* (Anticipation), *Action* (Exertion), *Follow through* (Recovery), and *Transition* (Settlement) (Tanenbaum et al., 2014).

B. Body:

This concept explains the structural aspects of the body in motion, such as which parts are moving or held, how movements flow from one part to another, how the kinetic chains of the body are being patterned and coordinated, as well as posture habits emerging from gestures (Tanenbaum et al., 2014).

In addition to being focused on the functional aspect of movement, this category allows us to observe the degree of ease within the body and its contribution to authentic expression through its outward manifestation (Tanenbaum et al., 2014).

C. Effort:

The attitude expressed through physical action is effort. Effort describes the dynamic characteristics of how a person uses their energy (Tanenbaum et al., 2014). The character can have either an active or passive attitude towards their movement. The effort is observed in subtle combinations of two elements, creating States, and three elements, creating Drives (Tanenbaum et al., 2014).

Categories that define the effort of movement:

Space: The attention to the surroundings. This is about whether the movement is direct or indirect (Fagerberg et al., 2003).

Weight: This is the view of the movement's impact. This is about how strong or light the action is (Fagerberg et al., 2003).

Time: This is the movement's lack of or sense of urgency. This is whether the action is sustained or sudden (Fagerberg et al., 2003).

Flow: This is about the amount of control and body tension. This is about the freedom and rigidity of the movement (Fagerberg et al., 2003).

D. Shape:

The shape is the area of LMA that is most similar to animation since it describes the process of shape change over time (Tanenbaum et al., 2014).

A person's inner attitude and relationship with the external environment influence their body's shape. What we express through our gestures reflects our feelings about our surroundings. Gestures connect the inner world of the self to the outer world of the environment (Tanenbaum et al., 2014).

In animation, shape translates into posing and the smooth interpolation of poses to create movement phrases (Tanenbaum et al., 2014).

E. Space:

This category describes the person's movement in the external environment, forming spatial forces and counterforces that stabilise or mobilise the body (Tanenbaum et al., 2014). The physical range of movement varies within the Kinesphere -the space around the body (Tanenbaum et al., 2014).

2.5.3. LMA vs Disney's 12 principles:

The LMA framework is helpful as it provides basic terms to describe and analyse the functional and expressive aspects of movement and identify areas that animators can use to adjust the performance of an action. According to Bishko, this framework is more suitable for analysing and discussing movement than Disney's 12 Principles. (Bishko, Leslie. *The Uses and Abuses of Cartoon Style in Animation*. 2007. Animation Studies. pp. 9–12).

In her article, she highlights the application limitations of *Disney's 12 principles* to create the illusion of life (Bishko, 2007). The article is about cartoon style and its use and abuse in various contexts (Bishko, 2007). It covers the evolution of cartoon style, what makes a character's animation authentic and alive, how movement economises, and how the LMA helps address these problems (Bishko, 2007).

She argues that the *12 Principles of Animation* are a good benchmark for animation; however, these principles are vague movement concepts. They influence specific movement patterns that are often applied without consideration of their effects, resulting in characterisation lacking authenticity (Bishko, 2007).

She explains that animation principles can impose a specific style of animated movement; however, it often leads to creating functional movement. In comparison, the LMA is style-neutral and excels at articulating style elements. Also, the LMA addresses the relationship of intent to action– the link

between how people move and what their movement communicates to others. This influential concept allows us to see authenticity in a way that the Animation Principles cannot (Bishko, 2007).

Abuse of cartoon style happens when the animation principles are used as a natural outcome without specifically crafting the expressiveness of movement to develop unique characterisation and style (Bishko, 2007). Without expression, the principles risk being treated as a formula that only creates functional movement (Bishko, 2007). This is severe in the initial stages of learning animation. Learning the functional aspects is the primary goal while expressing the intention of movement becomes inconsequential (Bishko, 2007).

This article has valid points on what constitutes an authentic performance of the character in terms of style. It addresses Disney's 12 principles (Bishko, 2007). The LMA is a more effective tool as it provides a framework that facilitates personal, subjective, and metaphoric inferences perceived empathically through movement. It considers people's movement habits, cultural traditions, and the immediate circumstances of movement communication (Bishko, 2007).

Although this article focused on its applicability to the cartoon style, it is still relevant when defining the style of any movement and the nuanced components.

2.5.4. Gallaher's Dimensions of Style:

The style of a movement is another factor in expressing motion. This is demonstrated in a study by Peggy Gallaher. She explains that style, an expression of action, is how behaviour is formed (Gallaher, Peggy E. *Individual Differences in Nonverbal Behavior: Dimensions of Style*. Journal of Personality and Social Psychology. 1992 pp 133 -145). She argues that individual consistencies and factors in behaviours are performed, suggesting that style may be a personality trait (ibid: 1). Her research involved systematically collecting words for movement qualities and using participants to rate the movement styles of loved ones (ibid: 1). The results showed connections between these movement qualities and the personal qualities of the subjects (ibid: 135-136). Other findings showed that trends between the person's body type and sex differences influence movement style (ibid: 138).

These are the dimensions of style:

- *Expressiveness:* The variety and energy in expressions and gestures when talking with others (Gallaher, 1992).

- *Animation:* Showing high energy levels in the general movement (Gallaher, 1992).

- *Expansiveness:* Taking up more space with one's body in movement (Gallaher, 1992).

- *Coordination*: Moving smoothly and with grace (Gallaher, 1992).

Working with Gallaher's and Laban's dimensions makes it possible to create a profile of a character's style of movement that can be useful for a design team in guiding choices about animation details (Isbister, 2006). One covers the functional and intentionality aspects of movement, while the other describes the behavioural interpretation of the movement. Therefore, I used these concepts in constructing and analysing Link's animations.

2.5.5. The Five Fundamentals of Video Game Animation:

In his book, Jonathan Cooper teaches the technical and artistic fundamentals (Cooper, Jonathan. *Game Anim: Video Game Animation Explained* (2nd ed.). CRC Press. 2021. pp 1 - 350). He has accumulated many modern techniques and practices from his 20 years of experience into a set of five new fundamentals, which complement Disney's twelve principles. These fundamentals consider the nonlinear nature of video games and form the basis of how video game characters should look and feel good under the player's control (Cooper, 2021).

The Fundamentals of Video Game Animation:

1. *Feel:* This is a significant component of gaming animation. This is about how the animations work under the control of the player. It involves the sub-concepts of responsiveness, inertia, momentum, and visual feedback. The time between a player's input and their desired reaction can differentiate between creating the illusion and influencing the player's distance from the avatar (Cooper, 2021).

2. *Fluidity:* This is about how smoothly and coherently different actions blend. It covers the sub-concepts of the blending and transitions between motions, seamless cycles, and the settling of motions. This concept aims to remove any unsightly movement (Cooper 2021).

3. *Readability:* It is about making sure all the character information is clear and coherent on-screen. It deals with the sub-concepts of posing for game cameras, silhouettes, collision, and centre of mass. The player will often view animations from different angles; therefore, actions must appeal from all angles (Cooper 2021).

4. *Context* is about where and how an animation will be used in-game. It covers the sub-concepts of distinction vs homogeneity of actions, repetition, and the character's

on-screen placement. Contextual animations make the player feel like their experience is personalised (Cooper 2021).

5. *Elegance* is about the complexity and efficiency of how the animation systems are designed to achieve the desired result without adding unnecessary costs in production. This involves the sub-concepts of the simplicity of design, cost efficiency, and sharing & standardisation of motions (Cooper 2021).

The concepts from the five fundamentals are helpful in the construction and analysis of animation and its influence on mechanics and interactivity. They can identify critical areas of the animation that are relevant to the player's engagement and identification with a character's action regarding their interaction and its effect on gameplay. However, the degrees of these concepts cannot predict how the player will react to the character's animation in isolation. Therefore, their effects need to be tested depending on how they affect the player's perception.

2.6. Conclusion:

As stated previously, there is broad research in character animation, yet, to my knowledge, there is little regarding video games, especially how their design plays a role in character identification.

In reviewing the literature on character animation in video games, I discussed its importance and effect on their play experience. Early research has shown that characters can enhance the player's experience. This is dependent on the player's perception, cognitive effort, social biases, and level of interactivity. The appeal of a player-character may be driven by identification, empathy, interactivity, visual design, and the psychological affordances they promote. How these appeals to the player are informed by the information and cues aligned with the character's design and the player’s impression.

The second section discussed how character animation had been approached in research regarding their appeal and perception. Recent research on the appeal of character animation focused on the perceptions of personality attributes, appearance, emotion and how they relate to other psychological concepts. The findings were significant for seeing correlations between concepts and phenomena for heuristics in practice. However, they are not enough for evaluations regarding design.

Recent studies have started to look at the artistic side of animation. However, the methods used for the work analysis are often limited. There was not much information on the practical elements that drive that experience. They highlighted that achieving character appeal would increase player engagement.

However, there is still a lack of robust research on successful game character animations and what leads to their enjoyment.

The third section covered the factors that affect how a character's actions are interpreted and the debates and theories regarding movement and action in animation. These factors were centred around the ideas of body language, acting, and the distance between the player and the character.

The final section focused on the theoretical aspects of interpreting and designing movement and how animation should be designed in the game context. It highlighted practical ways that inform how a character's actions and movement can be interpreted and constructed.

In conclusion, the studies presented show an increasing interest in the animation aspects of character design. However, there is a lack of robust research regarding practical approaches and results. Finding the appeal of animation requires subjective data and is context-dependent. Animation has been studied as a tool of expression rather than how its design informs the expression. Although the literature presents these themes in various contexts, this paper will focus on their application to gameplay animation. I propose that more research should be focused on specific audience studies and how animation design contributes to their experience.

3. Theoretical Framework

The concepts presented in the literature review suggested that the player's affinity towards characters is based on their ability to draw attention and interest, and how well the player identifies with them during the interaction. Character appeal promotes and maintains a character's satisfaction, leading to further involvement in a video game.

3.1. Player Interest, Identification, Character Appeal and Movement Style:

The basis of this theory will be on Calleja's Player Involvement model, as it addresses the necessary steps and attentional needs to achieve total immersion in the context of a game. However, I studied the initial stages of involvement for the scope of the project. I focused on how attention and character appeal function to serve the player's interest in the analysis.

In terms of definition, I used a combination of Disney's definition of appeal and the concept of wishful identification, by Hefner et al, as they address aspects of character design that attract and maintain a player's attention. In this paper, the appeal is a characteristic of how a character's design and action create interest and engagement and fulfil the player's identification needs with the character.

Studying player identification often requires investigating the focus group's preferences and perceptions. Therefore, the character's role, competence, performance, goal and habitus, empathy, interactivity and demonstration are valuable considerations in identifying the player's preferences, expectations and attentional needs.

In this study, I refer to animation style as the overall animation design, based on Gallaher's definition and *Dimensions of Style*, the *Laban Movement Analysis* and *Disney's 12 principles of animation,* and *The Five Fundamentals of Animation*. I used these concepts to study how Link's actions are structured and expressed, how the action communicates the character concept, and how his actions meet the game design needs.

Like the previous studies, I looked at the affinity to engage with a video game character. However, I took a practice-led approach to understand the relationship between player involvement and the player-character's animation design. The experiment is to assess how a character's actions can be expressed differently to affect the player's perception of the character.

Suppose an element of its design is changed, and the player notices it. In that case, the response may highlight what aspects of the character they care about and inform a designer's decisions on targeting the area that needs improvement. Through practice, understanding the relationship between player involvement, perception, and character appeal should allow us to further understand the nature of player experience.

4. Methodology:

This research is a qualitative study that explored and evaluated the perception of the animation style in the character's action and how its appeal has changed during the reception of its animation. I used the data from a focus group to identify the factors that facilitate character appeal based on the participants' feedback.

However, I also used quantitative methods for measuring and collecting data from a primary source as the research involves the manipulation of variables, creating style perception profiles, and measuring the overall trend and effects of a group.

4.1. Case Study:

Super Smash Bros. Ultimate (SSBU) is a 3D crossover action fighting game for the Nintendo Switch. The game was developed by Bandai Namco and published by Nintendo. The game was released internationally on December 7, 2018 (Nintendo, 2018).

I chose this game as a case study because it features a vast roster of characters from popular video games, which have a pre-established acceptance that can be assessed. The game is known for faithful character representations. It was interesting to see how a character's moveset and behaviour are translated into the game's context. The game also has a broad and diverse player base, and the players in the chosen age group play it frequently.

The game's mechanics also affect the animation design as it places them in the context of platforming and combat. In the gameplay, attention is focused on the responsiveness of the mechanics and feedback aspects of the animation, which limits the structure and clarity of the actions. Yet each character is presented with a unique movement and fighting style. This places interesting constraints on how the movements can be read to work with the needs of gameplay and the artistic choices that work with the character representation.

4.2. Animation Analysis:

An animation analysis was conducted to determine which of Link's animations should be created and manipulated. The focus of this analysis was to figure out how the visceral aspects of the character are expressed and how his movement is structured regarding frame data and animation principles presenting each action.

When deciding which actions should be animated, the findings from the analysis made of the games mentioned above were used. These six actions were chosen: Idle, Run cycle, Jump, Neutral attack, Neutral Special, and Taunt. I chose these actions as they best described the platforming and combat aspects of the game.

4.3. Model and Props:

The models and props in this project were purchased from the online platform, Sketchfab with a creative commons licence. The model used for this project was a rigged version of Link and his master sword created by Christoph Schoch (Model, 2020). This model was chosen because it was the closest visual representation of the character in the game.

His appearance was based on one of his outfits from the game, *The Legend of Zelda: Breath of the Wild* (Nintendo, 2017). Although the colours of his outfit are slightly different and he wears a cape, his appearance, silhouette, and features resemble the original character. The model was made freely available as a fully coloured (textured) asset with full animation rig functionality.

The character needed the appropriate props to demonstrate his fighting style and capabilities in the game. Link's equipment is iconic. Therefore, it needed accuracy in its representation. Separate artists made the props. The Hylian shield model was made by ArchViz (Link's Shield Hylian from Botw, 2019). The bow model was made by stinauinn (Soldier's Bow (TLoZ: Breath of the Wild), 2021). Finally, the arrow model was made by dgonlinebr4 (Simples Arrow, 2021).

4.4. Animation Demo Reel:

An animation demo reel displayed three style versions of Link's actions. The demo reel was a collection of short clips that showcased Link's abilities in a neutral environment. A total of eighteen animations were created. This demo reel was presented to the focus group, and they provided feedback on their impression of each version.

The animations were displayed in a Unity project to facilitate the feedback session. In the project, the participants could select, play and pause the animations in the reel. When the participants were done reviewing a style version, they would be taken to the online survey to record their feedback. When they were done with the survey, the following style version was loaded for the next review. The purpose of this was to provide the tester agency with which they could review the animations in their own time. The other reason was to make the feedback process seamless as switching between programs becomes a tedious task and to guide the tester to the correct survey.

4.5. Data Collection:

A series of semi-structured online questionnaires were used as the primary method to gather data from the participants.

The questionnaire contained both closed and open questions. The purpose of the closed questions was to collect specific answers to questions about the animation. The open questions were to allow the participants to write their answers freely and gather additional information regarding their thoughts and opinions.

There were three phases to the survey design. The first section focused on recruiting participants, introducing the game and gathering information about the individual. The survey contained screening questions to find out who was interested in the game—followed by category questions to identify the group's overall preferences and experience in playing *Super Smash Bros Ultimate* (Nintendo, 2018). The survey also involved demographic questions asking a set of fundamental questions such as age, race, and gender to understand the general trends in the focus group. This survey was sent on social media platforms such as Discord, Facebook, Whatsapp, and Instagram.

The second survey was a pre-test and involved the introduction of Link from the game *Super Smash Bros Ultimate* (Nintendo, 2018). The participants were given a character description regarding their abilities and personality and watched a trailer of Link's gameplay. The questions were intended to investigate the participant's initial impression of Link by identifying which of his features they value the most and how the participant describes Link's movement, based on Gallaher's *Dimensions of Style.*

The third section was the primary test involved looking at the animations presented in the demo reel. This survey involved looking at the change in Link's animation and recording feedback and opinions on the playtester's experience for each version. The questions involved the participant identifying what has changed in the animation, rating the character's appeal on a point ten scale, a repeat of questions regarding the style, and their overall impression and critique of the animations. The responses from this survey will be used to identify what changes were noticeable and whether those changes matter to the player. The survey questions and responses can be found in the **Appendix.**

4.6. Ethical Considerations:

This research involved the interaction of a focus group of human participants and recording their responses. Therefore, the ethical considerations of this project needed to be addressed and a clearance certificate were granted by the university to perform this study.

In terms of demographics, the research required forty participants of adults between the ages of eighteen and thirty-five in South Africa who have an interest or experience in playing *Super Smash Bros Ultimate* (Nintendo, 2018).

The participants are existing contacts, associated with the researcher. They are community members of video game players with varying levels of expertise in the field and exposure to the case study. Their role in the research was to provide external feedback on the effectiveness of the concepts tested in the character animation project.

This study considered restrictions around COVID-19. Due to concerns and constraints of movement and gathering publicly, the test was conducted online. Therefore, no in-person contact was established, and all communication was done via email and Microsoft Teams.

The potential participants were invited via email and social media, such as Facebook, Instagram and Discord. The participants were briefed about the research and the content. The participant's data and identity were only known by the researcher and were addressed anonymously.

The participants needed to have an internet connection to access to participate in the research. The participants had access to the animations and links to the survey on Google Drive. This allowed the participants to engage in the research on their own time. However, there was a deadline to end the participation period.

This research looked at age, race, gender, and region to contextualize the information presented in the final report. This data was used concerning the focus group and highlighted the general trends rather than the individual's background or identity. No biographical or sensitive topics were addressed in this study.

However, the nature of the project contained minimal risk regarding its effects on the participants. The first issue was that the referenced video game contains depictions of violence, regardless of its low age rating and level of representation. This may be sensitive to some participants. The next concern was that participants were required to watch fast animations repeatedly. This may be an issue for participants prone to epileptic seizures or sensitivities regarding motion and vision.

The final concern was that the creative work was based on my interpretation and discretion, and its reception will be recorded. There was potential that participants may find discomfort in how I approach certain representations. Therefore, I addressed the content warnings to the participants before the assessment.

The researcher abided by the codes of informed consent. Therefore, participation was voluntary. Everyone was informed of the nature of the project, and participation could be terminated at any point of the assessment. The answers from all participants will be anonymous in this report. Any information about their identity was not required for the research and thus will not feature.

5. Animation Process and Discussion

Before I worked on the animation, an analysis of Link's character design and moveset in *Super Smash Bros Ultimate* was conducted. This was to understand how the character is represented and how his animation is structured in the game.

I used various methods to study the character. The study involved watching clips of Link's gameplay footage, a trailer of the game, a character description, and a Game Design Conference presentation on the design of a previous game in the franchise, by the Head developer, Masahiro Sakurai.

5.1. Character Concept and Background:

Link is a recurring playable character in the Super Smash Bros franchise. In *Super Smash Bros. Ultimate* Link has been redesigned to match his appearance and features from the game, *The Legend of Zelda: Breath of the Wild* (Link (SSBU) - SmashWiki, the Super Smash Bros. wiki, 2022). Link was chosen as the ideal character for this study because he has a long history in video game culture. There are generations of players who may experience a particular version of this character.

5.1.1. Personality and Background:

Link is the legendary hero of Hyrule. He is the holder of the Triforce of Courage, a mystical sign of his being chosen by the golden goddesses. He is often portrayed as a curious boy, silent, energetic, brave, and occasionally reckless (Dean, 2019). Link is a skilled warrior known for his swordsmanship, marksmanship, and the variety of tools and gadgets he uses in his adventures (Dean, 2019).

5.1.2. Fighting Game Archetype:

Fighting games typically feature an array of characters with various backgrounds and personalities to play. However, the role of the character is based on their character archetype. Character archetype refers to a character's general strategy and gameplay style (Character Archetypes | Smashpedia | Fandom, 2022).

In SSBU, Link is considered to fit a defensive character archetype. Defensive characters usually avoid their opponents and lure them into traps to exploit their weaknesses from a distance before delivering a punishing blow (Character Archetypes | Smashpedia | Fandom, 2022).

Link's moveset is structured around zoning. His focus is on controlling the stage, mostly with tools and projectiles with a range advantage over his opponents. These characters typically lack the speed

and power to fight. Therefore, they focus on wearing down their opponents from a distance (Character Archetypes | Smashpedia | Fandom, 2022).

5.3. Link Moveset Animation Analysis:

In my analysis, I used the five fundamentals of animation, Disney's 12 principles, and the LMA to study the characteristics of animation in SSBU (Nintendo, 2018).

Animation in SSBU is structured with the following *phrases*:

- Idle - default state.
- Initiation (Anticipation) - Shortest phase of the action.
- Exertion - The Main pose of the action
- Recovery- The Longest phase of the action.
- Idle - default state.

Regarding *The Five fundamentals of video game animatio*n, there is an emphasis on *Readability, Elegance* and *Feel* in SSBU. In the posing, characters are staged in a ¾ view with their body facing the camera. At the same time, the animations are usually short to accommodate responsiveness during gameplay. The characters have exaggerated silhouettes and posing to ensure clarity. The animations are simple and efficient. The actions in *SSBU* are based on the character's orientation and directional input. Most of the actions take place in a single spot. Although the animations are quick, VFX such as dust clouds and slash trails are used to support feedback.

In SSBU, the *intent* of a character's movement style is based on their circumstances. Link's *intent* is structured on combat, survival and competence. This is because the *effort* dimensions combined in his moveset lean towards the *action drive*, where movement is performance-oriented and without feeling or emotion.

Link's attitude to *weight* appears to be controlled and deliberate based on my observation. The speed of the actions is usually quick and powerful. His use of *space* is direct and focused. His fighting stance is broad and balanced, and his equipment has little influence on his movement as he manages them and moves with relative ease.

5.4. Model Preparation:

Before starting the animation process, I adjusted the character's rig in Blender. The rig is the skeleton in the model that is attached to the model, which allows it to move. The first issue was that Link's legs were too long. He looked much taller compared with the character in the reference video. I shortened his legs so that the appearance was as close to the original as possible. Another issue was that there were too many bones on the limbs and face. This was a problem because it segments the body parts, which would take longer to move and adjust when the animation has movement errors. This would delay production. Therefore, I reduced the number of facial bones to simplify the model for the animation production. I then exported the model to iClone7 for animation.

5.5. Animation Project:

The final product consists of three style variations of Link's animations: his *Idle*, *Run cycle, Jump, Neutral attack, Neutral special,* and *Up taunt*. These actions were chosen as they are recognisable movements typically depicted in video games. Each animation also contains elements that express Link's movement style and abilities. At the end of the project, eighteen animations were produced.

The animations were intended to have a short duration and loop to fit in the game's context and seamless viewing. Each animation was rendered at 60 frames per second to slow down motions for clarity.

The software iCone7 and Blender were used to create the animations. The game engine, Unity, was used to create a platform for displaying the demo reel and facilitating each version's feedback session. The animation project took ten weeks to complete. Four workdays were assigned for each animation to ensure deadlines were reached.

The animation production was an iterative process of creating short playblasts and a review session with my supervisor. I worked on the animations, and he gave professional feedback to improve the quality of each animation.

5.5.1. Style Version 1:

I decided to recreate Link's move set in this version to use this as a baseline for his style. The objective was to get the *staging*, *timing*, *posing*, and *phrasing* as close to the reference possible. However, adjustments were made to suit the model as it has a different rig for articulation. I used a moveset animation comparison video from YouTube as a reference (Alex.EXE, 2019).

A. Idle Animation:



Figure 1: *Animated GIF of Original Idle Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 2: *Animated GIF of Idle Animation v 1.0.*

In the idle animation, Link performs three actions. Link assumes his battle stance. He then shifts his weight and turns his body to look behind. He then swings his sword downwards while raising his shield to his face. Afterwards, he returns to his battle stance.

When creating the main pose for the idle, I depicted Link in a wide stance, with his left foot leading. His posture has a slight forward lean in his upper body, with his chest rotated inward and puffed out. His sword leans outwards with his shield close to his body.

Regarding Disney's 12 principles, easing in and out was used for the initiation in action. *Stretch and squash* have been used subtly in the posing. In the look action, he stands tall and open during the exertion phase and squashes slightly during his preparations and settles. There is *overlapping action* in the hair, tunic and cape as it moves. *Arcs* were incorporated in his upper body for the head turns and sword swings. I also added some blinking to support his swings and turns as his secondary action.

In the review sessions between my supervisor and me, Link's movement needed adjustment. The overall posing and weight placement were great. However, the movement appeared rigid and snappy. The *arcs* in the sword swings were also changed as they did not work with the camera view. I needed to push the twisting in the posing to make him more dynamic and looser. *Anticipation* was also added in the sword swings as the *initiation* was unclear.

B. Run Cycle Animation:



Figure 3: *Animated GIF Original of Run Cycle Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 4: *Animated GIF of Run Cycle v 1.0.*

In this animation, Link runs at his maximum speed. He carries his sword and shield as he takes short and quick strides. His spine and torso were kept straight and leaned forward for the posing. His limbs were kept rigid and close to the body. His shoulders and head were also kept forward.

For the animation principles, overlapping action was incorporated in the cape and was used to emphasise the speed of his run. His hair has reduced *follow-through* and bounces lightly as he takes each step. *Arcs* were used in the legs to make the movement more natural. The bounces and dips in his run were dampened to match the subtlety and control in his movement. His arms do not extend during his *follow-through* to match the control in his arm swings.

Regarding *effort,* his steps have minor impact on the ground. His steps have a *dabbing* feel as they are light in weight, quick, and bound to maintain control. Link's face is not expressive in this action, so blinking was added for facial expression.

In the feedback sessions of the previous animation iterations, we found that the rotation of the upper body was great. The run felt balanced and natural. However, it needed *secondary animation* in the right arm and sword. The sword needed to sway between the strides to add dynamism to the action.

C. Jump Animation:



Figure 5: *Animated GIF of Jump Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 6: *Animated GIF of Jump Animation v 1.0.*

In this animation, Link quickly crouches down towards the ground, launches himself up in the air, eventually descending to the ground, and slowly returns to his idle. For the posing, I used to *stretch and squash* to contrast the stages of his jump. His body squashes during the crouch, apex, and landing.

His body expands during his rise and fall of the jump. Link's poses during the rise and fall have been held for a couple of frames to emphasise the stretch and control of his jump.

The most crucial principle that needed accuracy was the *timing* and *arc* in the jump and limbs. In this action, Link does not move forward. Therefore, the inertia of the action also needed to be communicated. *Arcs* are present in his sword, head, cape, and arms. *Ease in and ease out* were also used. Link slowly eases into his landing but quickly eases out as he recovers. There is also overlapping action in hair, tunic, and cape to suggest the power of his jump.

We found that the posing and timing were excellent in the feedback sessions between my supervisor and me. However, the timing of the jump needed to be adjusted as the initiation and landing needed more frames in between the poses. The foot placement was also adjusted to suggest the forward momentum of the jump. More *stretch and squash* were also needed as there was not much inertia as he landed.

D. Neutral Attack Animation:



Figure 7: *Animated GIF of Neutral Attack Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 8: *Animated GIF of Neutral Attack Animation v 1.0.*

In this animation, Link performs a sequence of three sword slashes, which are indirect, sudden and intense. He begins with a downward slash, which settles to the left side of the body—followed by an outward slash that settles to his right side. The final move is an upward slash, settling on the left side above the shoulder that settles to the left side of the body. Afterwards, he rewinds for recovery and transitions into idleness.

For the posing, Link does not take any steps in his attacks. His upper body maintains a forward lean in each attack. Link's stance has been depicted as a lunge with a low centre of gravity.

For the principles, I used *stretching* to emphasise the reach of his slashes with small squashes in his knees to reduce the impact of his weight. The f*ollow-through* of the tunic and cape has also been dampened as it interfered with the clarity of his posing. The sword swings in wide *arcs* across his body to make the action readable.

In the feedback sessions of the previous animation iterations, we found that the posing, holds, and speed of the attacks was great. Link appeared quick and robust. The animation also needed in-between frames to clarify the anticipation in the sword swings.

E. Neutral Special Animation:



Figure 9: *Animated GIF of Neutral Special Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 10: *Animated GIF of Neutral Special Animation v 1.0.*

In this animation, Link fires an arrow from his bow for his attack. He starts this action by equipping his bow while grabbing an arrow from his quiver. He then crouches down and begins to draw the arrow from his bow. Once he has reached his maximum range, he releases the arrow and returns to his

idle stance. Regarding *effort*, the action uses two types of motion. The arrow is equipped with a *flicking* motion while the draw motion uses a *glide*.

Link has a low centre of gravity for posing as he kneels. The weight is placed on his right knee while the left leg is stretched out. His torso gradually leans backwards until the arrow is released. His posture becomes upright as he recovers.

Link's right arm moves in a wide *arc* for animation principles from when he equips his arrow until he draws. There is subtle *follow-through and overlapping action* in the cape in each action stage. Minimal *stretch and squash were used* in the posing. As a *secondary action,* Link closes his eyes to reinforce the effort in the draw.

In the feedback sessions of the previous animation iterations, we found that the *posing* and *timing* were excellent. The weapons appearing and disappearing were not a problem as we believed that animations were too quick to notice this detail. The feet also needed to be adjusted as they appeared broken. And uncomfortable. The bowstring was another issue as it pushed through the character's face. This draw motion is the slowest part of the animation. Therefore, this needed to be fixed. The transitions needed *anticipation.* This was done by making the *initiation* start in the opposite direction of the main action.

F. Up Taunt Animation:



Figure 11: *Animated GIF of Taunt Animation in Super Smash Bros. Ultimate (Alex.EXE, 2019).*



Figure 12: *Animated GIF of Taunt Animation v 1.0.*

In this animation, Link narrows his stance and swings his sword across his body. He then twirls it behind him before sheathing it. Regarding *effort,* this action has three types of motions. The sword swings have a *slashing* motion, the twirl is a *flick*, and the sheathing has a *dabbing* motion.

In the posing, I kept Link's posture upright and straight. His stance is higher than the idle during his swing, and his legs are shoulder-width apart.

I used small and short bounces for animation principles in the *follow-through* of tunic, hair and hair posing settles. The sword moves in arcs until it is sheathed. Link extends the scabbard as a *secondary action* for the sheathing.

In the feedback sessions between my supervisor and me, we found that the posing and speed were excellent. The back scabbard was an issue. This motion does not work as the wrist stops the sword from extending. Therefore, I cut the transitions to create the illusion that it was drawn out. The swings needed more in-between frames in the *anticipation.*

5.5.2. Style Version 2:

In this version of Link's style, I decided to increase the effort in Link's actions. The objective was to make his action feel more energetic and aggressive. The animations followed the same phrasing as the original with slight variations in posing, style dimensions and animation principles. More frames were added in this version as the original timing was too quick for the new transitions.

A. Idle Animation:



Figure 13: *Animated GIF of Idle Animation v 2.0.*

In this animation, Link's *weight* and *expansiveness* increased. The goal was to make the Link feel quicker and more battle-ready. He has a broader stance with his weight shifted to his left leg to occupy more space. His torso has a forward tilt and is twisted inwards. I have added more gestures for secondary actions.

Link performs light, quick bounces to shift his weight and blinks more frequently to add more dynamism and energy to his movement. His body and swings move in wider arcs. The extreme poses and weight shifts were also exaggerated. There is more bending and twisting in the torso and arms before the sword swings. His weight shift has lower dips and higher stances to make the weight transfer clearer and heavier.

In the feedback sessions of the previous animation iterations, we found that the exaggerated posing was great. It made the action appear more dynamic. However, the weight and speed of the turn were too quick. He swapped positions too quickly. The transition needed more time to move around. The timing was adjusted, and more frames were added to reduce the impact on the legs.

He also wobbled during his look. It was a problem to fix without adjusting the length of the animation. Therefore, adjusted the timing to accommodate the beats of the action.

B. Run Cycle Animation:



Figure 14: *Animated GIF of Run Cycle v 2.0.*

In this animation, Link's *coordination, expansiveness* and *weight* were altered. The goal was to make his run feel clumsier and rushed. His body has a lower centre of gravity with a forward lean in the torso in the posing. His arms remain close to the body with a wider angle at the elbow. He takes long strides and lower dips when he contacts the ground. His chest swings in wider arcs to make his flow feel uncontrolled. *Follow-through* is exaggerated to add more weight and inertia to his steps.

C. Jump Animation:



Figure 15: *Animated GIF of Jump Animation v 2.0.*

Link's expansiveness, *weight,* and *timing* were altered in this animation. The goal was to make his jump feel more explosive and heavier.

In the feedback sessions between my supervisor and me, we found that the posing and exaggeration were great. There were interpenetration issues with the cape, which affected the readability of the action. His anticipation is more extended, with more in-between frames, and the height of his initiation pose has been exaggerated. The exertion pose is narrower, with his arms closer to his body. This is to suggest speed and the effects of gravity as he rises. The arms and head in the follow-through are more comprehensive to make them feel lighter and vulnerable to force. His hair bounces quicker at the apex and landing. The landing pose is held longer to emphasise the impact more.

D. Neutral Attack Animation:



Figure 16: *Animated GIF of Neutral Special Animation v 2.0.*

In this animation, I changed Link's e*xpansiveness, coordination* and *flow*. The goal was to increase the reach of his attacks and maintain the momentum of his attacks. I used videos on Historical European Martial Arts (HEMA) duelling techniques as an inspiration for designing aggressive styles. The anticipation of each attack is longer, and the slashes move in wider arcs. Link steps forward and backwards in between attacks to add variation and reach. Stretch and squash were used to exaggerate the weight shifts.

In the feedback sessions, we found that the pace of the attacks and weight were great. Initially, there were issues with the cape and hair. The overlapping action was too distracting. Therefore, I dampened the effect to make the action readable.

E. Neutral Special Animation:



Figure 17: *Animated GIF of Neutral Special Animation v 2.0.*

In this animation, I increased the arrow fire's strength, *timing,* and *expressiveness.* The goal was to exaggerate the power of his shot after the arrow was released. In the feedback sessions, we found that the recoil in the release was great. However, the posing needed to be adjusted to compensate for the effort in the draw. Link leans further in the beginning and end of the draw. The draw time is much longer to make the effort more like a wringing gesture, making it indirect, solid and sustained. The recoil in the release was exaggerated for the follow-through. Link eases back for recovery. The bow also bends as he draws to indicate the power in his pull.

F. Up Taunt Animation:



Figure 18: *Animated GIF of Taunt Animation v 2.0.*

In this animation, I changed the *expansiveness* and *expressiveness.* The goal of this was to emphasise the force and influence of his equipment on each beat of the action. Exaggeration was used on the keyframes in the windup and follow-through to make his swings higher and broader. The first swing has a slower swing to emphasise the drag of the sword. His knees bend lower on the swings and in his recovery to emphasise the weight of his sword.

In the feedback sessions, we found that the motion of the taunt felt great; it had a lot of weight and speed. However, this animation had interpenetration between the cape and the body. This made the animation look jerky and less fluid than it should be. Thus, the cape effects were dampened.

5.5.3. Style Version 3:

In this version of Link's style, I decided to decrease the *effort* in Link's actions. The objective was to make his actions appear calm and undramatic. The animations followed the same phrasing as the original, with slight variations in posing and animation principles.

A. Idle Animation:



Figure 19: *Animated GIF of Idle Animation v 3.0.*

I changed the Link's *expressiveness* in this animation and removed the sword swing in action. I wanted the idle expressions to have a different emotion. Link now has two actions in this state. In this version, Link moves from a relaxed state to a more conservative state and then back to his default idle pose. His fighting stance is upright with a higher centre of gravity. I also reduced the range of the swaying motion and added foot tapping as *a secondary action*. In the following animation, he has more head turns and has a lower stance to emphasise caution.

In the feedback sessions, we found that the posing was great. The *follow-through* in the tunic needed adjustment as its settlement appeared like jelly. The turns also had moments of odd bounces. We liked the placement of the bow and shield together. Initially, this was an accident, but it was an exciting look to explore. It suggested a sense of preparedness in character as the bow is always ready.

B. Run Cycle Animation:



Figure 20: *Animated GIF of Run Cycle v 3.0.*

In this animation, I changed the *weight* and *expansiveness* of the action. The goal was to make the motion more controlled and effortless. I made Link's posture upright with a higher centre of gravity. His sword is held closer to his waist. He takes shorter strides. The head bob in the *follow-through* was reduced to remove the weight of impact of his straight. The torso twists in smaller *arcs* to reduce the effort in the arm swing.

In the feedback sessions, we found that the posing and pace of the action were great. The action appeared clear when it was slowed down. The shield is more involved in the strides, suggesting balance in the movement. This also aligned with the shield changes in this iteration.

C. Jump Animation:



Figure 21: *Animated GIF of Jump Animation v 3.0.*

In this animation, I changed the *timing, expansiveness*, and *follow-through*. The goal was to make his jump more natural and looser. Link has a higher centre of gravity in the crouch and landing phase to reduce the impact of weight. His arms swing in wider arcs and take longer to settle as he recovers. The feedback was that it suggested a great sense of weight and appeared realistic.

D. Neutral Attack Animation:



Figure 22: *Animated GIF of Neutral Attack Animation v 3.0.*

In this animation, I change Link's *expansiveness, expressiveness,* and *flow.* The goal was to make Link's actions more energy-conservative. Therefore, his *effort* was structured to appear like a *dab* gesture, controlled, light and direct. He maintains a high and upright stance with a reduced forward lean. I changed the third attack to a shield bash. This was suggested in the feedback session as it appears more authentic for sword combat. We believed that it made the *flow* of the combo more dynamic by adding a gradual increase in *effort*. This change also gave the shield an alternative function for combat. Link's arms are bent during his attacks to create smaller arcs. This was done to reduce the reach of his attacks and reduce his *recovery.*

E. Neutral Special Animation:



Figure 23: *Animated GIF of Neutral Special Animation v 3.0.*

In this animation, I changed the *timing* and *expressiveness* of Link's shot. The goal was to make his action feel deliberate and slow, like an archer in the Olympics. Therefore, his bow has a longer draw time with reduced recoil. His posture remains during his shot. The follow-through in the clothing and bow has been dampened to reduce the impact on his body. The windup and recovery stages have remained the same. The shield was kept there because we thought it was interesting. It made it look like he was always ready.

F. Up Taunt Animation:



Figure 24: *Animated GIF of Taunt Animation v 3.0.*

In this animation, I changed his swings' *expansiveness, timing*, and *expressiveness.* The goal was to change the tone of the taunt. I wanted to make Link feel cheek and laid back compared with his upbeat and dominant persona. His sword swings are longer and have narrow arcs. His posture remains upright with little twisting. I made Link inspect his sword as a secondary action to add variation to the animation and the objective.

5.6. Discussion:

Although I achieved a satisfactory result in the animation project, there were challenges during production that may have affected the quality of the animations.

Working from the reference video was limited because of clarity. I animated the character from one view. It was challenging to figure out the depth and exact details of Link's posing and body mechanics. Although the animation needed to look readable from one view, Link is a 3D character. His animation has elements of realism that need to be defined from all sides for the movement to function. Some pose changes were very subtle and not noticed initially. This was also a problem for defining silhouettes. In hindsight, I could have made a reference video that depicts the action from all sides to improve my animations' body mechanics and clarity.

There were issues of readability when re-creating the animations. The original animations were usually 18-20 frames long, which was too quick when animations were played in real-time. The game uses explicit posing and visual effects (VFX), such as dust clouds, to aid communication. However, the production of VFX did not fit within the scope of this project. Therefore, I increased the frames between poses and used motion blur to compensate.

The model constraints were another issue during production. The model setup was set up for realistic movement in iClone7. The software constraints how the bones are attached and articulation for movement. It was complicated to break the model for exaggeration. Initially, the bow was a static model. Therefore, it also needed to be rigged to move, which caused some production delays.

Physics simulation was challenging to implement. There was interpenetration in the hair, clothes, and the bow, which could not be adjusted in iclone7. I used a spring effects add-on in Blender since the hair and clothes were also rigged. This helped reduce the problem, but not completely. There are moments when meshes collide with each other.

A major issue that affected production was deformity errors in the model. There was constant switching between iClone7 and Blender which caused this error after export. This took time to fix, which delayed production.

Foot sliding was another issue. iClone7 had the tools to help reduce the effects. However, when I exported it to Blender, an error removed the effects and made the model shift during each action. I had to adjust Link's feet manually. However, this was not as accurate due to lack of time and the number of animations.

Due to the challenges presented, the production timeline was also affected. Initially, the production was estimated to take eight weeks. However, it took ten weeks to complete. Time allocated for clean-up and polish was cut short to accommodate the errors and rendering time. This affected the consistency of the animation quality, as some animations were more refined than others. Some animations have janky interpolation and moments of snappiness. The blending between some animations was not seamless, making some actions appear rigid and robotic. Despite the problems present in the animations, they were appropriate to start the review session.

6. Results

The results presented here are from the review session of Link's animation. In the animation review session, the participants completed five surveys.

6.1. Playtester Recruitment and Demographics

This section covers the responses from the playtester information survey sent on social media. This study initially aimed at recruiting forty adults in South Africa. However, twenty-two adults willingly participated, with 13 (59,09%) completing the entire review session.

6.1.1 Focus Group:

The participants were between the ages of 19 and 30. Many of the participants were in their early to mid-twenties, with the oldest participant being between thirty years old. Among the participants, 63.6% identified as male, 9.1% identified as female, and 9.1% chose not to disclose.

Regarding race and ethnicity, 36,36% were Black/African, 27,27% were Asian, 18,18% were White, 4.54% were Coloured, and 13,63% were Biracial/Mixed.

I presented a trailer of the game to the participants, and they were asked about their experience with SSBU: 45,5% have played 1-2 times, 36,4% had no experience, and 18,2% have played many times. There were no players who played the game regularly.

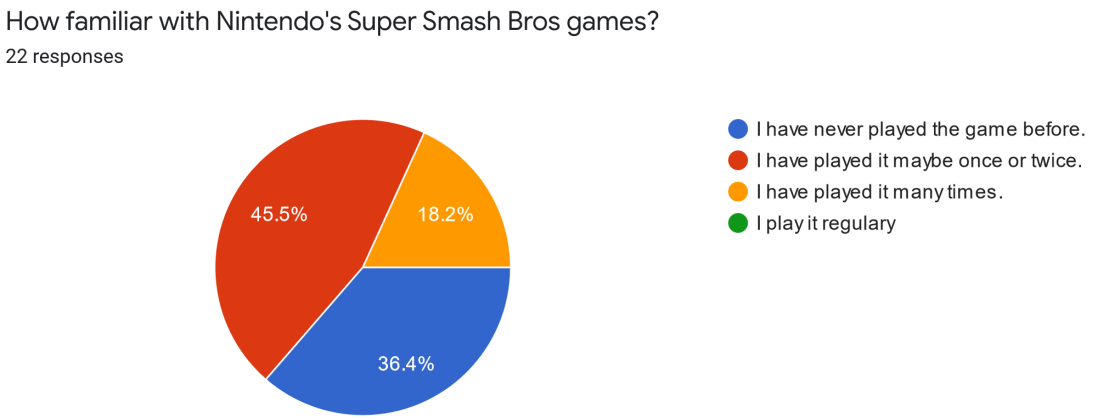


Figure 25: *A pie chart showing the focus group's experience in Super Smash Bros Ultimate.*

When asked about their interest in the game: 63,6% said yes, 27,3% said maybe, and 9,1% said no.

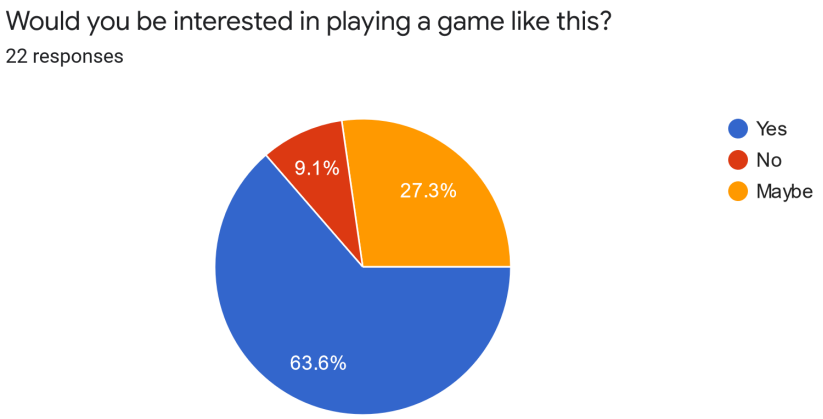


Figure 26: *A pie chart showing the focus group's interest to play Super Smash Bros Ultimate (Nintendo, 2018).*

6.1.2. Character Preferences:

When asked about their preferred character type regarding playstyle in a fighting game: 59,1% of the respondents preferred aggressive, 54,5% preferred flexible, and 9,1% preferred defensive.

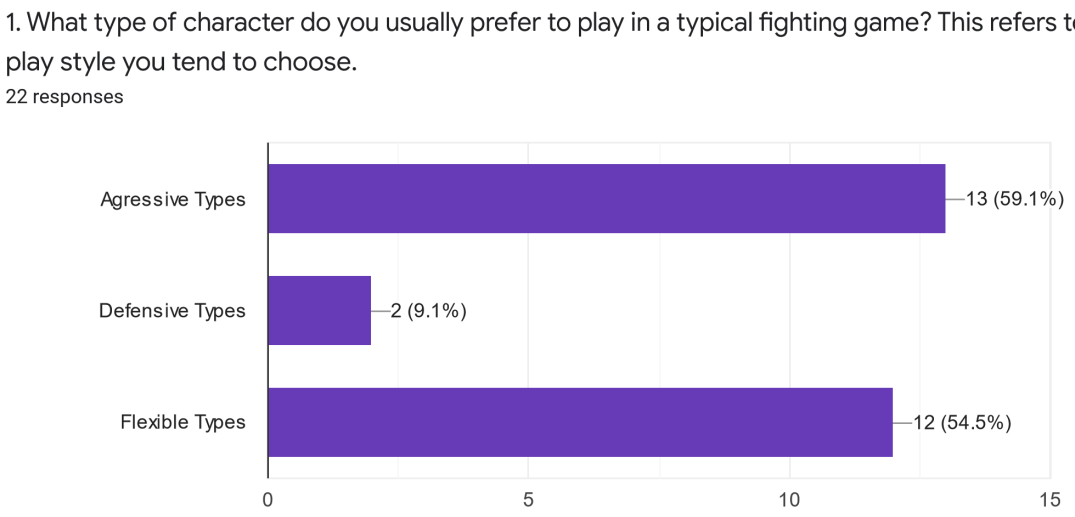


Figure 27: *A bar graph showing the focus group's preferred character archetype in a fighting game.*

When asked about their preference regarding character action in a video game, the respondents ranked the following criteria based on importance. The votes were counted, and a weighted score was calculated to determine the rank. The results show that the expression of emotion, personality and

highly exaggerated movement are the most valued criteria in action. The second is the level of realism and the functional purpose of the action. The least preferred criteria were the clarity and distinctness of posing in action.

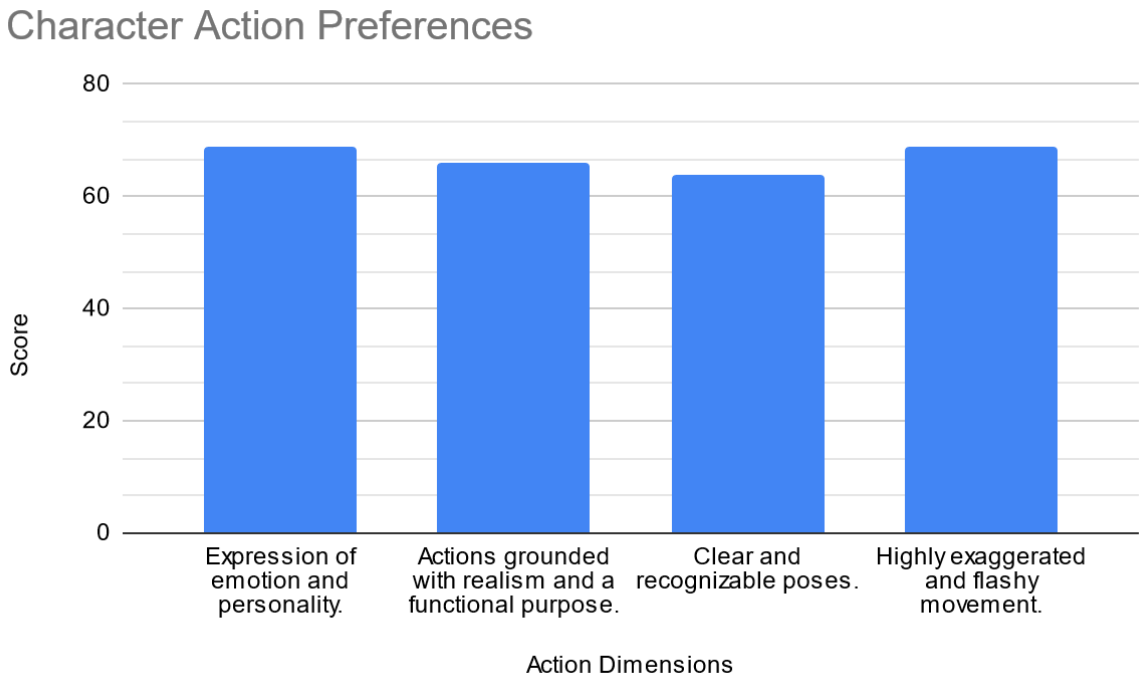


Figure 28: *A bar graph of the group's character action preferences.*

6.1.3. Pre-test: Link introduction Results

The participants were given a character description and watched a gameplay trailer of Link in SSBU. 13 of 22 (59,09%) participants responded to the questions in this survey.

When presented with a list of Link's abilities and features in the game, the participants rated the following criteria based on their interests. Link's archery skills were rated the most interesting skill. His remote bomb ability was the second most interesting feature. His personality and final smash were tied as third. The least interesting feature was his sword and shield skills.

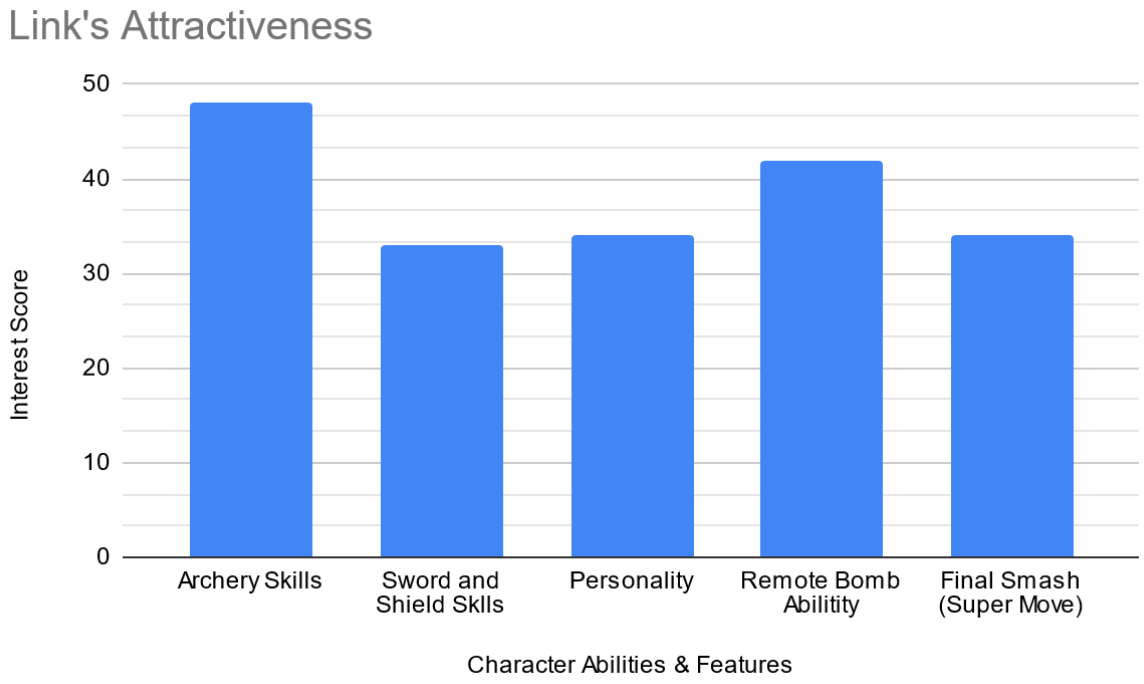


Figure 29: *A bar graph showing the focus group's interest in Link's abilities and features.*

When asked about their play experience with this character, 66,7% of the participants had no experience with playing Link, while 33,3% had experience playing him.

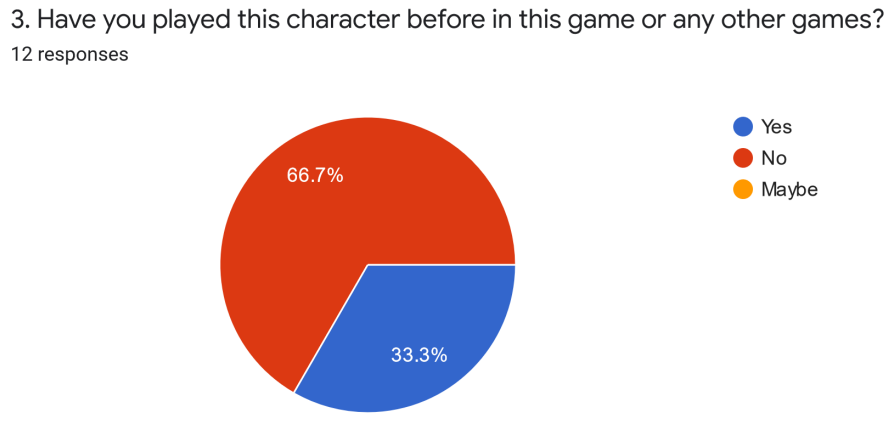


Figure 30: *A pie chart showing the focus group's experience with Link.*

6.2. Perception of Link's Movement Style

This section will cover the responses concerning the perception of Link's movement style. A profile was created to illustrate the variations in each animation. The terms used here are based on Gallaher's dimensions of style. *Expressiveness* is the variety and energy in expressions and gestures when talking with others (Gallaher, 1992). *Animation* refers to the overall energy level in his action (Gallaher, 1992). *Expansiveness* is the amount of space taken up in his movement (Gallaher, 1992). *Coordination*: is the smoothness and grace of his movement (Gallaher, 1992).

6.2.1. Trailer Animation:

The participants were asked to rate the following dimensions of style on a Likert scale from 1 to 5. When asked to describe his expressiveness, the average rating was 3,38. When asked to describe his *animation*, the average rating was 3,54. When asked to describe his *coordination,* the average rating was 3,38. When asked to describe his *expansiveness*, the average rating was 3,92.

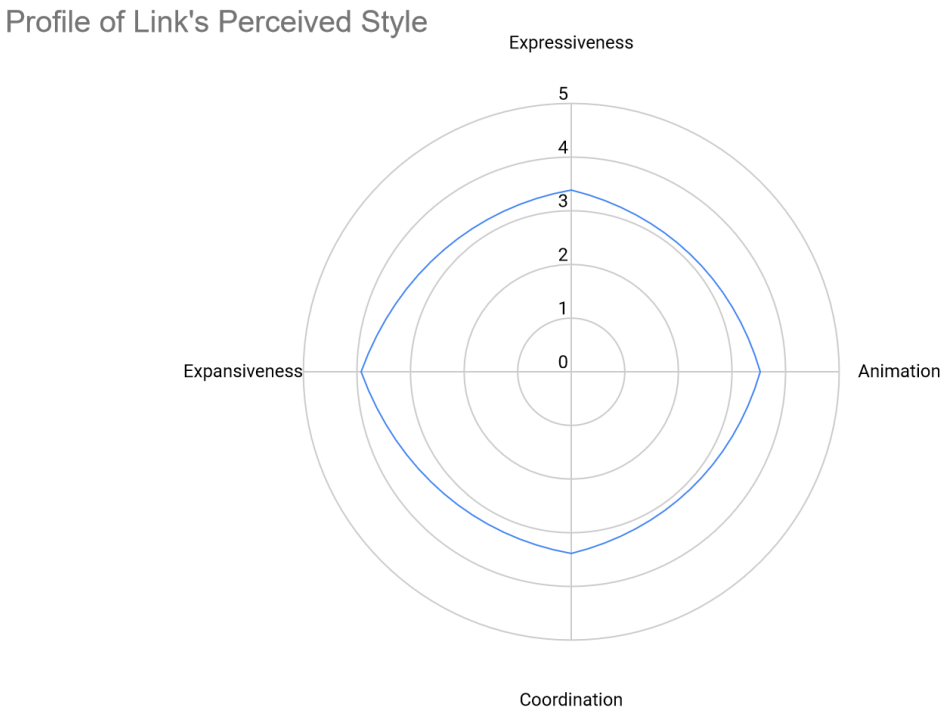


Figure 31: *The Focus Group's Perception of Link's style in the trailer.*

6.2.2. Style Version 1:

In this survey, 40,9% (9 of 22) of the participants responded to the questions. compared with Link's actions in the first trailer, the *expansiveness* and *expressiveness* of Link's actions were rated lower.

The participants gave a rating on a point 5 Likert scale, with word associations, to answer the questions. When asked to describe his *expressiveness*, the average rating was 2,89. When asked to describe his *animation*, the average rating was 3,56. When asked to describe his *coordination*, the average rating was 3,33. When asked to describe his expansiveness, the average rating was 3,22.

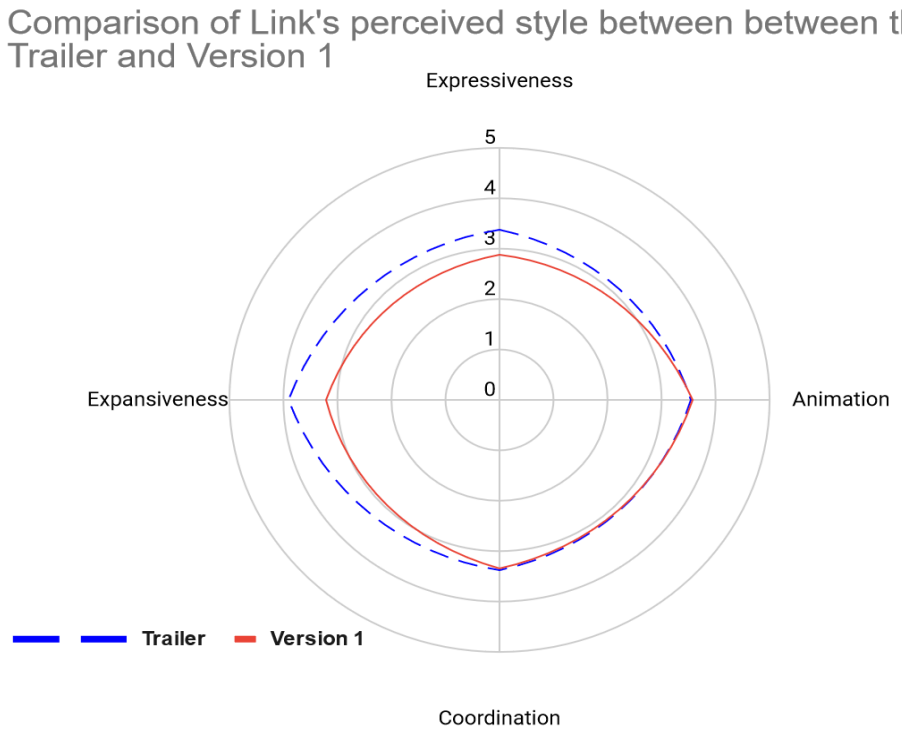


Figure 32: *The Comparison of Link's perceived style between the trailer and version 1.*

When asked about the change in the animation, the participants noted a change of personality, lack of fluidity and readability in the animations.

Nothing
Compared with the trailer, I would say that Link's moves are a bit more rigid.
Less polish, less dynamic poses, and less fluidity
Not much from what I've seen; keyframes are all there if a bit rigid, but solid stuff. Link seems a lot more aggressive, like a predator attacking prey.
The movements are a little more static (mainly the idle animation, though). I think the particle effects in the trailer hinder me from making a fair comparison (for the last move).

I think the animations are very similar to the ones in the trailer. I noticed that his eyes were closed when drawing the bow in the neutral special, and there were two arrows.
The animations felt like Link was keeping a more closed stance (arms tighter to the body), specifically while running and showing more of an aggressive demeanour when taunting and attacking.
The motion is not as fluid; the character seems rigid. It also feels like the frame rate has been decreased, and some in-betweens are missing.
I could be wrong, but I feel his movements feel a bit more spacious than in the trailer!
I believe that they were different from the trailer. I actually had no expectations so I'm not sure of how to answer this. The motions were nice.
Can't really pinpoint anything, per se.
I also think that the previous iteration's taunts worked better as they feel like more intentional openings while still keeping the shield in front.

Table 1: *Summary of the responses regarding perceived changes in Style Version 1.*

6.2.3. Style Version 2:

27,3% (6 of 22) of the participants responded to questions in this survey. compared with Link's actions in the first trailer, the *expansiveness, expressiveness, and animation* have increased, while his *coordination* has increased.

When asked to describe his *expressiveness*, the average rating was 3,67. When asked to describe his *animation*, the average rating was 3,83. When asked to describe his *coordination*, the average rating was 3,17. When asked to describe his *expansiveness,* the average rating was 4,33.

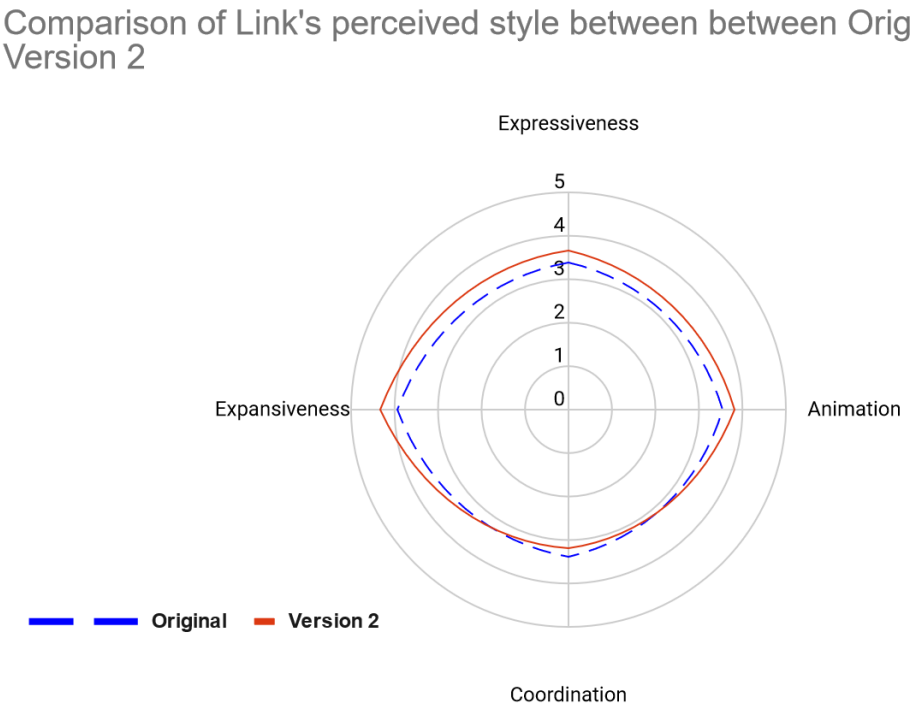


Figure 33: *The Comparison of Link's perceived style between the trailer and version 1.*

When asked about the change in the animation, the participants noted that Link's actions appeared faster, lacked fluidity and consistency, and felt clumsy, reckless, child-like, and energetic.

The speed of the animation is faster than the first Iteration.
The animations are even jankier. The smoothness is gone. The running animation seems asymmetrical and inconsistent. The fluidity of the movement is now almost entirely gone.
I think This iteration has more movement and energy to the animations that express the character a little differently while making the animations eye-catching
It's a lot more expressive, I think. Or maybe just faster, so it makes it feel more emotive. The run animation makes him look like he's limping, though.
Some of the movements feel a bit smoother! Some of the base limb placements also seem different (in a good way).
The animations feel much less refined and more uncoordinated.

Table 2: *Summary of the responses regarding perceived changes in Style Version 2.*

6.2.4. Style Version 3:

31,8% (7 of 22) of participants responded to the questions in this survey. Compared with the Link's actions in the trailer, the *expressiveness* and *coordination* have increased. At the same time, his *expansiveness* and *animation* have decreased.

When asked to describe his e*xpressiveness*, the average rating was 3,86. When asked to describe his *animation*, the average rating was 2,71. When asked to describe his *coordination,* the average rating was 4,29. When asked to describe his *expansiveness,* the average rating was 3,71.

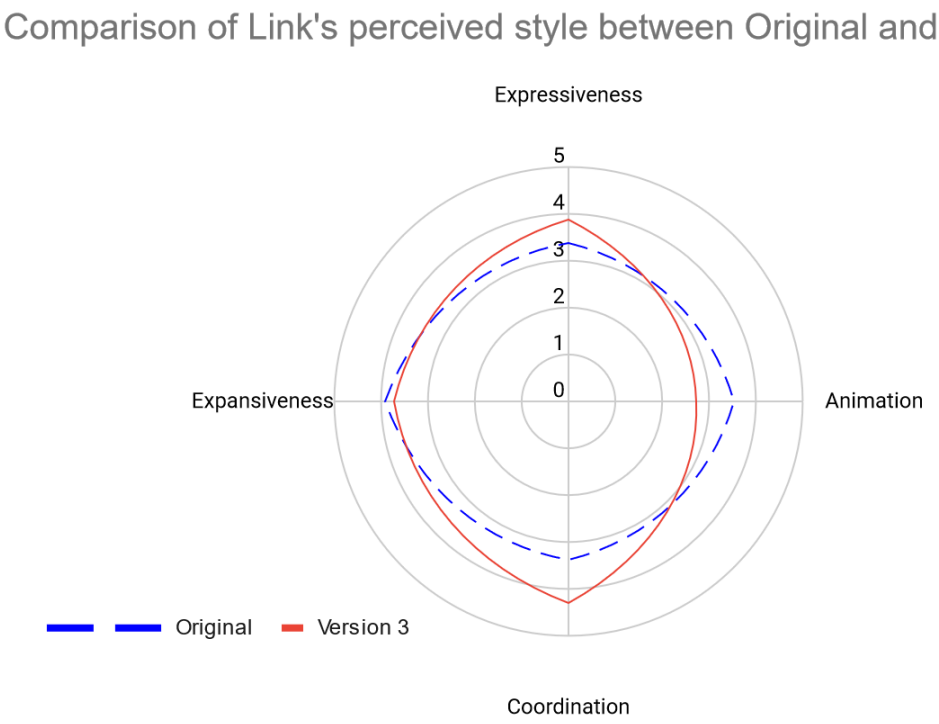


Figure 34: *The Comparison of Link's perceived style between the trailer and version 3.*

When asked about the change in the animation, the participants noted that Link's actions appeared slower, and had higher clarity, and expressiveness.

Change:
Much slower, more controlled animations with unique alterations to improve his depiction as being

skilled.
The movement is a lot more fluid, the frame rate seems to be back to normal and the character feels a lot cleaner in how he moves.
The animation is a lot clearer however it is also a lot slower.
WOO YES smooth like butter!! Definitely more flow and follow-through. Some movements felt slower and more controlled too. Also arm movement on the run cycle!
Wow, Just wow. Everything is a lot smoother.
I think there's more movement, without the increase in speed. The taunt animation feels a little less like a taunt though.
I think the motions in this iteration are a lot more compact and grounded. They are not as flashy as some of the past iteration's animations.

Table 3: *Summary of the responses regarding perceived changes in Style Version 3.*

6.3. Appeal Ratings and Demonstrated Interest

When asked about their impression of the character animation, participants were asked to rate how favourable their reaction was based on its appeal. The rating was on a Likert scale from 1 to 10. To measure the participant's willingness to play, they were also asked if they would play this version after its changes.

6.3.1. Trailer Version:

The trailer version was the second most appealing and had an average rating of seven. After the character's introduction, the participants were asked if they would be interested in playing Link. 76,9% of them said they were interested, 14,4% were unsure, and 7,7% were not interested in the character.

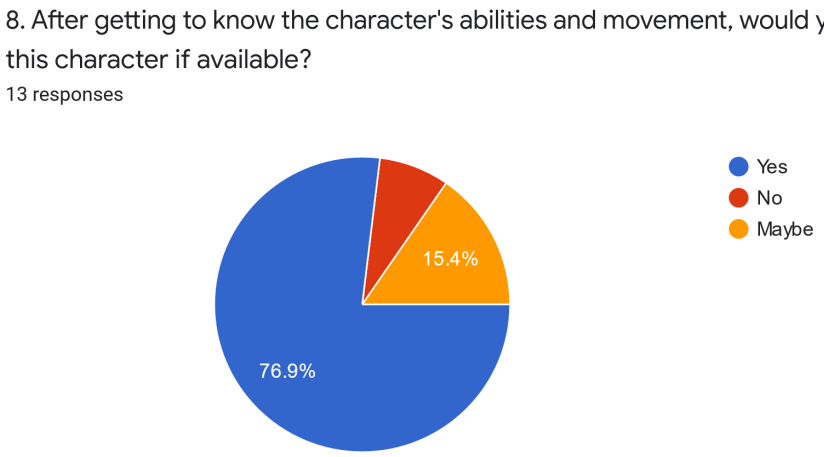


Figure 35: *A pie chart showing the focus group's interest to play Link (trailer version) (Nintendo, 2018).*

6.3.2. Style Version 1:

Version 1 of Link's style had an average rating of 6,8, ranking it the third most appealing. When the participants were asked if they would be interested in playing Link, in this group, 55,6% (5 out of 9) said they were unsure, 22,2% (2 out of 9) were willing, and 22,2% would not play this version of the character.

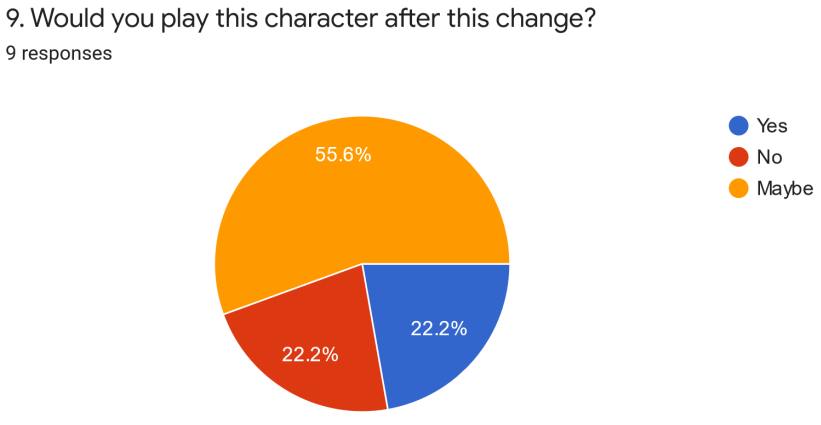


Figure 36: *A pie chart showing the focus group's interest to play Link v1,0 (Nintendo, 2018).*

6.3.3. Style Version 2:

Version 2 of Link's was the least appealing style and had an average rating of 5,8. When the participants were asked if they would be interested in playing Link, the responses were evenly divided. 33,3% (2 out of 6) of them said they were willing, 33,3% (2 out of 6) were unsure, and 33,3%% would not play this version of the character.

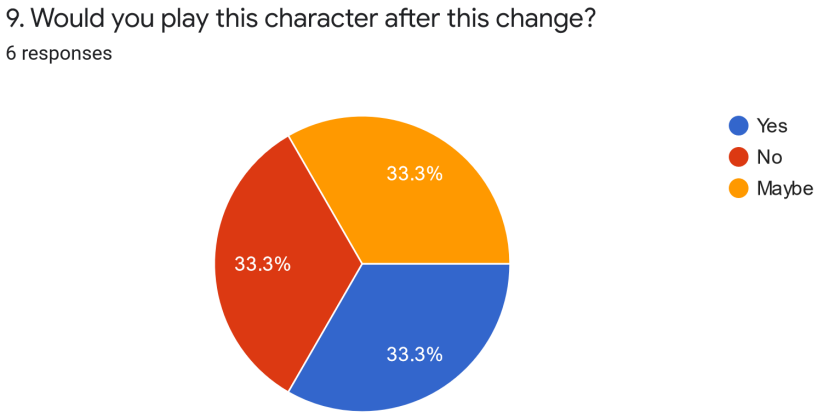


Figure 37: *A pie chart showing the focus group's interest to play Link v2,0 (Nintendo, 2018).*

6.3.4. Style Version 3:

Version 3 of Link's animation had an average rating of 8,3, ranking it the most appealing. After the animation was presented, the participants were asked if they would be interested in playing Link. In this group, 71,4% (5 out of 7) said they were willing, 14,3% (5 out of 7) were unsure, and 14,3% would not play this version of the character.

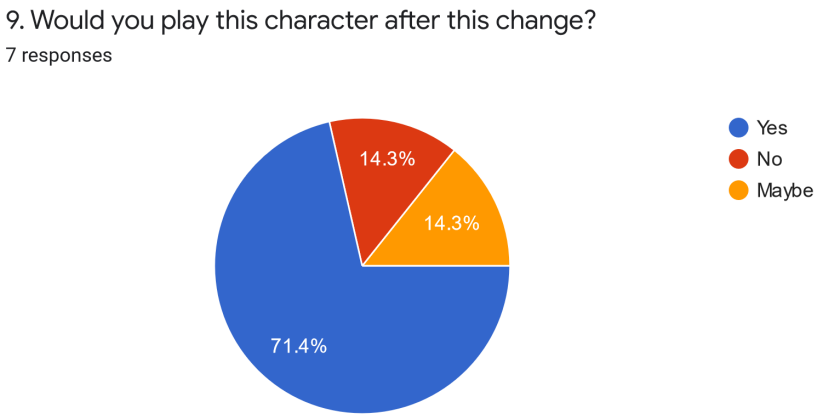


Figure 38: *A pie chart showing the focus group's interest to play Link v3,0 (Nintendo, 2018).*

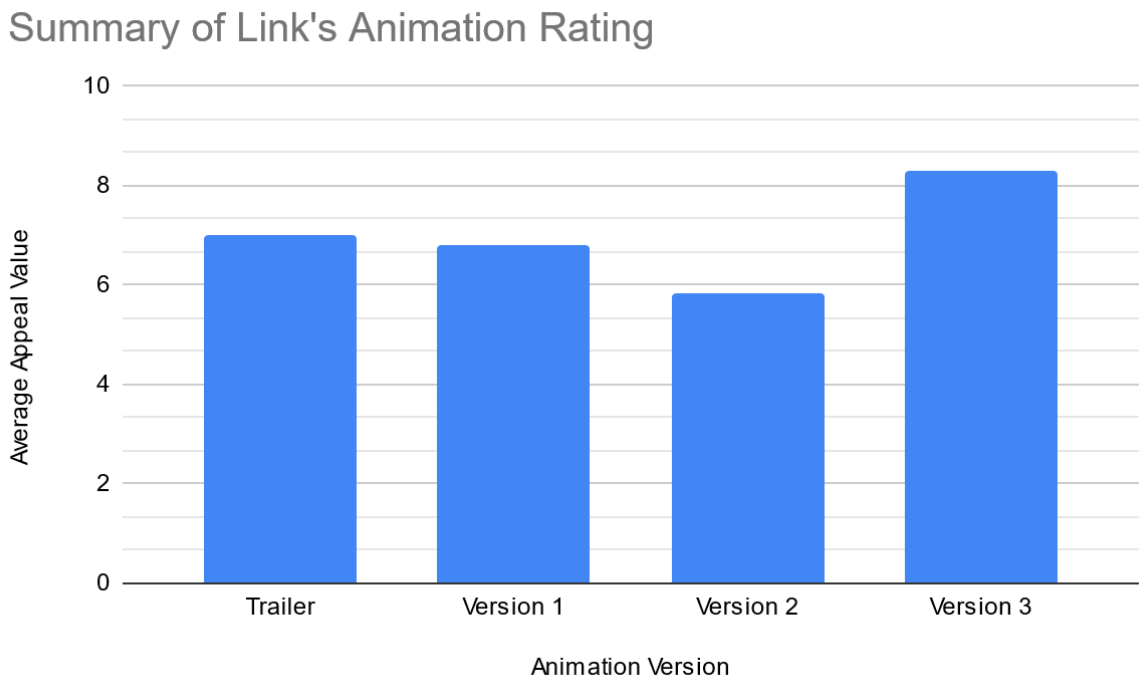


Figure 39: *A bar graph showing the average appeal ratings of each animation.*

6.4. Animation Feedback Findings:

After reviewing each animation, the participants were asked to comment on their perceived changes in the animations and their effect on their expectations.

Based on the feedback on the animations, the perceived changes that had an impact on the group were based on their expectations regarding the character concept, the readability, and the animation design. The expectations regarding character concept were the most recurring theme in how participants evaluated the style changes. Their responses were coded according to recurring themes.

6.4.1. Character Concept:

The comments from these responses show the character concept's expectations. The expectations were about the representation of the character's personality, fighting style, abilities, and background.

When asked how the animation has met their expectations, these were the responses.

Version 1: Positive Feedback
His movement was quite expressive and showed that he was a confident character. Whenever he swung the sword he took up a lot of space instead of feeling limited/restricted thus showing his confidence.
I could tell that this was Link. His facial features remained the same and likened to the Nintendo version, a sort of stiff face with only a determined expression.
It kept true to Link's energy and his overall aesthetics.
Link feels like he has matured more and refined his fighting style.
The attacks are good and he uses both the sword and bow, I enjoyed that
If Link had an agro side, this would be it.
I think the 1st part of the idle animation showcases Link's adventuring experience as he surveys his surroundings. His attack and special animations for the most part show he is practised in what he does, without any excessive shifts in weight or openings.

Table 4: *Summary of the positive responses concerning Link's character concept in style version 1.*

Version 2: Feedback
This change showed Link to be a lot more energetic.
He feels more childlike in his ability to fight, fitting his design a bit more.

I think the idle animation expresses a curiosity that is expected of an adventurer character like Link. In general, I think the motions and speed of the animations added some energy and deftness as well. The neutral attacks more specifically, are a lot more eye-catching with the added step.
It's fast and upbeat.

Table 5: *Summary of the positive responses concerning Link's Character concept in style version 2.*

Version 3: Feedback
It showed Link's skill well. Like how he aims his arrow and especially his neutral attack. The movements looked a lot more deliberate and solid and really look like he knows what he was doing.
The animations felt more realistic, his jump for example, while also making him seem more skilled and in control of his abilities.
I think this iteration further showcases a more cautious and prepared side of Link. The movement is less wild, leaving fewer openings for attacks and the added use of his shield makes him feel more coordinated. While the movements in this iteration aren't as flashy as the previous iterations, I think most of them suit the character more.

Table 4: *Summary of the responses concerning Link's character concept in style version 2.*

When asked how the animation has not met their expectations, these were the responses.

Version 1: Negative Feedback
Link's outfit was not the bright green clothes he usually wears. There was no sound present in the presentation.
With his more mature demeanour, he seems less unique.
Link has been through many transformations in his time, from what I've experienced, he always seemed like a balanced character to me. Although that might be because of the animations.
The trailer gives the impression that Link has a somewhat measured approach to combat that utilises a number of different skills. There are some small points in the animation that make him seem a little more careless or inexperienced IMO. In the 2nd half of the idle animation, his elbow bends up as he raises the shield which feels awkward. One of his fingers is loose on his shield

during his running animation. For his neutral special, I'm not sure if his eyes are closed or if he's narrowing his eyes for focus

Table 5: *Summary of the negative responses concerning Link's character concept in style version 1.*

Version 2: Negative Feedback
While I think the running animation feels more grounded and heavy with each step, the heaviness isn't something I expect from Link. While the neutral attack animations have more energy and are eye-catching, I also think that the wild swings make him seem more reckless for someone that uses a sword and shield.
He does not feel like he would be a competitive character to play due to how uncoordinated he looks.

Table 6: *Summary of the negative responses concerning Link's character concept in style version 2.*

Version 3: Negative Feedback
Link feels less like a child and more like a young adult which departs from his original concept slightly/
His Idle pose does not look like he is focused. His running is less energetic than the other iterations. Again, the way he jumped had less energy, it actually looked like he was struggling. The arrow move was also too slow and I can't imagine playing the game. I feel like it contrasts Link's personality of being energetic and can ruin the slowness of the game.
While I like that the idle animation has Link keep his stance as he surveys his surroundings, The drop in height makes him feel a lot more rigid, giving a nervous kinda feel. The slow speed of the neutral special, mid-draw, feels a bit awkward. I think that slowing the movement with the tension of the bow once the bow has been fully drawn like in the previous.

Table 7: *Summary of the negative responses concerning Link's character concept in style version 3.*

6.4.2. Readability:

When discussing the readability of the action, the viewing experience was affected by issues concerning speed and fluidity.

When asked how the animation has met their expectations, these were the responses.

Version 1: Positive Feedback
It felt like Link had a bit more presence on the screen in places! I especially liked the special animation with the arrow where the leg placement felt quite dynamic. I also really liked the leg movement in his run cycle!
The movements are still communicated effectively.

Table 8: *Summary of the positive responses concerning the animation readability in style version 1.*

Version 3: Positive Feedback
The motion is clear and smooth. The clips are a lot more appealing.
The run cycle is *MWAH* (chef's kiss). Love it! Really like the new jump too. Many of the animations felt a lot smoother and more satisfying to watch.

Table 9: *Summary of the positive responses concerning the animation readability in style version 3.*

When asked how the animation has not met their expectations, these were the responses.

Version 1: Negative Feedback
It was not as clear as I thought it would be. At some points, the animation was too fast and some moves were clear so I couldn't tell what exactly he was doing. I would describe it more as him generally moving and not doing a specific action.
The movement is a bit jarring, it's actually quite distracting.
Some animations are a bit choppy and unclear to read

Table 10: *Summary of the negative responses concerning the animation readability in style version 1.*

Version 2: Negative Feedback
The increase in speed/ motion might be exposing some stuttering. It might be a little less fluid looking, maybe?

The movement is still being communicated effectively, as in I can see what he is doing. But it is not appealing at all.

Table 11: *Summary of the negative responses concerning the animation readability in style version 2.*

6.4.3. Animation Design:

The comments in this section are about the technical aspects of the animation and its overall consistency.

When asked how the animation has met their expectations, these were the responses.

Version 1: Positive Feedback
I especially liked the special animation with the arrow where the leg placement felt quite dynamic. I also really liked the leg movement in his run cycle!

Table 12: *Summary of the positive responses concerning the animation design in style version 1.*

Version 2: Positive Feedback
It feels quite smoother in places! I really like the chest placement on the run cycle now. I also think there may have been a bit more recoil on the special arrow animation - which felt pretty cool! Also (I think I might have missed this before) I really like how Link closes one eye when he shoots - that's a really nice touch!

Table 12: *Summary of the positive responses concerning the animation design in style version 2*

When asked how the animation has not met their expectations, these were the responses.

Version 1: Negative Feedback
I expected the animations to not be as good as the professional ones and it does seem I was right in expecting that.

The movements occasionally felt a little as though they jerked from keyframe to keyframe without too much overshoot/recoil or flow between movements. The hair may have added to this a bit (but, from what I know, animating hair is HARD so please take that with a grain of salt!) Finally, the leg movement on the run felt *gorgeous* - but (for me, at least) I think the chest placement maybe felt a little more akin to a sneak or maybe a walk.
The first idle animation felt a bit too stiff.

Table 13: *Summary of the negative responses concerning the animation design in style version 1.*

Version 2: Negative Feedback
I think the movements may still feel a *bit* jerky in places. I could be wrong, but I think the legs in the run cycle maybe feel a bit jerkier now than they did before (although, again, I really like the chest placement now!) It might still be nice to see just a 'lil bit more follow-through and flow in a few places (like the jump).

Table 14: *Summary of the negative responses concerning the animation design in style version 2.*

Version 3: Negative Feedback
I think that maybe the idle animation still felt a *little* jerky in places - with the movement of Link's head maybe feeling just a tad *too* controlled. I think the shooting animation may have just a *little* less recoil. Also (and this is REALLY a nitpick - given that I internally did a little happy squeal when I saw the run cycle this time) the shield on the run cycle feels just a *little* awkwardly placed because it seems to come quite close to his eye at times.
The shield and bow don't seem to work the same way as the previous animations, during the special attack the shield is still in his hand and the bow is still in his hand for the taunt. This only bothers me because that was not the case previously but standing alone it's not really an expectation.

Table 15: *Summary of the negative responses concerning the animation design in style version 3.*

6.4.4. Summary:

Based on the feedback, the expectations of the character concept were a frequent topic in the discussion. The way Link’s actions were expressed informed how it aligned with the participant’s idea

of the character. The issues of speed and consistency of the animation design played a role in the clarity and appeal of the animation.

7. Discussion

7.1. Playtester Recruitment:

In the playtesting period, there are some problems that could have affected the sample size and the generalisability of the results.

A significant concern is that participation in the feedback has decreased. The number of responses may have affected the weight of the results. A probable cause may be due to a lack of interest. In the game or genre. fourteen out of twenty-two volunteers demonstrated interest, and thirteen completed the session.

This session was conducted remotely, and the participants downloaded the resources on a local server. The participants may have been unable to access the demo reel. I also did not consider the compatibility of the Unity build. The executable file was compatible with Windows computers only. In hindsight, this may have impacted the sample size due to accessibility issues.

Another factor that could impact the validity of the results is the nature of the test. The participants were aware that I created the animations in the demo reel. This could have impacted how the participants perceived the animation and how their responses were approached.

7.2. Character Features and Player Preferences:

The results suggest that specific actions had more impact than others because of preferences. Character skills and features were rarely mentioned in the feedback regarding the group's expectations. When the participants commented on the changes, the discussion was about the features that were voted the most interesting, had a drastic change and had an effect on Link's competence.

For example, Link's archery skills were rated the most exciting feature. The bow placement and recoil changes were noticed and mentioned in each animation. The sword and shield skills were rated the least exciting aspect of the character. The shield bash and shorter swings in the third animation had fewer discussions, due to the low scoring of the skill. The other features, such as the remote bombs and Final smash, were not presented and therefore, not discussed. This may have been a problem, as it

creates the expectation that those features would be showcased in the demo reel, even though interest was expressed.

Most of the group valued actions that highly exaggerated actions and expression of personality and emotion for character action. Version 3 fit that description, and players believed these aspects suited the character.

Perhaps, I did not get much feedback on skills and technique because the actions did not fit into the group's interest, or I needed to contextualise the feedback based on those actions. The extent of this cause was out of the scope of this research.

7.3. Perception of Link's Movement Style and Impression:

7.3.1. Feedback on Body language:

The participants demonstrated a good understanding of the character animations; however, the details of the responses need clarification. When describing the body language in the style changes, the responses varied. The key concepts that emerged from the descriptions point to *congruency*, *clustering,* and *consistency* from Goman's 5C of body language interpretation (Goman, 2008).

The *clustering* of Link's actions would be used to describe the technical details of the style design. Some responses would refer to his equipment placement and technique. For example, in the neutral special animations, the speed and recoil of the bow would be discussed to describe his strength or competence with the equipment. While others would focus on the emotive aspect or overall feeling the action conveys. For example, the participants would describe the run cycle of version 2 as "clumsy" or "wild" to describe the recklessness of the action. However, there were a few responses concerning the *clustering* aspects of his body language. Perhaps I needed to encourage more detail concerning this aspect from the participants. A solution could be to introduce new rounds of playtesting concerning the clustering aspects of specific animations. The tests could help identify which gestures and actions needed improvement or clarification, as well as identify which gestures or expressions suggested the overall behaviour

The *congruency* aspects of the action seem like they were not frequent in the reviews. The animations had a similar structure and described the actions that were playing. However, most of the descriptions looked at the character as a whole rather than the individual animations.

The c*onsistency* aspects were based on the perception of Link's behaviour and whether it aligns with his role, background and behaviour. *Consistency* was also used to discuss the fluidity and readability of the animations.

The focus groups' sensitivities to the changes seem to agree with the findings presented by Hyde et al. Their study explains that the magnitude and speed (i.e. level of exaggeration and dampness) of movement can affect the perception of personality traits of characters differently (Hyde et al., 2016). This factor seems to be the case with the perception of Link's style dimensions. In the responses concerning the change, the perception of the character's personality traits and expression seemed to change as well. Additionally, the use of space and coordination were also key factors. This change suggests that this may be the reason that the participants viewed various aspects of the character's personality.

Therefore, the responses indicated that the testers were able to spot *consistency* changes in the character's animation style and behaviour, provided that the animation was clear and readable.

7.3.2. Version 1:

This version of Link's animation was a recreation of the moveset in the game. I decided to recreate Link's move set to use this as a baseline for his style.

Some of the respondents noted a change of personality, lack of *fluidity*, and *readability* in the animations in the feedback. There was a marginal difference in perceived style dimensions and appeal between this version and the trailer. However, Link's overall *shape* and *timing* remained consistent and resembled the trailer. This suggests that players still perceived this version as a close representation of the character despite the lack of polish.

This version failed expectations on readability. The speed of the animations was perceived as too fast by the group, which made it difficult to read the movement. This may have impacted the appeal of the animation.

The perception of Link was divided concerning the expectations of the character concept. The consensus was that this version of Link succeeded in expressing his personality, depicting his features and abilities in his fighting style and overall screen presence. Some viewed Link's actions as aggressive, mature, and confident, competent. At the same time, others viewed his actions as careless, unchildlike, and inexperienced.

This version had the most uncertainty in comments on the expectations and demonstrated interest in playing the character. Some respondents could not identify the difference between the versions or had any expectations regarding the character or perceived changes. The participants did not know that this version was a re-creation. Most of the participants in this group had expressed interest in the game, but they also had little experience with the game and character. This suggests that the respondent's experience and personal biases may have affected their impression.

7.3.3. Version 2:

This version was more expressive of Link's animation than links of his moveset in the game. The objective was to make his action feel more energetic and aggressive.

There was a slight difference in perceived style dimensions but a significant difference in appeal between this version and the trailer. However, its overall shape also remained consistent and resembled the trailer.

This version succeeded in communicating the speed and energy in his actions. However, his lack of coordination affected his perceived competence. The participants noted that Link's actions appeared faster, lacked fluidity and consistency, and felt clumsy, reckless, child-like, and energetic.

This version failed the group's expectations on readability, polish and character concept. The details in the actions were clear; however, this also revealed the problems in the animation. The speed of the animations was also perceived as too fast by the group, which made it difficult to read the movement. This may have impacted the appeal of the animation.

7.3.4. Version 3:

In this version of Link's animation style, I decreased the *effort* in Link's actions to make his action feel calm and undramatic. There was a notable difference in perceived style and appeal between this version and the trailer. The appeal was high, and the overall shape had the most deviation.

There seemed to be a divide on how it affected his competence. The participants noted that Link's actions appeared less energetic, had higher clarity, controlled, and cautious. This speed of his actions also affected the perception of his concept and appropriateness for gameplay. The slow speed and caution in his actions contradicted the energetic side of the character. Despite the deviation in his action from the original, the participants considered this version as the most appropriate version of the character.

Overall, the animations succeeded in communicating the concepts as I intended. The actions in Link's styles seemed to align with the player's interpretations in each version. The participants noticed the effort changes, which affected how the style dimensions were interpreted.

7.3.5. Animation Style impact on Player-character experience:

Regarding how the animation style affected the participant's experience, the comments point toward Isbister's four layers of the player-character experience. According to their comments on expectations, the visceral feedback and fantasy affordances of their experience were impacted during the test.

A. The Visceral Feedback:

For the visceral aspects, the players were concerned with how the general effects that the animation had on their viewing experiences. The key points in the discussion related to Cooper's five fundamentals. The key concepts were the *readability* and *fluidity* of the animations. The comments that were based on *readability* concerned the speed and clarity of the character's actions While the comments on *fluidity* were based on the smoothness of the blending in the transitions and the posing of the action.

The result suggests that the presentation was a factor that impacted the group's experience. Satisfaction was expressed in the comments when the character's actions were smooth and fluid. While disappointment was expressed in the comments when the animation was too fast and rigid, and when the movements were unreadable.

The issues of speed and consistency of the animation design played a role in the clarity and appeal of the animation. However, the extent to which these factors impacted the character's appeal rating is unclear and needs to be measured in future studies. This finding shows the challenges of creating appeal as presented by Johnston and Thomas. The animations became unappealing when the design is too complicated to read (Johnston & Thomas, 1981).

I did not include VFX in the animations. Leaving out the VFX may have impacted the expectations of the *feel* and *readability* of the character. In my analysis of the animations in *SSBU,* the VFX in the game was used as a reinforcement tool to help make the actions readable and exciting.

Perhaps, including the VFX may have helped solve the clarity issues of the animations. The VFX may be a useful tool for increasing the appeal of the animation. The effects could help add drama to the actions by exaggerating aspects such as speed and weight. It may also be useful to hide fluidity errors through concealment and distraction.

B. The Fantasy Affordances: Role Perception and Character Concept

The comments on character descriptions suggest that players were concerned about role perception, the character's habitus, and how I communicated these aspects in the animation style. These considerations relate to the fantasy affordance of the player-character experience (Isbister, 2009).

The comments on the character concept relate to Lankoski's concept of the *habitus* (dramatic persona) (Lankoski, 2002). The comments regarding the character were based on his physical attributes (youth, equipment), lifestyle (Adventurer and Warrior), and psychological qualities (Personality). Denotatively, Link was the character model and performed the same actions in each version. However, the perception of the character's habitus seemed to be different in each version. The participants noted a distinct change in these areas. The aspects related to character personality expression and exaggerated movement were valued highly regarding their preferences, which may have been key points when considering the appeal and its suitability for the character concept.

Version 3 represented higher competence and appeal. The speed, use of space and control of his actions met those expectations. Whereas version 2 had the lowest appeal and was perceived as more aggressive, unbalanced, and reckless which made the character feel less competent.

The difference experienced in these style variations emphasises Isbister's point on how the visceral and fantasy aspects should act harmoniously (Isbister, 2009). When the layers did not line up, the player may have felt dissociated and dissatisfied with the experience.Version 3 had succeeded in the combination of these two layers and had a higher appeal score. While version two had the most issues with the lowest appeal score of the group.

The findings seem to correlate with the study by Engelberg and Melzer regarding the evaluation of character appeal. Although their results were more focused on gender attributes. Their results suggested that the attractiveness of the player-character's attributes play role in evaluating appeal. The responses in my study were centred on the perception of the character concept and their interest in features and abilities. The biases were based on the character's role, features and abilities, and personality traits. The results from both studies further suggest that appeal comes from the perceived attributes of the character and how it aligns with the player's preferences.

Therefore, the perception of the animation informed the character's appeal based on the group's expectations and preferences. The expectations of the character concept were a frequent topic in the discussion. The performance and perceived competence of Link's actions informed how they aligned with the participant's interpretation of the character concept.

However, the feedback was limited as there were also very few references on how gestures in the actions contribute to the character concept. I needed more in-depth questions regarding fighting style, personality, and gameplay suitability. Further longitudinal studies will be needed to investigate how the character's animation meets those expectations.

7.4. Character Appeal and Demonstrated Interest

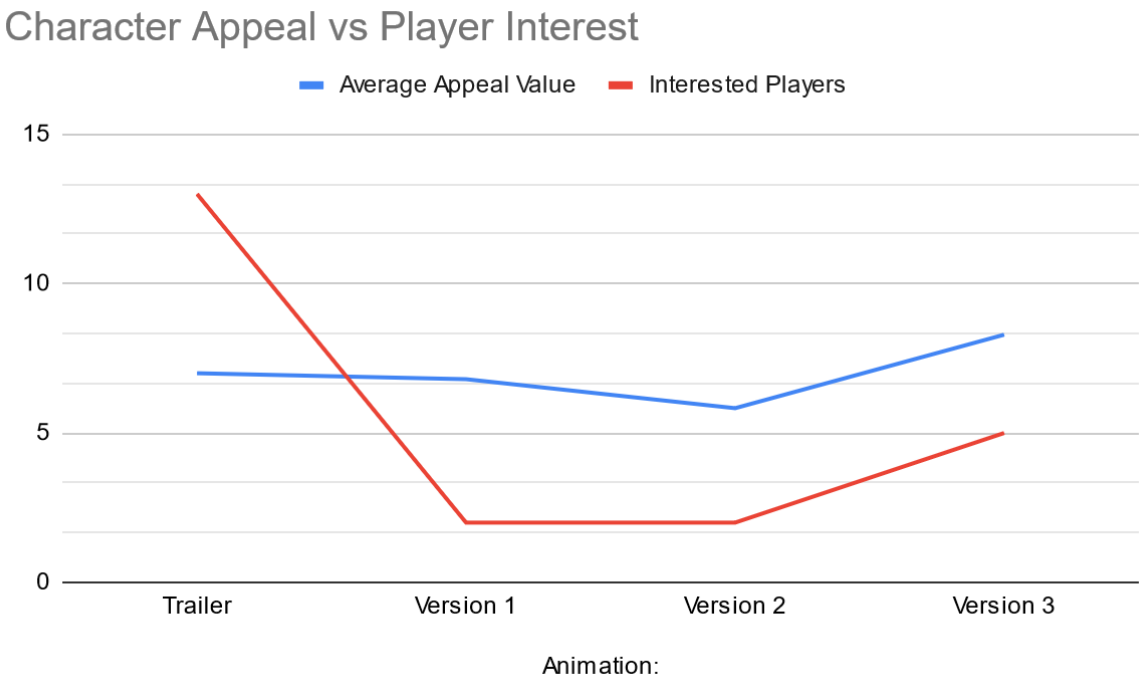


Figure 40: *A summary of the comparison between Character Appeal and Demonstrated interest.*

The results from this study indicate that a change in movement style impacted the perception of Link and the participant's demonstrated interest to play him.

The demonstrated interest seemed to change when there was a notable difference in style. Although slight artistic differences were in version 1 and version 2, the perceived style profiles and appeal ratings had marginal differences. There also seemed to be no significant difference in the interest in playing those character versions. This lack of difference may have occurred because the movement styles were not distinct enough, or the animation did not align with the player's expectations. Whereas for version 3, respondents perceived a significant difference in style profile and appeal rating. They demonstrated a higher willingness to play this version of the character.

The appeal of each animation during its reception seems to contribute to the overall perceived value of the player-character experience. When the style aligned with aspects of the character concept, the appeal was high. When the character's style did not match the concept, the appeal rating was low. Interest was a dimension of motivation, and the player's preferences played a role in informing conclusions about the character. The perceived style changes were based on the interest that was expressed. However, the extent to which the character's animation influenced these perceptions

remains inconclusive due to the small sample size. Larger sample size would be needed to determine the significance of the findings and correlations.

7.5. Validity of results:

As mentioned previously, the sample size impacted the generalisability of the results. The results showed that a change in the effort had an impact on how the animation style dimensions were perceived. The style dimensions helped illustrate the perceived difference between the animations. When it comes to improving character animation, the comments from the study helped identify the good and bad parts of the design and determine which style version was objectively better.

For practice, my method helped with concept testing by providing reasons to choose a specific style. The feedback on the animation perception addressed the character as a whole but not the individual action. However, more details would be needed to improve the appeal of a style design. A limitation of my method is that the results do not explain which animation style is appealing to which group or the character archetype suitability. The results explain which character variation had the most interest.

The results do demonstrate that interest to play a character can change based on how the animation is designed. The change in the *effort* of Link's actions changed the overall perception and appeal of his style dimensions. This confirms that appeal comes from how the animation is designed. However, as presented there are other many factors that could influence the appeal. Nonetheless, the study shows if a character's presented differently, the players may respond depending on their familiarity with the character concept and their personal preferences.

The data gathered concerning the feedback of the artefacts are useful regarding the style perception of the character. The participants could categorise the movements and relate them to their idea of the character concepts and their expectations. However, more robust questions in the survey would be needed to clarify the details of their perception.

8. Conclusion:

8.1. Summary:

This study aimed to answer whether a change in an existing animation style influences a player's interest in an established video game character. The objective of this study was to investigate what

players find appealing about a popular video game character and how animation affects the player's inclination to assume their role in the video game.

In the literature review on character animation in video games, I identified the aspects that affect the player's character experience. Key findings were on how character and animation design relate to the player's perception, cognitive effort, social biases, and level of interactivity. I concluded that the appeal of a player-character is an essential driver for player involvement. The appeal of a player-character is considered to be driven by identification, interactivity, visual design, and the psychological affordances they promote.

I took a practice-led approach to understand the relationship between player involvement and the player-character's action and investigate the aspects of Link's design that affected the player's experience.

To do this, an animation analysis of Link's actions in *SSBU* was conducted to determine which of Link's animations should be created and manipulated. Various animations were analysed to figure out how the interactive aspects of the character are expressed and how his movement is structured, regarding frame data and animation principles presenting each action. The terms used in the analysis were based on movement frameworks such as G*allaher's Dimensions of Style*, the *Laban Movement Analysis* and *Disney's 12 principles of animation.*

Eighteen animations were created for the animation reel to display three variations of movement style in Link's actions. I used the *effort* dimensions from the LMA to distinguish the styles. The animation reel was presented to a focus group of adults between eighteen and thirty-five in South Africa. They provided feedback on their impression of each iteration. A series of semi-structured online questionnaires were used as the primary method to gather data from the participants.

The results suggested that a notable change in movement style impacts the player's interest in the character. A style change can affect how the character concept is interpreted and evaluated. The style changes in Link questioned his perceived competence, which is a crucial dimension of character identification. Other factors that affected its evaluation were prior experience with the character and animation quality. The responses suggested that style changes affected the expectations of the character concept and his competence which may have affected the player's involvement with the character. However, the impact on the focus group's interest is inconclusive.

In the end, I was partially able to answer the question. This research illustrates that Link's style changes have impacted how the character was perceived and valued. However, it also raises the

question of what type of changes are appropriate for characterisation and which target groups they are suitable for. While the sample size limits the generalizability of the results, this approach provides insight into character style representation and concept testing.

8.2. Recommendations For Future Work:

I would be interested in further examining why the difference in style perceptions occurred and how they change when applied to an interactive context. This study touches briefly upon the subject, but I believe there is ultimately a lot more to be discovered within this topic.

Future studies could address how specific actions related to the character's competence and role in the game to understand the implications of these results. A higher quality of animations and the addition of context to actions during interaction may help prevent readability issues.

Further research is needed to determine the difference between the appeal of the animation and the character, as many dimensions can inform the player's bias.

This project can serve as a reference and inspiration for future research as there is much to be explored regarding good representation in character animation.

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Appendix

A. Animation Demo Reel Folder

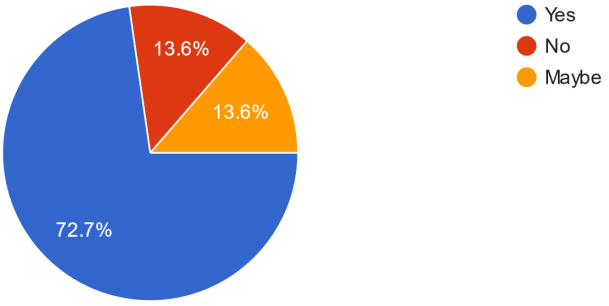
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B. Playtester Recruitment Results

Category Questions

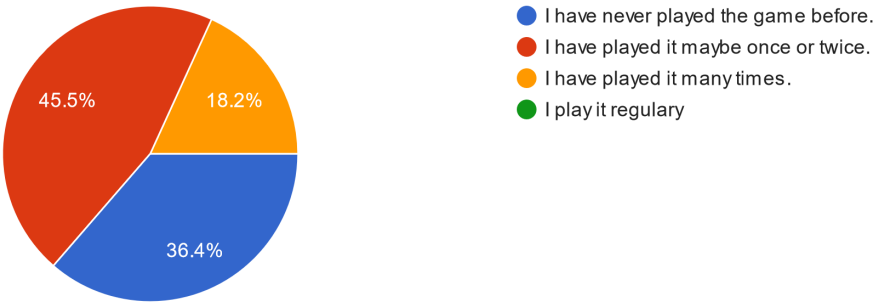
1. Do you you enjoy playing multiplayer fighting games?

22 responses



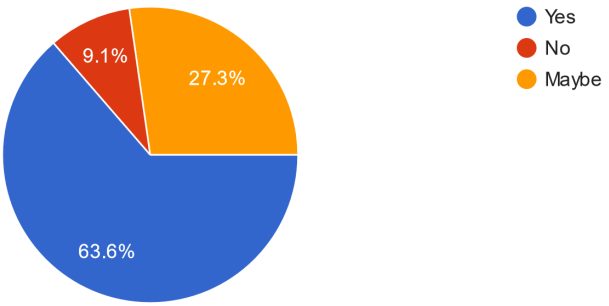
2. How familiar with Nintendo's Super Smash Bros games?

22 responses



3. Would you be interested in playing a game like this?

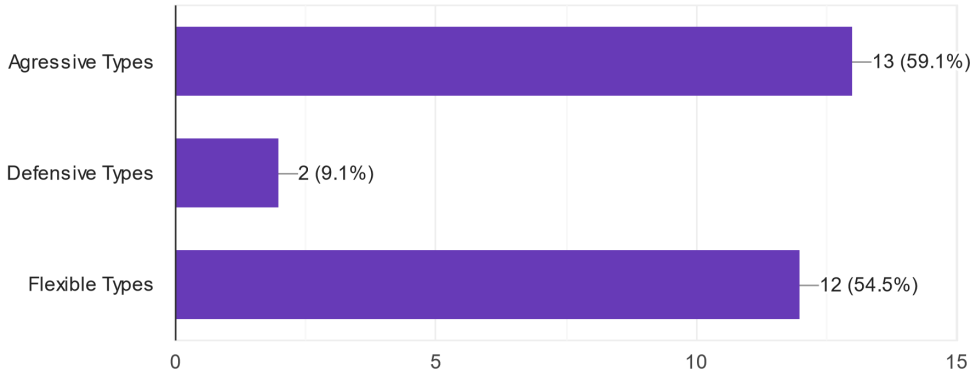
22 responses



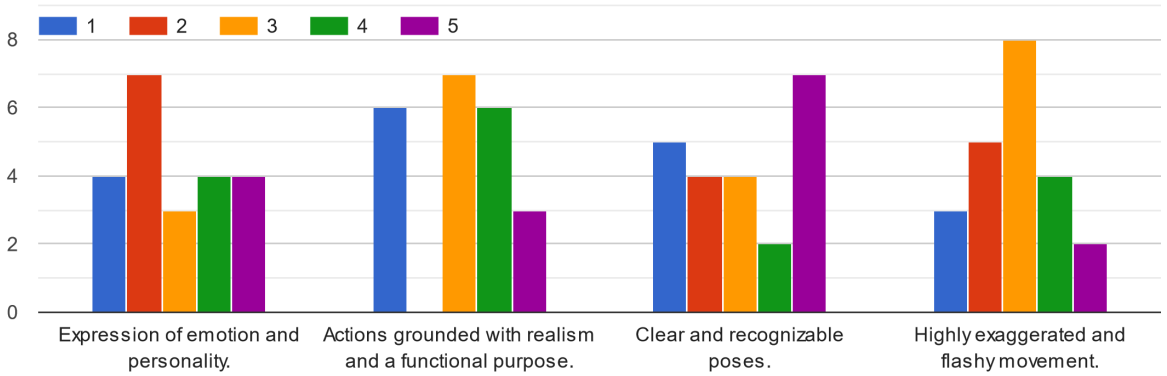
Character Preferences

1. What type of character do you usually prefer to play in a typical fighting game? This refers to the play style you tend to choose.

22 responses



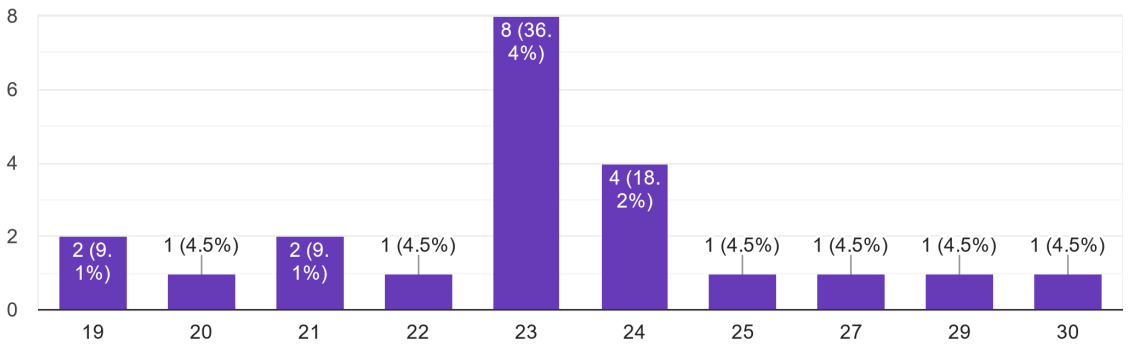
2. When it comes to a character's action in a video game, which aspect is the most important to you? Would you please rank the following [1 Highest and 5 Lowest]?



Demographic Questions:

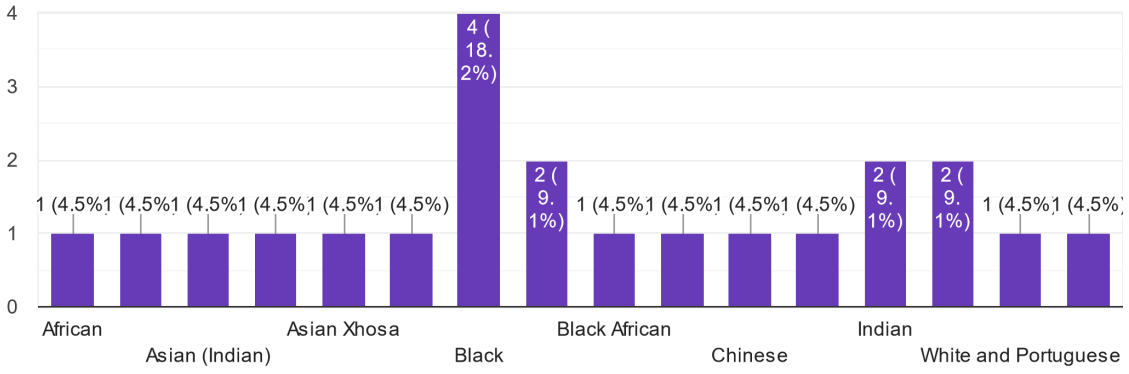
1. What is your age?

22 responses



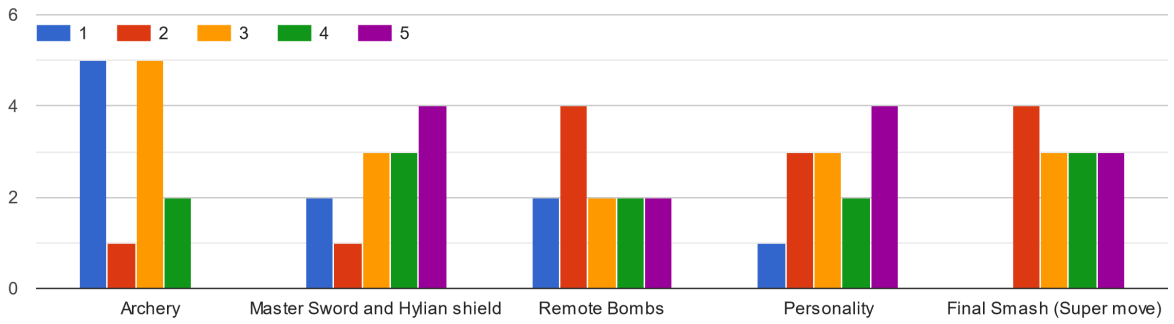
3. What is your race and ethnicity?

22 responses



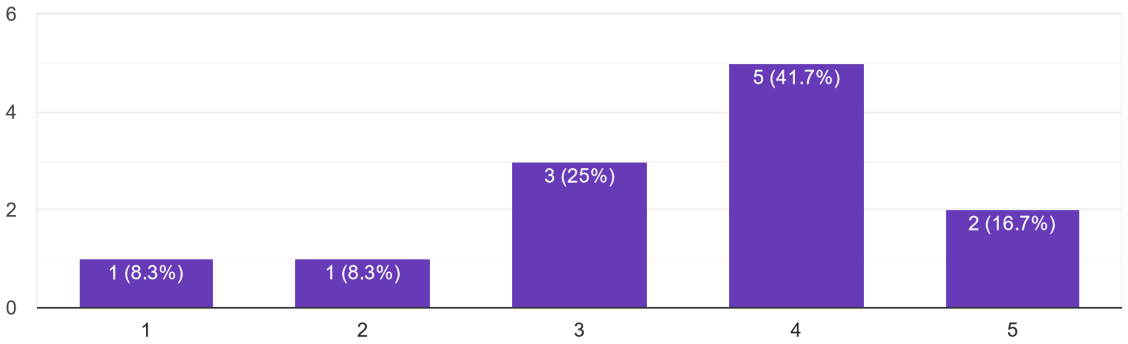
C. Link Introduction Results:

1. Below is a list of features that are part of Link's features and abilities in the game. Which quality do you find the most interesting? Please rank the following. [1 Highest and 5 Lowest]



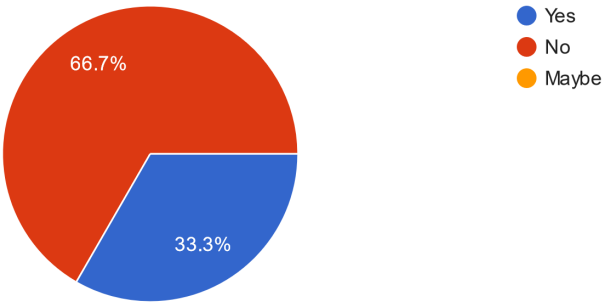
2. Whether or not you know about Link, how favourable is your overall reaction?

12 responses



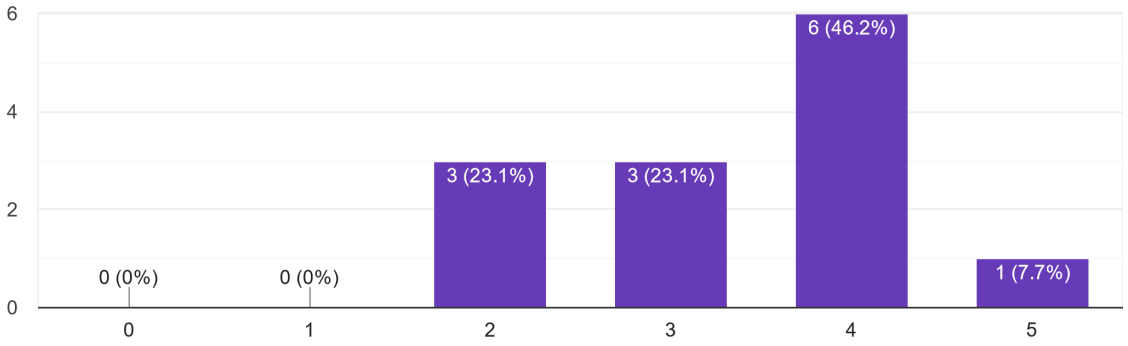
3. Have you played this character before in this game or any other games?

12 responses



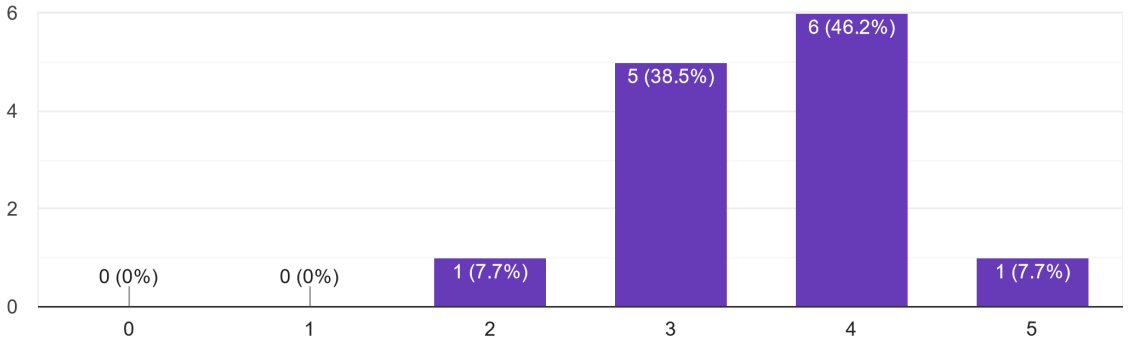
4. After watching Link's animations, how would you describe the Expressiveness of his actions? [0 Low and 5 High]

13 responses



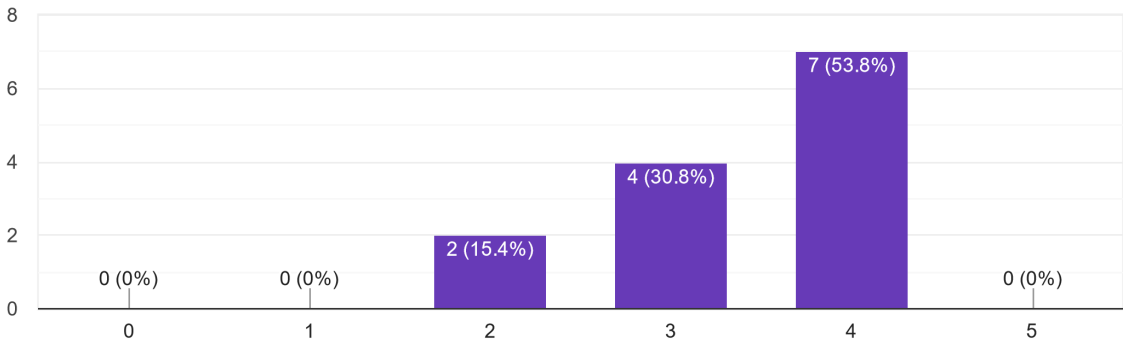
5. How would you describe the Animation of his actions? [0 Low and 5 High]

13 responses



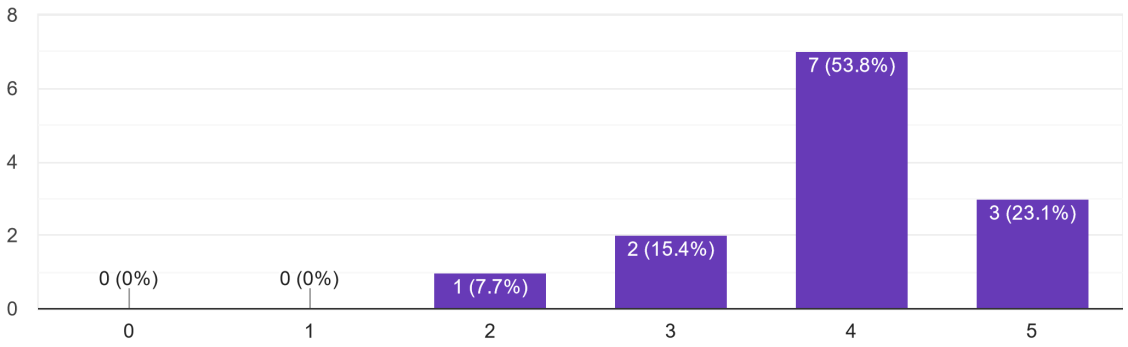
6. How would you describe the Expansiveness of his actions? [0 Low and 5 High]

13 responses



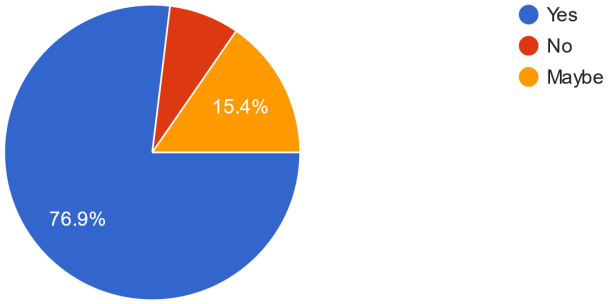
7. How would you describe the Coordination of his actions? [0 Low and 5 High]

13 responses



8. After getting to know the character's abilities and movement, would you be interested in playing this character if available?

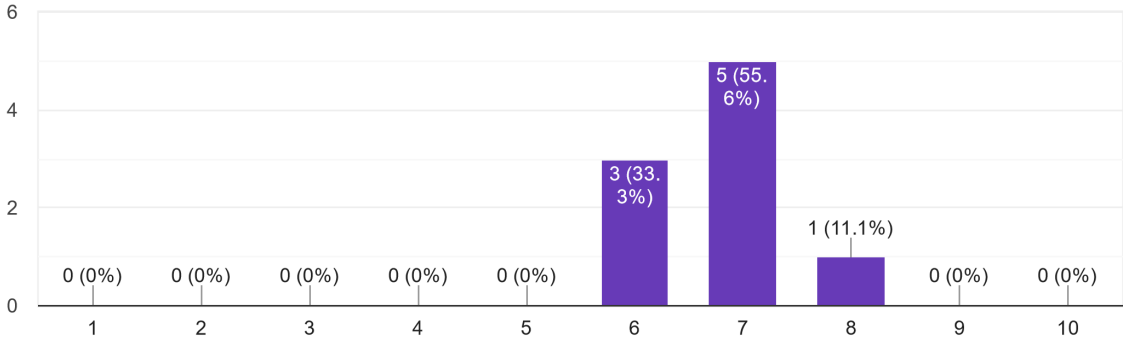
13 responses



D. Version 1 playtest Results:

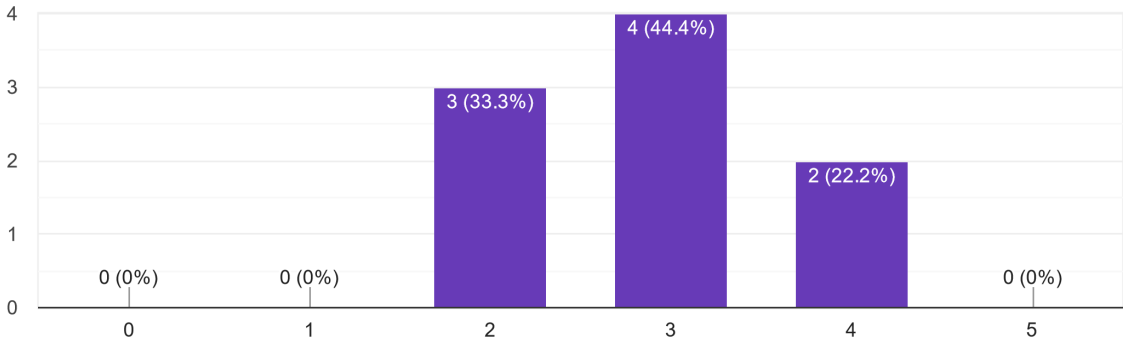
1. During this test, how favourable is your overall reaction?

9 responses



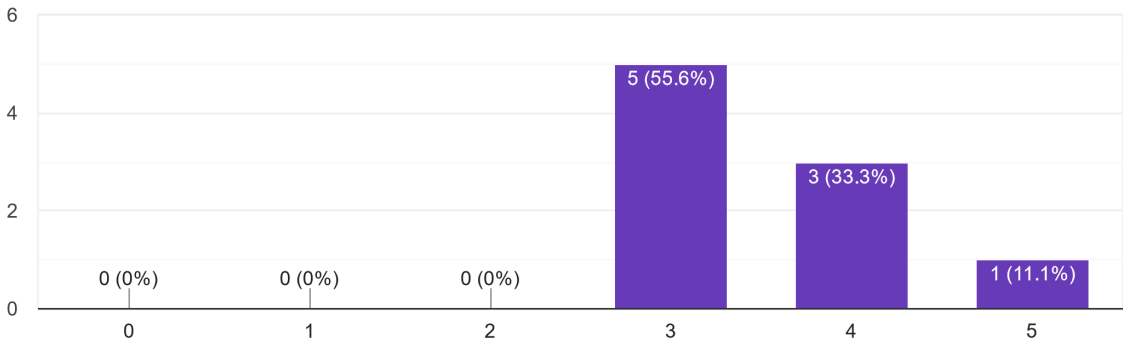
2. After watching Link's animations, how would you describe the Expressiveness of his actions? [0 Low and 5 High]

9 responses



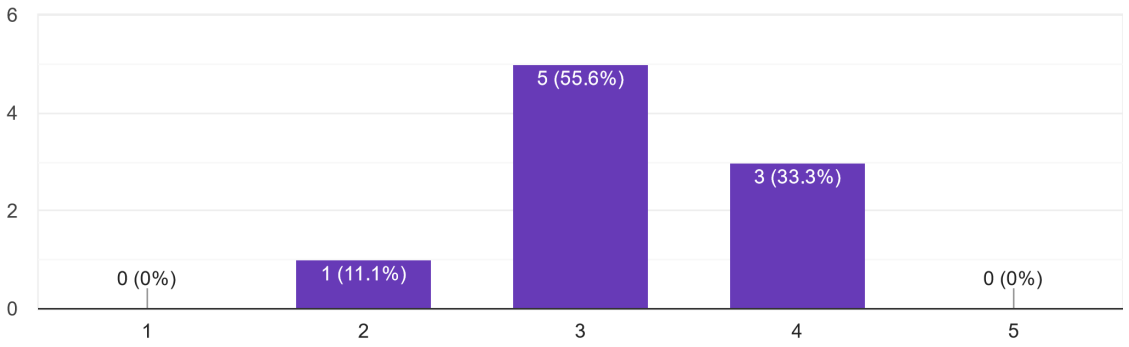
3. How would you describe the Animation of his actions? [0 Low and 5 High]

9 responses



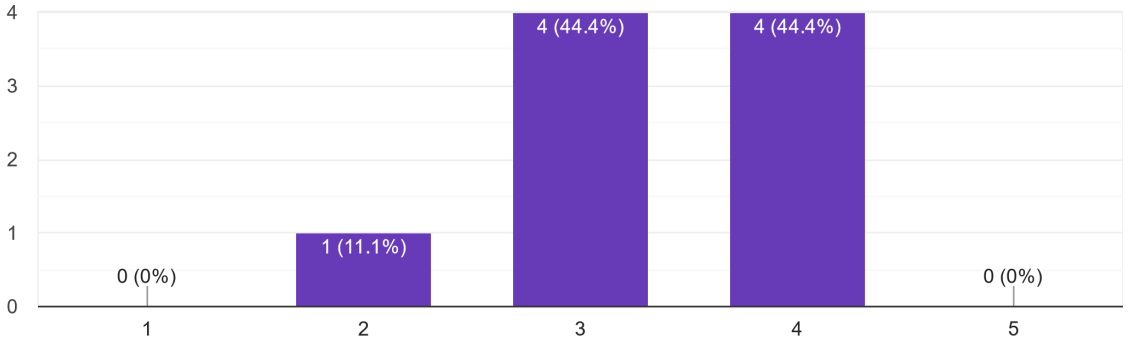
4. How would you describe the Expansiveness of his actions? [0 Low and 5 High]

9 responses



5. How would you describe the Coordination of his actions? [0 Low and 5 High]

9 responses



6. Compared to Link's moves in the trailer, what do you think has changed in the animation?

9 responses

I could be wrong, but I feel as though his movements feel a bit more spacious than in the trailer!

Nothing

The movements are little more static (mainly the idle animation though). I think the particle effects in the trailer hinder me from making a fair comparison (for the last move).

Compared to the trailer I would say that Link's moves are a bit more rigid.

The motion is not as fluid, the character seems rigid. It also feels like the frame rate has been decreased and some in-betweens are missing.

The animations felt like Link was keeping a more closed stance (arms tighter to the body), specifically while running, as well as showing more of an aggressive demeanor when taunting and attacking.

Less polish and less dynamic poses and less fluidity

Not much from what I've seen, Key frames are all there if a bit rigid, but solid stuff. Link seems a lot more

I think the animations are very similar to the ones in the trailer. The only thing I noticed was that his eyes were closed when drawing the bow in the neutral special and that there were 2 arrows.

7. In what ways has this iteration of the character met your expectations.

9 responses

It felt like Link had a bit more presence on the screen in places! I especially liked the special animation with the arrow where the leg placement felt quite dynamic. I also really liked the leg movement in his run cycle!

His movement was quite expressive and showed that he was a confident character. Whenever he swung the sword he took up a lot of space instead of feeling limited/restricted thus showing his confidence.

I could tell that this was Link. His facial features remained the same and likened the Nintendo version, a sort of stiff face with only a determined expression.

I believe that they were different from the trailer. I actually had no expectations so I'm not sure of how to answer this. The motions were nice.

It kept true to the Link's energy and his overall aesthetics.

The movements are still communicated effectively. I expected the animations to not be as good as the professionals ones and it does seem I was right in expecting that.

Link feels like he has matured more and refined his fighting style.

The attacks are good and he uses both the sword and bow, I enjoyed that

If Link had an agro side, this would be it.

I think the 1st part of the idle animation showcases Links adventuring experience as he surveys his surroundings . His attack and special animations for the most part show he is practiced in what he does, without any excessive shifts in weight or openings.

8. In what ways has this iteration of the character not met your expectations?

9 responses

The movements occasionally felt a little as though they jerked from keyframe to keyframe without too much overshoot/recoil or flow between movements. The hair may have added to this a bit (but, from what I know, animating hair is HARD so please take that with a grain of salt!) Finally the leg movement on the run felt *gorgeous* - but (for me, at least) I think the chest placement maybe felt a little more akin to a sneak or maybe a walk.

Link's outfit was not the bright green clothes he usually wears. There was no sound present in the presentation.

The first idle animation felt a bit too stiff.

It was not as clear as the what i thought it would be. At some points the animation was too fast and some moves were clear so i couldn't tell what exactly he was doing. I would describe it more as him generally moving and not doing a specific action.

The movement is a bit jarring, its actually quite distracting.

With his more mature demeanor, he seems less unique.

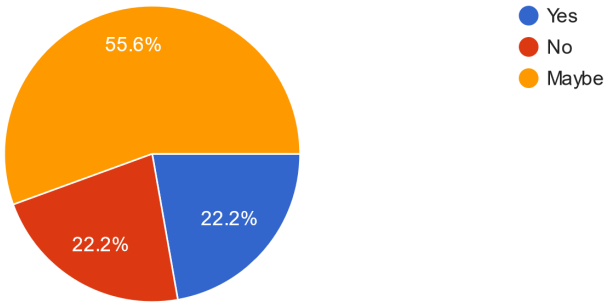
Some animations are a bit choppy and unclear to read

Link has been through many transformations in in his time, from what I've experienced, he always seemed like an balanced character to me. Although that might be because of the animations.

The trailer gives the impression that Link has a some what measured approach to combat that utilizes a number of different skills. The are some small points in the animation that makes him seem a little more careless or inexperienced IMO. In the 2nd half of the idle animation his elbow bends up as he raises the shield which feels really awkward. One of his fingers are loose on his shield during his running animation. For his neutral special, I'm not sure if his eyes are close or if he's narrowing his eyes for focus

9. Would you play this character after this change?

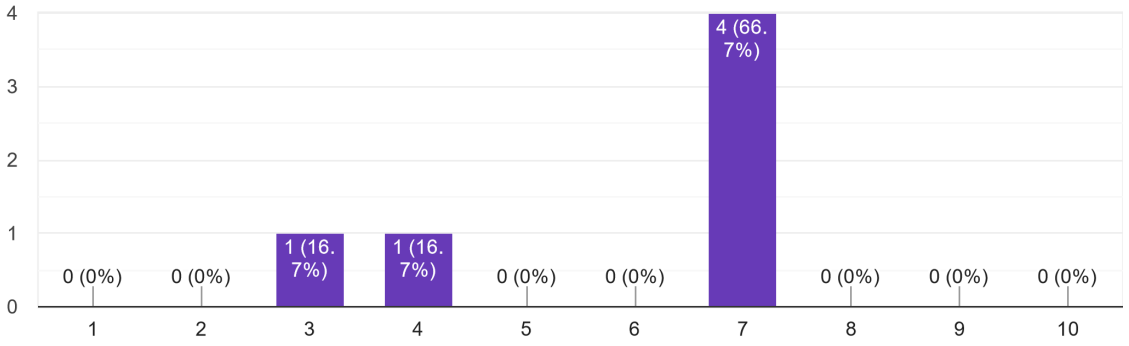
9 responses



E. Version 2 playtest Results:

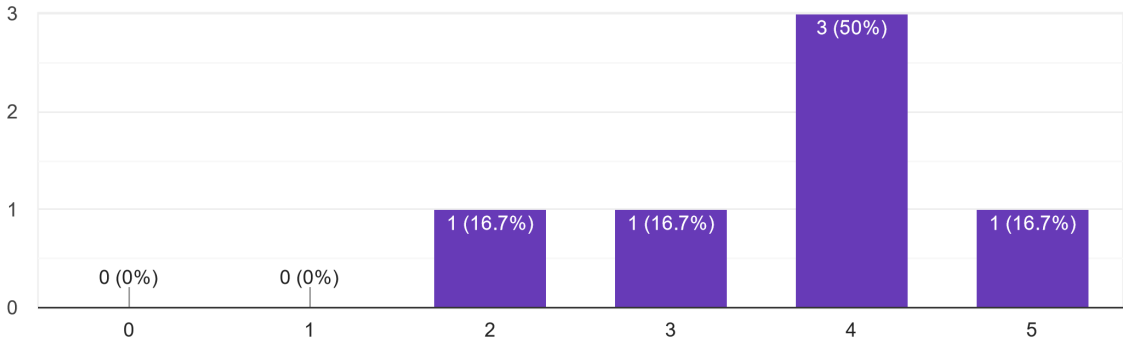
1. During this test, how favourable is your overall reaction?

6 responses



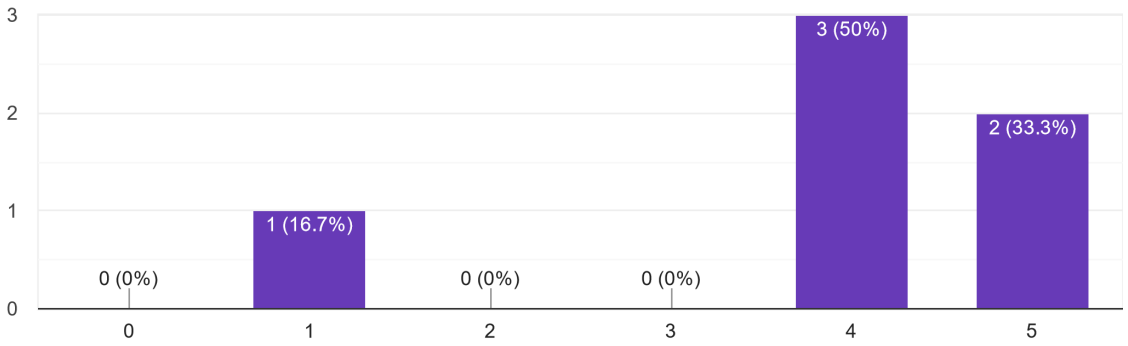
2. After watching Link's animations, how would you describe the Expressiveness of his actions? [0 Low and 5 High]

6 responses



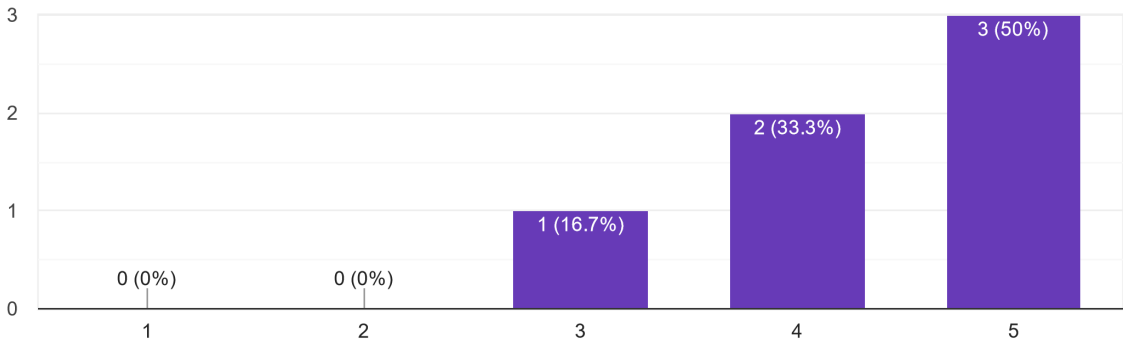
3. How would you describe the Animation of his actions? [0 Low and 5 High]

6 responses



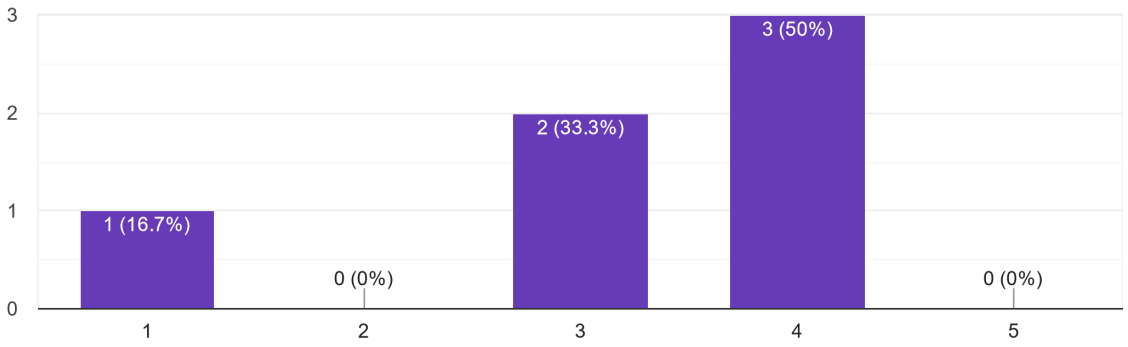
4. How would you describe the Expansiveness of his actions? [0 Low and 5 High]

6 responses



5. How would you describe the Coordination of his actions? [0 Low and 5 High]

6 responses



6. Compared to the previous iteration, what do you think has changed in the animation?

6 responses

The speed of the animation is faster than the first Iteration.

The animations are even more janky. The smoothness is gone. The running animation seems asymmetrical and inconsistent. The fluidity of the movement is now almost entirely gone.

I think This iteration has more movement and energy to the animations that expresses the character a little differently while making the animations for eye-catching

It's a lot more expressive, I think. Or maybe just faster, so it makes it feel more emotive. The run animation makes him look like he's limping, though.

Some of the movements feel a bit smoother! Some of the base limb placements also seem different (in a good way).

The animations feel much less refined and more uncoordinated.

7. In what ways has this iteration of the character met your expectations.

6 responses

This change showed Link to be a lot more energetic.

It has not met any expectations, its honestly very difficult to watch

I think the idle animation expresses a curiosity that expect of an adventurer character like Link. In general I think the motions and speed of the animations some added energy and deftness as well. The neutral attacks more specifically, are a lot more eye-catching with the added step.

It's fast and upbeat.

It feels quite smoother in places! I really like the chest placement on the run cycle now. I also think there may have been a bit more recoil on the special arrow animation - which felt pretty cool! Also (I think I might have missed this before) I really like how Link closes one eye when he shoots - that's a really nice touch!

He feels more child like in his ability to fight, fitting his design a bit more.

8. In what ways has this iteration of the character not met your expectations?

6 responses

N/A

The movement is still being communicated effectively, as in I can see what he is doing. But it is not appealing at all.

While I think the running animation feels more grounded and heavy with each step, the heaviness isn't something I expect from Link. While the neutral attack animations have more energy and are eye-catching, I also think that the wild swings make him seem more reckless for someone that uses a sword and shield.

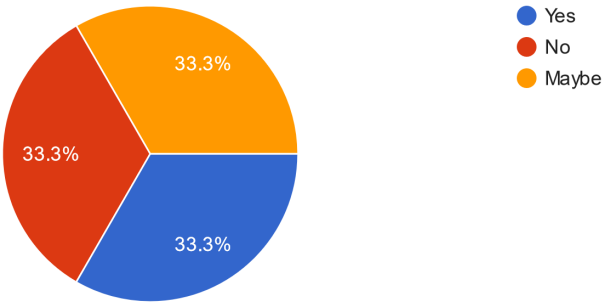
The increase in speed/ motion might be exposing some stuttering. It might be a little less fluid looking, maybe?

I think the movements may still feel a *bit* jerky in places. I could be wrong, but I think the legs in the run cycle maybe feel a bit jerkier now than they did before (although, again, I really like the chest placement now!) It might still be nice to see just a 'lil bit more follow-through and flow in a few places (like the jump).

He does not feel like he would be a competitive character to play due to how uncoordinated he looks.

9. Would you play this character after this change?

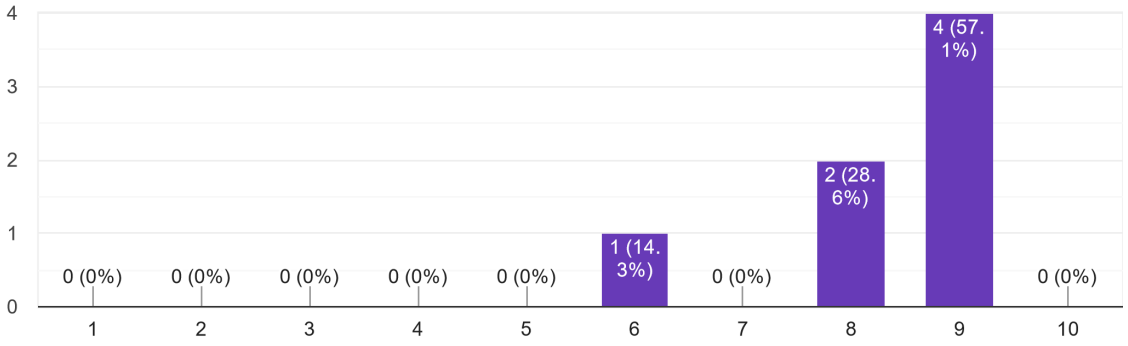
6 responses



F. Version 3 playtest Results:

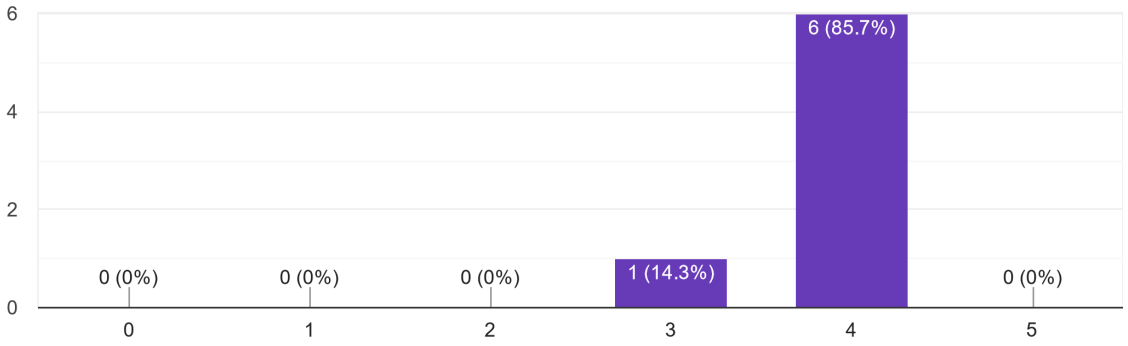
1. During this test, how favourable is your overall reaction?

7 responses



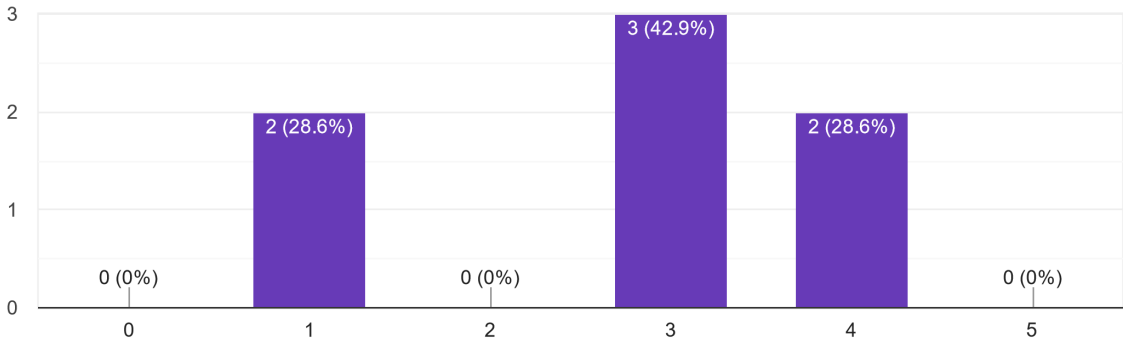
2. After watching Link's animations, how would you describe the Expressiveness of his actions? [0 Low and 5 High]

7 responses



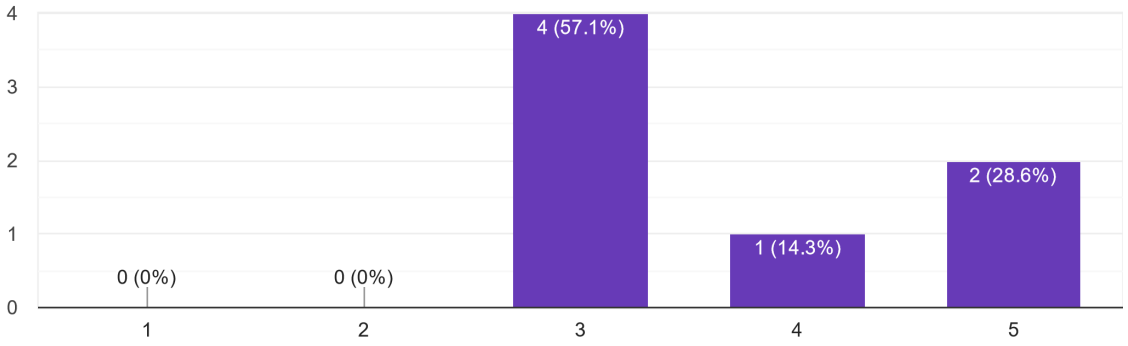
3. How would you describe the Animation of his actions? [0 Low and 5 High]

7 responses



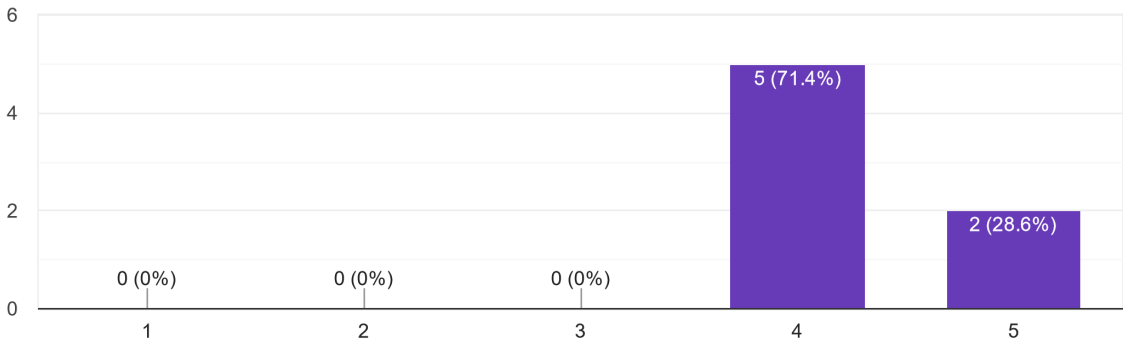
4. How would you describe the Expansiveness of his actions? [0 Low and 5 High]

7 responses



5. How would you describe the Coordination of his actions? [0 Low and 5 High]

7 responses



6. Compared to the previous iteration, what do you think has changed in the animation?

7 responses

Much slower, more controlled animations with unique alterations to improve his depiction as being skilled.

The movement is a lot more fluid, the frame rate seems to be back to normal and the character feels a lot cleaner in how he moves.

The animation is a lot clearer however it is also a lot slower.

WOO YES smooth like butter!! Definitely more flow and follow-through. Some movements felt slower and more controlled too. Also arm movement on the run cycle!

Wow, Just wow. Everything is a lot smoother.

I think there's more movement, without the increase in speed. The taunt animation feels a little less taunting though.

I think the motions in this iteration are a lot more compact and grounded. They are not as flashy as some of the past iterations animations.

7. In what ways has this iteration of the character met your expectations.

7 responses

The animations felt more realistic, his jump for example, while also making him seem more skilled and in control of his abilities.

The motion is clear and smooth. The clips are a lot more appealing.

It really showed Link's skill well. Like how he aims his arrow and especially his neutral attack. The movements looked a lot more deliberate and solid and really looks like he knows what he's doing.

The run cycle is *MWAH* (chef's kiss). Love it! Really like the new jump too. Many of the animations felt a lot smoother and more satisfying to watch.

It showed the skills that Link has.

It's much smoother. I liked the fluidity.

I think this iteration further showcases a more cautious and prepared side of Link. The movement is less wild, leaving less opening in attacks and the added use of his shield makes him feel more coordinated. While the movements in this iteration aren't as flashy as the previous iterations, I think most of them suit the character more.

Can't really pin-point anything, per say.

While I like that the idle animation has Link keep his stance as he surveys his surroundings, The drop in height makes him feel a lot more rigid, giving a nervous kinda feel.
The slow speed of the neutral special, mid draw, feels a bit awkward. I think that slowing the movement with the tension of the bow once the bow has been fully drawn like in the previous. I also think that the the previous iterations taunts worked better as they feel like more intentional openings while still keeping the shield in front.

9. Would you play this character after this change?

7 responses

