Universidade de Aveiro Departamento de Comunicação e Arte

Ano 2014/2015

FÁBIO ANDRÉ MARTINS LEMOS

EXPLORING THE RELATION BETWEEN VIDEOGAME PLAYERS AND SUPPORTING VIRTUAL ENTITIES: A PILOT STUDY

ESTUDO DA RELAÇÃO ENTRE JOGADORES DE VIDEOJOGOS E ENTIDADES VIRTUAIS SECUNDÁRIAS: UM ESTUDO PILOTO

Universidade de Aveiro Departamento de Comunicação e Arte

Ano 2014/2015

FÁBIO ANDRÉ MARTINS LEMOS

EXPLORING THE RELATION BETWEEN VIDEOGAME PLAYERS AND SUPPORTING VIRTUAL ENTITIES: A PILOT STUDY

ESTUDO DA RELAÇÃO ENTRE JOGADORES DE VIDEOJOGOS E ENTIDADES VIRTUAIS SECUNDÁRIAS: UM ESTUDO PILOTO

Dissertation presented to the University of Aveiro with the purpose of fulfilling the necessary requirements to obtain the Master's degree in Multimedia Communication, made under the scientific supervision of professor Óscar Mealha, associate professor at the Communication and Arts Department of the University of Aveiro, and co-supervised by professor Carsten Möller, senior lecturer at the Institute of Communication and Media Research at German Sport University Cologne.

Institutional support from the German Sport University Cologne (DSHS), Germany

Jury

President	Dr. Pedro Miguel dos Santos Beça Pereira Assistant professor at the Departamento de Comunicação e Arte of the Universidade de Aveiro
Supervisor	Dr. Óscar Emanuel Chaves Mealha Associate professor at the Departamento de Comunicação e Arte of the Universidade de Aveiro
External Examiner	Dr. Maria Fernanda da Silva Martins Assistant professor at the Departamento de Jornalismo e Ciências da Comunicação of the Faculdade de Letras da Universidade do Porto

Acknowledgements

Firstly I would like to thank to all my friends and family, specially my parents and brother, who have always supported me in any project I undertook.

I would also to thank to the teachers I had over the years for the knowledge they passed on, with special gratefulness towards my supervisors, Carsten Möller and Óscar Mealha, for their patience, guidance and support in this endeavor.

Palavras-chave

Apego à personagem, Avatar, Construct, Experiência de jogo, Interação Parasocial, Relação Parasocial, Videojogos.

resumo

Os videojogos têm sido uma área fascinante desde a sua criação, provenientes de simples conceitos como duas barras que ressaltam um ponto pelo ecrã e uma bola amarela que come pequenos pontos com uma guarnição de fruta, eventualmente transformando-se em universos virtuais totalmente desenvolvidos. O desenvolvimento tecnológico e a evolução do conteúdo de jogos fundaram uma nova era de entretenimento, com o surgimento de novos mundos contendo uma quantidade quase infindável de novas possibilidades e experiências. Estes mundos, ao contrário de quaisquer outros *media* anteriores, não só imergem o/a jogador/a numa realidade totalmente diferente como também lhe dão a habilidade de realmente interagir e possivelmente alterar o mundo virtual, tendo no entanto algumas restrições que podem tanto ser fruto de limitações tecnológicas, como do contexto do jogo, entre outras.

Existem variados fatores relevantes que definem o sucesso de um videojogo e a qualidade da experiência de jogo como um todo; a ligação que o jogador obtém com as construções virtuais que povoam o mundo do jogo é um destes fatores, tendo principal destaque na existência do fenómeno conhecido como "*Parasocial Interaction*" (PSI), traduzido em Português como "Interação Parassocial".

Este fenómeno está no núcleo do seguinte projeto, que pretende trabalhar a teoria PSI aplicada a videojogos, através de uma nova abordagem que não estuda a relação entre o/a jogador/a e a personagem que este/a identifica como a sua, mas entre o/a jogador/a e as restantes personagens, utilizando uma abordagem exploratória.

De forma a validar esta nova abordagem, estudar esta relação e compreender que fatores podem ser mais propensos para o seu desenvolvimento, dois métodos de recolher informação foram planeados: um questionário *online* para abordagem mais ampla, e sessões de jogo para uma abordagem mais profunda.

O questionário *online* é composto por um total de 25 questões, tendo sido adaptado da componente social de um questionário já existente, presente no trabalho de IJsselsteijn, W.A., de Kort, Y.A.W. & Poels, K. (2008); 17 destas questões são referentes à presença de personagens virtuais e os seus efeitos, com as restantes questões servindo como questões de controlo. Esta componente contou com a participação de 33 indivíduos.

As sessões de jogo teriam a duração individual de uma hora, nas quais o participante joga livremente o jogo *"South Park™: The Stick of Truth™",* tendo as ações, reações e opiniões gravadas para futura análise qualitativa.

Os resultados obtidos da análise das respostas dos participantes no questionário *online* indicam que os jogadores desenvolvem relacionamentos com as personagens secundárias do jogo, indicando ainda que estas personagens exercem alguma pressão social sobre o jogador, influenciando as ações e até a sua disposição, com o género de jogo "RPG" aparentando ser o género que mais facilita a criação de relações parassociais.

keywords

Avatar, Character Attachment, Construct, Gaming Experience, Parasocial Interaction, Parasocial Relation, Videogames.

abstract

Videogames have been a fascinating field from the moment of their creation, stemming from simple concepts such as two bars that bounced a dot around on the screen and a yellow ball that eats tiny dots with a side of fruit, growing into full-fledged virtual universes. The technological development and evolution of the gaming content founded a new age of entertainment, as new worlds emerge brimming with near infinite possibilities and experiences. These worlds, unlike any other medium before, do not only immerse the player in a different reality but also give him – or her – the ability to actually interact with and possibly shape the virtual world, though with some restraints which may be based either on technology or the game's context, among others.

There are many relevant factors as to the success of a videogame and the quality of the gaming experience as a whole; the attachment a player feels towards the virtual constructs that populate the game's world is one of these factors, having a very important role in the existence of the phenomenon known as Parasocial Interaction (PSI).

This phenomenon is at the core of this project, which seeks to research the PSI theory applied to videogames, using a new approach which seeks to study not the relationship between the player and the character that the player regards as his own, but between the player and the game's supporting characters, from an exploratory standpoint.

In order to validate this new approach, study this relationship and understanding which factors may be more amiable to the development of such a relationship, two methods of collecting information were planned: an online questionnaire for a more broad approach and gaming sessions for a more in-depth research.

The online questionnaire comprised of a total of 25 questions and was adapted from the social component of a pre-existing questionnaire by IJsselsteijn, W.A., de Kort, Y.A.W. & Poels, K. (2008); 17 of these questions refer to the social presence of virtual characters and its effects, with the remaining questions serving as control questions. This component counted with the participation of 33 individuals.

The gaming sessions consisted of one-hour long session in which the players would freely play the game "South Park™: The Stick of Truth™", having their actions, reactions and opinions recorded for later qualitative analysis.

The results obtained from the analysis of the responses of the online questionnaire's participants indicate that players do develop relationships with the in-game supporting characters and indicate that these characters also exert some degree of social pressure on the actions that players perform and even the player's mood, with RPG being the genre that appears to most facilitate the creation of parasocial relationships.

Table of Contents

List of Figures

List of Tables

List of Acronyms

AI	Artificial Intelligence
EA	Electronic Arts
FPS	First Person Shooter
MOBA	Multiplayer Online Battle Arena
MMORPG	Massively Multiplayer Online Role Playing Game
N/A	Non Available
NPC	Non-Player Character
OBS	Open Broadcast Software
PSI	Parasocial Interaction
PSP	Parasocial Presence
RPG	Role Playing Game
UA	Universidade de Aveiro / University of Aveiro

Introduction

This dissertation stems from the *Mestrado em Comunicação Multimédia* Masters from the Universidade de Aveiro (University of Aveiro) in collaboration with the Deutsche Sporthochschule Köln (German Sport University Cologne), and aims to provide an initial step towards a different way to explore the Parasocial Interaction theory in videogames, by introducing the game's NPCs (Non-Player Characters) as entities capable of developing emotional relations with the game's player.

This research thus provides the rethinking of two concepts, these being those of "Avatar" and "Construct" in order to differentiate characters that have established emotional connections and those who bear no attachment.

Due to the basilar aspect of this work, the empiric exploratory approach was taken, focusing on the conceptualization and development (stemming from adaptation) of research methods focused on studying the relationship between player and game's NPCs.

The problematic and research objectives of this work are explained in further detail below.

The Problematic

Parasocial Interaction (PSI) research related to videogames focuses mainly on the relationship between the gamer and his/her in-game character, which means that it looks only to study the perception of "self", by understanding how one establishes a relation with another virtual entity (Klimmt, Hefner, & Vorderer, 2009). This relationship is established either by exteriorizing one's own psychological traits onto an external character, the focus being the player's avatar, or by interiorizing the character aspects of that foreign agent into oneself, as well as evaluating how this relationship impacts the player performance in the game (Jin & Park, 2009).

As such, it can be said that the main purpose of the research done thus far is to understand how a player perceiving his/her character as an entity impacts his/her performance in the game; the lackluster point of such an approach is that it does not explore the social aspect of the other in-game characters. While there have been studies which focus on the interaction between the player as a self and other players in-game, such as the works of Bowman, Schultheiss, & Schumann (2012) and IJsselsteijn, W.A., de Kort, Y.A.W. & Poels, K. (2008), this particular research scope sees only the player's character as an avatar, and only to the player himself; other player's characters and NPCs are taken into account only as constructs, which are entities akin to programmed robots without emotions or personalities of their own.

A study conducted by Ravaja, N., Saari, T., Turpeinen, M., Laarni, J., Salminen, M., & Kivikangas, M. (2006) shows that there is a significant difference in the way a player

experiences the game depending of the social context he/she is playing by measuring anticipated threat, challenge, engagement and spatial presence, amongst others, on games that featured multiplayer modes. This study indicates that the player's psychological responses vary according to the degree of closeness the player has with the opponent, with "Friends" being the group that gave the player a more intense experience, followed by the "Strangers" group and in last the "Computer". As such, one can infer that a high social presence in videogames will change the way the way a player experiences the game and might serve as a motivator to perform better, even if this presence comes from a computer controlled character.

Objectives

The main objective of this research work is to establish an initial step towards a different view on Parasocial Interaction, focusing not on the relationship between a player and his/her own character but on the relationship between the player and the virtual world that envelops his/her avatar, while suggesting an adapted nomenclature regarding virtual entities based on their importance to the player.

This project also seeks to understand which factors may affect PSI resulting from interaction with in-game characters.

The tertiary objective is to understand how the presence of an Avatar will affect the overall experience, enjoyment and performance of the player when performing tasks, as well as the completion of given objectives, which then would serve as a means to help understanding how some characters are seen as mere tools or obstacles, and others as entities of their own, with personalities, feelings or even mannerisms.

In order to accomplish these goals, this research takes on an exploratory nature with the intent of producing new information, rather than testing pre-existing hypotheses with a deterministic approach; this approach produces answers in a more unbiased manner, as it seeks results regardless of whether they confirm, dismiss or even if they are unrelated with the assumptions that are made in light of the research made, present at the end "Theoretical Framework" chapter, along with the research questions.

The basis for this research is therefore to understand how a player develops a relationship with a virtual entity in a videogame and which factors support and affect this relation, as well as the impact that this relation has on the player's gaming experience.

Part I

The Project's Theoretical Background

1. Theoretical Framework

Though this work's focus is that of Parasocial Interaction and how it affects the player's gaming experience, there is one key concept which must be mentioned first, this being that of "Engagement", which can be roughly portrayed as the concept that describes the process through which a player or spectator is approached and "hooked" by any sort of work, such as movies, books, games, etc., standing as part of the foundation of Parasocial Interaction.

1.1. Engagement

The concept of engagement is not a byproduct of videogames; it has predominant use in cinema and other media, and is as old as storytelling itself, being used to describe the relationship between the spectator and the story he/she is experiencing. Rather than an isolated phenomenon however, Engagement is the product of an assortment of factors, these including Suspension of Disbelief, Immersion, Empathy, Entertainment, etc..

The table below is a translation of the table found in Nelson Zagalo's "*Emoções Interactivas. Do cinema para os videojogos*" (2009), translated as "Interactive Emotions. From cinema to videogames". The texts contained in the "Definition" row were translated from Zagalo's book which was in Portuguese; as such, the texts displayed are approximations rather than exact quotes.

Concept	Area	Definition
Emotional Connection	Communication	It refers to the act of recognition and acceptance of the emotional state of the other communication (Planalp, 1999).
Emotional Identification	Movie Studies	Act of putting yourself *in someone else's shoes* and feel exactly the same as the other (Tan, 1996).
Engagement	Arts	"To entertain an audience (...) involving and immersing it the psychologically in the experience" (Tallyn, 2000b).
Entertainment	Media Psychology	Activity that allows the subject to escape the surrounding reality, being rewarded with pleasure and personal fulfillment (Vorderer, 2001).
Flow	Psychology	"A sense of discovery, a creative feeling that transports oneself to a new reality that elevates a person to high levels of performance and leads to previously undreamed states of consciousness" (Csikszentmihalyi, 1990: 74).
Empathy	Psychology	Defines the act of placing ourselves "in place of the other - not in the sense of identification with that other, but as an attempt to realize their experiential state as much as possible (...) and is built by the subjects as a feeling with or for other individual" (Zillmann, 1994).

Somatic Movement/Displacement	Videogame Design	"A person's ability to project the mental model of their identity in another form of physical identity, representing the player in an alternative environment" (Holopainen and Meyers, 2001)
Immersion	Computer Sciences	"It is characterized by decreased critical distance to what is shown and increasing emotional involvement in what is happening" (Grau, 2003).
Presence	Computer Sciences	"Feeling the experiences of a conscious body when immersed in a concrete outside world" (Waterworth and Waterworth, 2003).
Mental Simulation	Cognitive Sciences	"Everyday skill used to make sense of the behavior of others. One of the crucial elements is the identification or attribution of a mental internal state that generates action, especially attitudes of belief and desire" (Gordon and Cruz, 2003).
Illusion	Philosophy	It is the capability to protect the real. (Rosset, 1976).
Suspension of disbelief	Literary Studies	It refers to the reader's will to accept the premises of fiction as fact. The audience agrees with the suspension of disbelief for the duration of the performance. (Coleridge, 1817)
Transportation into a Narrative World	Literary Studies	"Phenomenological experience of being pushed by a powerful, twisted history (...) cognitively and emotionally (...) involved in the world's history (Green, 2004a and 2004b).
Lost in a Book	Literary Studies	"The small black lines on the white page are as still as a grave, colorless like the desert, but give the reader a pleasure as sharp as the touch of a beloved body, so awake, colorful, and transfiguring like anything else in the world" (Nell, 1988)

Table 1 – Correlation between the concepts and the areas about the Immersion process (Zagalo, 2009, p.203 – 205)

This table maps the immersion process by presenting concepts that relate with one another in symbiotic ways, regardless of medium.

By linking the concepts in the table above, it can be said that Engagement is the process through which the narrative hooks the player/spectator by taking his mind from the physical setting he is and sending it to another world, where the notion of possibility is blurred and the action keeps the spectator in this escapist state, through emotional attachments and illusions. In other words, Engagement is the phenomenon pertaining to the involvement between the spectator and the narrative, as well as the processes that makes it possible.

Videogames bring something that movies cannot, however, which is control; with control now given to the previously mere spectator, the story can now follow a player and

change according to his/her actions, even if one does not stray from the script. Now the spectator doesn't have to send himself into the virtual world, as the medium not only performs such task as it empowers the spectator with tangibility in the virtual world, transforming spectator into player. This new paradigm has a problematic, which is whether the immersion of the player as an active part of the experience is smooth or if causes friction between the player/spectator and the medium. This friction can have a number of causes, such as the game's difficulty being too high, poor interaction between the game and the player, lack of information, etc..

Engagement in videogames is thus the process that describes how a player creates a parasocial relationship with the games' virtual entities by willingly immersing him/herself in the games' narrative/world whilst assuming the role of an in-game character (Transportation), and by finding common ground with the game's virtual entities, and maybe even adopting some of their beliefs or mannerisms (Identification) (Brown, W. J., 2015).These relationships are cultivated not only during game time but also in any other activity that may be related to the game, its characters or that just causes the player to reminisce about the game, some examples being reading character biographies, see media related to the franchise, such as movies, books, etc., or visit places that inspired game content.

1.2. Parasocial Interaction

1.2.1. Origin and key components

The term "Parasocial Interaction" was first coined in the scientific work "Mass Communication and Para-Social Interaction: Observations on Intimacy at a Distance" by Donald Horton and R. Richard Wohl (1956), proposing the existence of a pseudo relationship between media shows through their characters and the viewers of said shows, also explaining how these relationships take place and which factors are involved; this first landmark establishes the PSI theory, deconstructing the complex phenomenon into different categories, these being:

- **The Persona/Personae**
    - The Persona is the performer, the focus of the parasocial relationship; it is a pre-thought personality with no ill surprises to the viewer, assuring that a bond created between viewer and performer is a lasting and personal friendship just as any other "in real life", but predictable, without ever hitting any metaphorical "rough patch".

- **The Bond of Intimacy**
    - The bond of intimacy refers to the illusion perpetrated by the personae, in which the viewers are engaged with the intent of drawing them into feeling as if they are part of the show, or as if the whole show is a circle of friends which extends to the viewer himself in order to be complete, something achieved with the usage of the character's first names, their nicknames and overall

inclusion of the viewer in the personae's private lives; the personae may also step out of their limited reality, turning the "outside world" a part of their reality, thus inducing a sense of belonging in the viewers.

- **The Role of the Audience**
  - The Audience is composed by the viewers of the shows, which are engaged by the persona and reeled in to participate in the show; the acceptance, which can be related to suspension in disbelief, or refusal of the invitation, is entirely up to the audience - the viewer - and their willingness to participate.

- **The Coaching of Audience Attitudes**
  - The willingness to participate however, does not rest solely on the audience, as the media themselves employ tactics such as having guests over to "play" the role they intend for the audience to have when engaged by the shows' hosts.

- **Conditions of Acceptance of the Para-Social Role by the Audience**
  - The audience must be willing and expecting, preferably in a natural way rather than having to force itself into participating in the experience, so it does not suffer from a feeling of alienation which in turn will stop the spectator from even trying to adopt his designated role; such response may originate either from the spectator's own volition, or from a flawed prediction by the show's planning team.

- **Values of the Para-Social Role for the Audience**
  - The fealty of the spectator is rewarded with experiences and rewards, these being the inherent enjoyment from viewing the shows and their personae, as well as the mentorship provided by role models, better than their real counterparts such as the husband that is always thoughtful and understanding and the wife that is joyful and feels complacence. The spectator also has the possibility of assuming a role similar to the one of the personae, by interiorizing the traits he sees fit, such as being an exemplary person due to having children of his own, when such is viewed positively in the media.

- **Extreme Para-Sociability**
  - Individuals that experience parasocial interaction are not necessarily prone to anti-social or exclusive behavior; there are, however, extreme cases in which the audience uses this kind of socialization to fill in the voids created by their own lack of social relations, with these being mainly of the romantic, erotic and sexual nature.

- **The Image as Artifact**
  - The personae are not extensions of the real life "actors" that play them; their impact on the audience, however, varies immensely with the actors' private lives, which cannot be held a secret, as such would only increase the curiosity

> of the masses. This "open book-ish" approach allows the audience to perceive the actor as a quasi-heroic real life embodiment of the persona he plays, rather than the person he truly is. This may propel the audience members, as fans, to seek out the actor, either at a distance through letters and phone calls or even by face to face meeting in order to be truly acknowledged by the persona, with the intent of earning a sense of importance and self-achievement. Ultimately, the presence of the fictitious characters in the parasocial life of the audience may influence the very way an individual's social life evolves.

1.2.2. Development

Despite this concept of Parasocial Interaction being primarily of the psychological nature and its great usefulness for the media, it was target of little attention until the decade of 1970, when communication science's community started taking interest; as for the psychological science's community, it has yet to actively explore PSI as a field of research (Giles, 2009).

The concepts discussed by Horton and Wohl (1956) introduce parasocial interaction as existing predominantly in a theatrical-like scenario, having actors who perform a narrative, with the occasional inclusion of the public in the show, and audience, comprised of the spectators in their metaphorical seat, devoting their attention towards the stage and forming bonds with the characters they sympathize with, forming a pseudo-relationship with them.

While this theater metaphor applied seamlessly to the non-interactive media, the creation of videogames has since shambled it by putting the audience, now in the role of the player, inside the "show" rather than merely integrating it, also having weight in it, meaning this new audience – the player – depending on the degree of freedom given to him, can and will impact the way other in-game characters behave or even the game's very outcome, provided such effects are scripted in the game (Kavli, 2012), as it can be seen on the series "*Mass Effect*", where the choices made by the player can decide which characters live or die, which then may change the events later on in the game to extreme scenarios such as having the player and/or some (or even all of) his/her crew members die at the end of the second game in the series.

1.2.3. Evolution of Parasocial Interaction in Human Computer Interaction and Videogames

Another field of study pertaining to the context of PSI is the Human Computer Interaction, which aims to study which and why the boundaries between humans and computers exist, and how these may be overcome (Krämer, 2007). It has been shown that people will follow instructions better and will also react with less negativity when receiving bad news from virtual persons, rather than by conventional media such as simple audio; this influence is not without its downsides though, as a more human-like presence, may lead to actions that are not as truthful to the person, as they are socially acceptable, which in turn results in behavioral conditioning (Elson, Breuer, Ivory, & Quandt, 2014).

This sort of conditioning is not so prominent in videogames, especially when the player is alone or at least in a private context, as there is no active social pressure for him to behave in any expected way but his own (Elson et al., 2014), using his character as a representation or even an extension of himself, assuming the role which the game delegates to the character (Klimmt et al, 2009), with free reign over his actions within the constraints of the game, sometimes even bypassing said constraints by exploiting game bugs or glitches to "cheat" the game or gain advantages over other players, sometimes receiving dire penalties for such actions.

As such, using the nomenclature established by Horton and Wohl (1956), it can be said that the original relationship between Audience and Personae has not disappeared but morphed instead, in not one but two major perspectives, the first portraying the player as assuming the role of the Audience, and the character he controls being in turn the Persona, in a dyadic relationship (Klimmt et al., 2009); this perspective of the relationship, and the repercussions it may have on the psyche of the player has been the main focus of the parasocial interaction research thus far, as seen in works such as those of Lewis, Weber, & Bowman (2008) or Tukachinsky(2010). The second, and less explored approach to this subject, features this relationship as a monadic one (Klimmt et al., 2009), seeing the character as an extension or representation of the player, eroding the role of the Audience as a passive entity, by incorporating it in the action along with the Personae, effectively making the player an active, significant component of the Personae's virtual world; this approach is most easily recognized in games which use the player's body as a controller (Jin & Park, 2009), MMORPGs (Mass Multiplayer Online Role Playing Games) and certain "conventional" RPGs (Role Playing Games) such as "*The Elder Scrolls V: Skyrim*", where the played character is often created from an assortment of possible customizations (Kavli, 2012), which can span from, for example, simple face palettes to individual facial traits customized independently, such as eye width and height, brow size, jaw line depth, hair style, hair color, etc..

1.2.4. Pro-social and Anti-social gaming

Bowman et al (2012), with their research focused on online video gaming, divide the act of social behavior in gaming in two focused categories: Pro-social and Anti-Social Video Gaming. Pro-social Video Gaming exists when the player actively uses the videogame to either cultivate new social relationships which he possibly cannot find in other contexts, or to further evolve the social links he already has. Anti-Social Video Gaming is depicted when a gamer uses the social component of videogames in an aggressive way, fuelling narcissist tendencies whether through "griefing", the act of intentionally harassing and irritating other players, usually those which should be on the same side as the player himself; these players do not play the game primarily to develop social bonds but to infatuate themselves with pride over needlessly beating others, even without having an in-game-related purpose.

1.3. Distinction between Construct and Avatar

Gaming narrative, which sometimes may originate from the player's personal experiences – such as a rivalry felt towards a certain car/racer in a racing game, despite such a relation not being something intended by the game developers –, features many agents, these being divided into two major categories: Constructs and Avatars.

The term "construct" is defined by the Merriam-Webster Dictionary as "something (such as an idea or a theory) that is formed in people's minds", when used as a noun. Constructs, in this context, are the videogame characters that have been "constructed" by the development team and may have personality imbedded but are not seen by the player as entities themselves, instead being perceived as something no more alive than talking robots, with little to none social empathy. This kind of characters has also been referred to as "bots", being virtual characters comprised of digital models and AI (Artificial Intelligence), which serve to guide the player throughout the game, serve as obstacles, incentive him to perform tasks or simply to provide ambience, having every aspect of their existence pre-ordained by programming (Kavli, 2012). While technically true, when approaching the subject through broader sight, it can be hypothesized that, when engaged in online gaming for example, other players' characters might be as just or less important as the bots present in the game; as such, while bots are always constructs, constructs are not necessarily bots.

Avatars, like constructs, are characters in videogames, with the difference lying in the player's perception of them: they are not talking robots with preprogrammed voice lines and behavior, nor are they virtual suits for a player to put on: they are Arthas – both prince and paladin, on a quest to save and cleanse the world from the Undead, only to be consumed by the power he sought do eradicate, culminating with the murder of his father by his own hand, ultimately followed by his rising as the Lich King, leader of the Undead; they are Solid Snake – a secret agent sent on a mission at the paramilitary base "Outer Heaven" to prevent the activation of what he then discovers to be a bipedal tank, a Metal Gear, capable of serving as an unstoppable nuclear bomber, then uncovering government conspiracies tied with the incident and his own past; they are Mario, the plumber, trying to save a princess and they are Yoshi, a dinosaur that helps said plumber move around; they can be a person with severe headaches that needs medicine to get better, a trickster that keeps on pulling pranks, or a dog that the player plays around with (and then possibly hurts a leg for extra emotion); they are villains that make the player feel they must be stopped, not because the game tells the player to do so, but because the player feels a need that to be done, or just because the character's personality is so strong, that the player just wants to see more of it.

The concept of Avatar can be divided in two major distinctions: the Player's Avatar and the Other Avatar; the major differences between these two kinds are that the player has direct control over his own character and identifies the character as his/her own, while being only able, at most, to influence other characters' behaviors, if the game so allows it; even if the player is able to control other characters, these are not the Player's avatars if he/she does not consider them to be a representation of the self or, at a bare minimum , embody a generous amount of ideals that the player also shares or admires.

Figure 1– Example of Avatar (Big Boss) and Construct (Soldier being ambushed) from "Metal Gear Solid 5: Ground Zeroes" (Konami Digital Entertainment, 2014)

The image above shows two characters from the game "*Metal Gear Solid 5: Ground Zeroes*": the player' character and Avatar, Big Boss, who is the main character of the game, with whom the player establishes an emotional connection over the course of the game, and a soldier controlled by AI with no real impact or emotional bonding with the player; this second character is, in a way, just a drone doing his job; even if the player can interact and control him to such extent (as evidenced by the options depicted in the image), the player establishes no connection at the emotional level. In the end, the truest difference between Constructs and Avatars is the following: from the player's perspective, Avatars, unlike Constructs, are truly alive.

Such a distinction however, is dependent not only of the setting the game provides, or the role any character has had designed for itself, but also on the player that interacts with them or that merely spectates the interaction between these virtual characters, ultimately gifting them the final element needed for them to truly come alive, which means that whether a Construct becomes an Avatar or remains a programmed robot, depends on each player's perception of said Construct.

One example of AI controlled Avatars is the "Mass Effect" series, which focuses heavily on character progression. In these games the player takes the role of "Commander Shepard" and, as the games progress, is given the option to develop relationships with an assortment of characters, being even possible to develop romantic relations between the player's character and other party members. In the first game of the series, the player chooses two characters out of the six party members available to form a squad which accompanies him/her on each mission, these being changeable between missions. These characters are intended to be, by default, Avatars, though the player might see one or more party members as Constructs, if he/she does not establish an emotional link with the characters, "demoting" Avatars to Constructs.

Figure 2 – Cropped image of the first Mass Effect game's squad members selection screen (Author unknown, n.d.)

Another prime (and in this case, inverse) example of this clause is the character "Karima", from the "*Borderlands 2*" game, as it is stated in the Inside the Box article by the game's lead writer Anthony Burch (2013); the original intent for the character was for it to merely provide missions to the Vault Hunter (the player) which establishes the game's antagonist as a detached being, willing to sacrifice, enslave and experiment on innocent people, thus having consequences on the planet and its denizens. This character is afflicted with chronic stuttering, and is, to most players, just a regular NPC, thus being regarded by most as just a construct; to one specific player though, this character is an Avatar. The player in question suffers from brain damage caused by shrapnel while on tour in Iraq and has ever since been afflicted by chronic stuttering, having extreme difficult talking, which prompted him/her (the person's genre is not disclosed in the article) to first react negatively to the appearance of the character Karima, due to the game's tendency to joke about nearly everything contained in it. After the initial shock, the player found out there were no jokes related to stuttering at all and felt deeply touched by it, saying the character felt very sympathetic. This evolution would not be possible without the unfortunate past this player experienced as without it, even though the general idea that the villain's actions are taking a toll on the whole planet, there wouldn't be such an emotional connection.

Figure 3 – Portrait of Karima from Borderlands 2 (Burch, 2013)

This form of attachment can be referred to as Parasocial Friendship (Tukachinsky, 2010), where the player has found common ground with a character.

Given that this player has established a connection (of friendship) with the character Karima, it is expectable the player's performance while undertaking this character's missions was higher than average and that the level of enjoyment felt by the player upon completion was higher as well, due to being, in a way, fulfilling a request from a friend, which is a context (playing with friends) that helps players excel in their performance (IJsselsteijn, de Kort, & Poels, 2007).

1.4. Chapter Final Remarks

It can be hypothesized that playing with a character the player enjoys can emulate the same "social pressure" the player feels when playing with friends, which in turn should translate to enjoyment and perpetuation of the will to play the game. Should this line of thought be proven right, it can also be suggested that failing to accomplish the objectives can have a deeper negative impact on the players, as they have not only failed in the mission, they failed their friend, which can translate as sadness, frustration, guilt or even anger; this sort of emotional response varies, of course, according to how deeply attached the player is to the character. It is also safe to assume that, given the option of choice between different teams, cars, characters or classes to play (according to the game setting), a player is most likely to choose the one option which he/she has the most emotional connection with, even if that choice is statistically not the best or even below average; this is something which can be achieved, for example, by providing the player with a car model which he/she may have in real life in a racing game, when one of the football teams available to play with is the one from his/her city, or when the (class of a) character embodies ideals shared by the player.

There hasn't been found research that explores the bond between the player and the other characters in the game's world, and what repercussions these relations may have on the performance and experiences of the player.

1.5. Research Questions

The purpose of this research is thus to explore this named bond between player and virtual character by understanding how a player develops a relationship with a game's supporting characters and are the implications of such bond, with the ulterior motive of seeking to provide a base which helps future works to develop upon it, be it by using the information collected during the course of this project, this research's resulting data or the process depicted in this work.

The general purpose of this research is then broken down into more direct and concise research questions based on the research made thus far, these being the following:

1. Are any generic factors [outside of the specific gameplay] (gender, overall game genre, age, etc.) that help determinate if a player is more likely to relate with virtual entities?

2. Is it possible to identify a player profile that is more susceptible to be affected by the social component in videogames?

3. Is there a game genre that favors parasocial interaction with the supporting characters in videogames?

4. Does the parasocial relationship with virtual characters [other than the player character] in videogames impact the way the player experiences the game, and if so, how?

It is somewhat expected that genres which focus more heavily on the humane aspect of the game such as the RPG genre provide a heavier PSI experience, having as key components factors as empathy and caring for the virtual characters, which would in turn influence the way the player acts or experiences the game, be it by choosing options that are not considered the best ones available or by changing his/her own mood based on the opinions and feelings of the virtual character.

Part II

Empirical study and discussion of the data

2. Method

The empirical component of this work was originally to be conducted on a two pronged approach, these being an online questionnaire and gaming sessions with volunteers. The online questionnaire approach attempts to discern which factors impact the amount of PSI experienced in a more objective manner and if there is a possible pattern to them, while the gaming sessions explores the bonds players form with virtual entities, then crossing the resulting data with the one acquired from the questionnaires.

2.1. Target Audience and Means of Diffusion

Prior to the analysis of the questionnaire's results, it can only be determined that the target audience used for both the questionnaire and gaming session/interview is the student and staff population of the University of Aveiro, as well as former students/staff which might still be present on the departments' mailing lists; the method chosen to distribute the questionnaire was using the Google Docs service, with the questionnaire's link being sent in an email to would-be participants; firstly an email was sent to the different departments of the University of Aveiro requesting each department's communications' pivot or secretary services, if each would share the aforementioned questionnaire with their student and/or docent body; then, upon receiving a positive response, another email was sent with the questionnaire in question. The email also contained an invitation for any person willing to participate in the gaming sessions.

2.2. Procedure of the Qualitative Component

The interview component of this work aimed to achieve a more intimate approach, with a higher depth of responses, by accompanying players in their gaming experience on site to better understand how the organic interaction between the player and the game's characters takes place and how it affects the overall gaming experience.

2.2.1. Gaming Session Planning

With six to ten sessions expected, this approach would provide the research with somewhat "emotional data", by having the player expressing his/her opinions in front of a camera as he/she is playing, as well as by the observations noted by the researcher. The game's window and the player's bust are recorded in a way which is akin to the one taken by the Bolt|Peters research team and Electronic Arts (EA) observers in 2008, when researching how players reacted to the videogame – then in production – "Spore", though in a smaller scale. Using this method, the player's progress and reactions (such as facial expressions, remarks made during the game, the player's posture, etc.) are recorded for further analysis, which allows the player to speak naturally of his experience, and the researcher to see how the interaction happens "in real time" over the course of a one-hour session, rather than having to

ask the player to say how he felt during a specific part of the session afterwards. These follow-up questions can still be made, crossing the answers with the recorded footage.

The data retrieved by this approach would then be crossed with the more generic data gathered through the questionnaire to, at some extent, check the validity of the results.

Rather than having the participants play different games, it was chosen that only one game be used in order to have a common denominator in the players' reactions. As such, the game chosen for these sessions was "South Park™: The Stick of Truth™" (Ubisoft, 2014), published by Ubisoft.

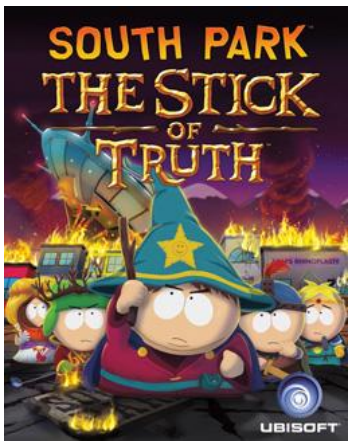

Figure 4 – Cover of "South Park™: The Stick of Truth™" (Author unknown, n.d.)

This choice stemmed from convenience and availability: a copy of the game in question was already owned by the researcher and it provided key components required for the research, these being the following:

- The game is of the RPG genre, which supports (the creation of) relationships and character development.
- The player's role is that of the "New Kid", meaning that the player is introduced as a new character into the already existent world from the franchise, thus being able to interact with all of the story's characters as if they were talking towards him/her.
- The game is based on a successful franchise that has a wide spread, thus allowing predisposition towards establishing a positive para-relationship with the show's characters.

The factors displayed below were also held into account:

- The player can choose one of five supporting characters which are the show's protagonists (changeable at any given moment after being unlocked) to accompany him.
- The game is of the humor nature.
- The game's mechanics are fairly simple but have enough depth to challenge players, while maintaining smooth gameplay.

2.2.2. Gaming Session Structuring

As mentioned before, the gaming sessions would have the length of one hour, taking place in a controlled environment, with the researcher present to answer any question the player might have, with information being recorded via camera and microphone, as well as screen footage, all three being compiled into one video file using the OBS (Open Broadcast Software) (Version 0.651 Beta; OBS Project, 2012) streaming program, which not only makes it possible to stream the footage online but allows the user to save it to the computer. The microphone is part of a headset that the player wears in order to prevent outside noises from distracting him/her. After the gaming portion of the session was done, the players would be asked to fill out a questionnaire similar to the one distributed online.

2.2.3. Method of Analysis

When analyzing the resultant videos of the players' gaming session, the players' words, reactions and mannerisms displayed over the gaming sessions would firstly be transcribed and noted to later be used in creating a baseline with the purpose of understanding how each player behaved when most relaxed and engaged, then crossing this "evaluated" feedback with the session footage in order to verify if the personality of the supporting characters impacted the game experience significantly.

2.2.4. Critical Incidents

Only one session took place before hardware problems forced this component to a halt, from which it could not recover due to time constrains.

This component was not entirely without results though, as this one session provided information regarding the approach itself, specifically the time span of the session and the lack of structure: one hour per session proved to be a too small amount of time for the player to contact with the game's virtual characters due to the exploration component of the videogame used. During the time spent playing, the player managed only to complete the tutorial along with one side quest, having spent most of the remaining time roaming around and exploring the game world while interacting with NPCs whose character depth consisted of a few lines of generic dialog.

The notes taken from this session indicate that this sort of approach requires a longer time-frame than the one initially planned, as the players need to progress at their own pace in order to get meaningful data.

As a means to focus the player without rushing him/her, future sessions should contain a loose structure of the course the player should follow with general directions in order to avoid making the player take the directions as tasks.

The data recorded on the session mentioned above was not able to be retrieved from the computer; due to the hardware problems tethered with the limited time available, re-structuring the qualitative analysis component of this research was not viable and as such, further pursuit of this component had to be abandoned.

2.3. Procedure of the Quantitative Component

As mentioned at the start of this chapter, the quantitative component of the research consists of an online questionnaire which was distributed through the Google Docs service via email. This approach aims to provide a more generic view of the PSI phenomenon by gathering information from a higher amount of participants focusing on discovering which factors impact the degree of PSI shown and if the emotional connection between player and virtual characters impacts the player's choices and experience.

2.3.1. Online Questionnaire Creation

The questionnaire in question was originally to be based and adapted from the work of Lewis, Weber, & Bowman (2008), which establishes a scale to measure character attachment between the player and the player character, having been credited with explaining about 66% of the variance of character attachment with just seventeen questions, having already been used in the work of Bowman et al (2012). This first choice proved to be a step in the wrong direction, not due to the lack of importance of said works but due to the core objective of the questionnaires themselves, which is to study character attachment between the player and the virtual entity he/she controls: the player's Avatar. In order to study the relationship between the player and the other in-game characters, a different, more social, approach had to be taken; as such the basis for the questionnaire was changed, using an adapted version of the social component present in the questionnaire used by IJsselsteijn et al (2008) which pertains to the impact that playing with other people has on the player; in other words, the questionnaire is focused on Social Presence, which used to describe the degree to which any type of media allows a user to establish personal connections with other users (Kumar, N., & Benbasat, I., 2002), in this case videogames. Parasocial Presence is both the focus of this adapted questionnaire and the term used when the medium itself makes use of any means available to it in order to become a social actor (Kumar et al, 2002), whether it may serve as a mediator between users, or as one of the mediated parties itself.

The questionnaire developed and used in this research is comprised by two parts:

- The first part contains questions that require mandatory response and pertains to the way the participant relates with in-game characters. In this part participants are asked to choose a game that comes to mind when thinking about relationships with in-game characters and to answer the questions that follow with that choice and own experiences in mind, stating whether or not they agree with the statements in a scaled answer comprised of multiple choice.
    - These questions have answers that range on five levels, the lowest being "Do not Agree at All" and the highest being "Agree Extremely".
- The second part is comprised of optional questions, which pertain to the player him/herself; these questions are meant to help establishing a pattern which might explain the individuals' score.

- In the second part still, there is an area designated for comments from the participants which was mostly left in blank, without any remarks worthy of note.

This approach was used for its wide area of coverage, allowing a bigger sample of the target audience, with clear and quantitative data.

2.3.2. Limitations

Unfortunately, the overall response from the population was dim, at best, with only thirty three participants answering to the online questionnaire, with one of the participants giving unusable data, possibly answering only as a joke; such a small amount of participants makes it more difficult produce statistically relevant results from the analysis of the data, as well as voiding the possibility of making a hypothetical deterministic generalization of the results to the sample's universe.

As a side note, only one person answered positively to the invitation to participate in the gaming session in the email sent as well.

3. Results

The following chapter pertains to the data retrieved via questionnaire, constituting the analysis of the empirical research of this research, where the participants' traits, preferences and opinions are analyzed.

3.1. Processing the data

3.1.1. Reliability Analysis

As this research focuses on a new approach to the PSI theory in videogames, the questionnaire employed had to be either built from the ground up or adapted from pre-existing works, with the latter option being chosen, based on the social presence component of the work of IJsselsteijn et al (2008). Though the original questionnaire has validity on its own, this research has not discarded that performing adaptations leaves margin for error and as such, required at least some rudimentary form of validation, which was achieved using an internal consistency test.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,885	,885	17

Table 2 – Internal Consistency test

With the Cronbach's Alpha value at 0,885, the test shows an acceptable degree of consistency, meaning that the answers provided by the players appear to be generally consistent, indicating that this version of the questionnaire is coherently built and therefore structurally reliable.

3.1.2. Quantifying PSI

In order to quantify the parasocial interaction the players show, the values of each participant's seventeen answers were turned into percentages using the cross-multiplication rule of three. This PSI value can be perceived as parasocial presence (PSP): the higher the percentage value is, the more PSP is shown by the participants.

3.1.3. Clustering the sample

As mentioned in "2.3.2. Limitations", the analysis of the data is compromised if it is used in its raw state due to high segmentation of the participants control answers, when

paired with the low amount of participants. The method used to circumvent this limitation was to generate clusters from values of the control variables whenever possible, grouping variables such as the chosen games' genre, the participants' occupations, etc.

This approach allows generating larger groups for analysis, thus producing more accurate results, in which odd discrepancies stand out rather than falling between the acceptable margin of error.

3.1.4. Tests used

Though parametric tests are at times used on this analysis, the majority of the tests performed are of the non-parametric nature. These tests are used in order to even out the weight of each value by attributing ranks, preventing rogue values with high discrepancies to skew the tests' results.

Of all the tests used, the Kruskal-Wallis is the one that most stands out, being used due to both the diversity of the variable types present in the test and to the test not assuming that the tested sample has a normal distribution.

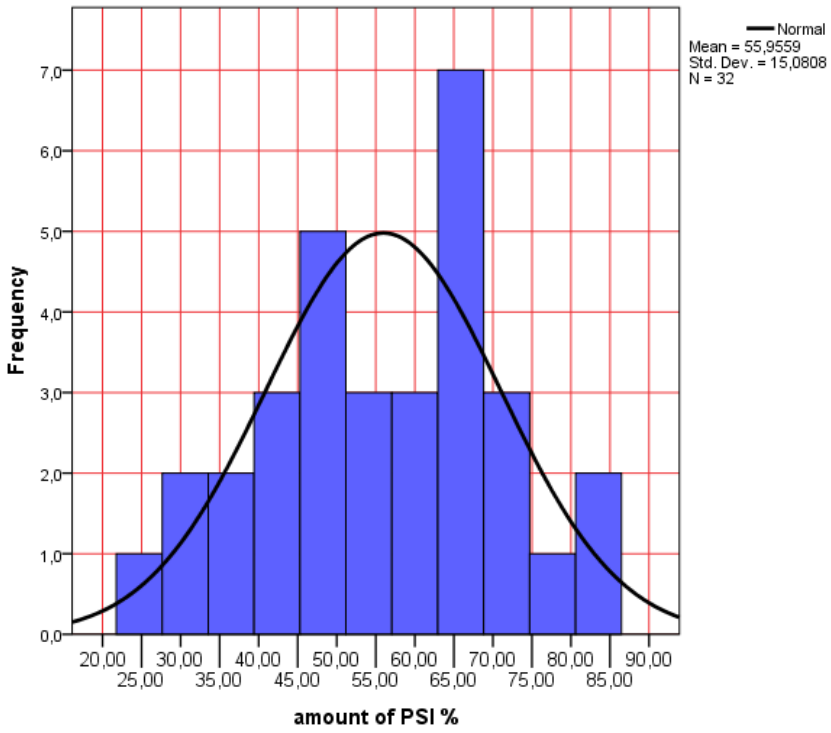

Figure 5 – [Normal] Distribution of the Participants' PSI scores

As seen in the figure above, the amount of PSI show by the participants, which is the basis for the grouping variable used in the Kruskal-Wallis Test, does not show a normal distribution.

3.2. Describing the Participants

The sample size is, as mentioned above, of thirty two participants due to one response being excluded. Through analysis of the questionnaire's control questions, it is determined that the questionnaire's participants were mainly students, accounting for 84.4% of the sample size, with the remaining 15.6% stating being either employed by others, by themselves or unemployed; due to these values being too scarce, they were clustered to form a larger group, thus facilitating data analysis.

Eighteen of the participants are male, representing 56.3% of the sample size, with the remaining fourteen being female, representing 43.8%.

Most players consider themselves to be of the Casual gamer kind, representing 59.4% of the sample size, with 34.4% ranking themselves as Core gamers and only 6.3% claiming to be hardcore gamers.

Age seems to be very clustered overall (Std. Deviation = 4.257 years), most probably a byproduct of using a university as the means of obtaining participants.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	3	9,4	9,4	9,4
	19	4	12,5	12,5	21,9
	20	4	12,5	12,5	34,4
	21	3	9,4	9,4	43,8
	22	1	3,1	3,1	46,9
	23	5	15,6	15,6	62,5
	24	4	12,5	12,5	75,0
	25	3	9,4	9,4	84,4
	26	1	3,1	3,1	87,5
	27	1	3,1	3,1	90,6
	31	1	3,1	3,1	93,8
	33	1	3,1	3,1	96,9
	36	1	3,1	3,1	100,0
	Total	32	100,0	100,0	

Table 3 – Ages grouped into quartiles by color

In order to perform a more accurate analysis, groups were created by dividing the participants' ages into quartiles by approximation; this grouping was then undone and age was used in its original values, due to the quartiles resulting in a "corruption" of the data; below is a bar chart for a visual representation of the aforementioned intervals resulting from the dividing by approximation.

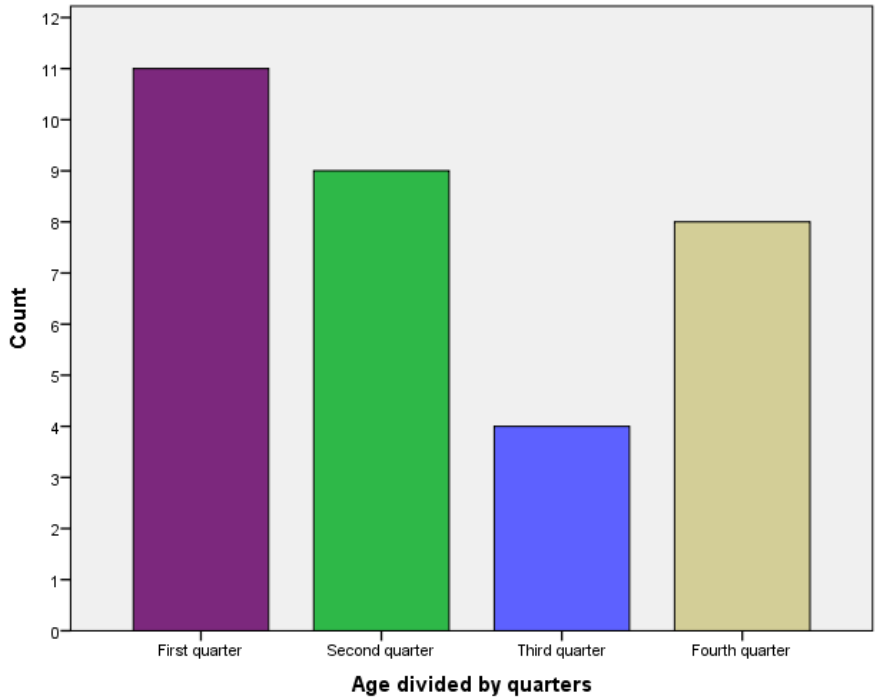

Figure 6 – Visual representation of age grouped in quartiles by approximation

As we can see, the division is all but balanced, which then results in the discrepancy noted in the following images, where the same relation was made between the percentage of PSI shown by players and their age, both grouped and ungrouped.

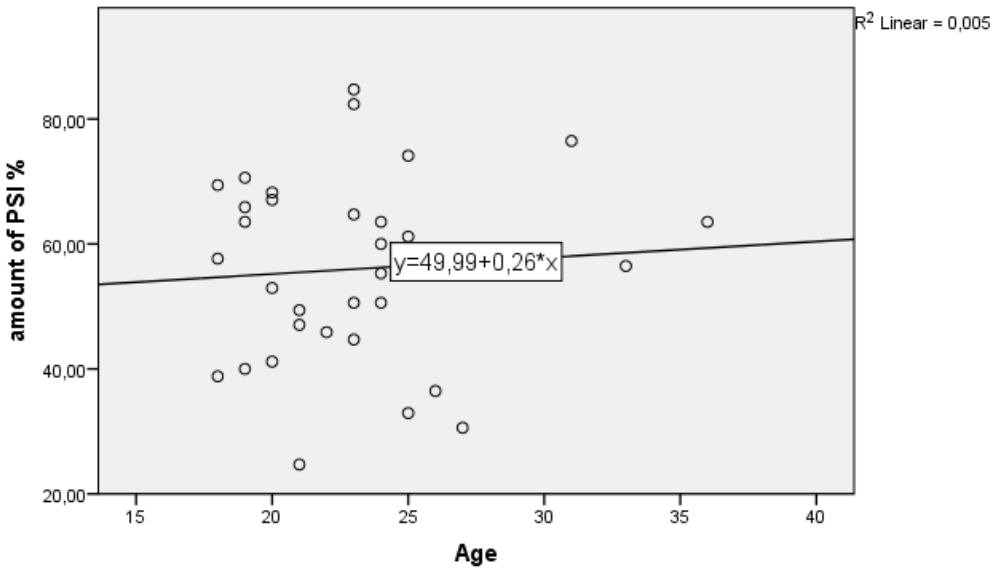

Figure 7 – Relation between Age and PSI percentage (the equation above does not overlap with any values)

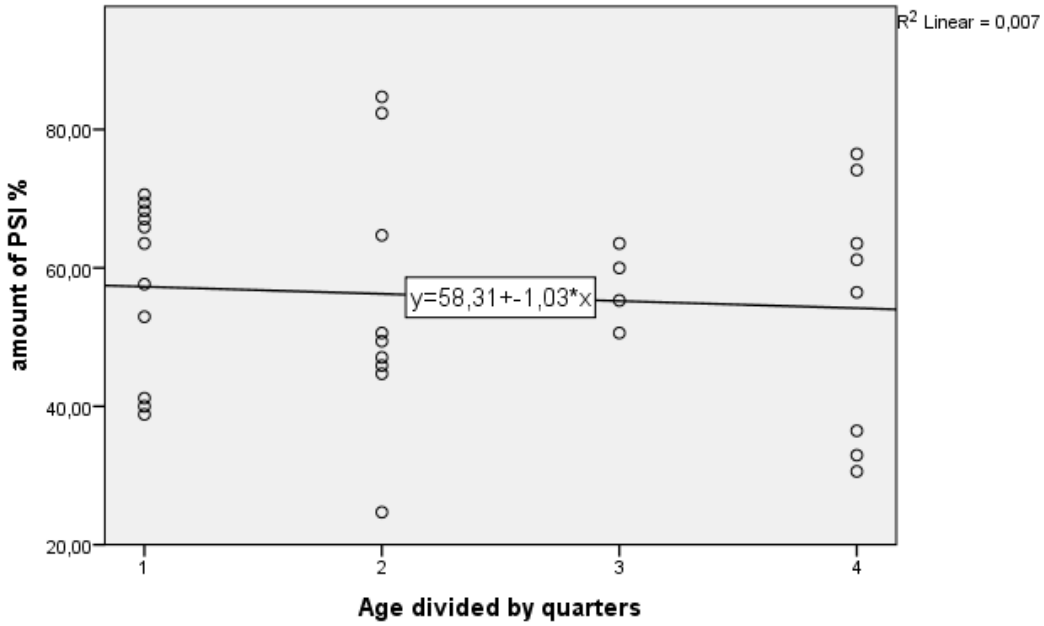

Figure 8– Relation between Age divided in quartiles and PSI percentage

As seen above, clustering age may affect the data analysis in a very strong way; in this case, it even inverts direction of the relation. Such an occurrence would be acceptable if the quartiles were evenly distributed; due to the discrepancy in the actual size of each "quartile" however, using the data in such a manner would be incorrect.

Correlations

		amount of PSI %	Age	Age divided by quarters
amount of PSI %	Pearson Correlation	1	,073	-,082
	p (2-tailed)		,690	,655
	N	32	32	32

Table 4 – Parametric correlation between the amounts of PSI shown and the two ways of use Age

As it can be seen in the table above, regardless of the method used, neither age in its "raw" state nor divided in quarters appear to have statistical relevance towards the amount of PSI shown by participants.

Participant's preferences

As previously mentioned, the participants were asked to write the name of a game they associate with relationships with virtual characters in order to answer the questionnaire. These games were then categorized by genre, this being the value used to perform analysis upon. This process was made using the games' website, the game's Steam service's page and/or game reviewers' websites as the baseline. The determination of in which genre should a game be placed upon was based on which genre appears to be more prominent in each game, choosing that factor over mechanics (i.e.: Action takes precedence over FPS).

Participant's chosen game's genre

In order to obtain large groups for analysis, genres were clustered based on their "family", where the more generic genres took over the more specific ones (one example being Action taking over Action-Adventure). The exact changes are depicted below:

Individual Genre	Grouped Genre
Action	Action
Action-Adventure	
FPS	
MOBA	
MMORPG	RPG
RPG	
Simulator	Simulator
Platform	Platform

Table 5 – Grouping of genres

The RPG genre was the most chosen genre of game for the participants to base their answers upon accounting for 40.6% of the choices, having the action genre closely behind with 37.5% of the participants' choice; trailing behind are the Simulation and Platform genres, with 12.5% and 9.4% of the total, respectively.

Genre of the participant's favorite game

For the genre of the participants' favorite videogame, the same process as before was applied: the participants wrote their favorite videogame's name, which was then categorized for analysis afterwards, using the categories "RPG" and "All Other Genres", with "N/A" being used for void responses. RPG also led the participants' choices amounting to 28.1% of the total value; despite not being a majority per se, the other choices were very scattered, being grouped under "All other genres" in order to provide better groups for analysis, ultimately accounting for 68.8% of the participant's choices; 3.1% of the participants left this field blank.

Participant's favorite genre of videogames

The participants were asked to write their favorite genre of videogames, their responses being grouped once again in the holistic categories "RPG", "All Other Genres" and "N/A", due to the wide dispersion of the participants' answers which resulted in sparse values divided across multiple genres. In cases where the participants wrote more than one genre, only the first genre was accounted. As with the previous cases, RPG led the participant's choices amounting to 46.9% of the total; the remaining genres, when grouped, accounted for 40.6% of the overall value, while 12.5% of the participants declined to answer.

3.3. Analysis and Discussion of the Data

As mentioned in the "Online Questionnaire Creation" sub-section, a questionnaire comprised of two parts was sent out via email; the first part of said questionnaire contains seventeen scaled questions, which are used to generate the PSI% value, with the remaining questions serving as grouping and controlling data.

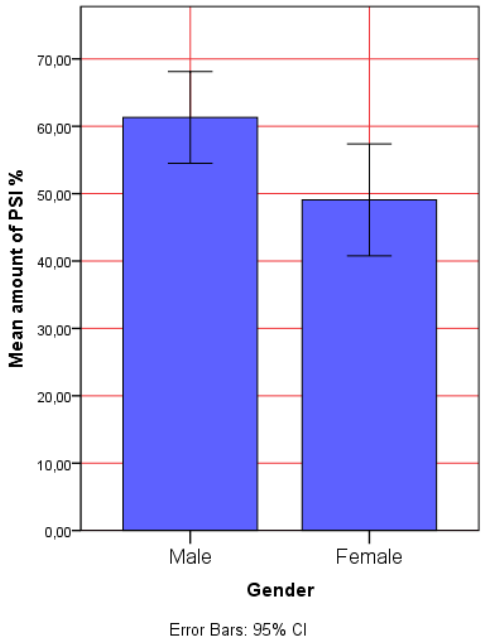

Figure 9 – Comparison of PSI% scores between genders

The mean amount of PSI is higher for males (18 cases) than females (14 cases), with its error margin falling below the 5%, being regarded as statistical relevant. This indicates that the male portion population is more likely to engage in parasocial relationships with virtual characters than its counterpart.

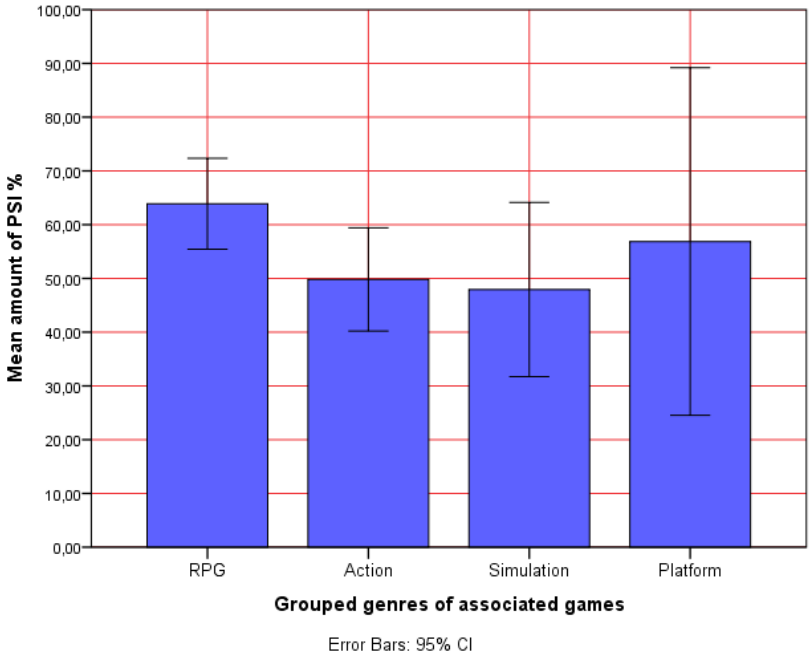

Figure 10 – Comparison of PSI% scores between the chosen games' genres

As for the chosen games' genres, RPG is the one that generates the most amount of PSI, although not being statistically different from the Platform genre at a 5%. Though the Platform genre has the second highest score, the error margin at 95% confidence is the largest of all, which means this score cannot be trusted to be accurate; this is likely due to the Platform genre constituting only a marginal amount of the total sample.

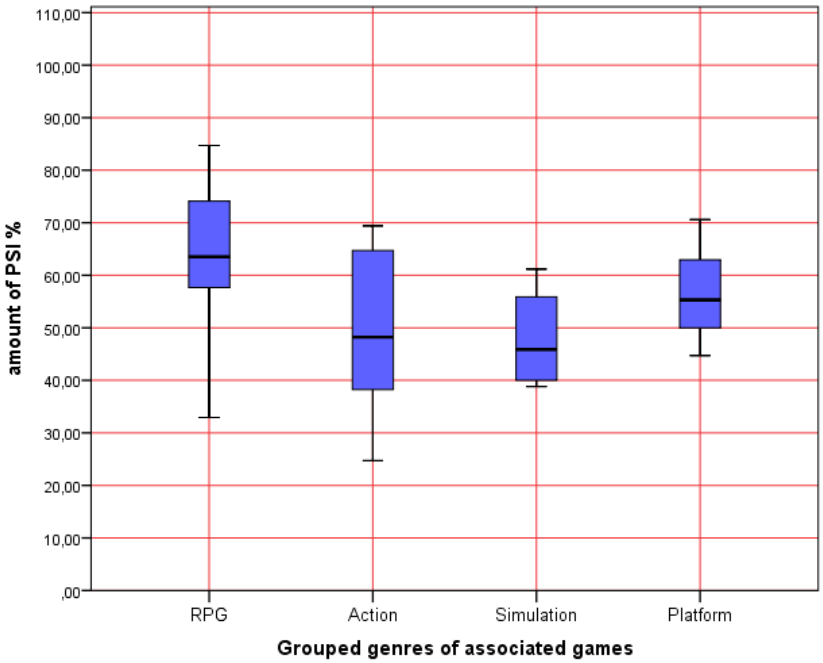

Figure 11 – Boxplots showing the median and distribution of the PSI% per game genre

This is the boxplot version of the previous graph, in which we can now see the distribution in quartiles; "RPG" stands as the genre that generates more parasocial presence, with both the highest absolute values and the highest median, but having its first quartile with values that fall between the 30% and nearly 65%; despite the first quartile of the "RPG" boxplot being as large as the other three quartiles combined, the value responsible for such a wide dispersion is not peripheral enough for it to be excluded from the rest of the sample. "Platform" has the second highest absolute value and is decently clustered, with "Action" as the genre with the third highest median while having the widest dispersion of values from all of the categories. Despite the "Simulation" genre having the lowest median of all four genres, it seems to have a higher threshold on the starting values than both "RPG" and "Action", a characteristic shared with the "Platform" genre, occurrences that can be explained by the dim amount of participants that picked these genres, keeping the values clustered; it is also possible that these genres are also more attractive to people that tend to be on the upper half (or at least near it).

Report

amount of PSI %

Grouped genres of associated games	Median	Mean	N	Std. Deviation
RPG	63,5294	63,8914	13	14,01420
Action	48,2353	49,8039	12	15,11065
Simulation	45,8824	47,9412	4	10,18287
Platform	55,2941	56,8627	3	13,01228
Total	57,0588	55,9559	32	15,08080

Table 6 – Comparison of PSI% scores between the chosen games' genres

The table above refers to the relation between the associated games and the PSI% shown; RPG has both the highest median and the highest mean of all the genres, as well as the lowest Std. Deviation when compared to the only other genre (Action) that has a similar number of cases.

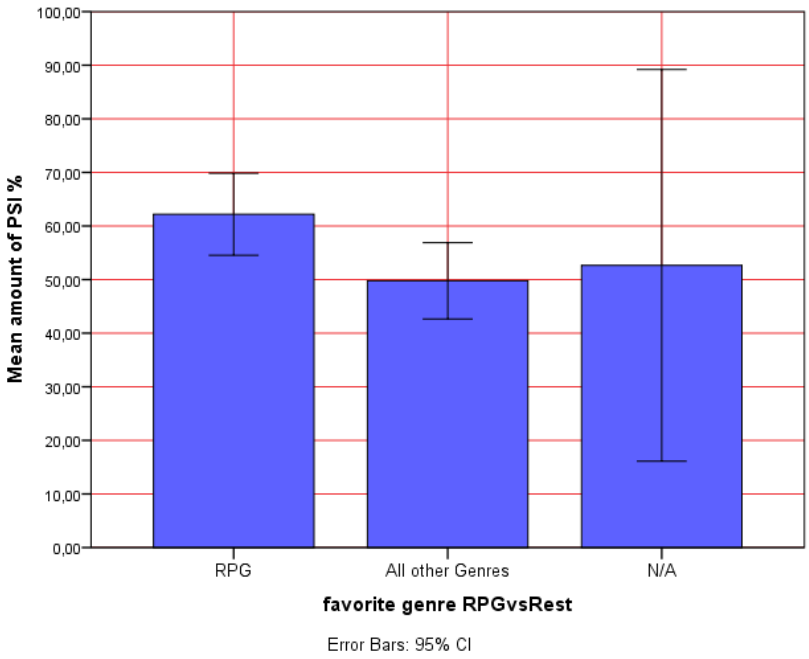

Figure 12 – Comparison of PSI% scores between the favorite genres

The same result is noted when comparing the mean percentile amount of PSI of the participant's favorite genre. In order to have a more accurate comparison, and because RPG covered about half of the sample size for favorite genre, three categories were created to cluster the sample: "RPG", "All other Genres" and "N/A"; the "N/A" category was created because this question stems from the optional part of the questionnaire and there is no way to know which genre is these participants' favorite.

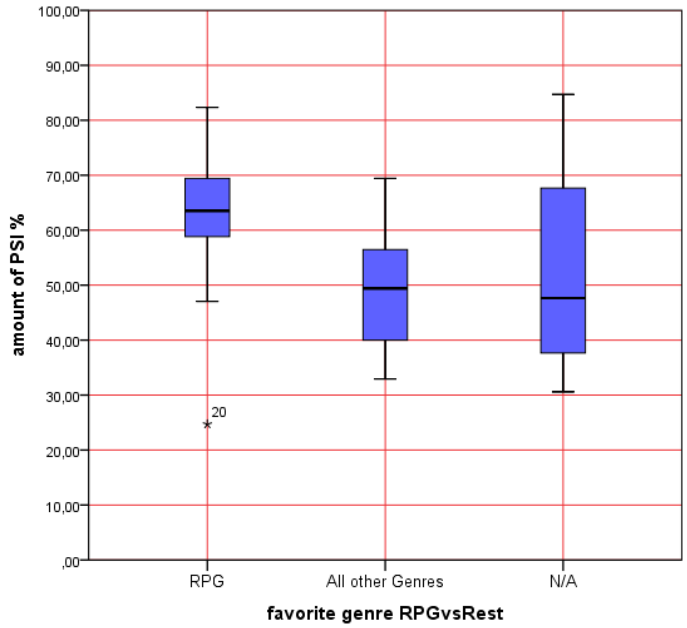

Figure 13 – Boxplot comparison of PSI% scores between the favorite genres

As in the first set, this graph portrays to the distribution of values between participants whose favorite genre is "RPG" and all others; in this graph it can be seen that the "RPG" category's boxplot nearly mirrors itself, having nearly all of the participants' scores above the median of the "All other Genres", with only marginal values below it. Due to case 20's incredible discrepancy in the amount of psi shown, it is considered an anomaly and, as such, is not taken into account in this comparison.

This suggests that Role Playing Games are the ones with the most capability to generate Parasocial Presence, as it can be noted that people who chose an RPG to answer the questionnaire and/or whose favorite game genre is "RPG" scored higher values than the other genres in the PSI scale.

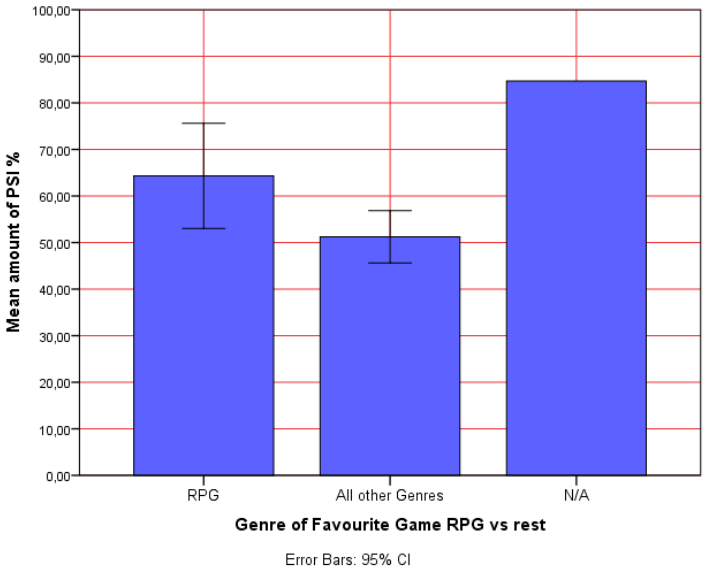

Figure 14 – Comparison of PSI% scores based on the genre of favorite videogame

The graph present in "Figure 14" pertains to the mean amount of PSI distributed by the genre of the participant's favorite videogame, rather than the overall favorite genre of videogames. As in the graphs previously shown, participants whose favorite game is of the RPG genre scored higher in the PSI scale than the other genres, this result being accurate up to a 5% error margin. Only one participant declined to answer this question, which results in the lack of an error bar in the "N/A" option.

It should be noted that both participants who have the RPG genre as their overall favorite and participants whose favorite game is of the RPG genre showed higher scores higher than those who don't when comparing PSI scores between the chosen games' genre.

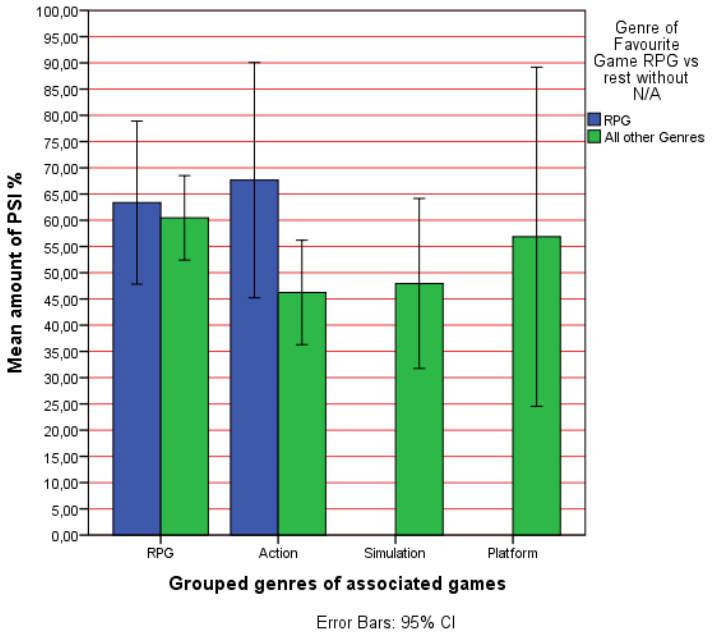

Figure 15 – Comparison of PSI% scores between the chosen games' genres, grouped by the genre of the participants' favorite videogame

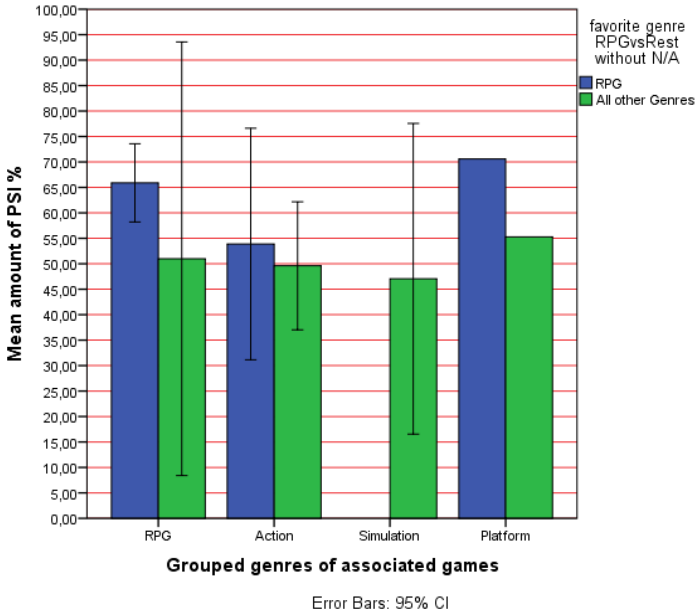

Figure 16 – Comparison of PSI% scores between the chosen games' genres, grouped by the participants' favorite genre

Due to the high segmentation of the sample, most of these results cannot be hold relevant at a 95% confidence level, though they can serve as indicators of the tendency shown. There are no error bars for the "Platform" genre on Figure 16 due to each bar due to representing only one participant each.

Because regression is impossible to perform with nominal variables, the Kruskal-Wallis test was used to check which factors may statistically contribute to determine whether there are factors that influence the amount of parasocial interaction that a player might experience. In order to get more accurate results, the scale was divided into two halves, due to most of the results being centered between the 31% and the 70%, amounting to 81.3% of the total sample size, as seen in the table below. There were no participants showing a PSI score below 20%, nor above 90%.

psi_tenths

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21% - 30%	1	3,1	3,1	3,1
	31% - 40%	5	15,6	15,6	18,8
	41% - 50%	5	15,6	15,6	34,4
	51% - 60%	7	21,9	21,9	56,3
	61% - 70%	9	28,1	28,1	84,4
	71% - 80%	3	9,4	9,4	93,8
	81% - 90%	2	6,3	6,3	100,0
	Total	32	100,0	100,0	

Table 7 – PSI results scaled in portions of tenths, with number of cases counted and percentages

These two halves that comprise the PSI% are the high (score above 50%) half and low (score below 50%) half, being used as the grouping values for the non-parametric Kruskal-Wallis Test in order to verify which factors may have a statistically relevant impact on the general amount of parasocial presence experienced by the player and to find a pattern amongst the variables if possible.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Gender	32	,44	,504	0	1
Participant's occupation	32	1,1563	,36890	1,00	2,00
RPG vs Action	25	1,4800	,50990	1,00	2,00
RPG vs Simulation	17	1,2353	,43724	1,00	2,00
RPG vs Platform	16	1,1875	,40311	1,00	2,00
Action vs Simulation	16	1,2500	,44721	1,00	2,00
Action vs Platform	15	1,2000	,41404	1,00	2,00
Simulation vs Platform	7	1,4286	,53452	1,00	2,00
Genre of Favourite Game RPG vs rest without N/A	31	1,7097	,46141	1,00	2,00

favorite genre RPGvsRest without N/A	28	1,4643	,50787	1,00	2,00
Type of player	32	1,4063	,49899	1,00	2,00
Age	32	22,94	4,257	18	36
psi above or below 50%	32	,66	,483	0	1

Table 8 – Descriptive statistics of the non-parametric test performed

With the exception of "Age", which was left untouched due to being a scale variable, and "Gender", all variables were simplified into one or more variables containing only two values; the "Grouped Game Genres" field was divided into straight comparisons between the four genres individually. For more accurate results, all responses that were classified as "N/A" were removed for the analysis; in addition, the "Participant's occupation" values were also grouped between "Students" and "Other occupations" to produce as fair grouping as possible, rather than accounting for groups with only one participant.

In the following tables a color code is used to mark the fields according to their statistical significance:

- Values in "Black" fall below the 5% error margin;
- Values in "Blue" are found between the 5% and 10% error margin;
- Values in "Red" are those above the 10% error margin.

Though the values that fall above the 10% error margin might be considered unimportant or not worthy of mention due to lack of statistical relevance, these results are depicted nonetheless due to their contextual value.

Test Statistics[a,b]

	Gender	Participant's occupation	RPG vs Action	RPG vs Simulation	RPG vs Platform	Action vs Simulation	Action vs Platform	Simulation vs Platform	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A	Type of player	Age
Chi-Square	2,609	,081	7,060	3,546	1,374	,079	,563	,167	3,185	5,053	,122	,144
df	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. *p*	,106	,777	,008	,060	,241	,778	,453	,683	,074	,025	,727	,705

a. Kruskal Wallis Test

b. Grouping Variable: psi above or below 50%

Table 9 – Results of the "Kruskal Wallis Test"

As noted in the table above, there are only two variables falling below the 5% error margin, these being the "RPG vs Action" and the "Favorite Genre RPGvsRest without N/A", which makes it is presently impossible to find a pattern that can identify whether these factors are determinant in the amount of PSI generated, which translates into parasocial presence.

Because of the lack of significance in nearly all values with a 5% error margin, and even with a 10% error margin (only two more than those at 5%), it is impossible to use these results to form any sort of pattern; the most probable cause for this lack of confidence is the dim number of participants that chose to take part in this project, which stands as more of an exploration than a project looking for absolute results.

It should be noted that the fields with lower error margin are those with the most participants and that share a more even distribution.

While the null hypothesis cannot be disproved for most of these results, it appears that the RPG genre holds weight on the degree of PSI that the player experiences, especially when compared with the Action genre; another factor that holds weight is whether the favorite genre of the participant is "RPG" or not, which indicates that the degree of PSI experienced by the player is related to what the player might usually seek when playing games, which may lead to a sort of "pre-disposition" to form attachments more easily, ultimately accounting for forming emotional links even when the situation is not amenable to it, such as seeing one particular car as a rival in a racing game.

In order to verify how these factors impact not only the halves but the overall values of the parasocial interaction experienced by the players, a non-parametric correlation was used containing the same fields which were used in the Kruskal-Wallis Test.

Correlations

			Gender	Participant's occupation	RPG vs Action	RPG vs Simulation	RPG vs Platform	Action vs Simulation	Action vs Platform	Simulation vs Platform	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A	Type of player	Age
Spearman's rho	amount of PSI %	Correlation Coefficient	-,386	-,261	-,422	-,496	-,226	-,063	,193	,433	-,437	-,483	,210	-,036
		p (2-tailed)	,029	,149	,036	,043	,400	,818	,491	,332	,014	,009	,248	,845
		N	32	32	25	17	16	16	15	7	31	28	32	32

Table 10 – Spearman's Correlation of the questionnaire's control questions

The fields shown above, with the exception of "Age", are Nominal and were coded with the first option being represented by the lowest value; in the case of "gender", "Male" is coded as the lower value and "Female" is coded as the higher one.

This correlation shows five fields with statistical relevance, all of them showing a weak to moderate strength. These results indicate that males have a slight inclination to develop more PSI than females and that the RPG genre is the genre that most generates parasocial presence, as both participants that have RPG as their favorite genre and participants whose favorite game is of the RPG genre show higher scores in the PSI scale when compared to the participants who have chosen other genres. The only correlations pertaining to the chosen games that are statistically relevant are those comparing the RPG genre against both the Action and the Simulation genres; in both these cases the RPG genre seems to generate more parasocial presence than its counterparts.

The table below (Table 11) pertains to how the control variables that show relevance in the amount of PSI shown correlate with the questionnaire's questions.

Correlations

			Gender	RPG vs Action	RPG vs Simulation	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A
Spearman's rho	I empathize with the other virtual character(s).	Correlation Coefficient	-,444	-,208	-,639	-,454	-,419
		p (2-tailed)	,011	,319	,006	,010	,026
		N	32	25	17	31	28
	My actions are influenced by the virtual character(s)' actions/suggestions.	Correlation Coefficient	-,429	-,428	-,300	-,337	-,228
		p (2-tailed)	,014	,033	,242	,064	,243
		N	32	25	17	31	28
	My actions are influenced by the other character(s)' feelings.	Correlation Coefficient	-,338	-,559	-,497	-,481	-,404
		p (2-tailed)	,058	,004	,042	,006	,033
		N	32	25	17	31	28
	I feel related with the virtual character(s).	Correlation Coefficient	-,282	-,246	-,307	-,271	-,250
		p (2-tailed)	,118	,237	,231	,140	,200
		N	32	25	17	31	28
	I feel that the virtual character(s) pay [close] attention to me.	Correlation Coefficient	-,384	-,543	-,445	-,167	-,287
		p (2-tailed)	,030	,005	,073	,370	,138
		N	32	25	17	31	28

			Gender	RPG vs Action	RPG vs Simulation	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A
	I pay close attention to the virtual character(s).	Correlation Coefficient	-,408	-,042	-,246	-,153	-,158
		p (2-tailed)	,020	,842	,341	,412	,423
		N	32	25	17	31	28
	I find it enjoyable to be with the virtual character(s).	Correlation Coefficient	-,244	-,242	,093	-,072	-,048
		p (2-tailed)	,178	,244	,722	,700	,809
		N	32	25	17	31	28
	I consider some character/s as a friend/s of mine.	Correlation Coefficient	-,125	-,344	-,446	-,086	-,228
		p (2-tailed)	,495	,092	,073	,644	,243
		N	32	25	17	31	28
	When I am happy, I feel the virtual character(s) is(are) happy.	Correlation Coefficient	,151	-,631	-,088	,022	-,170
		p (2-tailed)	,409	,001	,736	,908	,386
		N	32	25	17	31	28
	When the virtual character(s) is(are) happy, I am happy.	Correlation Coefficient	,110	-,294	,323	-,233	-,245
		p (2-tailed)	,547	,154	,206	,207	,210
		N	32	25	17	31	28

			Gender	RPG vs Action	RPG vs Simulation	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A
	I feel like my actions can influence the mood of the virtual character(s).	Correlation Coefficient	-,175	-,500	-,073	-,216	-,218
		p (2-tailed)	,339	,011	,780	,244	,266
		N	32	25	17	31	28
	I am influenced by the virtual character(s) moods.	Correlation Coefficient	-,232	-,190	,000	-,204	-,227
		p (2-tailed)	,201	,363	1,000	,270	,246
		N	32	25	17	31	28
	I admire some virtual character(s).	Correlation Coefficient	-,341	,035	-,529	-,347	-,340
		p (2-tailed)	,056	,869	,029	,056	,077
		N	32	25	17	31	28
	The other character(s)' actions affect my actions.	Correlation Coefficient	-,282	-,182	-,492	-,256	-,489
		p (2-tailed)	,117	,385	,045	,165	,008
		N	32	25	17	31	28
	At some point I may feel revengeful towards virtual character(s).	Correlation Coefficient	-,366	-,091	-,439	-,410	-,250
		p (2-tailed)	,039	,665	,078	,022	,200
		N	32	25	17	31	28

			Gender	RPG vs Action	RPG vs Simulation	Genre of Favourite Game RPG vs rest without N/A	favorite genre RPGvsRest without N/A
	Being around the virtual characters motivates me to keep playing.	Correlation Coefficient	-,323	-,120	-,059	-,131	-,101
		p (2-tailed)	,072	,568	,823	,483	,610
		N	32	25	17	31	28
	I feel responsible for the well-being of the friendly virtual characters/my companions.	Correlation Coefficient	-,171	-,325	-,366	-,268	-,195
		p (2-tailed)	,350	,113	,149	,144	,319
		N	32	25	17	31	28

Table 11 – Correlation between the control variables and the questionnaire's questions' individual results

The correlation table above is used to establish if there is a relationship between the participants' characteristics and choices that have shown to have a significant correlation with the total amount of psi scored, and their answers to the questionnaire's individual questions, with the purpose of trying to find if there is a player profile that is more susceptible to be influenced by the PSI component in games.

From the table above, it becomes apparent that male participants are slightly more susceptible than the female ones to empathize and change the way they play the game based on the virtual characters actions, suggestions and even feelings with weak to moderate correlation coefficients; male participants are also more likely to feel that the virtual characters pay attention to them and repaying that attention, than females participants, even developing feelings of admiration and revenge towards virtual characters, which also provides motivation to play.

The RPG genre also shows a moderate to strong correlation coefficients in all correlations with a 95% confidence level when compared with the Action genre, indicating that players that play an RPG game develop stronger and lasting relations with virtual characters, while having their way of playing changed due to the virtual characters suggestions and feelings, with the possibility of creating a friendship with the virtual characters; similar results are observed when comparing the RPG genre to the Simulation one.

Participants that have RPG as their favorite genre of videogames, or whose favorite game is of the RPG genre show higher scores than the participants who prefer other genres on both occasions, as it can be seen in the correlation coefficients which, though weak to moderate in strength, are skewed towards the RPG side of the genre spectrum in every statistical relevant correlation, further indicating that the RPG is the genre that creates and strengthens parasocial relationships the most.

Out of the 17 questions, 9 which describe the impact that parasocial relationships have in the player experience were selected; the following tables are referent to how parasocial interaction with virtual entities can impact the way a player experiences the game, according to the selected questions. Firstly, a correlation is used to verify how each variable individually relates with the total amount of PSI shown by players.

Correlations

			My actions are influenced by the virtual character(s)' actions/suggestions.	My actions are influenced by the other character(s)' feelings.	I consider some character/s as a friend/s of mine.	When the virtual character(s) is(are) happy, I am happy.	I feel like my actions can influence the mood of the virtual character(s).	I am influenced by the virtual character(s) moods.	The other character(s)' actions affect my actions.	Being around the virtual characters motivates me to keep playing.	I feel responsible for the well-being of the friendly virtual characters/my companions.
Spearman's rho	amount of PSI %	Correlation Coefficient	,600	,564	,599	,578	,482	,671	,709	,641	,738
		p (2-tailed)	,000	,001	,000	,001	,005	,000	,000	,000	,000
		N	32	32	32	32	32	32	32	32	32

Table 12 – Correlation between the PSI scored and individual variables

As it can be seen in Table 12, the relationship between each individual fields and the amount of PSI experienced by the player is positive and statistically accurate up to the 99% error margin. All fields have a correlation coefficient that indicates a medium to strong impact in the player's experience, indicating that each field in the table above has an important role in the amount of psi that a player develops whilst playing a game; such indications are to be expected however, as the questionnaire's results are the values that build the PSI scale. It is noteworthy that the fields that present a higher correlation coefficient are the fields that pertain to the sense of responsibility felt by the player towards the virtual characters' well being, and how the characters' actions, moods and suggestions condition the way the player plays, as well as his/her own willingness to play.

Below is a table that refers to the importance of each variable in the degree of PSI experienced, when analyzed as a group; this regression is used to understand how the gaming experience of the player can be impacted by each factor, while comparing their relevance to one another.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Std. Error	Beta		
1 (Constant) PSI %	11,035	3,028		3,645	,001
My actions are influenced by the virtual character(s)' actions/suggestions.	1,335	1,304	,117	1,024	,317
My actions are influenced by the other character(s)' feelings.	2,736	1,181	,238	2,317	,030
I consider some character/s as a friend/s of mine.	2,825	1,018	,194	2,775	,011
When the virtual character(s) is(are) happy, I am happy.	1,596	,863	,136	1,851	,078
I feel like my actions can influence the mood of the virtual character(s).	,814	,705	,080	1,154	,261
I am influenced by the virtual character(s) moods.	2,045	,831	,181	2,462	,022
The other character(s)' actions affect my actions.	3,627	,745	,344	4,869	,000
Being around the virtual characters motivates me to keep playing.	1,680	,937	,147	1,793	,087
I feel responsible for the well-being of the friendly virtual characters/my companions.	,450	,983	,042	,457	,652

a. Dependent Variable: amount of PSI %

Table 13 – Regression made to see how PSI% impacts the way player experiences the game

As mentioned before, the different variables used for the regression on the table above are questions selected from the online questionnaire which are referent to the way the player experiences the game as a whole. The relation between the amount of PSI% and the value of all the other variables is proportional, which is to be expected, although there are three factors that seem to have little importance in the amount of PSI experienced, these being the impact that virtual characters suggestions have on the player's actions, the interactivity of emotional depth of the virtual characters and the sense of responsibility of the player for the virtual characters. Although there two are factors that are also above the 5% error line, they are still below the 10% limit, thus being separated from the factors that show an overall very poor connection with the PSI% value; these two values suggest that a good relationship with in-game characters alone might be one of the motives for players choose to play a game, as well as providing the player with a sense of reward.

From the data seen in Table 13, it can also be noticed that the virtual characters' actions are the factor that has the most weight on the players' actions, this being possibly explained in part by the fact that there is no more direct way to impact how another person might act than actions, being followed by whether the player sees some game characters as friends or not, the influence that the characters' moods have on players and the actions that the virtual characters' feelings have on the player. These results indicate that the there is a link between the player's relationship with virtual entities, and the actions that a player may opt to take, as well as the general state of mind of the player.

The most glaring change from the correlation's results to the ones seen in the regression is the change in the values pertaining to the sense of responsibility of the player towards the virtual characters' well being, which stands as the field with the both the lowest impact as well as the highest error margin.

These results indicate that, though there is a correlation between all the selected variables above, there is no clear cause and effect relationship between the responsibility felt by the players towards the virtual entities, the influence the player may exert on said entities, or the impact these entities' suggestions have on the player's actions and the amount of parasocial presence experienced by players.

4. Discussions

This research has as its main objective to establish a forward step towards exploring the PSI theory, while having the relationship between the player and the videogame's virtual [supporting] characters as its focus. As a first step, the ulterior purpose of this work is to provide a somewhat solid basis and possible guidelines for future research works; in order to do so, this work focused on firstly trying to establish whether PSI with one or more videogame's supporting characters is possible and if so, to attempt to discern which factors are more influent in the development of this relationship, looking at factors both within and exterior to the game.

Unfortunately, the overall results of this research work fall short of undisputable evidence, though both the research made and the data gathered point with certainty towards the possibility of parasocial relationships between players and the supporting NPCs.

4.1. Interpretation of the Results

The RPG genre has shown to be the most prone to facilitate parasocial interaction, being the most picked genre in all categories, these being the genre that participants associate the most to relationships with virtual entities and the participants' favorite videogame genre; RPG is also the most frequent genre in the participants' favorite videogame category.

When comparing the chosen games' genre, only RPG and Action have an adequate sample size, 13 participants for RPG and 12 others for Action, which makes the comparison between these two genres the only one yielding statistically valid results at the 95% confidence level.

Between these two genres, RPG is the one that shows both higher median (63,529) and mean (63,8914) than Action (48,235 and 49,8039 respectively); the Standard Distribution is also lower for RPG (14,0142) than for Action (15,11065), which means that the parasocial interaction scores are more condensed for the RPG genre than the ones of the Action genre, which indicates that even the most discrepant scores in PSI referring to the RPG genre are likely to find themselves well above the Action genre's mean, as it can be seen on the graph present in "Figure 11".

When comparing the participants' favorite videogame genre, RPG has a distinct advantage over the other genres, as shown in "Figure 13", where each genre's distribution can be seen. Participants whose favorite genre is RPG have shown PSI scores in the 45% to 85% interval, having a median around 65%, in contrast with participants that have other genres as their preferred ones, having their scores in the interval between 35% and the 70%, with a median of nearly 50%; the RPG genre also as a denser distribution, with nearly three quartiles of the total values being above the 60% mark, in contrast with the other genres, that have over

three quartiles below the 60% mark. These results follow the same pattern as that of the "chosen games' genre", indicating that RPG is the genre most capable of endorsing PSI.

Lastly, by comparing the PSI scores of players divided by the chosen games' genres, firstly grouped by the players' favorite game's genre (Figure 15) and secondly by the player's favorite genre of videogames (Figure 16), participants who on both cases stated RPG as their answer showed higher PSI scores than participants who didn't, though these differences cannot be held absolute, due to the low amount of participants. Nevertheless, these results point towards the idea that RPG is the genre that facilitates the existence parasocial relationships the most, as well as their growth.

The results of the Kruskal-Wallis test also point towards a significant difference, although sometimes only at a 90% confidence level, between the amounts of PSI generated by the RPG genre and other genres, with the RPG genre generating higher PSI scores than the other genres in every case.

These factors not only point to RPG being the genre that most engages the players by providing stronger basis for the creation of parasocial relations, but also to the idea that a determining factor in the easiness of establishing parasocial relationships is what players most like and seek in games, as well as the predisposition to being immersed in a narrative; in other words, players that receive most enjoyment from playing games that engage in a strong storytelling, that immerse the players in a world that they make their own by taking the on a role, are more likely than players who don't to establish parasocial relationships with stronger and possibly lasting effects.

Age does not have weight in this research due to the highly dense distribution of the values; and while results do indicate that age shows a slightly positive correlation with the amount of psi shown (when not divided in pseudo-quarters), the sample size is not large enough, nor properly distributed to have any sort of result being of statistical relevance, with the ungrouped age's significance being "0,690" and the age divided by quarters' significance being "0,655", both well above the most lenient error margin of 10% when comparing the participants' age with the PSI scores shown. The only indication that can be taken from these values is that age does not appear to be one of the factors that impact the PSI shown by players.

Gender, on the other hand, seems to play a role in the amount of PSI shown by the players, with male participants having a statistically relevant discrepancy in the amount of PSI shown over that of the female participants: males show a mean amount of PSI a little over 60%, with females scoring closely under 50%.

The participants' occupation, as well as the type of player they consider themselves to be, do not show relevance in the degree of parasocial presence shown. It is possible that these results, much like Age, are a directly related to the lack of diversity in both these fields, as both contain values incredibly homogenous.

Although the scope of this research is still limited to quantitative data, it is still possible to see how the interaction with virtual entities has an effect on the way a player experiences

the game. As noted in Table 12, every variable showed correlates with the amount of PSI scored which, although being a positive note on how well these different factors relate with the amount of PSI shown, is expected due to the PSI score being a direct result of the participants' scores in these factors which, in conjunction with others, together form the questionnaire used; but even with this in mind, with correlation coefficients between 0,478 and 0,738, on a scale from negative one (-1) to positive one (1), these results are an indication that players that show higher amounts of PSI tend to have a much stronger link with the NPCs of the game, with their actions varying according to what the players perceive as the virtual characters' opinions, feelings or will, with the possibility of even feeling as if the player's actions have weight on the virtual character's behavior.

When put together and analyzed as a whole though, there are traits that do not seem to have statistical relevance to the amount of PSI displayed. The values seen on Table 13, indicate that the sense of responsibility towards virtual entities does not play a strong factor in the psi score, though parasocial relationships can change the way the player plays the game, even if only mildly, which points to that even if the player does not acknowledge virtual entities as near equals or as having a strong personality of their own, he/she can and still will be influenced by the humane traits of the virtual entities, such as the characters' moods, feelings and overall depth; these traits might even be perceived strongly enough for the player develop a liking to the game characters which is strong enough to motivate him/her to keep playing the game, when on other occasions the player would cease the gaming session.

4.2. Answering the research questions

The following sub-section pertains to the research questions made and the answer that this research has provided to them. Though the data does not provide absolute answers, there are still strong indicators which allow this research to answer the questions stated below.

Are any generic factors [outside of the specific gameplay] (gender, overall game genre, age,etc.) that help determinate if a player is more likely to relate with virtual entities?

There are indicators that the RPG genre is the genre that produces higher PSI scores, with gender also playing a factor; both the player's age and occupation still remain wildcards, with age demonstrating wavering results over the course of the data analysis, as some results point to a small increase of PSI as age heightens, and others to an inverse relation, where PSI decreases slightly as the participants grow older.

Is it possible to identify a player profile that is more susceptible to be affected by the social component in videogames?

Due to context of the research as well as the high density and homogeneity of the sample, the present research lacks the information to develop a proper player profile, which would also account at least for age range and occupation, though still able to establish rudimentary version of said profile.

The player most susceptible to be affected by the social component in videogames is male and shows a predilection towards RPG genre, possibly having an RPG game as his favorite title; these results are somewhat expected and unfortunately add little to the pre-existing research.

Is there a game genre that favors parasocial interaction with the supporting characters in videogames?

The RPG genre stands above all the others in the research made, being the most common choice of the participants when asked what their favorite game genre is, the most common genre amongst the participants' favorite games, whilst also standing as the genre most associated with relations between the player and NPCs. RPG not only stands as the most nominated genre by the participants, it also is the genre that appears to be linked to higher amounts of parasocial interaction.

Such an outcome was to be expected as the RPG genre is a genre that has its roots on character development through the telling of a story with a higher-than-most focus on the plot, which requires strong, deep or memorable personalities to progress.

Does the parasocial relationship with virtual characters [other than the player character] in videogames impact the way the player experiences the game, and if so, how?

This question cannot be answered to its full extent; though the results from the online questionnaire do point to a change in the player's behavior based on the way the virtual characters act and feel, there is no data on what immediate or long term effects the relationship with between player and NPC has on the gaming experience, though one can infer that both first impressions and lasting relations with the NPCs would be instrumental in the creation of tighter bonds of friendship and care, which would in turn escalate the player's reaction to events involving the character, such as a plot-related death or betrayal.

These results point towards the existence of a light form of social pressure originating from the game's supporting cast, though the values which such pressure entails will always vary according to the game's setting rather than what the player's social setting's values.

It must be noted however that there is no concrete data on how deep is the influence that this social pressure exerts on the player and whether it weights over the player on pivotal moments of the game, though it appears that this parasocial pressure does not influence the overall manner in which the player plays the game; this a desirable outcome, as the focus of a game is to have the player have fun in his/her own way.

Conclusion

The objective of this project was never to reach a final statement regarding the phenomenon which is Parasocial Interaction (PSI), but to provide a new approach with a different perception of the way that the social component of videogames is seen, by focusing on the relationship between the player and the game's supporting cast rather than the player's own character, while categorizing the NPCs (Non-Playing Characters) as "Avatars" or "Constructs" according to the established emotional connection between the player and said characters.

Although PSI has been the focus of many studies over the years, the core concepts that defined PSI when initially created were firstly studied and then complemented with newer readings on the development of the PSI theory referring to videogames and Human-Computer Interaction, as well as the process through which a player immerses himself/herself in fictional works such as books, television shows, movies, games, etc., with the purposes of establishing whether the approach proposed in this work had already been researched and to form a solid basis upon which to build the sequent work structure.

The subsequent empirical work aimed to expand on the research made by approaching the parasocial component of the gaming experience between the player and supporting characters similarly to the way that other works, such as that of IJsselsteijn et al (2008), approach the impact that playing with other people has on the player's overall experience.

This experience is mostly influenced by the player himself/herself, as the data analysis' results point towards the player's own motivations to play as the heavier factor regarding the amount of parasocial presence felt. These motivations appear to directly influence the genre a player is most fond of, being determinant in the choosing of playing a certain genre or even a specific game when looking to fulfill a wanting, with one example being the feeling of nostalgia for times spent with old friends.

Though the research's results are neither conclusive for the most part, nor have the proper dimension to be extrapolated to the larger universe, they constitute the first step towards a new way to explore the PSI theory in videogames, with the process through which they were achieved providing insight about the methodologies which can be used in later works, while showing first-handedly some of the difficulties that may appear and, when possible, how to circumvent them.

As such, the larger contribution this work may provide for future researches is this work's empirical process and its own meta-results, these being the information taken from the appliance of the processes themselves, with special attention to the critical aspects of the interview component which are the nature of the game used, the game's progression speed and the amount of freedom given to the player.

Future Work

By taking an empirical exploratory approach via the use of an online questionnaire complemented with a series of semi-structured game sessions which would themselves be followed by a simple interview and response to another version of the questionnaire, this methodology sought to provide two different sources upon which to compare data; this approach allows the research to reach participants both near and far with diverse player profiles, which in turn provide richer data.

As the interview component of the project could not come to fruition the research was left somewhat incomplete, an unfortunate outcome which would otherwise enrich the overall project and would make way to more elaborate explorations.

The next proper step in exploring PSI between the player and the games' supporting characters would be scale up this work's scope by seeking a higher number of participants, while further developing the questionnaire used in this work in order to encompass a wider amount of control variables, such as possibly the amount of time spent playing, and to finalize the data collection by recording and analyzing game sessions, using either games that:

- Focus primarily on the emotional attachment of the players to the virtual characters, such as games from the "Telltale Games" company, which creates interactive stories that focus on making the player invest him/herself emotionally;

- Are of different genres, in order to obtain a more holistic view of the players' attachment to virtual entities on different contexts.

Should a pattern or an amalgam of factors be revealed, it would then be possible to list what factors (and in what context) most influence the way a player relates with virtual characters; as trial by fire of sorts, a game architected on the principles then listed could be developed and used for further studies.

References

Author unknown. (n.d.). Screenshot of the Squad selection screen the game "Mass Effect". Retrieved from http://masseffect.wikia.com/wiki/Squad?file=ME_squad_selection.png

Author unknown. (n.d.). Cover for the game "South Park™: the Stick of Truth™". Retrieved from https://en.wikipedia.org/wiki/South_Park:_The_Stick_of_Truth

Bowman, N. D., Schultheiss, D., & Schumann, C. (2012). "I'm Attached, and I'm a Good Guy/Gal!": How Character Attachment Influences Pro- and Anti-Social Motivations to Play Massively Multiplayer Online Role-Playing Games. *Cyberpsychology, Behavior, and Social Networking*, *15*(3), 169–174. doi:10.1089/cyber.2011.0311

Brown, W. J. (2015). Examining Four Processes of Audience Involvement With Media Personae: Transportation, Parasocial Interaction, Identification, and Worship. *Communication Theory*.

Burch, A. (2013). Inside the Box: Inclusivity - Gearbox Software. Retrieved January 25, 2015, from http://www.gearboxsoftware.com/community/articles/1077/inside-the-box-inclusivity

Burch, Anthony. (2013). Portrait of the character "Karima" from the game "Borderlands 2". Retrieved from http://www.gearboxsoftware.com/community/articles/1077/inside-the-box-inclusivity

Elson, M., Breuer, J., Ivory, J. D., & Quandt, T. (2014). More than stories with buttons: Narrative, mechanics, and context as determinants of player experience in digital games. *Journal of Communication*, *64*(1993), 521–542. doi:10.1111/jcom.12096

Giles, D. C. (2009). Parasocial Interavtion: A Review of the Literature and a Model for Future Research. *Mediapsychology*, *4*(November 2014), 279–305. doi:10.1207/S1532785XMEP0403

IJsselsteijn, W. A., de Kort, Y. A. W., & Poels, K. (2007). Digital Games as Social Presence Technology : Development of the Social Presence in Gaming Questionnaire (SPGQ). *Presence*, 1–9. doi:10.1177/1046878111422121

IJsselsteijn, W. A., de Kort, Y. A. W., & Poels, K. (2008). *Development and validation of the Game Experience Questionnaire*. Helsinki.

Jin, S.-A. A., & Park, N. (2009). Parasocial interaction with my avatar: effects of interdependent self-construal and the mediating role of self-presence in an avatar-based console game, Wii. *Cyberpsychology & Behavior : The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, *12*(6), 723–727. doi:10.1089/cpb.2008.0289

Kavli, K. (2012). The player's parasocial interaction with digital entities. *Proceeding of the 16th International Academic MindTrek Conference on - MindTrek '12*, 83. doi:10.1145/2393132.2393150

Klimmt, C., Hefner, D., & Vorderer, P. (2009). The video game experience as "true" identification: A theory of enjoyable alterations of players' self-perception. *Communication Theory*, *19*, 351–373. doi:10.1111/j.1468-2885.2009.01347.x

Konami Digital Entertainment. (2014). Screenshot of Big Boss ambushing an enemy soldier in "Metal Gear Solid: Ground Zeroes". Retrieved from https://www.playstation.com/en-us/games/metal-gear-solid-v-ground-zeroes-ps4/

Krämer, N. C. (2007). social effects of emodied conversaional agents.pdf. In *Informieren mit Computeranimation : Zusammenfassung der Beiträge zum Usability Day V* (pp. 119 – 124). Lengerich: Pabst Science Publishers.

Kumar, N., & Benbasat, I. (2002, January). Para-social presence: A re-conceptualization of'social presence'to capture the relationship between a web site and her visitors. In *System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on* (pp. 106-112). IEEE.

Lewis, M. L., Weber, R., & Bowman, N. D. (2008). "They may be pixels, but they're MY pixels:" developing a metric of character attachment in role-playing video games. *Cyberpsychology & Behavior : The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, *11*(4), 515–518. doi:10.1089/cpb.2007.0137

OBS Project. (2012). Open Broadcaster Software (Version 0.651 Beta) [Software]. Retrieved from https://obsproject.com/index

Obsidian Entertainment, South Park Digital Studios. (2014). South Park™: the Stick of Truth™ [Video game]. Montreuil: Ubisoft

Oliver, M. B., & Bartsch, A. (2010). Appreciation as audience response: Exploring entertainment gratifications beyond hedonism. *Human Communication Research*, *36*, 53–81. doi:10.1111/j.1468-2958.2009.01368.x

Particip@tions Vol 3 (1) Article - Donald Horton & R. Richard Wohl. (n.d.). Retrieved January 17, 2015, from http://www.participations.org/volume 3/issue 1/3_01_hortonwohl.htm

Ravaja, N., Saari, T., Turpeinen, M., Laarni, J., Salminen, M., & Kivikangas, M. (2006). Spatial presence and emotions during video game playing: Does it matter with whom you play?. *Presence: Teleoperators and Virtual Environments*, *15*(4), 381-392.

Tukachinsky, R. (2010). A j m p. *American Journalof Media Psychology*, *3*(Nos. 1/2 (Winter/Spring 2010)), 73–94.

Tulathimutte, T. (2008). How B|P Researched Spore. Retrieved January 25, 2015, from http://boltpeters.com/blog/how-bp-researched-spore/

Zagalo, Nelson. (2009) Emoções Interactivas, do Cinema para os Videojogos, ed. 1ª, 1 vol.. ISBN: 978-989-96375-1-1. Coimbra: Gracio Editor.

Appendixes

Appendix 1 – Parasocial Game Experience Questionnaire

PART I of the questionnaire

What game occurs to you mind if you think of in-game characters?

- Open Field.

The following seventeen items that are graded with the following scale:

1 – Do not agree at all	2 – Disagree	3 – Mixed Feelings	4 - Agree	5 – Agree extremely

1. I empathize with the other virtual character(s).
2. My actions are influenced by the virtual character(s)' actions/suggestions.
3. My actions are influenced by the other character(s)' feelings.
4. I feel related with the virtual character(s).
5. I feel that the virtual character(s) pay [close] attention to me.
6. I pay close attention to the virtual character(s).
7. I find it enjoyable to be with the virtual character(s).
8. I consider some character/s as a friend/s of mine.
9. When I am happy, I feel the virtual character(s) is(are) happy.
10. When the virtual character(s) is(are) happy, I am happy.
11. I feel like my actions can influence the mood of the virtual character(s).
12. I am influenced by the virtual character(s) moods.
13. I admire some virtual character(s).
14. The other character(s)' actions affect my actions.
15. At some point I may feel revengeful towards virtual character(s).
16. Being around the virtual characters motivates me to keep playing.
17. I feel responsible for the well being of the friendly virtual characters/my companions.

PART II of the questionnaire

Please indicate your age.

- Open field.

Please state your gender.

- Masculine.
- Feminine.

What is your favorite videogame (regardless if you it is a browser, handheld, smartphone or computer game)?

- Open field.

Please state your current occupation

- Student.
- Free-lancer.
- Self-employed.
- Employed by others.
- Unemployed.
- Other.

What is your favorite videogame genre?

- Open field.

You consider yourself a:

- Casual Gamer.
- Core gamer.
- Hardcore Gamer.
- Professional game.

Thank you for your time and cooperation, leave any comments you like.

- Open field.

Appendix 2 – Database with the questionnaire's responses

The database is present in the folder "Project's Database".

The data base was created and worked upon using the program "IBM SPSS Statistics 22".

Annexes

Annex 1 - Social Presence in Gaming Questionnaire (SPGQ) Module of the Game Experience Questionnaire by IJsselsteijn, W.A., de Kort, Y.A.W. & Poels, K. (2008)

Please indicate how you felt while playing the game for each of the items, on the following scale:

not at all	slightly	moderately	fairly	extremely
0	1	2	3	4
< >	< >	< >	< >	< >

1 I empathized with the other(s)
2 My actions depended on the other(s) actions
3 The other's actions were dependent on my actions
4 I felt connected to the other(s)
5 The other(s) paid close attention to me
6 I paid close attention to the other(s)
7 I felt jealous about the other(s)
8 I found it enjoyable to be with the other(s)
9 When I was happy, the other(s) was(were) happy
10 When the other(s) was(were) happy, I was happy
11 I influenced the mood of the other(s)
12 I was influenced by the other(s) moods
13 I admired the other(s)
14 What the other(s) did affected what I did
15 What I did affected what the other(s) did
16 I felt revengeful
17 I felt schadenfreude (malicious delight)