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The Importance of Play: Identification with Video Game Characters' Intersectional Effects on Bias

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The Importance of Play: Identification with Video Game Characters' Intersectional Effects on Bias

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Presented to
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Doctor of Philosophy
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Abstract

Video games are steadily becoming one of the largest and most influential forms of media in history. Today, video games are so popular that the Nintendo mascot Mario from the *Mario Brothers* video game series is more recognized than Disney's Mickey Mouse [83]. The reach and influence of video games is cause for celebration and concern. After all, just like other forms of media video games can influence audiences far beyond their play sessions. Media can influence everything from how individuals treat others [141], to governmental policies [113]. With such a large scope of influence over who they reach and how they affect society it's necessary to examine how video games represent real world people.

Representation in video games has the potential to influence audiences' perceptions of and attitudes towards real people. Video games already come under constant scrutiny for their numerous portrayals of sexist and racist imagery [55]. These negative portrayals can affect real world biases against disenfranchised groups [125]. Which in some cases can even lead to an increase in violence against those groups [144]. Many forms of passive media, such as books and television, have already been analyzed to discern how their use of diverse non-stereotypical representation can combat biases, promote empathy, and encourage tolerance among their audiences [69, 112]. Video games have been researched in a similar manner, but stand apart from these mediums in an important way. Video games allow participants to take an active role in their entertainment. Unlike a book or a movie a video game offers participants control over the characters and the actions those characters take within the story. Video game audiences don't just witness the narrative, they give it form through their choices and actions.

Other researchers have examined how interactivity in video games influences real world biases. The first part of this dissertation provides background information for these past studies. We expanded on this research with three studies of our own featuring race and gender bias. The studies

reveal that in video games the experience of watching a character vs playing as a character greatly affects the character's ability to influence audience biases. Just seeing a female or black character in a video game is a very different experience from playing as them and being able to control their actions. Furthermore, in video games this experience of play via character control produces a unique psychological phenomenon called *embodied identification.* Embodied identification represents how much a player feels they are physically and/or mentally immersed in a playable character. The level of embodied identification a player experiences directly effects the virtual character's influence over the player. So, it plays an important role in influencing players and is the main focus of this dissertation. There is also an examination into how embodied identification effects players' attitudes toward underrepresented people. The third of the three studies in this paper includes perhaps the most prolific expansion on past research by incorporating intersectionality into the study. This study allows researchers and developers to better understand how all aspects of a player character's identity influence multiple societal biases. In this way, the study is able to look beyond a singular view of identity; only focusing on race or gender for example, to gain a more complete picture of video games' ability to combat biases and promote tolerance in society.

Dedication

This work is dedicated to my parents Allen and Donna, my three brothers Edward, Matthew, and Evan, and every family member, friend, advisor, and collaborator who helped me along my way.

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Chapter 1

Introduction

Media has long been a tool for shaping society and educating individuals on their culture's norms and taboos. We can see from the oldest legends to the latest blockbusters how a singular story can completely transform a community, reshape an economy, and leave a miraculous, or devastating, impact on the larger world. Sacred Christian texts and religious doctrine aided in the fall of the Roman Empire [102]. The blockbuster *Jaws* fueled such a massive shark panic that it heavily contributed to major changes in Australian governmental policy [113]. No matter the medium, no matter it's prestige, and no matter it's audience size all media contains the potential to influence people for good or ill. One of the most infamous examples was how D. W. Griffith's 1915 film *The Birth of a Nation* rejuvenated white supremacism in the United Sates leading to a revival of the white supremacist hate group the Klu Klux Klan (KKK) [27]. However less spoken of is how a simple children's radio show in the 1940s staring *Superman* was also able to influence the country in the opposite manor [81]. The radio show combated white supremacism by featuring the Klan as major antagonist [81]. This squashed the KKK's recruitment all the way down to zero in just two weeks [81]. The key to these outcomes in most cases is the application of representation.

1.1 Representation in Media

Representation is how a subject is designed and presented to an audience through a combination of physical appearance, personality traits, and narrative. It has a huge impact on how audiences view a character in a narrative and how they view similar individuals in real life. Thus,

positive representation of underrepresented groups in media has long been used to combat societal biases against said groups. From childhood development programs like Sesame Street [69] to prime time space operas like Star Trek [141], media representation has been used to shape how mainstream audiences view "the other". Representation is a simple thing, but can have a powerful impact. Take the case in 2015, where Professor Ted Cantle from the Institute of Community Cohesion (iCoCo), the UK's leading authority on community cohesion, stated that the positive representation provided by British Muslim Nadiya Hussain on the hit show *Great British Bake-Off* had: "done more for integration of Muslim communities [into British society] than ten years of government policy" [86]. We shape our perceptions of others through multiple complex interactions. However, when people find it difficult to interact, either due to lack of access or fear generated from societal taboos, media can end up as the sole method people learn about different groups and their lifestyles.

Unfortunately, this is not always a positive thing. Problems arise when media presents representation that is maliciously stereotypical or outright negative propaganda. These problems are drastically increased when said media is extremely popular and engaging. This was the case in 1915 when D. W. Griffith's film *The Birth of a Nation* presented newly freed black men as barbaric rapists [93]. The movie had black politicians overtaking state legislature and passing measures to "steal" white women for black male pleasure through interracial marriages [93]. The film even included a scene where a black man chases after a young white woman with the intent to rape her [100]. The scene ends with the woman jumping off a cliff to her death to escape her assailant [100]. After the film debuted the white supremacist group the Klu Klux Klan received a massive recruitment boost and proceeded to lynch and terrorize black communities [27]. Thus, it is easy to understand why there is so much research into how popular entertainment represents underrepresented and disenfranchised groups. Which brings us to the present where we have a relatively new form of media with extreme popularity, engagement, and economic power; video games.

1.2   Why the Focus on Video Games

As with other media, video games have been studied to try and understand how interactive entertainment affects human behavior. Historically, these studies have largely focused on whether or not violent video games increase aggressive behavior. The predominance of violence focused research was discussed in a meta analysis of video game academic studies by Williams et al. [157]. Academia

has neglected many areas when it comes to video game research as a result of this hyper focus on violence and video games. We know from studies into violent games that in certain conditions games can increase hostility in children and adults [5]. This research shows video games can significantly affect players' attitudes, but the work does not examine behaviors unrelated to violence or aggression. What researchers are still trying to figure out is how video games affect attitudes outside of hostility, like prejudices and/or social biases.

This is the driving focus of the research outlined in this dissertation. Specifically, it looks at how playing as a character from an underrepresented group can improve attitudes towards real world members of that group. This builds on the plethora of existing research into representation in media affecting perceptions of the represented. Ample evidence suggests that exposing people to nuanced positive portrayals of underrepresented individuals can increase positive perceptions of them [69, 141, 86]. Still, researchers have yet to fully grasp the distinction between viewing representation and interacting with representation. For viewing representation of the many factors that come into play one of the most basic and robust psychological effects is *mere exposure.*

1.3 An Overview of Mere Exposure

Mere Exposure is as physiological phenomenon whereby the act of making people aware of a stimulus increases positive perceptions of the stimulus [17]. The effect has proven to be incredibly robust and observed with a wide array of stimuli including nonsense words, polygons, and pictures [18, 44, 166, 167]. The effect has been noted to produce higher ratings of likability for exposed stimuli and stimuli that are similar to the exposed stimuli [17, 166]. Furthermore, research has shown the mere exposure effect can increase perceptions of camaraderie and understanding between participants and the people they have been exposed to [20]. This occurs even when the method of exposure, such as showing an image of a person, does not allow a participant to form a meaningful connection with or understanding of the exposed person [20]. The effect can even shift attitudes towards an argument from an exposed person. When participants are exposed to an individual it increases the chance of the participant agreeing with the exposed person's statements [20]. Participants need not even be aware of the stimuli; exposure can be conscious or unconscious [164]. But perhaps most meaningful for video games is the fact that the mere exposure effect can be nullified with boredom and enhanced with novelty, complexity, and excitement [19]. However, some studies suggest mere

exposure is not the main mechanism through which video games influences players. Instead the psychological phenomenon of *identification* is accredited. Other mediums such as film and literature have been examined through the lenses of mere exposure, but these mediums all rely on passive consumption. In them audiences cannot interact with the characters or their environment. Video games allow for a certain amount of control and interactivity; giving them even more potential to affect audiences. People do not just watch a video game, they play it. Meaning they get to identify with the characters in a manor that is unique to the video game medium.

1.4   Introduction to Embodied Identification

For written media Cohen proclaimed identification was a "mechanism through which audience members experience reception and interpretation of the text from the inside, as if the events were happening to them" [30]. He noted audiences loose themselves in the narrative and experience the text from the point of view of the protagonist [30]. It has even been found that identification can create a merger of audience and character; resulting in a new and separate identity [88]. This is the standard case for video games. Studies have witnessed mental changes in users after playing games that align them with the characters they were playing as. For example, players who identified with soldiers in first-person shooter games reported feeling more brave, patriotic, strong, and loyal [87]. They ascribed the soldier's salient properties, such as physical strength, courage, and patriotism to themselves. For these participants, their image of themselves while identifying with the soldiers differed substantially from their usual self-image [87]. This connection forms with low concept individuals, such as soldiers or racers, that are only known by their profession without displaying unique personalities [87], and high concept fully formed individuals [87, 40, 68]. That is, characters with unique names, histories, and personalities, such as the famous English literary and cinematic spy James Bond [87, 40, 68]. These connections are the main means by which attitudes in video game players are influenced. A deep connection with a character can not only shift a player's perceptions of themselves but their internal biases towards real world human beings [7]. Therefore, it is imperative for academic research to address how this phenomenon can be utilized to encourage positive change. As many video game developers believe [134], video games and identification have the potential to encourage empathy in players for all sorts of people including the underrepresented, disfranchised, and downtrodden members of society.

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1.5   Empathy, Bias, and Video Games

Using video games to combat bias and promote empathy is not a new concept. Many game developers have posited that through interactivity the medium has unique potential to change people's attitudes towards others. For this reason, developers have specifically designed games to capitalize on this theory. These "empathy games" have narratives designed explicitly to induce empathy in players and advocate for real world people and causes. Games such as *Spent*, which was used to positively change grade school students' perceptions of homeless people [135]. The results of playing this game showed students increased their engagement in homelessness discussions, initiatives, and community service projects [135]. Since these games have such a niche focus they rarely enter the mainstream market; unlike big budget AAA video games designed by major studios. However, empathetic narratives have been used by big name developers to highlight real world issues as added features of many games' overall story. Quantic Dream's big budget release *Detroit Become Human* features incredibly emotional scenes of child and domestic abuse. These highly distressful moments, which include having the player fight against a father intent on assaulting his daughter, largely exist to create obstacles for the player to overcome. They also give one of the three main characters, Cara, a reason to go on the run from the law. Regardless, quite a few players who have experienced similar situations to those depicted in the game have praised the scenes for helping to promote discussion and understanding on living in an abusive household [3, 4]. Meanwhile, the *Dragon Age* series from developer Bioware has long had a reputation for regularly including LGBT+ characters with empathetic narratives into their games for players to learn from and connect with. The last instalment from 2014's *Dragon Age: Inquisition* featured empathetic narratives for gay, lesbian, and transgender characters, Dorian, Sera, and Krem. As PBS video game media critic Mike Rougeau noted in his video essay on the game and the subject of empathetic narratives these types of inclusions allow for a "wider variety of stories and experiences to be heard and that many believe such games can reduce prejudices and encourage empathy" [134].

Still, most games that include empathetic narratives or have been developed to induce empathy are constructed around theories that have not been scientifically validated. Therefore, they can not make adequate claims on how their games affected the audiences that interacted with them. Evidence from research on the educational potential of games supports claims that interactivity allows for a new learning experience [135, 63]. Yet, the inner mechanisms and end results
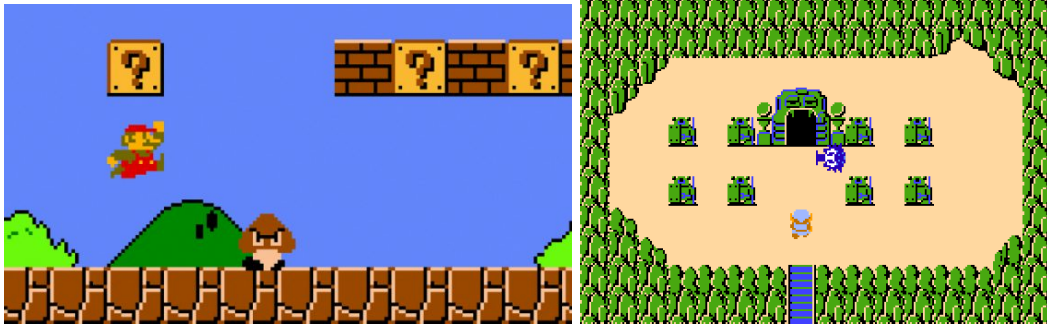
Figure 1.1: Examples of classic video games which utilized simplistic designs and the most basic of story lines [169, 114].

of the phenomenon within these experiences require further analysis. For example, there has been little research into the correlation between the presence of underrepresented playable characters and reduction in bias towards real world underrepresented people when players engage with traditional game play experiences. That is, games without empathetic narratives where characters simply do things like jumping around platforms or traversing dungeons. As is the case in early installments from the *Super Mario* and *The Legend of Zelda* game series, Figure 1.1. In order for developers to design effective "empathy games" and empathetic narratives we need to fully understand how the most basic gaming experiences and interactions with virtual characters can manipulate biases towards real world people.

1.6 Justification for Our Studies

This is the reason we conducted our three studies focused on this topic. In the first study participants played a video game alongside or as a black or white character. They then viewed two persuasive speeches by real life actors of the same races as the characters in the game. Participants rated the presenters on a variety of factors to test for bias under the assumption that they were reviewing a demo of a childhood educational video game. They were led to believe they were rating the speakers on their ability to sell the game as an educational tool. What participants did not know was that the study was actually exploring how the race of the characters in the game and the race of the speakers interacted in determining the ratings the speakers received. Due to existing societal biases we predicted (and indeed confirmed) that our white speaker would generally be perceived more favorably than our black speaker. Moreover, following the results from studies of the mere

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exposure effect and racial bias [66, 123, 125, 167], we hypothesized that exposure to a black character (i.e., playing alongside a black character) would result in a more positive rating of our black speaker. This effect was being tested alongside an embodiment effect. We hypothesized embodiment of a black character (i.e., playing as a black character) would have a similar, arguably stronger, effect on the rating of our black speaker. Especially for participants who felt they were able to identify with the playable character. While our findings were inconclusive for mere exposure, we found that embodiment of a black character reduced racial bias and that the effect of embodiment was strengthened when participants experienced high levels of identification with the player character aka embodied identification.

In the second study participants played a video game as or alongside a male or female character and viewed a persuasive speech by a real life actor whose gender was similarly manipulated. Participants rated the presenter on the same factors of the first study, but they also filled out surveys judging their attitudes towards gender equality and adolescent women. Under the same circumstances of deception as the first study, participants were tested for existing societal gender biases. Once again, we predicted (and confirmed) that under certain circumstances the genders of the characters would affect the speakers ratings, the ratings of participants attitudes towards gender equality, and/or participants attitudes towards adolescent women. The study again provided evidence that embodiment of the characters produced different effects from mere exposure to the characters. Also, the embodiment effects were again modified by player character identification. However, the results of these interacting phenomenon did not perform in the same manor as they did during the racial bias study.

Now, the second study did not just repeat the first study from a new angle. Rather, it expanded on the first by incorporating empathetic narratives. This time some participants played games with a female character and a narrative designed to evoke empathy for women. These situations were found to evoke different responses from non-empathetic cases. Based on past research of empathetic games we expected both embodied identification and engagement with the narrative to interact with our narratives to manipulate player biases in unique ways. The study found there was a special interaction effect between empathetic narratives and embodied identification. However, unlike past research levels of engagement with neither the non-empathetic nor empathetic narratives had a significant effect on results. Unfortunately, population covariates such as a participants race or gender disrupted our results. In the case of the second study these factors and an issue with

sampling distribution produced so much noise that our findings put even our significant results under need of review. Nevertheless, the two studies showed that while embodied identification was a robust influencer on societal biases the effect does not behave the same way across different situations.

This led to the formation of this paper's third study; to see how embodied identification's effect on bias is modified by multiple identities. Such as when a character or person of judgement is underrepresented in multiple ways such as being black and a woman. The third study included intersectionality by examining how a playable characters' intersecting gender and race identities manipulate gender and racial biases and the intersection of the two. Once again participants played a video game. But, this time we only examined playing as an unrepresented character whose race and gender were manipulated. So there were four player options participants were randomly sorted into without their knowledge; white male, white female, black male, and black female. Participants again rated real world people, though this time we used LinkedIn profile applications to ensure uniformity between the four individuals save for their race and gender. They filled out surveys rating the applications in the same manner as the presentations in the first two studies. This time the explanation for the true purpose of the study was that we were examining how playing video games affected reading comprehension and decision making. Here our results showed that participants harbored racial and gender biases against black and female LinkedIn profile applicant. Furthermore, the black female LinkedIn profile applicant was subjected to bias against them on both their race and gender simultaneously. However, when participants played the game with the black female playable character and experienced high levels of embodied identification with the character there was a significant reduction in bias against the black female applicant. A reduction which was produced from the addictive effect of playing as and identifying with a female character and a black character. This study verified past research on the uniqueness of bias and how bias is not uniform nor does it behave in a uniform manor across underrepresented identities. Racial bias did not behave in the same manor as gender bias but both were present and both affected the applicant that was underrepresented in both areas. The study offered something new to the discussion of virtual character bias manipulation as it was the first that we are aware of to look at how more than one aspect of a playable character's identity (race and gender) interact to manipulate biases against individuals that are similarly underrepresented in multiple ways.

This dissertation is structured as follows: after outlining related work on mere exposure, identification, racial bias, and diverse representation in video games, we showcase how our additional

studies approached these concepts and built upon them. From each study's results we set up our main argument that embodied identification is a critical component for designing video games that seek to manipulate audience biases. Our work revolves around bias reduction for underrepresented populations, but it is possible our research could be applied to any type of bias manipulation. From our final study we end on a discussion of how intersectional theory contributes to our findings. We hope our research encourages more consideration regarding identity and the fact that it is a multi-faceted construct when individuals research and develop video games. We discuss both the limitations and implications of our research to illustrate its scope and importance. The end goal is to provide a foundation for further research which we contribute to in the final part of the dissertation with proposals for even more studies using the three previous studies as a starting point.

Chapter 2

Background And Related Works

In this section we provide an in depth analysis of the psychological factors behind the three studies in this dissertation. To emphasize these studies importance a historical summarization of gender and race representation in video games over the past few decades is provided. As well as, an overview of the larger cultural and economic reasons this research is so vital for the industry. Like other forms of media video games have a complex and difficult history in how they, their developers, and their larger community have interacted with issues of gender, race, and representation. Though progress has been made, many recent scandals have illustrated the continued need for research in these areas. There have been numerous studies and initiatives focused on using virtual systems to influence players perceptions of underrepresented groups. However, there are still holes in our understanding that our research can fill.

Most examinations of virtual systems and reducing bias only focus on highly specific experiences. For example, experiences in fully immersive Virtual Reality (VR) systems that use a Head Mounted Display (HMD) like the Oculus Rift, Figure 2.1. Other studies feature participants who self select underrepresented avatars. This creates a selection bias and researchers can not tell if playing as these characters instills a tolerant mindset or if players with a tolerant mindset seek out certain characters. Other studies feature games specifically designed to evoke empathy. Their results can only be applied to games with both underrepresented characters and empathetic narratives. The unique effects of underrepresented characters and empathetic narratives can not be examined independently, nor can the interactions between them. Here we address these topics to help frame our research on race and gender and bias manipulation.

Figure 2.1: Example of fully immersive HMD VR system from *Oculus VR* [85].

2.1 Race and Racial Stereotypes In Video Games

The need for proper diverse representation in the gaming market can not be understated. All forms of entertainment provide multiple valuable contributions to their audiences. One contribution is the ability for media to allow audiences the chance to comprehend and explore their personal identities [107]. Internal examination of one's identity is integral to proper development and understanding of one's self and place in society [75]. Video games are one of many types of media through which this identity examination occurs. This makes the fact that they are also enjoyed by a great proportion of people of color, especially black individuals especially important [6]. Video games therefore play a key part in the identity formation of these populations, and this contribution from video games is only likely to grow. The black population; for example, is amongst the fastest growing markets in the gaming industry [117]. Numerous reports find the black population has one of the highest percentages of video game players [116, 94, 121]. Populations of color are deeply invested in video games and these populations are poised to continue to increase and overtake the white population in the United States gaming market [121, 125]. Unfortunately, the gaming industry still has a ways to go regarding properties staring and targeted to these populations.

Focusing on representation from the past two decades we see that from the start of the century representation in games has been lacking on multiple fronts. In 2001 one study of the top-selling games over six consoles revealed over half of all characters were White (56%); one-fifth

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were Black (22%), one-tenth were Asian/Pacific Islanders (9%), and nearly none being Latino (2%), Native American (.2%), or multiracial characters (.2%) [55]. Of those characters the distribution of roles among the varying races are uneven and follow larger societal stereotypes. For example, more than 80% of all black male characters and 100% of Latino characters appear as competitors in sports-oriented games [55]. Meanwhile, close to 90% of all heroes in these games were White [55]. Four years later in 2005 a large scale content analysis of 5000 characters in games covering 95% of US sales from 2005 to 2006 found extreme underrepresentation of black, Hispanic, biracial, and Native American people; with some groups being underrepresented as much as 90% less when compared to the US population [156]. Another study from 2014 analyzed the top 10 highest-ranked games from 2007–2012 and found black and Asian characters main protagonists only 3% of the time and Latinx characters just 1%, with no Indigenous playable characters in the entire data set [49]. Though the rise of indie games over the past decade has allowed smaller developers to create games that feature more diverse stories and characters a study from 2017 found that even in this market the lack of diversity pattern remains [126]. One might assume that a major solution to this problem is to increase the availability of character creation. However, games which feature character creators have their own myriad of issues when it comes to handling diversity. Studies focused on character creators constantly find "whiteness" upheld as the "default option"; often only going so far as to place non-white skin-tones over white modelled bodies [158, 111]. Thus, giving the characters uncanny and sometimes offensive appearances (deemed "high-tech blackface"), that are identified by players of colors as diversity afterthoughts and the barest of efforts at providing representation [123, 158, 111, 104]. Basically, players of color do want to self represent in their games and create avatars that reflect their racial identities. Sadly, the limits from most games make players of color feel as though self-representation can not be meaningfully accomplished [124].

Of course the issue goes beyond percentages of character representation. Of equal importance is how games are marketed to audiences and what those games contain. Advertisement is one of the key means through which audiences are made aware of most video games and it plays a huge role in shaping a game's audience. Games staring characters with certain qualities are more likely to be perceived as "for" audiences that share those qualities. For example, games with female protagonists are more likely to be perceived as "for girls" and give young girls the message that not only this game but video games as a whole are something socially acceptable for them to take part in [120]. This is one of the key reasons why diverse advertisement is so important; it can build an

audience and community from the ground up. Which is what makes the results of the 2009 study into the "face" of gaming so unfortunate [110]. Here by examining trailers, opening sequences, and game cover sleeves researchers found that not only were female and non-white characters underrepresented, but that the few who existed were presented in stereotypical and (for the non-white male characters) villainous ways [110]. The items from the study were specifically created to summarize the games for audiences and present the most important features of the games to said audiences. In an analysis of the characters featured in these items 74% of the leading characters were white and a total of only four black characters from a basketball game held a leading role [110]. There were no leading characters from any other racial demographic but there were villains [110]. In fact, while there were only four leading non-white characters literally half of all the racial minority characters in the study were villains [110].

The study of the "face" of gaming conducted by Mou & Peng highlights another major problem with racial representation in gaming, the portrayal and roles characters are given [110]. After all, as Mou & Peng write "The representation and portrayal of female and minority characters might have significant impact on the players, especially adolescent players who are in the developing stage to form their self-identity, self-image, gender role perception, as well as their expectation of and attitude toward the other gender and other racial groups[110]." As previously stated, for many media is a means for individuals to understand and evaluate their own identities [107]. Media can even be a resource for forming identities as it presents options for individuals; covering everything from gender, to ethnicity, to lifestyle, and more [75]. Media also shapes the feelings, behaviors, and attitudes an identity is recognized to contain; showing what is common or appropriate for an identity vs what is irregular and taboo [75]. This is why the types of representation characters of color are given and the ways they are portrayed are so important.

Sadly, when underrepresented populations are included in video games, they often must deal with simplistic and harmful stereotypes. Focusing on black character portrayals, as the larger effects of positive and negative representation of this group have long been documented [43, 55, 95, 130], we see that black characters are often relegated to one of two categories; athletes and gangsters. A report by Children Now, a children's advocacy group, shows more than 80% of black characters appear as competitors within sports-oriented games [55]. Meanwhile, the remainder of black male characters are regulated to what Everett et al. call "urban/street" games [43]. These games feature hyper-masculine, aggressive, streetwise black men engaging in criminal activity [43]. Leonard pointed

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to the 2004 *Grand Theft Auto: San Andreas* as a prime example of this type of game, "Set in a gang-ridden, war-like 1990s Los Angeles, San Andreas features an array of Black and Latino men, all with braids, bandanas, and guns. The game allows players to form gangs to rob, commit drive-by shootings, and even rape [95]." Leonard explained that *San Andreas* was following a trend in video games of playing into racial stereotypes through the presence of black and brown people reveling in violent street crime [95]. This issue is not unique for video games but a part of a larger problem with representation in media. As professor Kishonna Gray from the University of Illinois—Chicago reported on the subject in one article "In film, there have historically been three roles you see Black characters in: Black as violent, Black as the sidekick, Black as the help. This has also been true in video games [129]." For the *Grand Theft Auto* series the impact of their representation is even more pronounced today as the latest installment, *Grand Theft Auto V*, is the highest grossing entertainment release of any form of media to date [143]. In Polasek's review of the game we find that the series still relies on stereotypes while portraying a type of colorblind racism [130]. This time the black male lead, Franklin, participates in crimes with two other white leads. Franklin is a street hustler desperate to leave the poor, downtrodden, graffiti laden, South-Central Los Angeles [130]. In his community violence is not only common but expected with residents carrying guns and shooting on sight when police appear [130]. As Polasek notes, "the game design of Franklin's community illustrates the criminal threat hypothesis; where whites rely on the racial stereotype of blacks posing a greater criminal threat, linking the presence of blacks in an area to an increase in the perceived risk of crime," [130].

To summarize, the lack of racial diversity in video games is wide spread and significant [55, 123, 126, 156, 49]. Existing representation limits many players of color, especially black players, to sports games and games with gang violence [95, 130, 55, 43]. This is despite the fact that players of color are one of the largest and continually growing populations in video games [117, 116, 94, 121]. Though this problem is frequently reported white members of the gaming population are often not aware of its severity [123]. Worse poor diversity is also an issue in gaming development, with multiple major studios having extremely low workforce diversity [155, 21, 67]. A recent survey from the International Game Developers Association in 2017 listed the majority of people working in the industry as white (68%) and Black/African American as a measly 1% [155]. As the majority of respondents reported the United States as their country of origin and data from 2016 calculates the US population as 61% White and 12.7% Black/African American the disparity is clear [149].

These numbers are important since research focusing on players found white individuals were less likely to perceive the low rates of racial-ethnic representation in video games [123]. Passmore wrote the following on the phenomenon: "It is more difficult for White participants to perceive poor representation because they feel accurately racially represented, they must learn to identify discrimination as a norm [123]." Along with being less likely to perceive the low rates of non-white representation white players were significantly more likely to agree that the video games industry represents enough racial or ethnic diversity over their black peers [123]. Meaning there is a chance that overly white represented gaming organizations, like their white players, will misidentify the severity of this problem and do little to change the problem. A possibility that could jeopardize these companies profits and leave over $36 billion US dollars alone at the way side [67]. Representation is important to players of color as they see the possible experiences games build around their identities as highly important and desirable [123]. These people have stated that accurate representation of underrepresented racial groups improves a game's experience as a whole [123]. Luckily, even though white players were more likely to be satisfied with the current state of video game representation; players and developers from all walks of life have expressed a desire for more representation [123, 155]. "In game diversity" has been ranked as the third most vital factor for industry growth by the IGDA Developer Satisfaction Survey, with 53% saying diversity in storytelling was a priority for their organization [155]. They also highlighted key issues regarding diversity and tolerance, such as racism amongst gamers and the gaming community, as major contributors in the negative perception of gaming by society [155]. Making academic research that examines methods for reducing racism and promoting tolerance vital for the industry and community at large.

2.2   Gender and Sexism in Games

Much like racial diversity, gender representation in video games has been a key issue in the industry for some time. Along with the discussion of women's representation in games a great of attention has been given the discussion about women in gaming spaces and the video game workforce. Video games are often classified as a media for and dominated by men [120]; however, the market is much different from most people's preconceptions. According to the latest report on distribution of video gamers in the US by gender in 2019 46% of all reported video game players were female identified[58]. Some argue that while the numbers of male to female gamers are similar, women are

not as "hard-core" as male gamers and play with less skill and investment in the hobby[120]. There is some research to suggest female players play slightly less then male players [94, 58]; but, other studies suggest that female players play the same as their male counterparts and any differences between the two are the result of an environment that is hostile towards women [120]. One study argues that the male gamer stereotype is only partially true but perpetuated by many factors such as men being more likely to self identify as gamers privately and publicly [120]. Furthermore, even when women identify as gamers society's perceptions of the gamer and feminine identity are not compatible; resulting in female gamers being mentally categorized as only women or only gamers [120]. Perhaps these findings explain why a large number of online female players disguise themselves as men and engage in cross-gender play.

Cross-gender play refers to the practice where a player adopts an opposite gender identity; often with the aid of an opposite gender avatar [25]. There are multiple reasons for cross-gender play and it is prevalent across all genders and ages [99]. However, the reasons for cross-gender play vary significantly between male and female groups. All genders have reported engaging in cross-gender play to take advantage of gender specific game mechanics; such as different genders having specific classes or equipment [25]. However, men admit engaging in the practice to look at attractive female avatars, more easily gain gifts from strangers (since female avatars are given gift items from other players far more than male avatars), and to trick other players by pretending to be women only to later reveal they are men[25, 160]. Meanwhile, women commonly report engaging in the practice as a way to avoid harassment from other players[25]. Unfortunately, there is quite a lot of sexism in video game online communities and the gaming community as a whole[48, 155]. Fox and Tang wrote that the key reasons for sexist behavior from men towards women in these spaces came from (1) a need to have power over women and (2) a need for heterosexual self-presentation [48]. Often men outnumber women in these spaces and masculine behavior is rewarded even if it is toxic and involves some form of harassment[48]. So, rather than battle against discrimination some women choose to simply hide their gender with a male avatar to avoid detection [48]. This is not to criticize cross-gender play as an activity. The process obviously provides key mental and emotional support as well as freedom to male and female players. It has also aided many trans players as a safe mechanism for them to experiment with and express their gender identity [32]. Plus, from the practice we see concrete proof that many stereotypes about gender are largely false and mainly exist because they are perpetrated by the community. Such as the belief that women prefer to take on the role of a healer [162], or that

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male players are more achievement oriented [99]. Instead, men who desire to play as healers and achievement oriented women often model their avatars as the other gender in order to fit in[162]. If anything cross-gender play shows us how games may be missing out on providing representation for men and women who seek experiences outside current gender norms.

Still, cross-gender play and the presence of female avatar creators, much like the presence of racially diverse avatar creators, are not the sole solution to fixing gender representation in games. After all, much like with race and whiteness, character creators are often male dominated with male characters taking the place of default avatars and the male player base often cast as the target audience [32]. That is assuming the game even has a character creator. Most games feature a set story with a pre-established character whose identity and gender are predetermined. Studies focusing on gender representation in video games show that even though women make up nearly half the population, they are woefully underrepresented as characters in video games. One study from 2002 analyzed 47 games and coded nearly 597 characters [11]. Of those 597 characters 427 (71.52%) were coded male, 82 (13.74%) were coded female, and 88 (14.74%) were of an indeterminable gender [11]. The ratio of representation in advertisements of games is also disproportionate with one study finding male characters outnumbering female characters three to one [39]. Audiences are aware of this lack of representation; especially women, who are more likely to report feeling unsatisfied with female representation in video games [90]. However, the lack of female characters, specifically female protagonists, in video games has been noted by all genders and there is substantial support for endeavor seeking to improve these statistics [90]. Many players and developers are excited about more games striving for equal gender representation and applaud the increase in video games featuring female protagonists [90, 155]. Players, developers, and activist are also paying close attention to the relationship between gender-focused inclusivity programs, such as women-in-games incubators and feminist discourse, and game production environments [65]. The numbers are growing and situations have improved from the 80s and 90s, in part due to the presence of independent companies [90]. Still, numbers are only part of the puzzle we also need to examine how these characters are portrayed.

Looking into the types of bodies and roles most female characters have many prominent stereotypes stand out. Miller & Summers conducted a study featuring 49 games including 282 male humans and 53 female human characters [108]. They ended up comparing 62 males to 53 females to determine their ethnicities, abilities, physical body type, sexual portrayal, and adherence to societal beauty standards [108]. It was discovered that men and women served very different roles in most

games; for example, in 51% of the games, men were playable, whereas women were only playable in 26.5% of the games [108]. Meanwhile, men were significantly less likely to be supplemental characters than women with 14.5% of male characters being coded as supplemental compared to the 30.8% of female characters [108]. As for their appearances, males were significantly more muscular and powerful whereas females were significantly more innocent, attractive, sexy, and helpless [108]. Women were also more likely to be placed in sexy and revealing clothing over their male peers [108]. As Dickerman et al. wrote in their discussion of racial and gender representation, the vast majority of games adhere to societal expectations of beauty [38]. "Women are most commonly depicted as having very large breasts, tiny waists, and full, pouting lips," and female characters' breast sizes are exaggerated far beyond the average's woman [38]. These types of portrayals mean that even when games star accomplished and multi-talented women with complex backstories discussions about the women can be waylaid by arguments about their bodies as they provide both empowerment and objectification in equal measure. Look no further than the numerous think pieces written on Laura Croft, the main character of the *Tomb Raider* series, who is seen as both a feminist icon and a "barbarised representation of falsified femininity [103]."

Unfortunately, sexualization of female characters is not just a norm in most video games but a selling point. Dickerman et al. wrote about the common practice for video game advertisement to feature sexualized women in their add campaigns; even when the game has nothing to do with sexual gratification [38]. As an example they point to a 2003 Gamespy magazine advertisement for *Neverwinter Nights* which featured a nearly naked women (Figure 2.2) even though the character in the game is in no way depicted as such in the add [38]. A mass analysis of video game characters in top-selling American gaming magazines supported Dickerman et al.'s work, finding the norm for female characters is to be "depicted as sex objects who wear skimpy clothing, conform to an idealized body type, and are visions of beauty" [39]. The mass analysis outlined three main stereotypical portrayals of women; sexual, scantily clad, and "vision of beauty", with over 80% of the 119 female characters fulfilling at least one of these conditions, and over a quarter being depicted as all three [39]. A similar study from 2008 also focusing on gaming advertisement found that among 19 video game trailers from the top 20 most popular games of the 21st century (based on expert and player input) over half of all female characters (58.3%) were unrealistically thin and one fourth (25%) were dressed in revealing clothing [110]. Meanwhile, all but one male character observed in the trailers appeared with unrevealing clothing, and most of them had a normal or heavy body type[110].
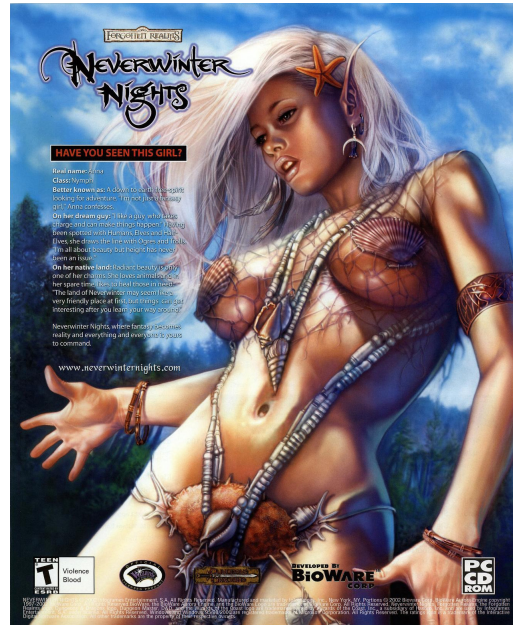
Figure 2.2: *Neverwinter Nights* add featured in *Gamespy* magazine [128].

But the state of female characters belies a larger conversation on how welcoming video games are to women in general. There is a prominent market of girl gamers which has only been growing [58, 67]. These types of stereotypical depictions could negatively impact this growing female audience. Miller & Summers bring up the possibility that common portrayals of women as sexy, helpless, and innocent could influence the behaviors and attitudes of female players [108]. They and other researchers suggest such portrayals could contribute to issues with self-esteem and body image [108, 15]. They argue video games could influence young girls and lead them to try and emulate the sexy appearance of these female characters, damaging the girls self-esteem and contributing to eating disorders [108]. Luckily, game makers are taking notice of the surging female audience; a survey conducted by the *International Game Developers Association* found a majority of game developers (58%) named diversity in game content as a most important factor to future growth in the industry [155]. The bulk of these developers (84%) feel that diversity in the game industry is important, an upward trend as 66% reported this in 2015 [155]. They also overwhelmingly agreed (85%) that diversity in game content was vitally important to them. Finally, over half of developers surveyed in the report agreed that sexism among gamers (57%), and sexism in games (55%) were key contributors to the negative perceptions people have about video games [155].
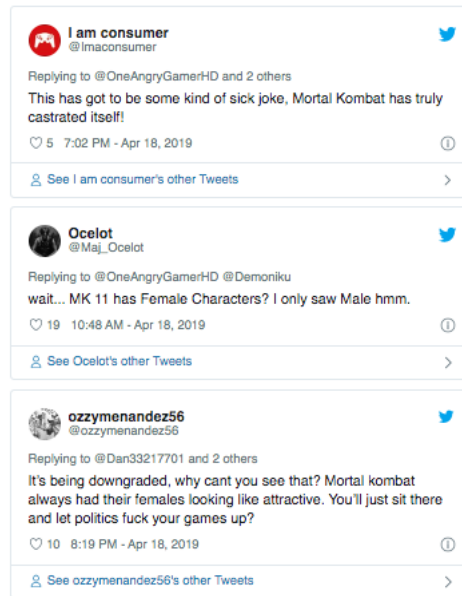
Figure 2.3: Comments on changes to female characters [105].

Gender representation is also a key issue for video-gaming audiences. According to the results of one survey 76.9% participants from a sample of 234 think that women are stereotyped in video games [90]. Of those surveyed 78.4% (51) of the female participants agreed that there is stereotyping of women in video games and 76.4% (182) of male participants also agreed [90]. Many respondents said they ended up avoiding games with obviously stereotyped characters [90]. The data showed most respondents wanted change in regards to negative stereotyping in games [90]. Participants had different ideas on how to improve representation of women in games, but one popular suggestion was for more female protagonists to be created who were not objectified or sexualized by game designers [90]. The overwhelming awareness of representation issues and desire for greater diversity means companies put themselves at risk by ignoring what so many have called a problem in video games and video game culture with sexism [155, 90, 58, 67].

This problem has been and remains extremely important to the gaming industry as the industry is constantly under fire for cases of discriminatory harassment. Jenson & De Castell conducted an expose on feminism and video game culture and found women, both in and out of the industry, constantly face gender based forms of harassment from gaming culture [79]. They give special mention to the online hate campaigns geared at famous game writer Jennifer Hepler and blogger Anita Sarkeesian, both women who received numerous threats of death and violence for

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expressing unconventional opinions on video games such as Helper's idea that narratively driven games should allow players to skip fighting sections [79]. Jenson & De Castell also highlighted the #1reasonwhy twitter campaign which sought to expose the types of first hand instances of sexism and misogyny women in the gaming industry faced along with the types of sexual harassment and assault they had experienced at conferences [79]. Even attempts by game designers to reduce the exaggerated sexualized bodies of women in long running franchises like *Mortal Combat* and *Final Fantasy VII* have been met by rabid backlash from some fans leading to internet outrage, social media campaigns (Figure 2.3), and company harassment over the changes [105, 74]. A troubling turn of events showing some players feel entitled to sexualized bodies and will resist change with as much fervor as they can muster. Still, the industry is slowly responding, and efforts to improve are taking shape.

Game makers are fighting for the ability to create games with female leads and to highlight major female characters in their advertisement. Over the decades more and more female characters have been coming into the spotlight and taking on leading roles [76]. As was the case for *Remember Me's* Nilin (who was both black and biracial, Figure 2.4) and *Bioshoke: Infinite's* Elizabeth, both women (the former lead and the latter support) who originally faced push back for their inclusion with developers saying they had to be changed the men or removed entirely [31, 153]. Both games were critically acclaimed and well received by their audiences showing the markets interest in these types of character. Meanwhile Remedy Entertainment created the game *Control* staring their first ever main female character, Jesse [33]. All three games are examples of how the industry is fighting to include more representation. Each one plays a vital part in the games' stories while being given less exaggerated, sexualized appearances. So, we can see the industry's desire to create more important nuanced women in games.

2.3   Intersectional Identities

There has been a great deal of research on race and gender representation in video games. However, it is important to note that most individuals are not just one thing; black or white, male or female, rich or poor, etc. Rather, individuals contain a multitude of identities which interact to create unique experiences, hardships, and stereotypes. The term for this phenomenon, intersectionality, was coined in 1989 by Kimberlé Williams Crenshaw the explain how black women face distinct forms

Figure 2.4: The lead character Nilin from Dontnod Entertainment's *Remember Me* [46].

of discrimination that are not shared by their black male and white female peers and how the legal system often fails to address theses discriminatory acts. [34]. Crenshaw brings up the 1976 case of DeGraffenreid v. General Motors, in which five black women sued General Motors for a seniority firing policy that disproportionately affected black women [34]. In the firing policy all the plaintiffs ended up loosing their jobs since they did not qualify for the seniority-based layoff exemption [34]. However, records revealed General Motors had refused to hire black women until 1964; though it had hired white women and black men before then [34]. Despite the discriminatory hiring policies that made it impossible for any black woman to be exempt from being fired the courts ruled in the favor of General Motors since the black women could only file either a race based or gender based discrimination violation; which the black male and white female hires protected the company from [34]. Intersectionality was originally created to explain lapses in legal proceedings; however, it was soon expanded to other areas of life including education, leadership, and media representation [132, 78, 35]. Crenshaw later used the controversy over the portrayal of domestic violence in *The Color Purple* as an example of how black women's responses to media can end up split between two identities [35]. Many racial activists at the time stated the presence of domestic violence contributed to negative stereotypes of black men as violent thugs [35]. This unfortunately halted any discussion of sexism and patriarchy in the black community which is no more immune to domestic violence than white communities [35]. The absence of positive black representation meant black women felt they were unable to support a film that brought much needed attention to a feminist issue because it ended up reinforcing negative racial stereotypes [35].

Other researchers have brought up how multiple underrepresented identities can conflate discrimination making intersectional lives more difficult. Ro et al. revealed how the double effect of gender and race leads to women of color facing more challenges in their academic careers [132]. Stating this was especially true in historically white male dominated programs like the physical sciences, computer science, and engineering [132]. This double disadvantage was highlighted as a key contributor to why only 4% of all 2009-2010 bachelor's degrees in engineering went to women of color [132]. Jean-Marie et al. discussed how black women encounter racist and sexist demarcations within historically white and black institutions from white men, white women, and black men, and are isolated from all three groups [78]. These issues are constantly present in an individual's life. Smith pointed out that second wave feminism of the 1950s an 60s often overlooked the experiences of women beyond the white middle-class homemaker [145]. In their critique of *The Feminine Mystique*

they provide the example of the author's proposal that women hire domestic workers to perform the daily household chores; allowing the women to escape household drudgery and find their own voice [145]. This advice was useless for most working-class women, but for black women the advice reflected their experiences as nursemaids and housekeepers for wealthy families [145]. Black women frequently spent their days working at other people's homes as well as tend to their own housework and child care [145]. As women's historian and civil rights activist Gerda Lerner wrote the author, Friedan, was addressing "solely to the problems of middle class, college-educated women." and that "Working women, especially Negro women, labor not only under the disadvantages imposed by the feminine mystique, but under the more pressing disadvantages of economic discrimination [71]."

However, intersectional theory does not uphold the idea that intersectional lives are necessarily always more difficult. In an interview with *Vox*, Crenshaw claims intersectionality is not meant to create a hierarchy of oppression [28]. Rather, it illustrates how intersecting identities reveal the feebleness of identity based stereotypes [28]. Crenshaw brings up the famous Sojourner Truth speech *Ain't I A Woman?* delivered at the 1851 Women's Rights Convention [34, 150]. Ms. Truth, renowned woman's rights activist, used her past as a slave to challenge the sexist idea that women were "too frail and delicate to take on the responsibilities of political activity [34]."

> "That man over there says that women need to be helped into carriages, and lifted over ditches, and to have the best place everywhere. Nobody ever helps me into carriages, or over mud-puddles, or gives me any best place! And ain't I a woman? Look at me! Look at my arm! I have ploughed and planted, and gathered into barns, and no man could head me! And ain't I a woman? I could work as much and eat as much as a man - when I could get it - and bear the lash as well! And ain't I a woman? I have borne thirteen children, and seen most all sold off to slavery, and when I cried out with my mother's grief, none but Jesus heard me! And ain't I a woman? [150]"

In her speech Ms. Truth forces the audience to acknowledge both her identities as a black person and woman simultaneously. This illustrated that womanhood could not be simplified into a singular shape or experience. The speech also rejected "the racist attempts to rationalize the contradiction-that because black women were something less than real women, their experiences had no bearing on true womanhood [34]. "Intersectional theory's fundamental concept is "that individuals have individual identities that intersect in ways that impact how they are viewed, un-

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derstood, and treated." [28]. So black women are both black and women. Unfortunately, this means they endure specific forms of discrimination with black representation, female representation, and black female representation. Obviously this compounds their representation issues; such as the lack of characters both supporting and leading that reflect their identities. The Children Now report that analyzed 1,716 characters mentioned in an earlier section found 17% were female [55]. Of those female player-controlled characters only 10% were black/African American [55]. Furthermore, black women are not given the same roles as their light skinned counterparts. White women are often portrayed as helpless and innocent in video games [108]. Meanwhile, as Everett noted in games like *GTA: San Andreas, Def Jam Vendetta,* and *Saint's Row,* black women are "portrayed quite casually as sexually available bystanders...and as streetwalking prostitutes [43]". Everett writes this "reinforces lessons about race and sexuality, especially the sexual mores, appetites, and behaviors of women marginalized by race and ethnicity [43]."

So, not only do black female characters suffer from similar issues as white female and black male characters; they have their own unique struggles that set them apart from their peers. Certain portrayals of black women can be positive or negative forms of representation in ways not shared with white women or black men. For example, a white woman being portrayed as a dainty weak individual in need of saving would be a stereotypical trope; however, a black female character portrayed the same way would in fact be revolutionary as black women have been historically denied feminine perceptions as precious innocents [34]. However, the opposite is also true. Intersectionality means a single individual with multiple underrepresented identities can provide positive representation for multiple groups of underrepresented people. Nichelle Nichols, a black female actress, provided such influential positive representation in the initial run of *Star Trek* that from the late 1970s to 1980s NASA hired her to recruit various minority candidates into the space program [112]. Nichols recruited people from a varity of backgrounds including, Guion Bluford, the first African-American astronaut, and Sally Ride, the first female American astronaut [112]. Individuals with intersectional identities often find themselves as representatives and advocators for all of their backgrounds. Meaning they can help address multiple groups' representation issues while helping to combat the multiple prejudices and biases these groups face with the aid of several psychological phenomenon.

2.4 Mere Exposure

The mere exposure effect is a robust and well-researched psychological phenomenon that occurs whereby presentation of a stimulus in a positive or neutral setting increases positive perceptions of the stimulus [18]. Strong reliable results of the effect have been produced with a variety of stimuli including drawings, photographs, nonsense words, and non-visual stimuli, like word frequency [18, 164]. Mere exposure can change a multitude of judgments, from liking and trust ratings to forced-choice decisions [18]. There are many theories into the mechanics of the mere exposure effect. One posits that participants confuse familiarity with an object with positive emotional connections to said object [44]. Participants know there is something about the object that feels different from other novel objects and mistake that feeling as being a preference for the object. Perhaps this is why recognition of the stimuli is not necessary for the mere exposure effect to influence attitudes. Multiple experiments conducted by Bornstein & Galley investigating subliminal mere exposure (where participants are exposed to a stimuli so quickly they are unable to recognize the exposure occurred) found that the subliminal mere exposure resulted in a significant enhancement of the effect [20].

Another theory posits that the simple act of processing an object one has been exposed too creates a sort of cognitive loop that the subject's brain finds pleasurable [17]. When a person's brain takes in information about an object the processing mechanisms in the brain fire off chemicals and set up electrical paths to encode information about the object automatically and without any conscious effort [17, 44]. This causes the brain to fixate on the object, strengthening mental connections to it, and forming a sort of subconscious internal loop of exposure. For this reason complex stimuli can enhance the mere exposure effect and boredom, from either overly simplistic stimuli or individuals who are prone to boredom, can diminish the effect [19]. It has also been found, through conducting brain scans of participants during mere exposure research, that mere exposure is in some situations the product of the ease at which participants can process a stimulus, aka fluency [96]. Something to keep in mind for video games as interactivity engages participants to a higher degree and provides more stimulation than other passive media. Video games do this while maintaining high levels of fluency so players can absorb large amounts of information as easily as possible [91]. Games even go so far as to simplify complex processes like grasping a character's personality and moral leanings. In fact, many characters' moral alignment can be understood by their shape alone, Figure 2.5. Lovable heroes like Kirby are circular while major antagonists like Bowzer are sharp and triangular [146].
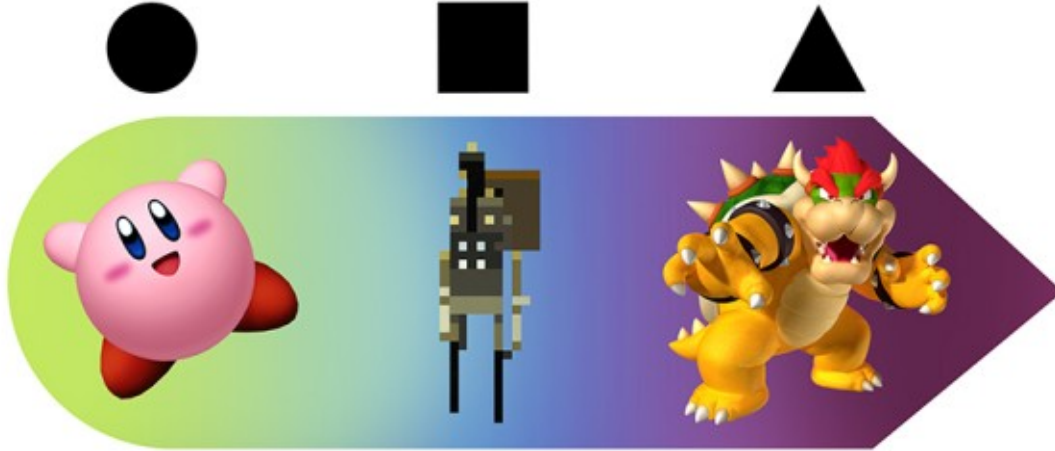
Figure 2.5: Examples of Shape Character Design Theory [146].

Either way, when people are presented with a stimulus they tend to like and choose that stimulus over stimuli that they were not exposed to. The positive responses can be witnessed from surveys and decisions [20]. There are correlations between mere exposure and physical changes in the body along with participants rating familiar stimuli more likable than unfamiliar stimuli [64]. This can be seen in the zygomatic muscle region which shows more activity while viewing familiar stimuli than unfamiliar stimuli [64]. These muscles control our cheeks and are what allow us to smile, so the mere exposure effect produces biological as well as attitudinal changes in participants [64]. Mere exposure is also noteworthy because exposed and rated stimuli do not need to be perfect matches [166]. The mere exposure effect also increases preference for stimuli which share a strong resemblance to the exposed stimulus. Zebrowitz et. al found that exposing white participants to Korean and black faces during an attention task led to higher perceived familiarity to, and likability for, different novel Korean and black faces in a subsequent judgement task [166]. Furthermore, decisions made in interpersonal and social situations can also be influenced by mere exposure as they are in part based on subliminally/marginally perceived stimuli [20].

These findings support the idea that mere exposure to an individual of another race can improve perceptions of all people from that race and influence how participants interact with them in social situations. Zebrowitz et al. discovered exposing white participants to black faces resulted in participants having reduced neural activation in the lateral orbitofrontal cortex, the part of the

brain that handles socially significant negative reactions to unfamiliar stimuli [167]. Meaning exposed white participants were less afraid when viewing the image of the previously exposed black individual and images of other novel black people than non-exposed white participants [167]. Zebrowitz et al. note many aspects of discrimination result from fear of the "other", as well as the fact that white individuals in countries like the US tend to show stronger levels of activation in brain regions that respond to threats when viewing novel black faces [167]. Furthermore, exposure under negative circumstances can trigger threat responses and create more bias and mental distress [36, 133]. Simply put, mere exposure can overcome the brain's initial negative fearful responses to other races or increase it based on the nature of the exposure. Mere exposure can even encourage participants to feel closer to exposed to individuals during interactions and discussions [20]. Bornstein & Galley found that participants exposed to an image of a person said they got along with the actual exposed individual better during a discussion than they did with a novel individual [20]. Participants reported this despite the fact that they actually spent an equal amount of time interacting with both exposed and novel subjects [20]. The mere exposure effect has even been able to influence individuals' moral leanings and ethical tolerance. One study showed that exposing people to immoral acts that did not immediately negatively affect them, like watching a businessman commit white collar crime, resulted in participants feeling the immoral act was more acceptable [154]. Since the mere exposure effect is so robust and replicable it has long been used to combat prejudice in many forms of entertainment. For example, studies have explored multiple instances of positive portrayals of black individuals increasing both explicit and implicit attitudes towards black people [123, 125, 141]. Hence our initial two studies on video games' influence over bias used the mere exposure effect as a comparative psychological phenomenon. This allowed us to examine the difference between merely being exposed to an underrepresented character, like a non-playable character (NPC), or identifying with a playable underrepresented character through embodied identification.

2.5   Identification and Embodiment

Identification is the means through which audiences experience text and it allows them to interpret and receive the narrative on a personal level [30]. Through identification audience members forget themselves and in a sense become the character they are identifying with [30]. This process can lead to increased feelings of affinity and similarity with the character. It is a theorized merger

of media user and character resulting in the formation of a new identity [88]. This merger results in many mental changes for the user. Multiple studies have characterized identification as a mediator between media exposure and viewer attitudes [91]. This can occur even if participants do not match the avatars they are embodying. In one study by Patané et al. white participants were asked to embody a black virtual avatar and engage in either cooperative or non-cooperative tasks with another VR agent [127]. Despite the difference in race between the participants and their avatars all participants experienced full body ownership with the black avatar and participants were able to highly identify with the avatars [127]. Others have found that individuals will project biases onto identifiable characters which can augment the behavior of the viewer so that they begin to act in accordance with those biases be they racial [40], or based on other physical attributes such as height and beauty [164, 161].

Identification can even be used to persuade viewers as Graaf et al. showed in their work on narrative perspective's effect on audience attitudes [37]. When they manipulated the framing of a narrative's perspective Graaf et al. found they could strengthen or even change people's attitudes towards mundane and controversial topics such as euthanasia [37]. In a large-scale examination of Sesame Street's impact on early educational performance the ability for black, non-Hispanic boys to identify with the black characters and their environments coincided with some of the highest educational outcomes [84]. Simply put, identification with media characters has huge impacts on the lives of real people. Though it is important to note that identification is not the same thing in each medium. Hefner et al. found that when applied to video games the temporary shift in a person's self-perception requires a different sort of self-perception than non-gaming situations [68]. This may be due to the fact that when playing a video game participants are engaged in a task which requires personal levels of mastery and skill in order for the narrative to proceed [68]. So, if video games have an opportunity to reduce bias that goes beyond the mere exposure effect the answer may lie in Hefner et al.'s description of identification. After all, in video games audiences experience the story through the character, rather than passively viewing the events as a spectator.

The end result is that audiences who engage in play with these digital characters pick up attributes and self-perceptions mirroring the in-game character [87]. Players who played as and identified with soldiers in first-person shooter games reported feeling more brave, patriotic, strong, and loyal than before play [88]. Similarly, players who played a video game as British spy James Bond altered mentally during the play period to align with the secret agent [87]. This change in

self-perception was accompanied by positive experiences which became integral toward the overall enjoyment of the game [87]. The effect can even augment cognitive ability as a study by Banakou et al. found that when participants in fully immersive VR embodied an Albert Einstein avatar their cognitive processing abilities significantly improved resulting in them performing better on a logic test than participants who did not [8]. The change in self-perception was linked by Farmer et al. to a change in the conceptual self through information manipulation of the bodily self [45]. Studying fully immersive VR manipulations they concluded that when individuals get to experience fully embodying another person the individual they embody becomes a part of the participants conceptual-self [45]. This increases empathy for the VR character and can change social attitudes [44]. A study by Gonzalez-Liencres et al. found that embodying and highly identifying with a virtual female victim of domestic abuse greatly reduced prejudice against women [56]. A similar study where participants could embody either a male harasser or female victim in a VR simulation found that even after a week of embodying the female avatar participants were less likely to physically harm another virtual female character in a recreation of the famous Milgram experiment [115]. Returning to Banakou et al.'s Einstien study not only did high identification with the character increase cognitive ability it decreased age-based discrimination in participants [8]. These results were supported by another fully immersive VR study involving common elderly avatars which found embodiment of the virtual elder adult characters reduced ageism amongst participants [118]. The study also found that embodiment was more effective than asking participants to look at a screen shot of the individuals and try to mentally empathize with them [118]. Though, at least one study found these changes are not always positive. Participants tasked with perspective-taking during a virtual interview in a study by Groom et al. showed increased signs of bias against black applicants after embodying black avatars [62]. However, Hasler et al. expanded on this research and discovered that a key component in racial bias manipulation is the environment of the interaction [66]. Heavily racially priming situations, such as interviews, can trigger people's implicit biases and thus enhance them [66]. However, under different circumstances virtual body skins can outright reverse in-group bias effects towards different racial groups regardless of the participant's implicit racial bias [66].

In other studies, embodied identification with a dark-skinned avatar in a fully immersive VR environment decreased implicit racial biases regardless of whether participants were primed to connect with the VR body [7, 26, 125]. Banakou et al.'s VR study had participants take part in a TaiChi class with a white or black avatar before testing for bias [7]. They found embodied identification can

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alter perceptions even when the participant's focus is directed away from embodying their avatar and towards another task [7]. Although these studies suggest that it is possible to reduce biases by means of identification through interactivity, these fully immersive VR experiences, in which players don a head-mounted display cutting them off from all visual connection to the real world, are not the norm when it comes to game play. Moreover, reports suggest there may be a significantly different mental load in fully immersive VR as just playing a game using a first person versus third person perspective produces drastically different cognitive effects on players [30]. Plus, the experiences from the just mentioned studies are closer to "virtual tourism" than traditional video games: in them participants enter a room, look around, and occasionally interact with other VR avatars. Instead our research focused on the perspective-taking inherent in standard video game play (i.e., embodied identification) and how this alone may be sufficient in reducing bias. The studies separated the phenomenon from games with empathetic narratives and did not feature fully immersive VR. This is vitally important research as it could have major implications for all types of representation in video games. The unique experience embodied identification produces and the desire to utilize it for promoting positive change is the driving force behind multiple initiatives in the industry. Developers aspirations to promote identification with disenfranchised people has even led to the rise of a new video game genre.

2.6   Identification and Empathy Games

Identification as a tool for advocacy has a notable history in academia. There are articles about using video games to increase understanding [63] , advocacy [135], self-confidence [123], and decrease ingroup bias [66]. Industry is even further ahead having developed a whole genre dedicated to promoting identification with disenfranchised and underrepresented people, the empathy game. Empathy games use evocative narratives to expose players to others' lives and experiences in the hopes of eliciting compassion and understanding. For example, Gutierrez et al. developed the empathy game, *Fair Play*, to see if the interactive nature of the medium could be used to prompt non-black audiences to empathize with the world view of a black graduate student in a predominately white university [63]. The study is one of many examining the impact of representation in games. It showed that playing a game with a well-rounded black character who deals with the real world consequences of racial bias can reduce a player's actual biases towards real people. It compared

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playing the game and reading text with similar information to what the game provided and found playing the game was able to decrease IAT racial bias scores to a far greater degree [63].

Empathy games cover everything from facing bullying [22], to overcoming depression [122], to surviving in a war-torn town [73]. Some games put you in the figurative shoes of the people experiencing these scenarios, and others present characters to watch and interact with. The end goal of these games is to combat bias and discrimination through experience, and their efforts are backed by evidence. The empathy game *Spent* was used to positively change grade school students' perceptions of the homeless, resulting in students increasing their engagement with homelessness community service projects [135]. Empathy games are usually a niche market producing content for individuals specifically seeking out these experiences. However, larger game developers have realized the emotional and meaningful impact of this work and empathetic narratives can be found in and even be the main focus of major video game blockbusters. Bioware's *Dragon Age: Inquisition* features a powerful narrative on gay conversion initiatives and rejecting or reconnecting with estranged family [148]. Meanwhile Quantic Dream's *Detroit Become Human* uses the science fiction struggle between androids and humans for equal rights to allude to real world civil rights movements. The game also touches on issues of abuse and domestic violence. In some of it's most distressful and emotional scenes we witness an android, Kara, forced to live and work in a physically abusive household while trying to care for and protect a young girl. Though the moment is fictional and not a true one-to-one comparison with real world abuse some gamers and non-gamers have deeply connected with the depiction. Even going so far as to use the game to talk about their own struggles for the first time [4]. As player Katya and her mother Patte, both victims of domestic abuse, speak about in tearful YouTube videos games such as these bring the reality of abuse to their audiences and prove to real life victims they are not alone [3, 4]. They go one to say the game can give survivors of abuse the confidence to speak up, seek help, and talk about their experiences [4, 3]. Katya says she is especially thankful the game gives players who have never experienced these situations the chance to witness and learn about both the larger obvious moments of abuse and the minutia of how survivors cope and process [3]. She brings up a moment in the game where Kara finds drawings detailing the abuse created by the little girl in the family. Saying it shows how survivors are often unable to talk about their experiences and withdraw into art and books as a means of escape [3]. It may be the case that due to overwhelming love and support for these games from some players and developers that academic research tends to strictly focus on games with empathetic narratives as

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tools for bias manipulation. Unfortunately, this means an examination into the correlation between the presence of underrepresented playable characters and reduction of bias in more traditional game play experiences is woefully under researched. Morawitz et al.'s study of *The Sims Social* is one exception, but even this game centers around empathy-stimulating experiences such as forming relationships [13]. Enter our three studies that specifically focus on the power of representation and identification via play to reduce biases against real people.

Chapter 3

Study 1: Mere Exposure, Embodied Identification, and Racial Bias

As mentioned a great deal of research has already been conducted surrounding video games, mere exposure, and various means of reducing bias. However, an in-depth look into these studies reveal several holes that past research has not covered. For example, research regarding mere exposure and video games tends to focus on character representation not on the effects of playable character control [123, 125, 55]. Meanwhile, research that does involve play with embodied identification focuses primarily on fully immersive HMD virtual experiences [44, 62, 7]. These studies fail to account for more standard types of play where participants use a laptop or television screen to display the game with a mouse, keypad, or handheld game controller to allow for interaction with the world. The few studies that do feature more standard forms of play use games with empathetic narratives specifically designed to evoke empathy [135, 63]. What is missing are studies that focus on the simple act of playing as a virtual character in a video game whose setting and narrative are not tailor made to evoke changes in attitudes towards underrepresented populations. Thus, this first study was conducted to fill in those gaps and highlight how impactful playing as an underrepresented character can be on an audiences' perceptions of real world underrepresented people.

3.1   Introduction

This study examined if exposure to and/or embodiment of video game characters can be used to decrease bias towards their non-virtual counterparts. An effect that has been studied in fully immersive VR experiences and games purposefully designed to evoke empathy but rarely beyond that. In the study, participants were asked to play a short 2D video game as, or alongside, a black or white character. They then viewed and rated a persuasive argument delivered by a white or black speaker. While white participants who played as a non-black character showed bias against the black speaker, participants who played the game as a black character demonstrated bias reduction. No bias reduction was found for players who played alongside a black character, ruling out a mere exposure effect. Thus, this study stands out by highlighting how even without empathic narratives games can be a tool for combating societal biases by means of embodied identification with a diverse virtual character.

3.2   Research Questions

If we assume the interactivity of video games is truly such a powerful thing, analysis into it separate from the empathetic narratives found in empathy games is vital. Hence, this section outlines our paper studying bias reduction in "regular" video games (i.e., games without an emphatic narrative) and endeavors to answer the following research questions:

RQ1: Can embodiment of a black game character be used to reduce the racial bias of an individual in a video game that does not have a narrative tailor-made to evoke sympathy?

At the same time, we investigated whether this effect was indeed driven by embodied identification (identification through the operation of a playable character in the game), rather than the mere exposure effect that also exists in traditional non-interactive media. In other words:

RQ2: Is the effect driven by embodied identification with the player character, or is it similar to the mere exposure effect, unaffected by the connection interactivity creates between the player and player character?

Arguably, the former would occur only when playing *as* a black character, while the latter would occur while also playing *alongside* a black character.

Figure 3.1: Character manipulations, top row companions, bottom row players

3.3   Experimental Setup

The focus of the study was to examine if exposure to and/or identification with video game characters can be used to decrease bias towards non-virtual counterparts, even if the game has no explicit emphatic narrative. To this end, we developed two task-based video games (puzzle or action) featuring two characters (a controllable player character and a non-controllable companion character), whose races were manipulated between-subjects to be a white human, a black human, or an anthropomorphic cat Figure 3.1. After playing and then evaluating the game, participants viewed two videos in which a white and black presenter gave arguments for using the game as an early childhood development tool. Participants then rated the presenters on a variety of presentation skills. We then tested whether participants' evaluations were biased against the black presenter by comparing the overall ratings of the black and white presenter, and whether playing as or with the black character reduced their bias. By separately testing the effect of the race of the player character versus the companion character, our evaluation can disentangle whether this effect occurs with mere exposure to a character, or whether embodiment is required. Finally, the study validates the necessity of embodied identification by testing whether self-perceived embodied identification with the player character (measured via a questionnaire) acted as a significant moderator of the aforementioned effect. These tests are represented by the following hypotheses:

Racial bias hypothesis (H1): There is a significant main effect of speaker race: Participants rate the black presenter lower than the white in terms of technical skills (H1a) and likability (H1b).

Mere exposure hypothesis (H2): There is an interaction between companion character race and speaker race: The effect of H1 is significantly weaker for participants who play alongside the black companion character.

Embodiment hypothesis (H3): There is an interaction between player character race and speaker race: The effect of H1 is significantly weaker for participants who play as the black player character.

Identification moderates embodiment hypothesis (H4): There is a three-way interaction between embodied identification, player character race and speaker race: the effect of H3 is significantly stronger for participants who experience a high level of embodied identification with the player character than for participants who perceive a low level of embodied identification with the player character.

3.3.1 Participants

Using Amazon Mechanical Turk 369 participants (189 male, 180 female) were recruited to participate. Of our participants, 12% were aged 18-25, 29% were aged 25-30, 35% were aged 31-40, and 24% were aged 41 and above. Moreover, 75.1% self-identified as White/Caucasian, 12% as Hispanic/Latino, and 10.6% as Black/African American. Participants were screened for attentiveness via multiple attention checks and long-form answer screenings. Participation was voluntary, and each participant received 2 US dollars as compensation. The study was designed to take 20 minutes to complete putting the pay rate of 2 dollars for 20 minutes at 6 dollars an hour, the Amazon-recommended pay rate. The study was reviewed and approved by the university's Institutional Review Board (IRB).

3.3.2 Procedure

Participants were told they would test a prototype of an educational game for children and then rate arguments for the game's application in a classroom environment. After reviewing the study procedures, participants were randomly assigned to one of two game types: a puzzle game
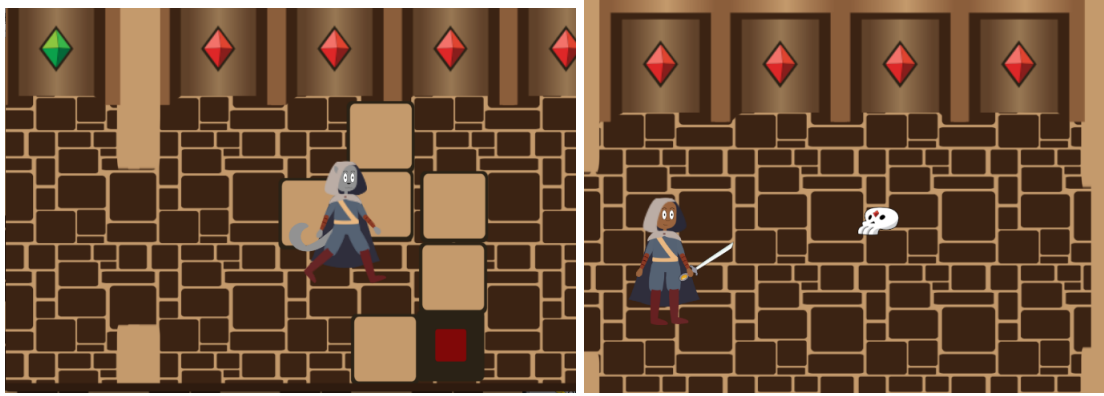
Figure 3.2: Screenshots of the puzzle (left) and action (right) game formats developed for the study.
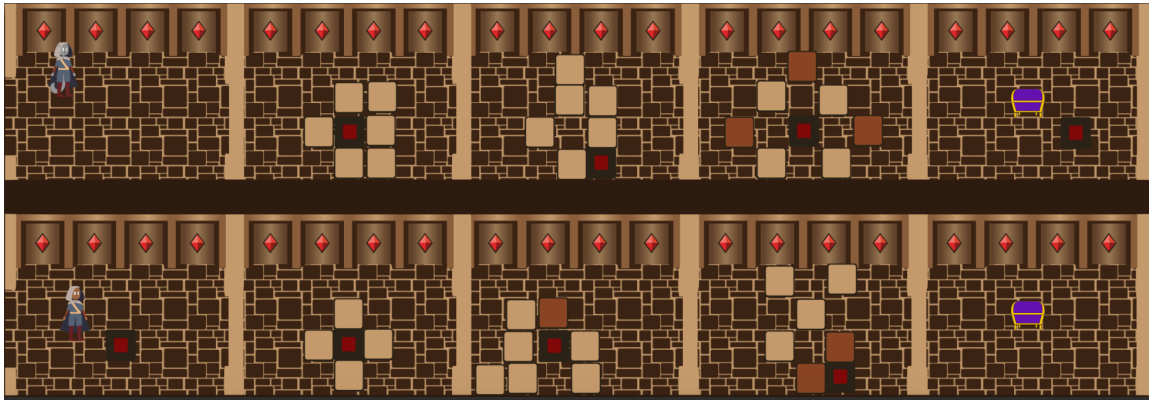
Figure 3.3: Sample of the puzzle game with a black player character on the bottom and a cat companion character on the top. During game play the camera was zoomed in to the view of one room to better allow players to see the actions of the characters.

where players pushed blocks around a room to reach a button on the floor and an action game where players cleared a room full of skeletal monsters using a sword Figure 3.2. Each game was comprised of multiple dungeon rooms and was split in two horizontally, with the player's rooms on the bottom and the companion's rooms on the top Figure 3.3. To progress, participants needed to clear their room, which would open a door to allow the companion (controlled by an AI) to progress, clear their own room, and then open the door to the player's next room. The game took on average 2 minutes and 30 seconds to complete.

At the start of the game, participants were instructed on how to play the game using their keyboard to move and interact with the game environment. Here, participants read a dialogue between the player and companion, which included close ups of the characters' faces. These close

Figure 3.4: Screenshots of the two speakers.

ups were included so that participants could be made fully aware of the characters' appearance. The races of the player and companion characters were manipulated between-subjects with 5 experimental conditions. After playing the game, participants completed a questionnaire evaluating the game and their identification with each of the characters. Before answering questions about the characters, participants were shown visual reminders to explain which character the questions were referencing.

Participants then watched two 1m45s videos of presenters (one black male and one white male, presented in random order) making a persuasive argument about the game. The presenters were matched in age, demeanor, physical appearance, and presentation style Figure 3.4. The arguments they presented were randomized and were carefully pre-tested to have a similar level of quality. After each video, participants answered a survey evaluating the presenter and the presentation. Finally, to rule out desirability bias, participants answered a question on whether or not they had realized the study was about race and racial bias, rather than testing the game.

Independent Variables We randomly assigned participants to one of two 2-D side scrolling games (puzzle or action) to control for potential environmental effects priming certain racial biases [66]. The game was played with one of five character set-ups:

- Control (cat player and cat companion)

- Black companion (cat player), to test the mere exposure hypothesis

- White companion (cat player), the comparative control for the mere exposure hypothesis

- Black player (cat companion), to test the embodiment hypothesis

- White player (cat companion), the comparative control for the embodiment hypothesis

In the second part of the study (evaluating the presenters), the essential within-subjects manipulation is the race of the speaker: Black speaker and White speaker. The order of the presenters

and the arguments presented were randomized to eliminate potential order and perceived argument strength effects. Moreover, the arguments were pretested to ensure they were equally persuasive.

Dependent Variables After playing the game, participants answered questions regarding immersion, enjoyment, player identification via similarity to the player character, player identification via shared embodied presence with the player character, companion identification via similarity to the companion character, companion identification via shared embodied presence with the companion character, and in-group identification. Each of these constructs was measured with several 7-point scale items, mostly ranging from 1-Completely Disagree to 7-Completely Agree. Table 3.3.2 shows the participant and game related questions used in the experiment. All factors were adapted from existing externally validated scales [2, 50, 131, 136, 139, 97]. We conducted a Confirmatory Factor Analysis (CFA) on these items. The factors show convergent validity (AVE > 0.50) and discriminant validity ($\sqrt{}$ AVE $>$ largest correlation), with a good model fit: $\chi2$ (539) $= 629.0$, $p <$ 0.001; RMSEA $= 0.048$, CFI $= 0.996$, TLI $= 0.996$. While hypothesis 4 revolves around embodied identification (i.e., "identification via shared embodied presence"), we included the other evaluations to rule out alternative explanations of the hypothesized effect.

After watching each video, participants rated the speaker on their likability and technical skills. Since both speakers were effectively identical save for their races, a racially unbiased sample population should rate them equally across all factors. If not, we have evidence of bias towards or against one speaker based on their race. We chose to focus on conscious bias, rather than implicit bias (e.g., IAT), in line with previous work that used subjective scales to evaluate cognitive biases in real-world settings [70, 140]. We also included presentation quality to rule out any effect of differences in quality between the two arguments (which were randomly assigned to the two speakers for each participant). Each of these constructs was measured with 7-point scale items that were adapted from existing validated scales [82, 119, 23, 147]. Table 3.3.2 shows the speaker and argument related questions used in the experiment. We conducted a CFA on these items as well. The factors show convergent validity (AVE > 0.50) and discriminant validity ($\sqrt{}$ AVE $>$ largest correlation), with a reasonable model fit: $\chi2$ (87) $= 207.2$, $p < 0.001$; RMSEA $= 0.106$, CFI $= 0.987$, TLI $= 0.984$.

	While I was playing the game I was thinking about how much I enjoyed it.	.923
Enjoyment [139] AVE: .917 Largest Correlation: .627	I found playing the game very interesting.	.944
	I enjoyed playing the game very much.	.964
	I thought playing the game was boring.	-.917
	Playing the game was fun.	.991
	I thought playing the game was interesting.	.974
	I would describe playing the game as enjoyable.	.987
Immersion [136, 2] AVE: .694 Largest Correlation: .627	While playing the game I blocked out most of the distraction.	.598
	While playing the game I was immersed in the task I was performing.	.958
	While playing the game I was absorbed in what I was doing.	1.00
	While playing the game, my attention did not get diverted very easily.	.706
Player/Companion character identification: similarity [97] AVE: .882 Largest Correlation: .708	The player/companion character is like me in many ways.	.916
	The player/companion character resembles me.	.905
	I identify with the player/companion character.	.957
	The player/companion character is similar to me.	.977
Player/Companion character identification: embodied presence [97] AVE: .882 Largest Correlation: .708	While I was playing, it felt as if I was the player/companion character.	.960
	I felt like I was inside the player/companion character while I was playing.	.976
	While I was playing I was transported into the player/companion character.	.934
	While playing, it felt as if the player/companion character's body became my own.	.908
	It was as if I acted directly through the player/companion character.	.917
In-group identification [50, 131] AVE: .745 Largest Correlation: .483	I recognize myself in others of my ethnic group.	.742
	How strongly do you identify with your ethnic background?	.899
	How close do you feel toward other members of your ethnic group?	.962
	How similar or dissimilar are you compared to other people of your ethnicity?	.834

Table 3.1: Participant/game related factors and questions

Speaker technical skills [82, 119] AVE: .755 Largest Correlation: .860	I believe that the speaker is competent when it comes to video game development.	.922
	The speaker seems to be an expert in video game development.	.792
	I feel like the speaker knows what he is talking about.	.990
	The speaker seems capable to build this game.	.921
	The speaker comes off as a rookie game developer.	-.686
Presentation quality [23] AVE: .816 Largest Correlation: .860	The presented argument had substance.	.900
	The presented argument was thoughtful and in-depth.	.883
	The presented argument was coherent and logical.	.909
	The speaker was able to hold my attention.	.927
	The speaker was able to communicate their point.	.858
	The speaker informed me adequately on the thesis topic.	.943
Speaker likability [147] AVE: .886 Largest Correlation: .598	The speaker had a warm personality.	.956
	How friendly did the speaker seem?	.973
	How personable was the speaker?	.952
	The speaker is the kind of person almost everyone likes.	.882

Table 3.2: Speaker/argument related factors and questions

3.4   Results

3.4.1   Descriptive Statistics

First and Second Speaker Figure 3.5 shows an overview of the average ratings of the black and white presenters across different game character conditions, split between the first and second speaker. The graphs presented show that the effect of game character and speaker race is substantially different for the first and second speaker. Such an order-effect is not uncommon in within-subjects studies—it is a sign of asymmetric transfer, and it has been suggested to remedy this issue by limiting the analysis to the first exposure [29]. In effect, we change our study from a within-subject comparison of how participants rated both speakers to a between-subject comparison of how participants rated their first speaker. This is similar to other studies on racial bias, which also use a between-subjects study designs [140].

Presentation Quality We found no difference between the two arguments in terms of presentation quality (p = 0.639), suggesting that we succeeded in making the two arguments equally convincing. As expected, speaker race also had no significant effect on presentation quality (p =
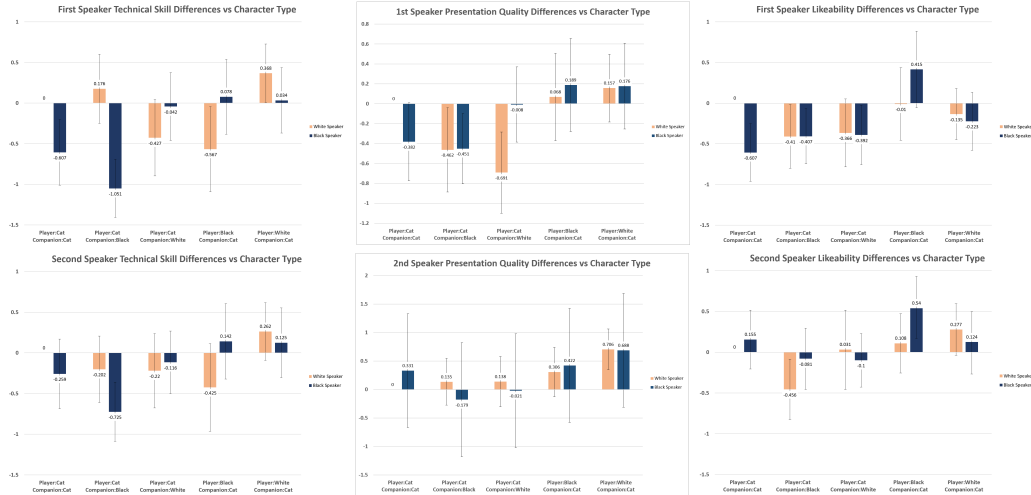
Figure 3.5: Technical skills (left panels), argument quality (middle panels) and speaker likability (right panels), split by speaker order (top: speaker 1, bottom: speaker 2), speaker race (dark blue: black speaker, light orange: white speaker) and character condition (five pairs of bars). As factors are scale-free, the value for the white speaker in the control condition is fixed to zero.

Condition	Wrong player	Wrong companion	Wrong either character
Control	18%	12%	19%
Black Companion	40%	18%	54%
White Companion	50%	8%	57%
Black Player	18%	23%	36%
White Player	11%	18%	30%

Table 3.3: Misidentifications of player and companion characters per condition. Removals are listed in boldface (removals in the control condition depend on the test).

0.380).

Character Misidentification We included a wide range of attention checks in our study, including reading comprehension questions, game play time, and character misidentification. The latter checked whether participants were able to successfully identify the race of the player and companion character. As can be seen in Table 3.4.1, participants did not misidentify the characters in equal measure. Specifically, they were disproportionately more likely to misidentify the player character as human when the companion character was human (i.e., in the white companion and black companion conditions). Overall misidentification in these conditions was relatively high—57% and 54%, respectively. In the remaining conditions, misidentification was much lower (19%-36%), and misidentification of the player character was even lower (11%-18%).

As we were testing the cognitively mediated effects of character race on speaker evaluation, misidentification of the human character would have strong adverse effects on our results. For instance, if a participant in the "white player" condition perceived the player as black, they would effectively be in the "black player" condition (and vice versa), thereby thwarting the intended effect. In contrast, misidentified non-human characters (as either a black human or a white human) would merely add noise to our results.

Thus, participants who misidentified the human character were removed from each analysis to ensure successful implementation of the manipulation and to allow us to demonstrate causality [47]. Moreover, since the "control" condition is relevant in all tests, we removed participants who misidentified the character under investigation in that particular test (misidentified companions when testing H2; misidentified players when testing H3 and H4). These changes gave us overall sample sizes of 145 participants to test the mere exposure hypothesis (H2) and 124 participants to test the embodiment hypotheses (H3 and H4). In these analyses, each sample was split six ways by our experimental conditions [3 character x 2 speaker], leaving us with enough statistical power to detect medium-to-large effects.

Game Type We ran our study with two types of games (puzzle and action) to control for potential environmental effects priming certain racial biases [66]. Specifically, existing literature suggests that participants might have exhibited higher levels of aggression when playing the action as black characters [62], which could have influenced their evaluation of the speakers. However, we found that none of the effects presented below are moderated by game type, suggesting an absence of such priming effects.

Participant Characteristics Past literature focusing on racial bias in Western nations such as the US tends to focus on how bias from predominately white populations and organizations affects non-white groups [7, 43, 62, 123, 166, 167]. After all, these mainly white groups tend to be disproportionately susceptible to racial bias due to experiencing higher familiarity with people from their own rather than other races [166, 167] and having lower exposure to other-race narratives and issues [49, 123, 123, 156]. Our statistical analysis supported these findings as our racial bias effects were weakened when non-white participants were included in our data sets. Consequently, we limited subsequent analysis to white participants. We also tested for main and interaction effects with participants' gender, age, and the average number of hours participants devoted weekly to playing video games.

Deception check To rule out desirability bias, we checked whether participants had realized the study was about race and racial bias, rather than testing a game. Although a fair number of participants realized the racial ramifications of the study (33%), we found no differences in our results between them and participants who did not report such a realization.

3.4.2 Racial Bias Hypothesis (H1)

The racial bias hypothesis suggests a main effect of speaker race on technical skills. Structural Equation Model (SEM) was used instead of a traditional t-test to keep the independent variable (technical skills) as a standardized latent factor. We found that white participants who did not play as or alongside a black character (i.e., participants in the control, white companion, and white player conditions), rated the black speaker's technical skills 0.426 standard deviations lower than the white speaker; a significant effect (p = 0.031). Showing that an overall racial bias exists among our study participants (H1a confirmed). They also rated the black speaker 0.402 standard deviations lower on likability, but this effect is not significant (p = 0.053; H1b not confirmed). Since we only found a racial bias on technical skills, we only consider this variable for subsequent tests.

3.4.3 Mere Exposure Hypothesis (H2)

The mere exposure hypothesis suggests that the racial bias is significantly weaker for participants who play alongside the black companion character. This hypothesis can be tested as an interaction between companion character race and speaker race. This interaction effect was not significant, $\chi^2(2) = 3.929$, p = 0.1402, suggesting that the difference between the black speaker and the white speaker was not significantly different between the control condition, the black companion condition (p one-tailed = 0.124), and the white companion condition (p one-tailed = 0.197). As such, we were unable to confirm the presence of a mere exposure effect (H2 not confirmed). Figure 3.6 shows that while participants in the control condition (cat companion) rated the technical skills of the black speaker 0.186 standard deviations lower than the white speaker, participants in the black companion condition rated the black speaker even lower than the white speaker (0.718 standard deviations), and participants in the white companion condition rated the black speaker 0.18 standard deviations higher than the white speaker.
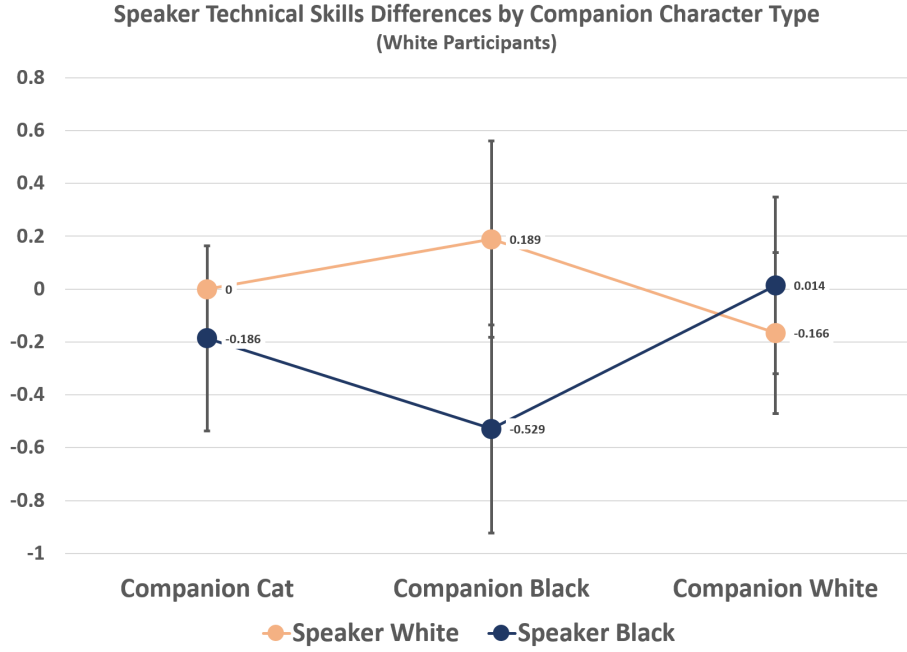
Figure 3.6: White and black speaker technical skill ratings for the control (cat companion), black companion, and white companion conditions.

3.4.4 Embodiment Hypothesis (H3)

The embodiment hypothesis suggests that the racial bias is significantly weaker for participants who play as the black player character. This hypothesis can be tested as an interaction between player character race and speaker race. This interaction effect was significant, $\chi2(2) = 7.231$, p = 0.0269: compared to the control condition, the difference between the black speaker and the white speaker was significantly more positive in the black player condition (p one-tailed = 0.036) but not in the white player condition (p one-tailed = 0.161). These results support H3.

Figure 3.7 shows that while participants in the control condition (cat player) rated the technical skills of the black speaker 0.270 standard deviations lower than the white speaker. This number is slightly different from the control condition in H2, because of the different removal criterion (misidentified companion for H2, misidentified player for H3) Meanwhile, participants in the white player condition rated the black speaker even lower than the white speaker (0.695 standard deviations), participants in the black player condition rated the black speaker 0.650 standard deviations higher than the white speaker. These results suggest that embodiment can indeed reduce racial bias.

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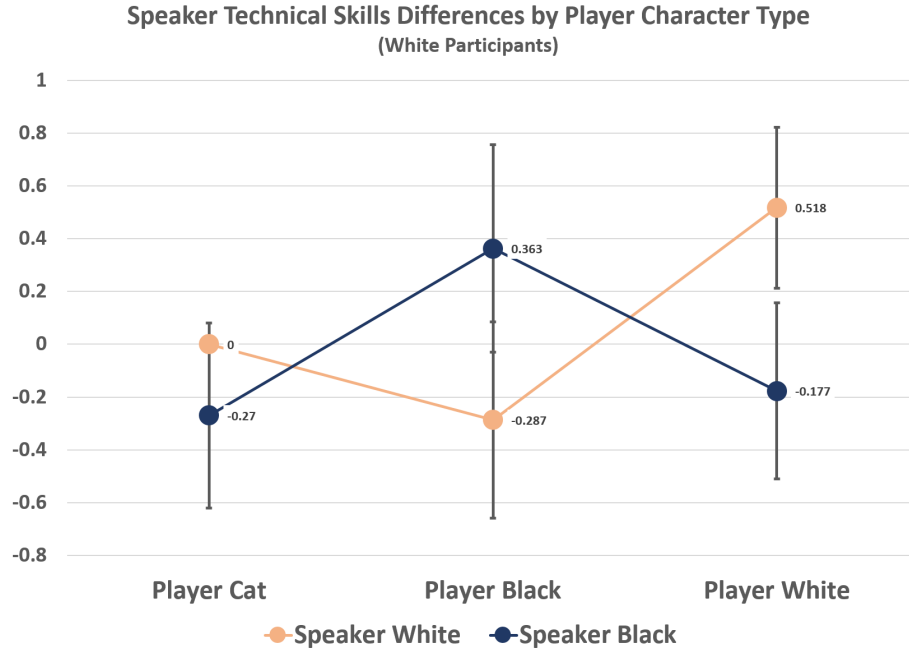
Figure 3.7: White and black speaker technical skill ratings for the control (cat player), black player, and white player conditions.

Game Condition	White Speaker	Black Speaker
Default (Cat Player)	0.92 (SD = 0.83)	0.98 (SD = 0.69)
White Player	1.25 (SD = 0.58)	0.95 (SD = 0.84)
Black Player	0.96 (SD = 0.53)	1.28 (SD = 0.65)

Table 3.4: Technical Skill Rating Sum Score Mean Averages of the Player Character Conditions. (All game conditions have a Cat Companion).

Game Condition	Estimate	SE	P one-tailed
Default (Baseline Cat Player)			
White Player	0.518	0.282	0.033
Black Player	-0.287	0.349	0.205
Black Speaker	-0.270	0.329	0.206
White Player, Black Speaker	-0.425	0.430	0.161
Black Player, Black Speaker	0.920	0.511	0.036

Table 3.5: Technical Skill Rating Stat Breakdowns of the Player Character Conditions. (All game conditions have a Cat Companion).

Game Condition	White Speaker	Black Speaker
Control (Cat Player, −Ave Identification)	0.72 (SD = 1.01)	1.31 (SD = 0.46)
White Player, −Ave Identification	0.73 (SD = 0.58)	1.00 (SD = 0.73)
Black Player, −Ave Identification	0.88 (SD = 0.42)	0.70 (SD = 0.66)
Cat Player, +Ave Identification	1.16 (SD = 0.49)	0.71 (SD = 0.74)
White Player, +Ave Identification	1.48 (SD = 0.41)	0.89 (SD = 0.99)
Black Player, +Ave Identification	1.04 (SD = 0.63)	1.53 (SD = 0.48)

Table 3.6: Technical Skill Rating Sum Score Mean Averages of the Player Character Conditions Modified by Level of Identification with Player Character. Results show below to average (−Ave) and above average (+Ave) mean scores. (All game conditions have a Cat Companion).

3.4.5 Identification Moderates Embodiment Hypothesis (H4)

Hypothesis 4 suggests that the effect of embodiment is stronger for participants who experience a high level of embodied identification with the player character than for participants who perceive a low level of embodied identification with the player character. This hypothesis can be tested as a three-way interaction between embodied identification, player character race and speaker race. For this purpose, the "player character identification via embodied presence" scale (from hereon, "embodied identification") was turned into a sum score (range [–15, 15]) to allow for interactions with the independent variables. The three-way interaction effect between embodied identification, player character race and speaker race was significant, $\chi 2(2) = 8.926$, p = 0.0115; compared to the control condition, the interaction effect between speaker race and embodied identification on technical skills was significantly different in the black player condition (p = 0.018) but not in the white player condition (p = 0.431). Figure 3.8 shows how embodied identification moderates the effect of player character on racial bias: racial bias exists for participants in the control (cat player) and white player conditions who experience high levels of embodied identification, while the bias is reversed for participants in the black player condition who experience high levels of embodied identification. In other words: as hypothesized, the bias-reducing effect of embodiment only occurs with high levels of embodied identification.

3.5 Discussion

Our study examined if even without the aid of empathetic narratives or fully immersive VR, video games can be used to decrease racial bias through exposure to and/or embodiment of racially diverse video game characters. Our results showed that white study participants harbored cognitive
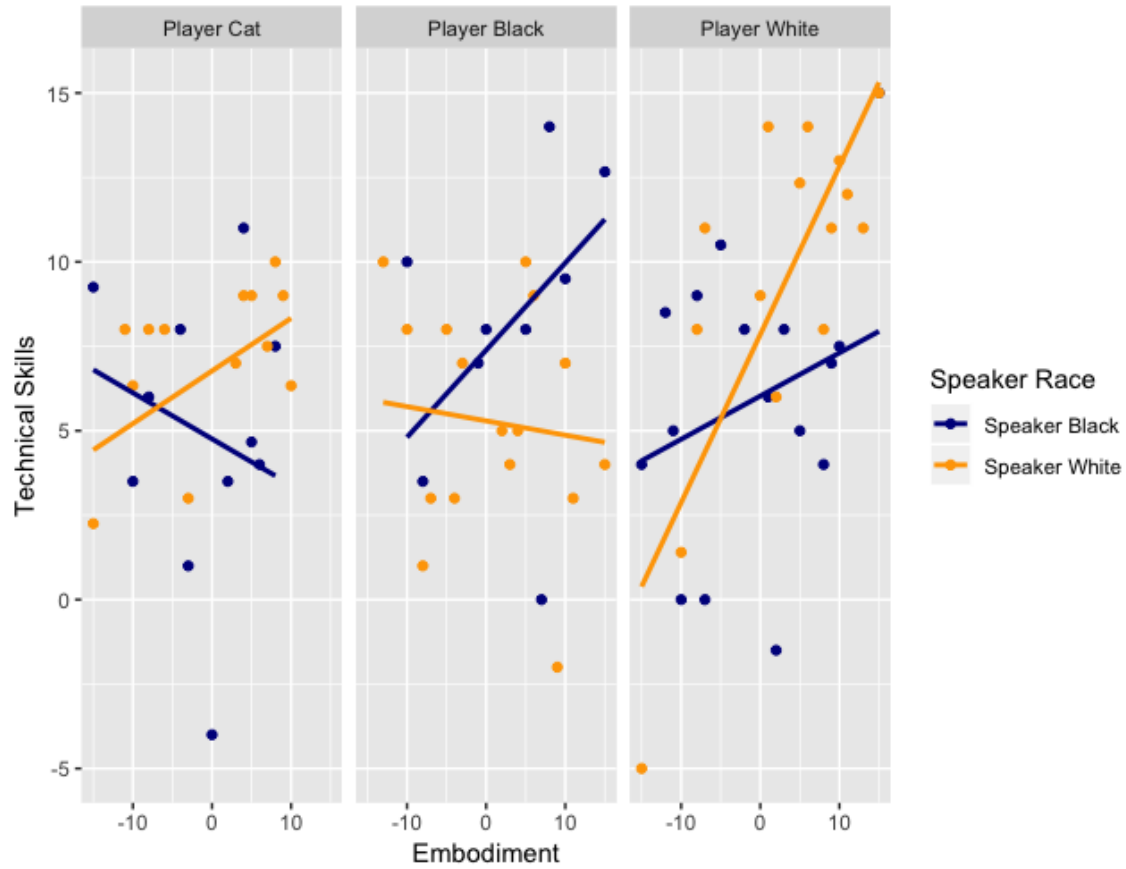
Figure 3.8: White and black speaker technical skill ratings for the control (cat player), black player, and white player conditions, moderated by embodied identification.

Game Condition	Estimate	SE	P
Default (Baseline Cat Player)			
White Player	0.302	0.278	0.277
Black Player	-0.303	0.305	0.320
Black Speaker	-0.338	0.299	0.259
White Player, Black Speaker	-0.117	0.386	0.762
Black Player, Black Speaker	0.591	0.497	0.235
Player Identification	0.015	0.020	0.451
White Player, Player Identification	0.093	0.027	0.001
Black Player, Player Identification	-0.019	0.033	0.563
Black Speaker, Player Identification	-0.049	0.032	0.130
White Player, Black Speaker, Player Identification	-0.035	0.045	0.431
Black Player, Black Speaker, Player Identification	0.125	0.053	0.018

Table 3.7: Technical Skill Rating Stat Breakdowns of Player Character Conditions Modified by Level of Identification with Player Character. (All game conditions have a Cat Companion).

racial biases, as they rated our black speaker's technical skills lower than our white speaker, even though both presented equally convincing arguments in an equally likeable manner. We also found that white participants who played as a black character displayed reduced bias against the black speaker, evaluating his technical skills more positively than players who played as a cat or a white character. Evidence suggests that these results are not caused by a mere exposure effect, because our results regarding the companion character conditions were unable to support the mere exposure hypothesis that playing alongside a black character reduces biases as well.

Our results do not imply that embodiment of a racially diverse character guarantees change, for we found evidence that this effect is reliant on participants experiencing high levels of embodied identification with their player character. While participants with above average levels of embodied identification while playing as the black character rated technical skills of the black speaker higher than the white speaker, participants who reported very low levels of embodied identification still rated the black speaker's technical skills substantially lower, to the point where among participants with low embodied identification, the racial bias may in fact be higher playing with the black character than with the white or cat character (compare the left sides of each panel in Figure3.8). This is extremely important, for it tells us that a video game with an underrepresented player character could potentially increase biases against the under-represented group if players fail to experience sufficiently high levels of embodied identification with the character. Following this insight, we recommend that game developers interested in reducing racial biases design a racially diverse player character that is not just a character on the screen but an extension of a player's self-perception and sense of personal identity.

3.6   Limitations and Future Work

This study has several limitations that can be resolved in future work. Most importantly, while the absence of a significant mere exposure effect in our study suggests that embodiment is a requirement for bias reduction, this result may have been influenced by the relatively high levels of misidentification in the black companion and white companion conditions. Future work should revisit this issue and attempt to avoid high amounts misidentification (e.g. by making the non-human character more clearly non-human). Future work should also further investigate the surprising pattern of misidentifications uncovered in our study. We found that misidentifications

in the white companion and black companion conditions were much higher than in the control, white player, and black player conditions. For some reason, when participants played as a cat alongside a human companion, they were more prone to misidentifying their player character as human—specifically, as a human of a different race from the companion. Our sample was not large enough to thoroughly investigate how such mis-identifications affected participants, but this issue could be revisited in future work.

We also had to turn our within-subjects study into a between-subjects study due to asymmetric transfer effects between the two speakers. Literature suggests a potential explanation for this effect: humans prefer to make judgements comparatively [152]—something that was possible for the second speaker only. Therefore, the ratings of the second speaker were arguably not only based on merits and subjective judgements combined with our experimental manipulations, but were possibly also judged in comparison to the first speaker. Another potential explanation lies in the fact that by the time participants were viewing and rating the second speaker, they had already been exposed to the first speaker. Their exposure to (the race of) this first speaker may have interfered with the effect of the game characters.

Our study design focused on reducing racial bias against black individuals, and hence our results pertain to the reduction of this specific type of bias. Future work could expand this to other races, genders, and other under-represented groups. We also made no comparisons to non-interactive media, or to games with am implicitly emphatic narrative. We note that the main prerequisites for our results—embodiment and embodied identification—are much harder to achieve in non-interactive media. That said, existing work has shown the mere exposure effect to work in such media [20, 84, 166, 167]. Regarding empathy games, we have demonstrated that video games can reduce racial biases through embodiment without the need for an empathic narrative. Future work should investigate whether our effects of embodiment extend to, or are perhaps enhanced by, an emphatic narrative.

3.7 Conclusion

Like other media, video games possess great potential for shaping human perceptions and behavior. While it is by no means certain that playing a game featuring an under-represented person will unequivocally result in reduced biases towards the underrepresented group, our research suggests

that embodying a racially diverse player character can significantly reduce racial bias, provided that players experience a substantial amount of embodied identification. In fact, our results imply that even games that do not employ an explicit empathetic narrative could be used to counteract real world biases, simply by allowing players to identify with people from different backgrounds and walks of life.

While we can only suggest that implementing such characters is likely to result in positive perceptions towards real world people in these specific types of video games (2-D fantasy side scrolling dungeon crawlers). Further research must be conducted before any conclusions can be made about the overall scope of this effect, but the fact that the game type had no significant effect on participant perceptions suggest that the overall effect is likely to be robust and applicable to a wide variety of games. Indeed, it is likely that any game that allows players to embody an underrepresented player character has the potential to be a vehicle for spreading acceptance, as long as the player is not just a character on the screen but an extension of the player's self-perception and sense of personal identity. Our results suggest that this common characteristic of popular games is, indeed, sufficient to reduce or even revert common biases.

Chapter 4

Study 2: Embodied Identification, Empathetic Narratives, and Gender Bias

4.1 Introduction

This study examines if exposure to and/or embodiment of female video game characters can be used to manipulate both gender biases against real women and individual attitudes towards feminist concepts. It also examines if these effects are moderated by empathetic narratives, narrative engagement, and embodied identification. Past studies have looked at virtual characters' effects on gender bias. These studies featured fully immersive VR or games with empathetic narratives designed to evoke positive attitudes towards women / women's issues. Unfortunately, these studies do not provide valid data on how their effects operate in more standard experiences, i.e. games without fully immersive VR or empathetic narratives. Furthermore, there are no instances of empathetic narratives being uses as experimental variables [63, 135]. Thus they do not provide any means for comparing the same game play experience with or without an empathetic narrative. Instead, the studies often compare results from a video game to another medium like literature [63]. Game developers pour a momentous amount of time, effort, and capital into games with empathetic narratives [22], so there are legitimate reasons the impact of these narratives ought to be examined.

In this study, participants were asked to play a short 2D video game as, or alongside, a female or male character. They then viewed a persuasive argument delivered by a male or female speaker. Next they answered questions on their attitudes toward the speakers, adolescent women, and gender equality. This study stands out from the previous study in two distinct ways. First, by examining gender bias instead of racial bias to test for robustness and allow comparisons between biases. Second, by analyzing how empathic narratives and narrative engagement interact with mere exposure, embodiment, and identification to combat bias.

4.2   Research Questions

The last study suggested that racial bias against black individuals could be reduced through player embodiment of a black character. However, those findings do not guarantee the effect also translates to gender bias. After all, it has been effectively argued that racial discrimination and gender discrimination are separate phenomenon [34]. When looking to games we find that indeed racial and gender representation in the medium have different standards and stereotypes [110, 55, 123]. Thus, a logical next step for our research was to investigate if the bias manipulation effect of player embodiment was the same for multiple biases. The study also expanded on the previous study by including an empathetic narrative. This was to reflect how many games feature both underrepresented characters and deep emotional stories meant to connect audiences to actual underrepresented groups [63, 134, 3]. This section outlines our research studying gender bias reduction in "regular" and "empathetic" video games to answer the following research questions:

RQ1: Can embodiment of a female game character be used to reduce the gender bias of an individual in a video game that does not have a narrative tailor-made to evoke empathy?

RQ2: Is the embodiment effect driven by embodied identification with the player character or is it unaffected by the connection interactivity creates between the player and player character?

RQ3: Can the presence of a narrative made to evoke empathy influence gender bias either directly or indirectly through interactions with the embodiment effect?

RQ4: Is the empathetic narrative's effect driven by player based embodied identification, or engagement with the narrative?

4.3 Experimental Setup

For this study we modified the simple block pushing puzzle video game featuring two characters (a controllable player character and a non-controllable companion character) from the first study. This time we manipulated the characters' genders between-subjects to be a male human, a female human, or a husky like dog, Figure 4.1. The game featured two narratives that we manipulated between-subjects. The standard narrative simply had the human characters express a desire to prove themselves for an undetermined reason. The empathetic narrative made it clear the female human characters were experiencing discrimination based on their gender. This narrative highlighted the female characters' desire to prove their ability despite other off screen characters' sexism. Figure 4.2 shows a comparison of the two narratives used for the game. Only the female characters (player - human dressed in blue , and companion - human dressed in green) had the option of receiving the empathetic narrative. The empathetic narrative had lines such as "Did you hear those Adventurers saying girls aren't cut out to be adventurers." Whereas, the non-empathetic narrative had a similar line that did not mention gender, "Did you hear those Adventurers saying I'm not cut out to be an adventurer". So, participants playing with or as a male character did not receive an empathetic narrative advocating for men. In this study participants additionally answered questions on narrative engagement to see if the presence of an empathetic narrative alone could influence gender bias, or if participants needed to experience high levels of narrative engagement for a significant effect to affect perceived participant bias.

After playing and evaluating the game, participants viewed a video in which a male or female presenter gave arguments for using the game as an early childhood development tool. They then rated the presenter on a variety of multi-item scales including; perceived technical skill, presentation quality, and overall likability. We tested whether participants' evaluations were biased against the female presenter by comparing the ratings of the presenters. Participants also answered questions from established scales to ascertain their attitudes towards adolescent women and gender equality. We tested whether playing as or with a female character reduced their biases against the female presenter or improved the attitudes towards adolescent women or gender equality. Figure 4.3 shows the model representation of the effects we predicted would interact to influence the applicant ratings. Figure 4.4 shows the model representation of the effects we predicted would interact to influence the attitude ratings.
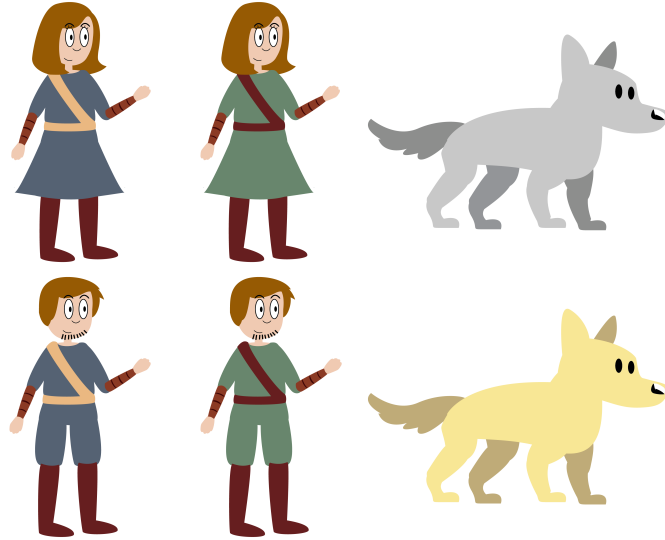
Figure 4.1: Character manipulations, green dressed humans and yellow dog are companions, blue dressed humans and the grey dog are players.
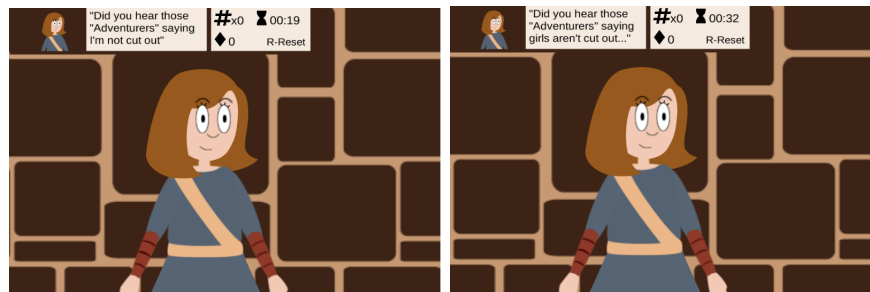
Figure 4.2: Narrative manipulations, left non-empathetic narrative, right empathetic narrative
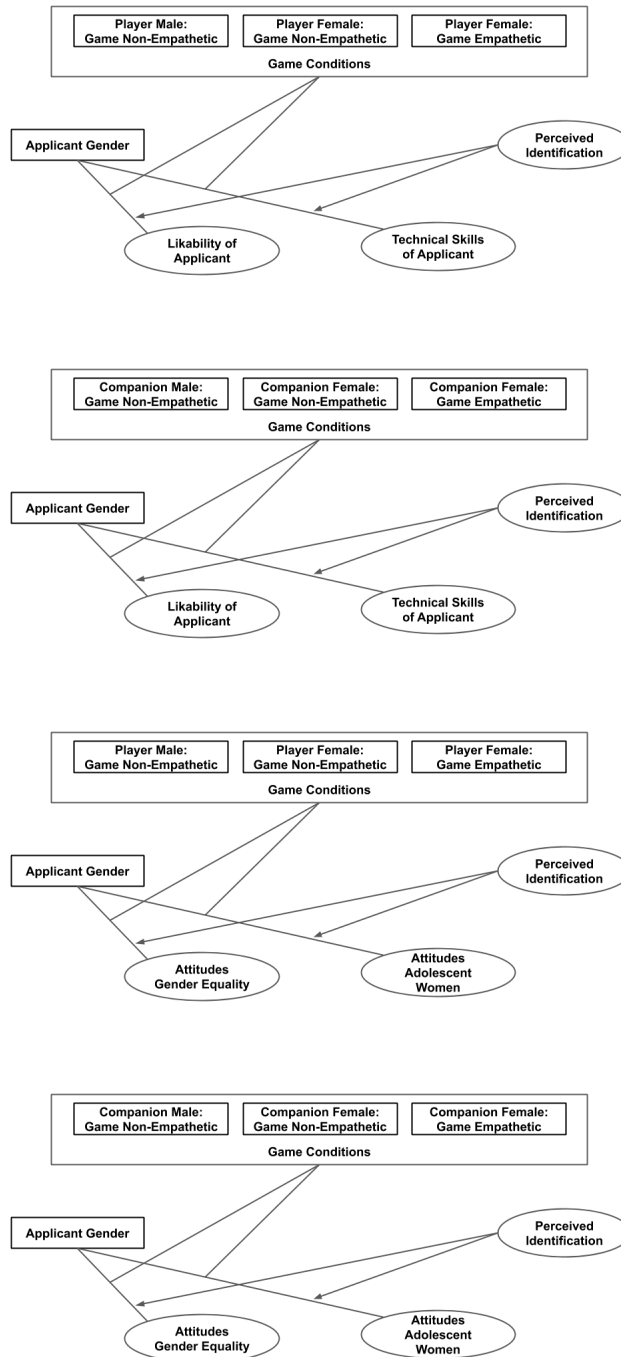
Figure 4.3: Model of the effects modified by identification we predicted to witness.
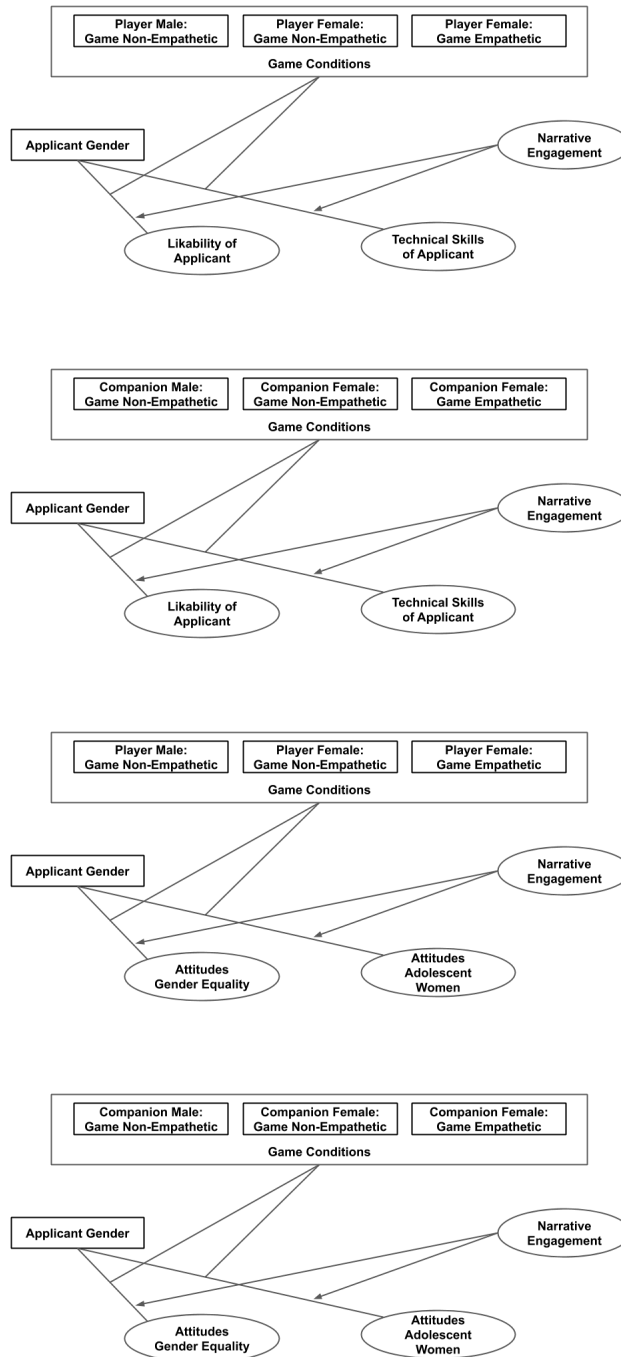
Figure 4.4: Model of the effects modified by narrative engagement we predicted to witness.

By separately testing the player and companion characters' gender we disentangle whether changes in bias are due to mere exposure or embodiment. Finally, by manipulating the narrative in the game and testing whether playing with an empathetic narrative vs playing without one our study could examine the unique effects empathetic narratives offer. The narrative manipulation also allowed us to test if the narrative's effect occurs regardless of participant engagement with the empathetic narrative, regardless of the type of narrative (empathetic or non-empathetic), or if a combination of an empathetic narrative with high engagement significantly modifies bias reduction. These tests are represented by the following hypotheses:

Gender bias hypothesis (H1): There is a significant main effect of speaker gender: Participants rate the female presenter lower than the male in terms of technical skills (H1a) and likability (H1b). Or participants have lower ratings in gender equality (H1c) or their attitudes towards adolescent women (H1d).

Female Character Mere exposure hypothesis (H2): There is an interaction between companion character gender and speaker gender: The effect of H1 is significantly weaker for participants who play alongside the female companion character even without an empathetic narrative.

Female Character Embodiment hypothesis (H3): There is an interaction between player character gender and speaker gender: The effect of H1 is significantly weaker for participants who play as the female player character even without an empathetic narrative.

Empathetic Narrative Mere exposure hypothesis (H4): There is an interaction between the presence of and empathetic narrative in a female companion character game condition and speaker gender: the effects of H1 is significantly weaker for participants who play alongside a female character with an empathetic narrative designed to advocate for women.

Empathetic Narrative Embodiment hypothesis (H5): There is an interaction between the presence of empathetic narrative in a female player/companion character game condition and speaker gender: the effects of H1 is significantly weaker for participants who play as a female character with an empathetic narrative empathetic narrative designed to advocate for women.

Identification moderates embodiment hypothesis (H6): There is an interaction between embodied identification and player character gender: the effects of H3 and H5 are significantly stronger for participants who experience a high level of embodied identification with the female player character than for participants who perceive a low level of embodied identification with the female player character.

Narrative engagement moderates empathetic narratives hypothesis (H7): There is an interaction between the presence of an empathetic narratives and the level of engagement a participant experiences: the effects of H4 and H5 are significantly stronger for participants who experience a high level of engagement with the empathetic narrative than for participants who perceive a low level of engagement with the empathetic narrative.

4.3.1   Participants

Using Amazon Mechanical Turk 328 participants (208 male, 120 female) were recruited to participate. Of our participants, 10% were aged 18-25, 34% were aged 25-30, 32% were aged 31-40, and 23% were aged 41 and above. In terms of ethnic distribution 48% self-identified as White/Caucasian, 25% as Indian, 9% as Asian, 4% as Hispanic/Latino, 6% as Black/African American, and 8% as various other races. Nationally, 61% put the US as their national country, and 34% put India, with the rest reporting various other countries. Finally, participants were asked to list their highest level of completed education with most (61%) having completed a bachelors program, 15% having completed a graduate program, 7% receiving an associates degree, 10% having attended some college and 7% just completing high school. All 329 participants were screened for attentiveness via multiple attention checks and long-form answer screenings and passed our qualifications. Participation was voluntary, and each participant received 2.50 US dollars as compensation. The study was designed to take 20 minutes to complete putting the pay rate of 2.50 dollars for 20 minutes, at 7.50 dollars an hour, above the US minimum wage of 7.25 dollars an hour. The study was reviewed and approved by the university's Institutional Review Board (IRB).

4.3.2   Procedure

Participants were told they would be testing a prototype of an educational game for children and rating arguments for the game's application in a classroom environment. After reviewing the study procedures, participants played the same puzzle game level from the race study where they pushed blocks around a room to reach a button on the floor. The game was comprised of multiple rooms and was split horizontally, with five rooms for the player on the bottom and five rooms for the companion on the top. During game play the camera covers the area of a single room. However, it also zooms in at certain points of character dialogue to force participants to focus solely
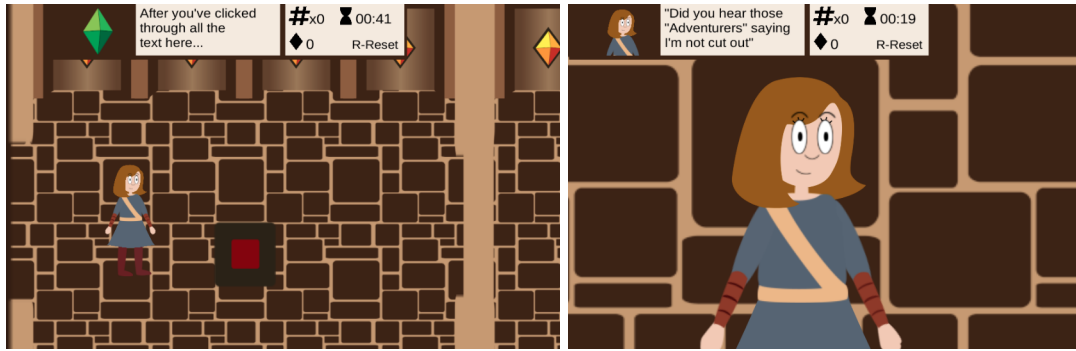
Figure 4.5: Sample of the game with a female player character. During play the camera zooms out to allow view of the overall room. During select moments of dialogue it zooms in to allow for easier identification of character.

on the character allowing for easier comprehension of their gender identity, Figure 4.5. The game was designed with a simple sidescrolling style to resemble both retro 2D games and modern mobile phone games. This allows us to cover some of the most well known and popular types of games on the market. *The Legend of Zelda, Majora's mask* a classic Nintendo game and *Fallout Shelter* a modern mobile game were the primary sources of inspiration for the game's style as seen in Figure 4.6. To progress in the game participants needed to clear their room to open a door that allowed the companion (controlled by a pre-established program) to progress. The companion would then clear their own room and open the door to the player's next room. The AI followed a set path that was pre-mapped and constant across all games. The companion walked at a moderate speed equal to the player character. The AI was designed to push the minimum amount of blocks needed to clear its room and did so without error to ensure it appeared competent to participants. The game took on average 2 minutes and 30 seconds to complete.

At the start of the game, participants were instructed on how to play using their keyboard to move and interact with the game environment. Here, participants read a dialogue between the player and companion, which included close ups of the characters' faces. These close ups were included so that participants could be made fully aware of the characters' appearance. The human characters had dialogue that revealed their backstory and the goal of the game whereas the dog characters only responded in barks. This was done to encourage participants to connect with the human characters so any effects of exposure to or identification with the dog characters was minimized. Our previous study which used anthropomorphic cat characters suffered from high levels of misidentification which

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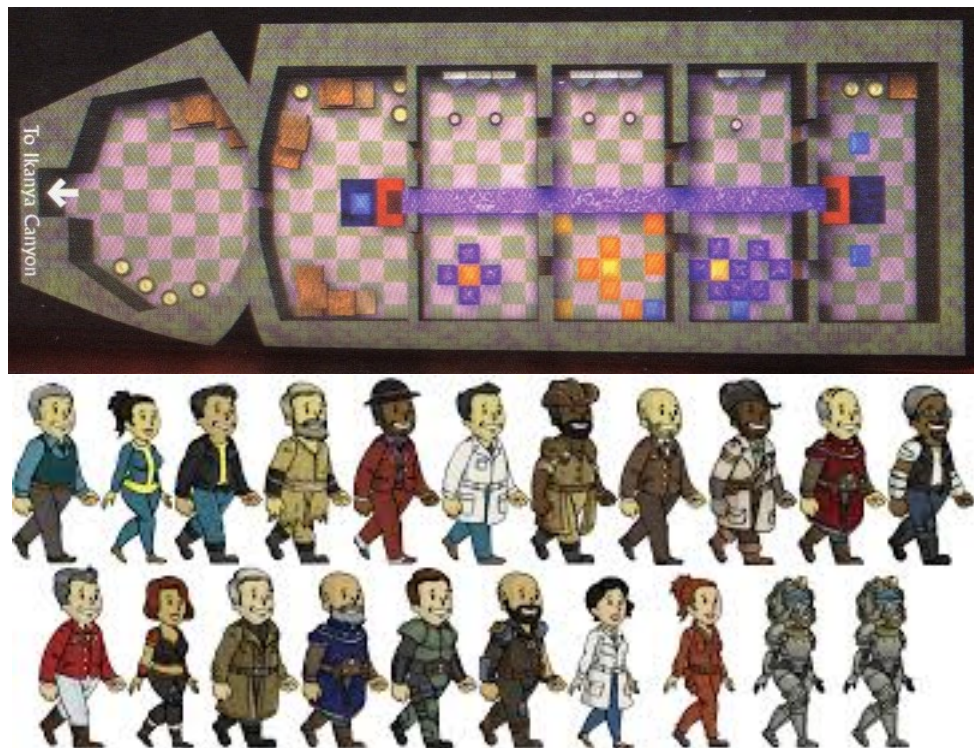
Figure 4.6: Comparison images top to bottom of influences for our game, *The Legend of Zelda: Majora's Mask* [168] and *Fallout Shelter* [77].
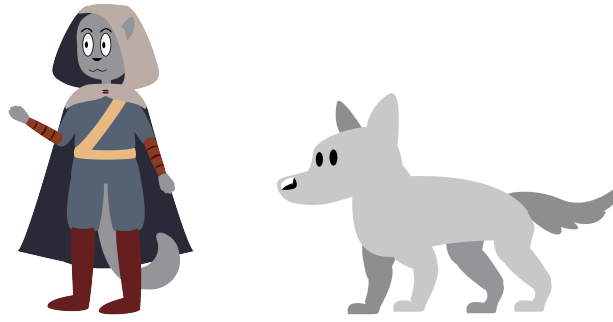
Figure 4.7: Images of the old anthropomorphic cat characters and the new common dog characters

was likely the result of participants connecting with the cat avatars and perceiving them as more human like than intended. The shift to a non-speaking quadrupedal dog was made to avoid these issues. Figure 4.7 gives a comparison between the old and new animal characters.

The genders of the human player character and companion character were manipulated between-subjects. After playing the game, participants completed a questionnaire evaluating the game and their identification with each of the characters. Before answering questions about the characters, participants were shown visual reminders to explain which character the questions were referencing. The narratives of the game for the female human player character and female human companion character were also manipulated between-subjects with an empathetic and non-empathetic condition. The narratives were identical save for moments where the female characters talked about proving themselves. Such as when talking about the belittling comments they had received from off screen guild members. ("Did you hear those Adventurers saying **girls aren't/I'm not** cut out to be adventurers/an adventurer.") At the end of the game participants were taken to a page saying the level they played was a demo of a larger game in development with the empathetic or non-empathetic narrative goal emphasized and the two characters once again shown on screen, Figure 4.8. After playing the game participants answered questions on how engaged they felt with the narrative.

Participants then watched a 1 minute 45 second video of a presenter with the gender (one white male and one white female) manipulated between-subjects. The presenters made a persuasive argument about using the game as a childhood educational tool. The presenters were matched in age, demeanor, physical appearance, and presentation style, Figure 4.9. The arguments presented were uniform and pre-tested to be persuasive. After watching a video, participants answered a survey
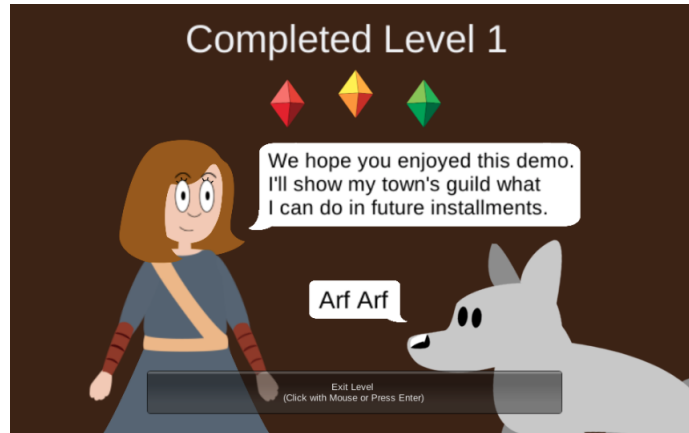
Figure 4.8: Sample image of the standard non-empathetic narrative end credits as before the empathetic narrative end credits replace the "I can do" with "girls can do"
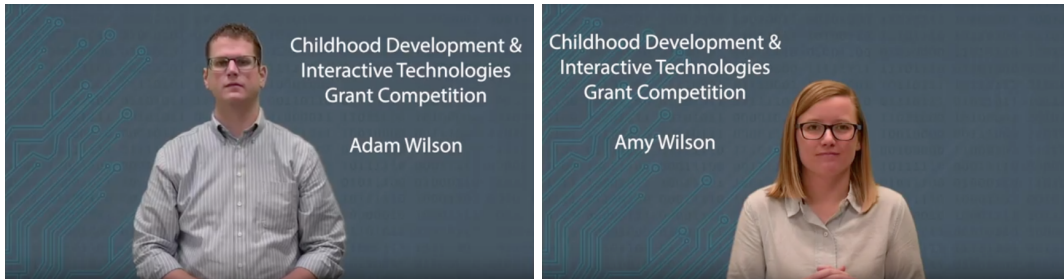
Figure 4.9: Screenshots of the two speakers.

evaluating the presenter. They also answered a survey evaluating their attitudes toward adolescent women and gender equality. Finally, to rule out desirability bias, participants answered a question on whether or not they had realized the study was about gender and gender bias.

Independent Variables Participants were assigned at random to 1 of 4 character set-ups:

• Female human companion NPC (dog as controllable player character), to test the mere exposure hypothesis

• Male human companion NPC (dog as controllable player character), the comparative control for the mere exposure hypothesis

• Female human as controllable player (dog companion NPC), to test the embodiment hypothesis

• Male human as controllable player (dog companion NPC), the comparative control for the embodiment hypothesis

Dependent Variables After playing the game, participants answered questions regarding immersion, enjoyment, player identification via similarity to the player character, player identification via shared embodied presence with the player character, companion identification via similarity to the companion character, companion identification via shared embodied presence with the companion character, in-group identification, and narrative engagement. Each of these constructs was measured with several 7-point scale items, mostly ranging from 1-Completely Disagree to 7-Completely Agree. Table 4.3.2 shows the participant and game related questions used in the experiment. All factors were adapted from existing externally validated scales [2, 50, 131, 136, 139, 97, 59]. We conducted a Confirmatory Factor Analysis (CFA) on these items, plus the speaker items and attitude items listed below. The factors show convergent validity (AVE > 0.50) and discriminant validity ($\sqrt{}$ AVE > largest correlation), with a good model fit: $\chi 2$ (1812) = 2861.714, $p < .0.001$; RMSEA = 0.042, CFI = 0.985, TLI = 0.984. While hypothesis 4 revolves around embodied identification (i.e., "identification via shared embodied presence"), we included the other evaluations such as game enjoyment and immersion to rule out alternative explanations of the hypothesized effect.

After watching the video, participants rated the speaker on their likability and technical skills. Since both speakers were nearly identical save for their genders, a gender unbiased sample population should rate them equally. If not, we have evidence of bias against a speaker based on gender. Differences in attitudes towards adolescent women and gender equality would also provide evidence of biases for or against these concepts as an unbiased population would express equal attitudes towards these factors. We chose to focus on conscious bias, rather than implicit bias (e.g., IAT), in line with previous work that used subjective scales to evaluate cognitive biases in real-world settings [70, 140]. We also included presentation quality to rule out any effect of differences in quality between the speakers presentation of the arguments. Each of these constructs was measured with 7-point scale items that were adapted from existing validated scales [82, 119, 23, 147]. Table 4.3.2 shows the speaker and argument related questions used in the experiment.

Lastly, participants answered questions on their attitudes toward adolescent women and gender equality. This allowed us to examine correlations between participants larger attitudes towards gender equality and their play conditions. We tested both how participants viewed women and how they felt about gender equality advocacy. Each construct was measured with 7-point scale items that were adapted from existing validated scales [163, 53]. Table 4.3.2 shows the attitudes towards women and gender equality questions used in the experiment.

Enjoyment [139] AVE: .932 Largest Correlation: .734	While I was playing the game I was thinking about how much I enjoyed it.	.922
	I found playing the game very interesting.	.927
	I enjoyed playing the game very much.	.932
	Playing the game was fun.	.935
	I thought playing the game was interesting.	.921
	I would describe playing the game as enjoyable.	.955
Immersion [136, 2] AVE: .678 Largest Correlation: .554	While playing the game I blocked out most of the distraction.	.436
	While playing the game I was immersed in the task I was performing.	.897
	While playing the game I was absorbed in what I was doing.	.840
	While playing the game, my attention did not get diverted very easily.	.538
Player/Companion character identification: similarity [97] AVE: .930 / .914 Largest Correlation: .878 / .901	The player/companion character is like me in many ways.	.943 / .902
	The player/companion character resembles me.	.939 / .923
	I identify with the player/companion character.	.923 / .869
	The player/companion character is similar to me.	.910 / .907
	I resemble the player/companion character.	.934 / .967
Player/Companion character identification: embodied presence [97] AVE: .895 / .948 Largest Correlation: .857 / .901	While I was playing, it felt as if I was the player/companion character.	.891 / .951
	I felt like I was inside the player/companion character while I was playing.	.919 / .941
	While I was playing I was transported into the player/companion character.	.924 / .955
	While playing, it felt as if the player/companion character's body became my own.	.905 / .943
	It was as if I acted directly through the player/companion character.	.837 / .948
In-group identification [50, 131] AVE: .732 Largest Correlation: .477	I recognize myself in others of my gender.	.643
	How strongly do you identify with your gender.	.647
	How close do you feel toward other members of your gender?	.834
	How similar or dissimilar are you compared to other people of your gender?	.805
Narrative engagement [59] AVE: .824 Largest Correlation: .878	While I was reading the story of the game, activity going on in the room around me was on my mind.	.750
	The story of the game affected me emotionally.	.824
	I found myself thinking of ways the story of the game could have turned out differently.	.798
	The events in the story of the game are relevant to my everyday life.	.923

Table 4.1: Participant/game related factors and questions

Speaker technical skills [82, 119] AVE: .851 Largest Correlation: .851	I believe that the speaker is competent when it comes to video game development.	.869
	The speaker seems capable to build this game.	.841
	The speaker comes off as a rookie game developer.	.844
Presentation quality [23] AVE: .788 Largest Correlation: .851	The presented argument had substance.	.847
	The presented argument was thoughtful and in-depth.	.795
	The presented argument was coherent and logical.	.789
	The speaker was able to hold my attention.	.750
	The speaker was able to communicate their point.	.778
	The speaker informed me adequately on the thesis topic.	.766
Speaker likability [147] AVE: .803 Largest Correlation: .720	How friendly did the speaker seem?	.680
	How personable was the speaker?	.713
	The speaker is the kind of person almost everyone likes.	.836
	The speaker is someone people really enjoy spending time with.	.905
	How much do you think you would like the speaker as a person?	.879

Table 4.2: Speaker/argument related factors and questions

Gender equality Importance [163] AVE: .920 Largest Correlation: .555	To me, gender equality is important/unimportant.	.926
	To me, gender equality is relevant/irrelevant.	.928
	To me, gender equality is appealing/unappealing.	.892
	To me, gender equality is needed/not needed.	.935
Attitudes Towards Adolescent Women [53] AVE: .873 Largest Correlation: .837	Swearing is worse for a girl than for a boy.	.809
	On a date, the boy should be expected to pay all expenses.	.821
	More encouragement in a family should be given to sons than daughters to go to college.	.893
	In general, the father should have greater authority than the mother in making family decisions.	.894
	It is more important for boys than girls to do well in school.	.919
	Boys are better leaders than girls.	.872
	Girls should be more concerned with becoming good wives and mothers than desiring a professional or business career.	.903

Table 4.3: Gender equality and attitudes towards women factors and questions

4.4 Results

4.4.1 Descriptive Statistics

Character Misidentification We included both reading comprehension questions and game identification attention checks. In the game identification questions participants were asked to identify the genders of the characters. As we were testing cognitively mediated effects of character gender on speaker evaluation, misidentification of the human character would have strong adverse effects on our results. For instance, if a participant in the "male player" condition perceived the player as female, they would effectively be in the "female player" condition (and vice versa), thereby thwarting the intended effect. In contrast, misidentified non-human characters (as either a male human or a female human) would merely add noise to our results. Thankfully, misidentification did not play any role in this study as it did in the previous chapter since not a single case of character misidentification was found.

Participant Characteristics Past literature focusing on gender bias shows a participant's gender affects perception of bias presence, preference for individuals based on gender, and attitudes towards gender advocacy and equality [54, 101, 16]. Male identifying individuals tend to be disproportionately susceptible to gender bias as they largely profit from current patriarchal hierarchies [54]. Our statistical analysis supported these findings as the gender of the participants played a significant effect in their reported attitudes toward women (p one tailed = 0.008) and ratings on the importance of gender equality (p one tailed = 0.025). With male participants rating gender equality importance 0.353 standard deviations lower than female participants and having a lower (0.401 standard deviations) attitude towards adolescent women than female participants. These findings seemed to support our hypotheses on the presence of gender bias within our sample (H1c - H1b). However, the participants gender did not play a significant role in ratings of the female and male speakers. Consequently, we conducted data analyses with both gender groups and with the sample limited to male participants for comparison. The full female and male population group having an N = 328 and the full male only population group having an N = 208.

Our sample was multi-national with our two largest contributions coming from the US and India. Research has shown that culture plays an important role in how individuals perceive gender with different nationalities having unique and even incomparable concepts of gender [1]. Our statistical analysis supported these findings as the nationality of the participants also played a significant

effect in their reported attitudes toward women ($p < .0.001$) and ratings on the importance of gender equality ($p = .0.002$). With US participants rating gender equality importance 0.527 standard deviations higher than non-US participants and US participants' attitude towards adolescent women rating being 1.114 standard deviations more positive than non-US participants. However, the participants nationality did not play a significant role in ratings of the female and male speakers. Thus, we also conducted comparative analyses that limited the sample to focus on US participants. The US female and male population group having an N = 200 and the US male only population group having an N = 121. We also tested for effects caused by participants' race, age, education level, and the average number of hours they devoted weekly to playing video games but found no significance.

Participant Realization To test for desirability bias, participants were asked if they realized the study was about gender and gender bias, rather than testing a game. A majority of participants realized the true ramifications of the study (58%). Especially those in the female-character x empathetic narrative groups which had a total of 22 participants who did not realize the true focus of the study. Interestingly enough participants who realized the nature of the study acted in ways completely opposite from what one might expect from the effect. Social desirability bias, occurs when participants in a study give response that align with what is deemed socially acceptable versus their true feelings[61]. In our study, we would expect the socially desirable response to be for participants to answer positively when asked about the importance of gender equality and or to display more positive attitudes towards women. Participants who realized the nature of the study did have significantly different attitude toward adolescent women ($p < .0.001$) and importance of gender equality ($p < .0.001$) ratings. However, our statistical analysis revealed awareness of the study increased socially undesirable responses. Realized participants rated gender equality importance 0.775 standard deviations lower than non-realized participants and realized participants' attitude towards adolescent women ratings were 1.708 standard deviations less than non-realized participants. However, the participants who realized the nature of the study did not significantly rate the female and male speakers differently. This was taken into consideration when it came to analyzing results for the gender equality and attitudes towards women results and comparative analysis between realized and non-realized groups were conducted. From these analyses it was revealed that while realization had a significant main effect on the entire sample's responses to the factors no significant interaction effect between the character types and game types could be found.

4.4.2 Embodiment, Empathetic Narratives, and Embodied Identification (H1-H6)

Our embodiment hypothesis suggests that our predicted gender bias (H1) would be significantly weaker for participants who played with/as a female character (H2 - H3). These results were expected with the female character games with no empathetic narratives (H2,H3), the female character games with an empathetic narratives (H4, H5), or both. However, unlike the mere exposure conditions (H2, H4) embodiment conditions (H3,H5) could be modified by participants level of embodied identification with the player character(H6). Structural Equation Model (SEM) was used instead of a traditional t-test to keep the independent variables as standardized latent factors. As we conducted analyses on our subgroups we found with US male and female participants the embodied conditions (playing as a character) modified by identification levels had a significant effect on perceived audience bias (H3,H5,H6). Meanwhile the mere exposure conditions (playing with a character) were not significantly different. The technical skill ratings for the female vs male character conditions with no empathetic narrative ($p < .0.004$), the female with empathetic narrative vs male character with no empathetic narrative conditions ($p < .0.043$), and the female with empathetic narrative vs female character with no empathetic narrative conditions ($p < .0.044$) were all significantly different. However, the results behaved in a manner completely unlike our expected hypotheses.

Participants who played as a female character (regardless of the narrative) and experienced above average levels of player embodiment did not rate the female speaker's technical skills higher than those that played with a male character. In fact, the male player high embodiment condition's rating of the female applicant's technical skills was 0.686 higher than the male player with average levels of embodiment baseline condition. Compared to the female player character condition without an empathetic narrative which was 0.33 lower than the baseline. Even worse, the female player character condition with an empathetic narrative was 0.528 standard deviations lower than the baseline. The speaker ratings were different between the two female player character narrative conditions and as stated when compared to the average engagement level baselines (female vs male no empathetic, female no empathetic vs female empathetic) they were significantly distinct. However, when both female character conditions experienced high levels of embodied identification they were not significantly different in reducing bias against the female speaker. Rather it was the opposite. In all cases the more a participant reported experiencing embodied identification with the female

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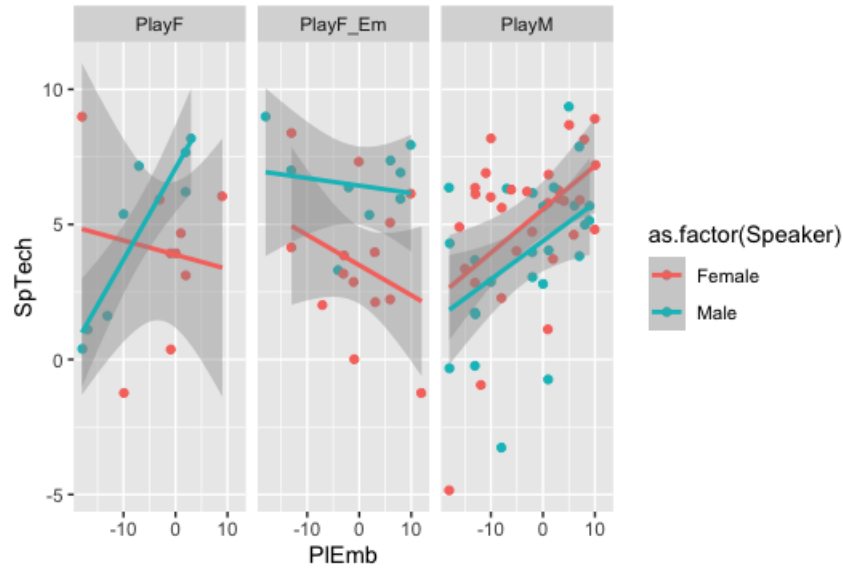
Figure 4.10: US participants' male and female speaker technical skill sum score ratings with male player, female player, and female empathic player, modified by player embodied identification.

Game Condition	Male Speaker	Female Speaker
Default (Male Player Non-Empathetic, –Ave Iden.)	1.02 (SD = 0.87)	1.40 (SD = 1.10)
Female Player Non-Empathetic, –Ave Iden.	1.00 (SD = 0.97)	1.22 (SD = 1.24)
Female Player Empathetic, –Ave Iden.	2.08 (SD = 0.83)	1.29 (SD = 0.86)
Male Player Non-Empathetic, +Ave Iden.	1.73 (SD = 0.90)	2.02 (SD = 0.69)
Female Player Non-Empathetic, +Ave Iden.	2.44 (SD = 0.38)	1.56 (SD = 0.51)
Female Player Empathetic, +Ave Iden.	2.20 (SD = 0.38)	1.00 (SD = 0.84)

Table 4.4: US participants' Technical Skill Rating Sum Score Mean Averages of the Player Character Conditions Modified by Level of Identification (Iden.) with Player Character. Results show below to average (–Ave) and above average (+Ave) mean scores. (All conditions have a Dog Companion)

player character the worse the female speaker was rated. The effect appeared to increase bias against our female speaker not reduce it. Figure 4.10 shows how the sum score results from the interactions of game conditions and speaker gender played out and were moderated by embodied identification. Thus, while our data did provide evidence of a significant interaction for the speaker ratings it could not be used to confirm our established hypotheses on bias reduction (H1, H3, H5, H6).

These results included both male and female US participants. Gender did not produce a significant effect main effect on speaker ratings. However, it did significantly effect the attitude factors; importance of gender equality and attitudes towards adolescent women. So analyses was completed with only US male participants to remove the possibility of participant covariate effects

Game Condition	Estimate	SE	P
Default (Baseline Male Player Non-Empathetic)			
Female Player Non-Empathetic	1.667	0.631	0.008
Female Player Empathetic	-0.581	0.659	0.378
Female Speaker	0.612	0.337	0.069
Female Player Non-Empathetic, Female Speaker	-2.552	0.889	0.004
Female Player Empathetic, Female Speaker	0.383	0.896	0.669
Player Identification	0.063	0.021	0.003
Female Player Non-Empathetic, Player Identification	0.107	0.050	0.033
Female Player Empathetic, Player Identification	-0.193	0.062	0.002
Female Speaker, Player Identification	0.011	0.032	0.729
Female Player Non-Empathetic, Female Speaker, P. Identification	-0.238	0.082	0.004
Female Player Empathetic, Female Speaker, P. Identification	0.193	0.096	0.043

Table 4.5: US participants' Technical Skill Rating Stat Breakdowns of Player Character Conditions Modified by Level of Identification with Player Character. (All conditions have a Dog Companion).
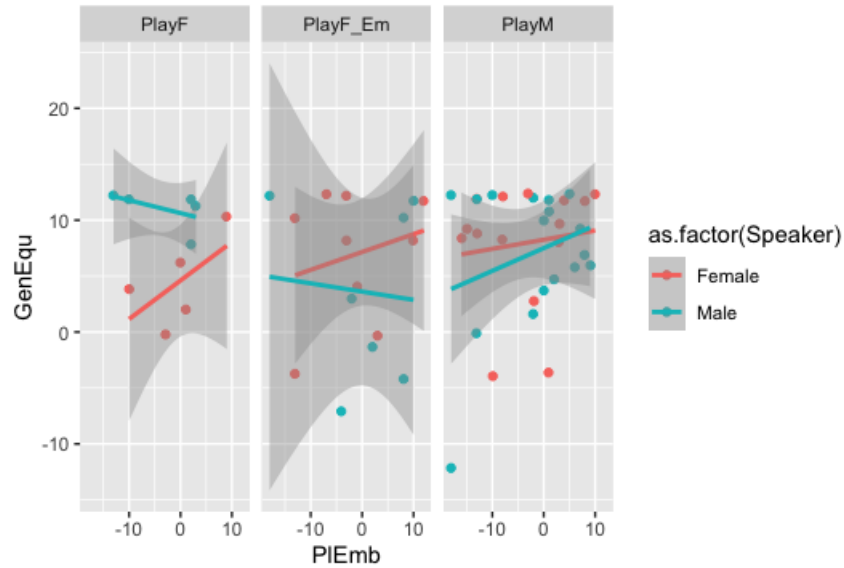
Figure 4.11: US male participants' importance of gender equality sum score ratings unscaled with male player, female player, and female empathic player, when game was presented by male and female speakers modified by player embodied identification.

Game Condition	Male Speaker	Female Speaker
Default (Male Player Non-Empathetic, –Ave Iden.)	1.44 (SD = 2.05)	1.92 (SD = 1.31)
Female Player Non-Empathetic, –Ave Iden.	3.00 (SD ¡ 0.01)	0.83 (SD = 0.76)
Female Player Empathetic, –Ave Iden.	0.67 (SD = 2.38)	1.75 (SD = 1.54)
Male Player Non-Empathetic, +Ave Iden.	2.13 (SD = 0.72)	2.08 (SD = 1.56)
Female Player Non-Empathetic, +Ave Iden.	2.58 (SD = 0.52)	1.50 (SD = 1.41)
Female Player Empathetic, +Ave Iden.	1.06 (SD = 1.98)	1.67 (SD = 1.53)

Table 4.6: US male participants' Importance of Gender Equality Rating Sum Score Mean Averages of the Player Character Conditions Modified by Level of Identification (Iden.) with Player Character. Results show below to average (–Ave) and above average (+Ave) mean scores. (All conditions have a Dog Companion).

Game Condition	Estimate	SE	P
Default (Baseline Male Player Non-Empathetic)			
Female Player Non-Empathetic	3.373	1.382	0.015
Female Player Empathetic	-3.797	1.317	0.004
Female Speaker	0.220	0.446	0.621
Female Player Non-Empathetic, Female Speaker	-4.261	1.830	0.020
Female Player Empathetic, Female Speaker	4.311	1.847	0.020
Player Identification	0.238	0.293	0.416
Female Player Non-Empathetic, Player Identification	-5.784	1.304	<0.001
Female Player Empathetic, Player Identification	5.623	1.344	<0.001
Female Speaker, Player Identification	-0.013	0.474	0.977
Female Player Non-Empathetic, Female Speaker, P. Identification	5.666	1.779	0.001
Female Player Empathetic, Female Speaker, P. Identification	-5.548	1.726	0.001

Table 4.7: US male participants' Importance of Gender Equality Rating Stat Breakdowns of Player Character Conditions Modified by Level of Identification with Player Character. (All conditions have a Dog Companion).

and to focus on the gender population historically sited to be susceptible to bias against women [54]. The participants' player embodied identification ratings were also scaled to ensure extreme responses were more properly weighted. With these modifications the data revealed a significant interaction for the importance of gender equality attitude factor. Here ratings for the female vs male character conditions with no empathetic narrative ($p < .0.001$), the female with empathetic narrative vs male character with no empathetic narrative conditions ($p < .0.001$), and the female with empathetic narrative vs female character with no empathetic narrative conditions ($p < .0.006$) were all significantly different. Yet, again the results were not as predicted. High levels of identification with the female player characters did increase perceived importance of gender equality when participants believed the game developer was a woman. On the extreme ends when participants reported extremely high levels of embodied identification with a female character in a game with no empathetic narrative the importance of gender equality was rated as 1.009 standard deviations more important than the male player character with average identification baseline ($p < .0.001$). Participants that reported the highest levels of identification when playing as a female character in a game with an empathetic narrative rated gender equality as 2.501 standard deviations more important than the male player character with average identification baseline ($p < .0.001$). What was odd was the fact that gender equality importance ratings reduced when embodied identification was high while playing as a female character and the developer was perceived as male. The worst case being the female player character with an empathetic narrative condition and a male developer. Figure 4.11 shows how the interactions of game conditions and speaker gender when moderated by embodied identification played out in unscaled sum scores. In the graph we can see that the lowest gender equality importance rating was in the female character with empathetic narrative condition when the developer was male and players were experiencing high levels of embodied identification. For our hypotheses we believed that when modified by player embodied identification playing as a female character with an empathetic narrative would reduce biases by promoting gender equality importance (H1c, H3, H5, H6). Our results suggest the set up can significantly reduce biases when the message is linked to a female source. As for the mere exposure conditions there were no significant reductions in bias in terms of attitude ratings for any group (H1c,H1d, H2, H4).

4.4.3 Empathetic Narratives and Narrative Engagement (H1-H5, H7)

As with player embodied identification several analyses involving the game conditions, speakers, and levels of narrative engagement were conducted. Our narrative engagement hypothesis suggested that gender bias would be significantly weaker for participants who experienced above average levels of narrative engagement, especially if they were playing a game featuring an empathetic narrative. However, there were no significant interactions for any of our groups regardless of nationality or gender restriction. Implying that in our study the level of engagement participants reported had no significant effect on participants gender biases. This was also the case even when the game featured an empathetic narrative. Thus, we were unable to confirm a narrative engagement moderation effect (H7).

4.5 Discussion

4.5.1 Speaker Bias Factors

Our study examined if standard 2D video games could be used to decrease gender bias through exposure to and/or embodiment of female video game characters. It also examined if empathetic narratives could aid such games and moderate their gender bias reduction effects. Our results showed that compared to the previous racial bias study influencing the gender of a character has a very different effect on the corresponding bias. This time we also expanded our analysis covering both the individual perceptions of bias through our speaker ratings and a larger population bias through scales on gender equality and attitudes toward adolescent women. For the speaker ratings a significant effect was discovered for the US population subset of participants and the US male population. In these groups embodied identification had a significant moderation effect on overall biases. However, these effects went against our initial hypotheses in how they manipulated gender biases. For the female speaker having a female character and experiencing high levels of identification with that character *decreased* the perceived technical skill rating in the US population group. Arguably, this negative reaction can be explained by in-group vs out-group threat theory. Research into in-group vs out-group threats shows when participants are exposed to stimuli that they perceive as presenting their social group in a negative light it can result in negative perceptions of the source [36]. For a comparison, men are more likely to endorse traditional gender roles when

under the belief that their gender identity is threatened [137]. It is possible that unlike the race study our female character conditions triggered a perceived identity threat amongst our gaming participants who viewed the female speaker as a member of an out group due to stereotypes that cast gaming as a male space [120]. There was evidence of at least one participant believing the study was trying to attack all male players. The following is a response sent to the researcher from such a participant about how the study deeply offended them:

> "You are aware many male players will play as female avatars right? I'm doing so myself in Skyrim as we speak. People who actually play video games are looking for fun gameplay and interesting stories. If your story is meant to have a female MC (main character), then design it as such. What players have issues with is when it feels forced, say an MC was intended to be Male, but was forced switch to female (or as a minority) last second for the sake of being "inclusive". That's a major turn off in games when it doesn't feel right to the story (for example, if the time period of a game was set at a time where women were mostly supportive and you're going for "realism", then forcing a female main role in such a time is not immersive, though many games let you choose anyway if the MC is generic (Character Creation, etc) vs a unique entity. Either way, only non-game players actually think Gamers hate playing as women (or minorities). Gamers just love good games in the end. Thanks."

Interestingly this response came from a participant in the male player x male presenter group. So even without the presence of a female character or speaker the participant still felt as if there was an out-group threat. To this participant their identity as a gamer and the gamer population was under attack from non-gamers, "only non-game players actually think Gamers hate playing as women". If other participants experienced similar levels of group scrutiny the presence of a female character and speaker might have heightened this perception of threat. The male character and male speaker have offered protection from the perception of threat by conforming to gamer in-group stereotypes [120]. If so it would also explain why player embodied identification heightened the effect. Along with encouraging identification with women the player embodied identification could heighten their perceptions of themselves as puzzle solving virtual task completers, aka gamers. Furthermore, the phenomenon of in-group vs out-group acceptance affecting activism efforts has been verified and utilized by activist for decades by using in-group members to help spread positive messages

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and even deradicalize extremists [42, 9, 72]. Looking at the application of in-group acceptance to reduce gender bias, the call to include more male voices to advocate for feminist ideals has seen multiple pushes in university Women's Studies courses [106]. Not only that but, evidence shows gender inclusion programs that receive the deliberate engagement of men see progress 96% of the time whereas those without only witness progress 30% of the time [80].

4.5.2 Attitudinal Bias Factors

For the larger population biases, as handled by the gender equality and adolescent women factors, a significant effect was discovered among the US male participants in the importance of gender equality factor. Here player-embodiment, player character gender, and the game developer's gender significantly interacted to manipulate ratings of gender equality importance. However, it was the male developer conditions that saw the greatest changes in bias with the female player character and empathetic game have the most negative ratings for high embodied participants. The fact that the male speaker's interaction with the female character resulted in decreasing importance ratings among the US male sub-group could reflect past research showing male participants often underestimate issues of gender bias as they largely profit from it and therefore do not experience underrepresentation and stereotyping in the same manner as female participants [54, 90]. For example, Kondrat noted that female participants were more unsatisfied with female representation in video games with most rating the representation as poor [90]. Meanwhile about 31% of male respondents thought that the representation was good [90]. It is possible US male participants that played the games with the female protagonists they believed were developed by a man saw the games as proof gender equality was not so necessary. Under a male developer the game was evidence female representation was a priority of the gaming industry. (Something an outsider female developer did not imply.) If the games were proof women were being properly represented in the gaming market then there would be less urgency for promoting gender equality.

Another possibility is that the participants noted of the developers' gender and responded in ways that were more truthful or combative. Perhaps male participants that thought the developer was male were more willing to admit they did not see gender equality as important. Meanwhile, participants responding to the female developer could have gone out of their way to prove they did not "hate playing as women" as our responded reported. There is precedence for this as well. As written about in *Salon* podcast hosts of *Scene Radio* John Biewen and Celeste Headlee note that

when confronted with discussing sexism or issues when gender equality many men become instantly defensive [138]. That some individuals will erroneously see mention of these issues as a personal attack for either being sexist or "creating patriarchy" [138]. When this happens the response can include outright rejection of the topic and personal offense and that this response can in part be automatic like a muscle flexing in defense [138]. It is likely some participants were unhappy with us broaching the subject of advocacy for women and the importance of gender equality. They may have responded to the hypothetical female game developer of a game with a female player character and a narrative advocating for women in a similar defensive manner. Thus they tried to prove they cared a great deal about gender equality and rated that extremely high while rating the female presenter extremely low in the technical skill rating. Unfortunately, this is only speculation as we were unable to ask participants more in-depth questions on they rated the presenters and attitude factors the way they did.

4.5.3 Summary & Importance of Findings

This time our study not only examined modification effects from player embodied identification but also modification effects from narrative engagement. This was because most empathy games which promote identification with underrepresented groups do so with the aid of narratives designed to connect with audiences [135, 63, 22]. These games operate under the assumption that engagement with the story can facilitate attitudinal changes in the audience. Thus, we compared how narrative engagement with both empathetic and non-empathetic narratives could promote bias reduction. However, in the study narrative engagement had no significant main or interactive effects for any of our participant groups. This goes against past research which revealed narratives can strengthen and/or change people's attitudes [37]. It also seems to contradict past results from research on games with empathetic narratives [135, 63]. There researchers saw drastic changes in participants' attitudes and behaviors after engaging with the game's subject matter [135, 63]. This does not mean that the presence of an empathetic narratives was superfluous; interactions between empathetic narrative, player character gender, player embodied identification, and speaker gender were found to be significantly different than interactions between a non-empathetic narrative, player character gender, player embodied identification, and speaker gender. What our research seems to suggest is that games with empathetic narrative manipulate biases in different ways then non-empathetic games but that player embodied identification not narrative engagement may be the

driving force behind bias manipulation. If so these findings are extremely important for empathy game developers as it suggests they ought to dedicate their time and capital towards examining how embodied identification affects players not whether or not the story is engaging. Still further research needs to be conducted to fully examine the scope of narrative engagement as our narrative was extremely simple and short without any highly emotional or dramatic moments.

4.6   Limitations and Future Work

While amongst our US combined male and female group and US only male group we found player embodied identification had a significant moderation effect on gender bias there were multiple issues that question the validity of our findings. As mentioned several participant covariates strengthened and/or weakened the perceived biases. Specifically, nationality, gender, and level of realization of the study all affected how participants rated gender equality importance and attitudes towards adolescent women. None of these covariates were found to have interaction effects with the character or narrative types in the game but the removal of certain groups did strengthen effects enough that some populations were significantly affected by our independent variables that were not present in other populations. However, we could not remove the gender, nationality, and level of realization covariates within the same analysis sample without ending up with sample sizes too small to conduct statistical analysis.

There are pros and cons to our decisions. Since the US population group includes male and female participants there is the possibility of a cross gender interaction on attitude shifts [165]. Meaning female participants and male participants could have reacted differently to the speakers based not only on the speakers gender but the gender of the participant. However, this does not mean the female participants were not susceptible to gender bias. While research shows men are more susceptible to gender bias than women [54], women can also perpetrate sexism. One article by Bearman et al., noted some women are susceptible to "internalized sexism" which may present as an assertion of incompetence [10]. This leads the women in question to underplay or doubt their own abilities and the abilities of other competent women [10]. By examining both female-and-male and male-only US populations we examine effects on both a population that more closely represents the actual gaming market and parts of the market flagged as being more likely to be susceptible to sexist attitudes and behaviors [58, 54]. As for controlling for realization, analyses were done on

to try and solely focus on individuals who did not realize the nature of the study. However, these sample groups were both too small to analyze and disproportionately affected based on the gaming condition the participant was in. About 75% of the individuals who played with a female character and empathetic narrative were likely to realize the nature of the study. Still, the reason realized participants were included in our analysis came back to the fact that when compared to realized participants and unrealized participants actually showed more bias than realized. This is inline with many examples of real world backlash against empathy games and diversity initiatives. Women often face harassment from gaming culture when expressing a desire to critique gender representation [79], and multiple boycotts have been formed against video game companies for their decisions to change female character's stereotypically sexualized bodies [105, 74]. Conducting another study that controls for realization could ensure participants were not responding to desirability bias. However, as the inclusion of realized participants better reflects real world interactions with games in which consumers come in with varying degrees of knowledge about the games content and purpose the study provides a legitimate foundation for future work.

Beyond the previous there were other important limitations to the study. For starters, our research was limited by the amount of time participants spent with the game. This was in part due to the simplicity of the game as it only featured one level and the barest of narratives. It has been shown that the mere exposure effect can be strengthened with complexity and overly simplistic stimuli can diminish the effect [19]. Perhaps the reason mere exposure was not found to play a significant role in manipulating bias was that our stimuli was too simplistic. It is likely that player embodied identification and narrative engagement could also be strengthened by a more complex game. A less simplistic narrative with more content and more emotional moments could be necessary for narrative engagement to have a significant effect on bias manipulations and our game may have simply failed to meet those requirements. Also we assume that participants were reacting to perceived threats of being labeled as a sexist from non-gamer developers we should work to either design a game to alleviate these fears or one that addresses this mindset head on. It may be possible to design a game that tackles sexism that is overwhelmingly seen as the product of recognized members of the gaming community. Or to design a game that is still viewed as an outside creation but is instead welcomed and still manages to reduce biases without activating threat responses. As is our game does not address any of these issues. Plus, while our study design focused on reducing gender bias against female individuals, gender is far more varied and complex than the

study represents. Both our characters and speakers conformed to modern gender norms and the study did not acknowledge genders beyond male or female such as non-binary or agender individuals. There was also no examination into how intersectionality affected our results. Both our avatars and presenters were white, cisgender, able-bodied, educated, young, and seemingly financially stable. Perceptions of the characters and speakers thus only pertains to a subjection of the population that shares all of these characteristics. Future work could expand this to other genders, races, and under-represented groups.

4.7   Conclusion

Like other media, video games possess great potential for shaping human perceptions and behavior. While it is by no means certain that playing a game featuring an underrepresented person will unequivocally result in reduced biases towards the underrepresented group, our research suggests that games with female characters with and without empathetic narratives can significantly manipulate gender biases. However, our findings show these manipulations may not always be positive and depending how the game is received by audiences these games can actually increase biases as well as decrease them. While narrative engagement was not found to have a significant effect on bias even when the narrative was empathetic towards our underrepresented group, games featuring underrepresented characters were found to produce different effects based on the type of narrative present. Rather than narrative engagement it appears that player embodied identification was the significant modifier that interacted with the game's narrative and character to manipulate participants' biases. Similarly mere exposure was not found to have a significant effect on participants' perceived biases meaning playing with an underrepresented character did not affect participants' attitudes but playing as and underrepresented character that participants experienced embodied identification with did. Suggesting developers seeking to manipulate biases in their audiences should focus on designing games with underrepresented playable characters. Furthermore, developers ought to pay close attention to how participants are identifying with the playable characters and be aware that games featuring empathetic narratives show evidence of producing different results than games without empathetic narratives. Still, our results further support the idea that even games that do not employ an explicit empathetic narrative can be used to manipulate real world biases and that player embodied identification is a key factor through which biases manipulation occurs.

Chapter 5

Study 3: Embodied Identification, Intersectional Player Character Identities, and Intersectional Bias

In our previous studies we examined how having participants play a video game as a black character and play a video game as a female character affected those participants perceived biases towards black and female individuals respectively. Our investigations into playing as a female characters also suggested manipulations to participants' biases even went beyond perceptions of individuals to include greater societal attitudes such as the importance of gender equality. However, as mentioned in previously, individuals can not be classified into singular categories but are instead made up of multiple complex identities. These identities merge to compliment and contradict each other in unique ways. For example, an individual living as a black woman will share experiences to both black men and white women but also face experiences hot shared with either population [34].

To fully grasp how embodied identification effects audiences we need to look beyond singular identity categories such as only comparing biases between races or genders within a study. Instead research is needed that examines how multiple intersecting identities both within the game and real world populations interact. By examining how intersectional characters affect multiple biases through their multitude of identities we gain a more complete understanding of how people's varied identities affect and are affected by media at large. Thus a third study was conducted utilizing the

same video game from the previous studies but with four possible player characters avatars each with a mix of racial and gender based identities to monitor their unique effects of biases towards people who experience biases on multiple levels such as the black women from Crenshaw's articles.

While virtual character embodiment has been studied as a mitigator of singular societal biases in fully immersive VR and empathy games, there have been no major studies on representation featuring standard game play or intersectional identities. In our study, participants played a short 2D video game with racial *and* gender character manipulations. They then rated a LinkedIn profile application to examine interactions of racial and gender bias. White male participants showed bias against black and female applicants, with the black female applicant experiencing both racial and gender bias. However, participants who embodied certain underrepresented characters in the game displayed reduced biases. Participants' perceived identification with the characters moderated this effect. The study highlights a lack of homogeneity in the prevalence and potential reduction of different societal biases and incorporates intersectionality to illustrate how multiple parts of a player character's identity can simultaneously be used to combat biases.

5.1   Introduction

This study examined if embodiment of video game characters can be used to decrease bias towards non-virtual counterparts and how the concept of intersectionality plays into the effects of these bias manipulations. Previous studies have examined video games and bias reduction, yet they often only focus on one type of bias or one aspect of a character's or non-virtual person's identity such as race *or* gender. Meanwhile, the unique ways two or more aspects of human identity interact are examined. We understand how embodying a black character or a female character affects racial or gender bias. But how does playing as a character that is black and female; for example, affect biases against women, biases, against black individuals, and biases against black women in particular? By only focusing on one aspect of identity the studies are unable to compare effects on bias or examine the unique circumstances individuals with multiple underrepresented peoples face. This study aimed to examine those unique effects and circumstances by asking participants to again play the short 2D game from before only featuring player character manipulations and no empathetic narratives. This minimization of in game features instead allowed us to conduct a between-subjects design study with four experimental character manipulations and four experimental bias manipulations [4 character x

4 bias]. The avatars and subjects for participant scrutinization a mix of racial (black vs white) and gender (male vs female) representations. The study also removed the video presentations and instead featured LinkedIn profiles that were completely identical to each other save for the users name and image to signify their racial and gender identities. Profiles were still judged by participants on their perceived levels of technical skill, quality of application (formally presentation) and likability. By comparing evaluations of these profiles against the game character sample groups played as we were able to identify the unique effects characters with multiple underrepresented identities can have on the perception of and biases against real world people with those same multiple underrepresented identities. Thus the study contributes to the field of embodied identification research by providing previously missing data analysis on these phenomenon.

To answer these research questions, we conducted a study in which participants played a video game with a player character whose race and gender were randomly manipulated. They then viewed and evaluated a LinkedIn profile they had been told features an applicant interested in game design. The profiles contained the same language across all participants but the photo and name of the individual were manipulated. Participants were told the true nature of the study was to examine how playing video games affected reading comprehension and analytical decision making. Due to existing societal biases, we predicted (and indeed confirmed) that underrepresented applicants would be perceived as less favorable and capable and that there would be an intersectional effect with gender and race simultaneously influencing an applicant's rating. We hypothesized that embodiment of the underrepresented characters (i.e., playing as an underrepresented character) would reduce bias. Moreover, we argued that this effect would be stronger when participants reported high levels of identification with the character.

Our results confirm that embodiment of an underrepresented character, levels of embodied identification, and intersectionality did indeed interact to mitigate various biases. The study stands out by not focusing on fully immersive VR or games with explicitly empathetic narrative (the bias-reducing effects of which have been studied in the past) to see how the simple act of play can combat real world biases. The study is also one of the only if not *the only* study of its kind to approach this topic from an intersectional standpoint, examining both race *and* gender and the combination of the two simultaneously.

The remainder of this paper is structured as follows: After outlining related work on identification, racial and gender bias in video games, and intersectional theory, we develop our hypotheses

and experimental design. We then present the results of our study, and discuss how these results demonstrate how embodied identification and intersectionality offer unique means for designing video games to manipulate a variety of biases.

5.2 Background: Intersectionalism and Representation

Most research on video games, bias, and identification only looks at one aspect of identity: examining race [7, 66, 26], or gender [90, 51], but not multiple aspects of identity at the same time. This is unfortunate, because research shows that all aspects of identity interact to create unique experiences, hardships, and stereotypes. The term for this phenomenon, intersectionality, was coined in 1989 by Kimberlé Williams Crenshaw to explain how black women face distinct forms of discrimination that are not shared by their black male and white female peers and how the legal system often fails to address theses discriminatory acts [34]. Intersectionality was soon expanded to other areas of life, including education, leadership, and media representation [132, 78, 35].

From these conversations incorporating gender *and* race into media analysis more nuanced discussions about representation formed. It was noted, for example, that some depictions that are cliche and damaging for some members of a group could actually be progressive for others. A prime example of this is the portrayal of princesses in modern media and how race influences the perception of this trope. Recently, *Disney* has been trying to reinvent its classic *Disney Princess* from a pure innocent young girl who is rescued by and falls in love with a prince into a more active character who is not defined by a relationship. A noble effort to combat the stereotypical depiction of female characters as weak vulnerable individuals unable to fight and needing a male protagonist to save them. However, when the princes is also women of color the modern changes are not necessarily positive. Kadeen Griffiths wrote about this in their article discussing the first Polynesian princess from the company, *'Moana' Kicking The Love Interest Storyline To The Curb May Not Be Something To Celebrate* [60]. In the article Griffiths' writes that cliche fairy tale romances are actually something more woman of color want to see represented for themselves [60]. The article states that, "The message in Hollywood has always been clear: you can't be a woman of color, a strong woman of color, and happily fall in love. Not for long. Or not at all[60]."

For these reasons the intersectional representation needs to be the main focus of more identification research. That way intersectional representation's unique effects, pitfalls, and limitations

could be examined. These findings could aid developers who want to create games featuring characters with multiple underrepresented identities. Not only because they would provide empirical data analysis but because there are an astronomically low number of industry examples. Using women of color as an example, an analysis of 1,716 characters in video games found that representation for women of color was exceedingly low[55]. In the study only 17% of the characters were female, and only 10% of those characters were non-white (black/African American) [55]. Highlighting black women we see that similar to how women and men have different roles, black women are treated fundamentally differently from white women. Whereas many white women are portrayed as helpless and innocent [108], black women are commonly over-sexualized [43]. Thus, by incorporating intersectionality while examining identification and bias manipulation in basic non-empathetic game play our study stands out from past research.

5.3   Research Questions

At the very least we need to create a baseline to see how effective intersectional identities are at changing attitudes to the various populations they represent and if they effect all these identities in a similar manner or if there are specific gains to each group. Instead we must devise means to examine these various groups directly so that a more complete scope of understanding can be made pertaining playing as an underrepresented person. From past research we see that player embodiment is correlated with reductions in racial bias and has a significant effect on gender bias. Though embodiment's ability to reduce gender bias has thus far not been supported by our findings. Still, these studies support the idea that racial discrimination and gender discrimination are separate phenomenon [34] as mentioned in the second study. Plus in the industry each type of representation (i.e., race and gender) experiences unique struggles and stereotypes [110, 55, 123]. Thus, we intended to examine the following research questions in this study on how embodiment can result in and bias reduction towards intersectional identities of race and gender:

RQ1: Can embodiment of a black game character be used to reduce the racial bias against any individual who shares this racial identity in a video game that does not have a narrative tailor-made to evoke sympathy?

RQ2: Can embodiment of a female game character be used to reduce the gender bias against any individual who shares this gender identity in a video game that does not have a narrative tailor-

made to evoke sympathy?

RQ3: Can embodiment of an intersectional black and female game character be used to reduce the bias against any individual who shares one or both of it's underrepresented identities in a video game that does not have a narrative tailor-made to evoke sympathy?

RQ4: Does embodiment of an intersectional black and female game character reduce the bias against an individual who shares **both** of it's underrepresented identities **to a greater degree** than characters that only share one identity in a video game that does not have a narrative tailor-made to evoke sympathy?

RQ5: Does a participant's perceived identification with a game character amplify the afore-mentioned effects in a video game that does not use fully immersive VR technology?

5.4   Experimental Setup

The goal of the present study was to examine if embodied identification with video game characters in a non-VR game with no empathetic narrative can decrease racial, gender, and inter-sectional biases towards real people. Thus, we developed a simple video game with four character variants (white male, black male, white female, black female) that are assigned to study participants on a between-subjects basis. Figure 5.1 showcases the designs of the characters, which were cre-ated with the collaboration of the researcher's University Office of Inclusion and Equity to ensure that the characters were visually similar while maintaining authentic and natural features such as hairstyles and clothing choices that are representative but do not evoke harmful stereotypes. After playing and evaluating the game, participants were told that they would evaluate an applicant for a job. They viewed and rated a LinkedIn profile with one of four gender × race options (white male, black male, white female, black female). The profiles were identical save for the photo (Figure 5.2) and name of the applicant. This approach was based on previous research into how societal biases play a significant role in job application evaluations [14, 140]. The applicant was judged on several pre-validated measurement scales that past research has used to evaluate bias, including perceived technical skill, application quality, and overall applicant likability. Deception was used to hide the main purpose of the study (i.e., studying biases) from participants: they were initially told that the study's purpose was to examine how interactive media like video games affected reading comprehension and analytical decision making.
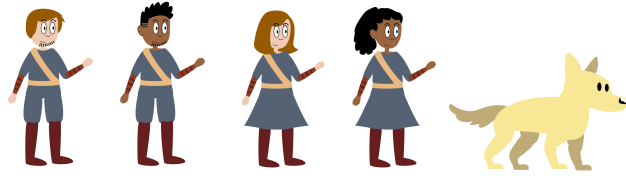
Figure 5.1: Character manipulations: the humans are the possible player character variants, while the yellow dog is the companion character.
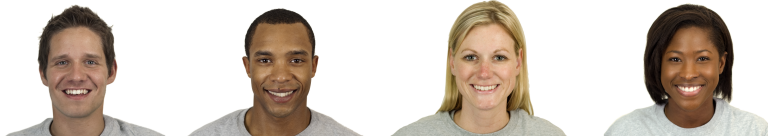
Figure 5.2: Headshot images used for the intersectional gender and race manipulations applied to the LinkedIn profile to be evaluated by study participants.

By examining the ratings of the LinkedIn profiles, the study was able to examine whether participants' evaluations were biased against specific individuals and whether playing as specific characters reduced participants' biases. By using characters of different genders and races, we were able to analyze overall racial and gender bias in such a way that one character alone did not represent the entire sub-group (gender = white and black male vs female characters, black = male and female black vs white characters). The study was also able to analyze the unique interaction of race and gender for the black female character and LinkedIn profile applicant. Unlike the white female and black male options, which each only have one underrepresented aspect of their identity, a black female character has multiple underrepresented identity markers. Lastly, the study looked at the necessity of embodied identification for bias manipulation by testing whether self-perceived embodied identification with the player character (measured via a pre-validated questionnaire) acted as a significant moderator of applicant ratings to judge bias manipulation effects. Figure 5.3 shows the model representation of the effects we predicted would interact to influence the applicant ratings. First, the gender and race of the player character, and the level of embodied identification the participant felt with the player character, interact to prime preferences for specific types of people: a player character that is black may reduce participants' bias against the black applicants (racial bias reduction), a player character that is female may reduce participants' bias against the female applicants (gender bias reduction), and a player character that is black *and* female may particularly

Racial Bias reduction (H1+H4)

Intersectional Bias reduction (H3+H6)

Gender Bias reduction (H2+H5)
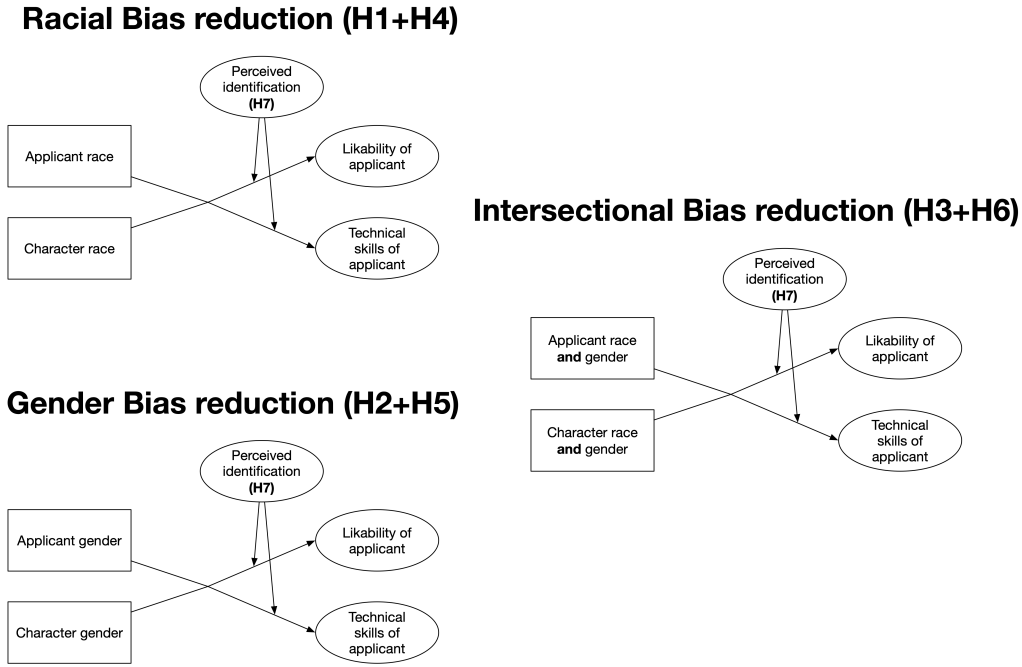
Figure 5.3: Model of the various effects we predicted to witness in the study.

reduce participants' bias against the black female applicant (intersectional bias reduction). Moreover, these effects are expected to be stronger when the participant experiences a high level of identification with the player character. These tests are represented by the following hypotheses:

Racial Bias Hypothesis (H1): There is a significant racial bias against black applicants: Participants rate the black profiles lower than the white profiles in terms of technical skills (H1a) and likability (H1b).

Gender Bias Hypothesis (H2): There is a significant gender bias against female applicants: Participants rate the female profiles lower than the male profiles in terms of technical skills (H2a) and likability (H2b).

Intersectional Bias Hypothesis (H3): Biases based on gender and race exist simultaneously so that applicants underrepresented in both aspects experience the effects of both H1 and H2. Specifically, with black female LinkedIn Profiles will be rated significantly lower than both white applicants and male applicants in terms of technical skills (H3a) and likability (H3b).

Racial Embodiment hypothesis (H4): There is an interaction effect between the player character race and the LinkedIn profile race: Racial biases against black applicants are significantly

weaker for participants who play as black characters. Participants who play as black characters will rate the black profiles higher in terms of technical skills combating the predicted H1a effect (H4a) and likability combating the predicted H1b effect (H4b).

Gender Embodiment hypothesis (H5): There is an interaction effect between the player character gender and the LinkedIn profile gender: Gender biases against female applicants are significantly weaker for participants who play as female characters. Participants who play as female characters will rate the female profiles higher in terms of technical skills combating the predicted H2a effect (H5a) and likability combating the predicted H2b effect (H5b).

Intersectionality and Embodiment hypothesis (H6): There is a super additive effect created an intersectional interaction between the player character identity and the LinkedIn profile identity: The effect of H3 is weakened to a greater degree when the player character the participants play as more closely reassembles the LinkedIn profile applicant's overall identity. Specifically, H3 is weaker for participants who play the game as black player characters and female player characters, but will be the weakest for participants who play as player characters that are black *and* female. Participants who play as a black female character will rate the black female profile higher in terms of technical skills combating the predicted H3a effect (H6a) and likability combating the predicted H3b effect (H6b).

Identification moderates Embodiment hypothesis (H7): There is an interaction between embodied identification and player character gender: the effects of H4, H5, and H6 are significantly stronger for participants who experience a high level of embodied identification with the player character than for participants who perceive a low level of embodied identification with the player character. High levels of identification with character will moderated the bias reduction effects with regards to technical skills ratings (H7a) and likability ratings (H7b).

5.4.1   Participants

Using Amazon Mechanical Turk, we recruited 691 participants including 410 males, 273 females, 7 non-binary individuals, and 1 person who preferred not to disclose their gender. The study was location-restricted to the United States since previous literature shows that concepts of race and gender are unique to one's community and nationality [1, 12]. Of our participants, 9% were aged 18-25, 28% were aged 25-30, 31% were aged 31-40, and 32% were aged 41 and above. In terms of ethnic distribution 69% self-identified as White/Caucasian, 13% as Black/African American, 5%

as Asian, 5% as Hispanic/Latino, 3% as biracial, and 5% as various other races. Participants were also asked to list their highest level of completed education with most (56%) having completed a bachelors program, 19% having completed a graduate program, 8% receiving an associates degree, 12% having attended some college and 5% just completing high school. Finally, participants listed how often a week they played video games 25% reported they played 3 to 5 hours a week, 24% 1 to 2 hours a week, 21% 6 to 10 hours a week, 12% 11 to 20 hours, 8% 0 hours, 6% 21 to 40 hours, 4% over 40 hours. Participants were screened with attention checks and short essay questions about the LinkedIn profile. Participation was voluntary, and each participant received 2.00 US dollars as compensation. The study was designed to take 15 minutes to complete, putting the pay rate of 2.00 dollars for 15 minutes at 8.00 dollars an hour, 75 cents above the 7.25 US minimum wage. The study was reviewed and approved by the [Blind for Review] University Institutional Review Board (IRB).

5.4.2 Procedure

Before beginning the study participants viewed the informed consent form telling them they would play a game and rate a LinkedIn profile. No specific information about the game or profile were given to avoid any priming effects. After agreeing to participate in the study, they played a single level of a puzzle game in which a young adventurer and their AI companion (a yellow dog, see Figure 5.1) want to explore a dungeon to find treasure. The game starts by instructing participants how to play the game using their keyboard, and a narrative to set up the premise of the game. During this narrative, the in-game camera repeatedly zooms in on the face of the character (see Figure 5.6), making their race and gender unmistakably clear to the participant. Following this dialogue, the player and the companion take turns to push blocks around a room to reach a button on the floor. Once the button is pushed a door opens in the other character's path, which changes the control to the other character. The inclusion of a companion character gives the participant a character to compare against their playable character. The process repeats for a total of five room pairs. Participants have an unlimited number of pushes and can reset rooms if they become stuck. Figure 5.5 shows the entire game layout. The game is designed to take an average of two minutes to complete.

At the end of the game, participants go to a page stating the level they just played was a demo of a larger game in development, with the player character and dog being displayed to them one final time, Figure 5.7. Subsequently, participants are asked to complete a questionnaire evaluating
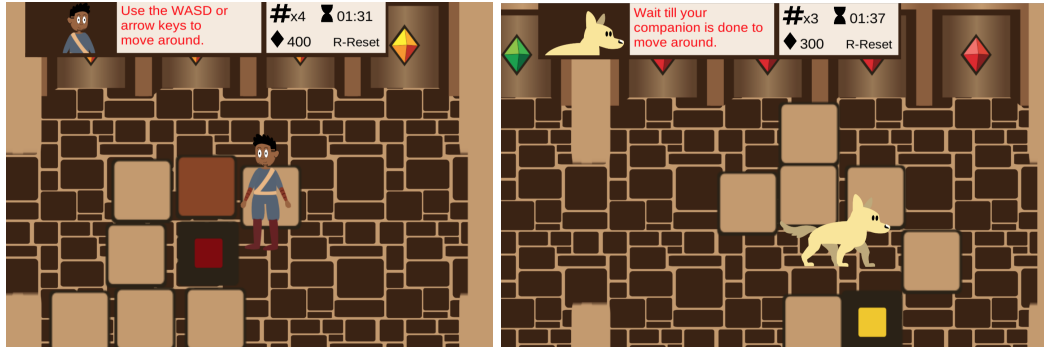
Figure 5.4: Screenshots of the player and companion characters completing room puzzles.
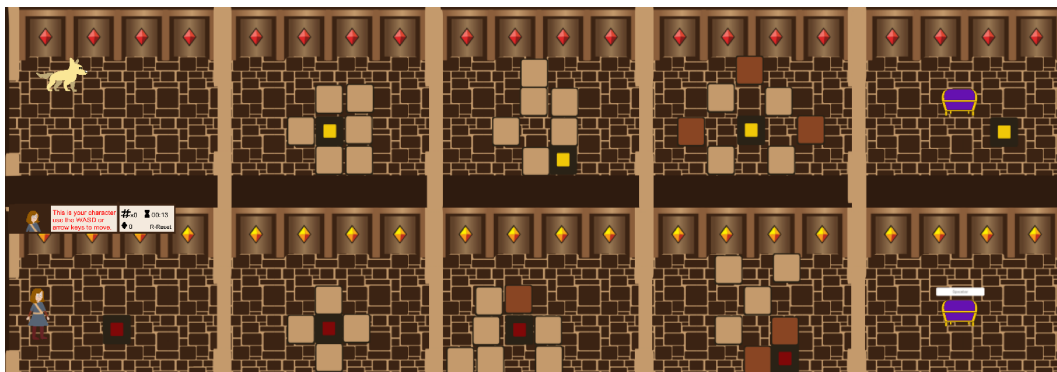
Figure 5.5: Sample of the puzzle game level with a white female player character on the bottom and the dog companion character on the top.
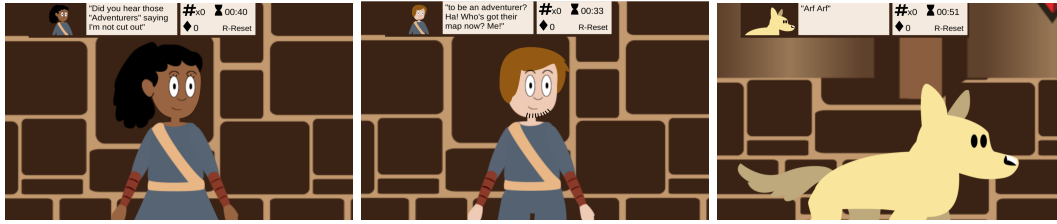
Figure 5.6: Samples of character close ups that occur at the beginning of the game. All characters have spoken dialogue presented in textboxes that are accompanied by miniature avatars but the dog character only responds with barks where as the human characters explain the plot of the game.
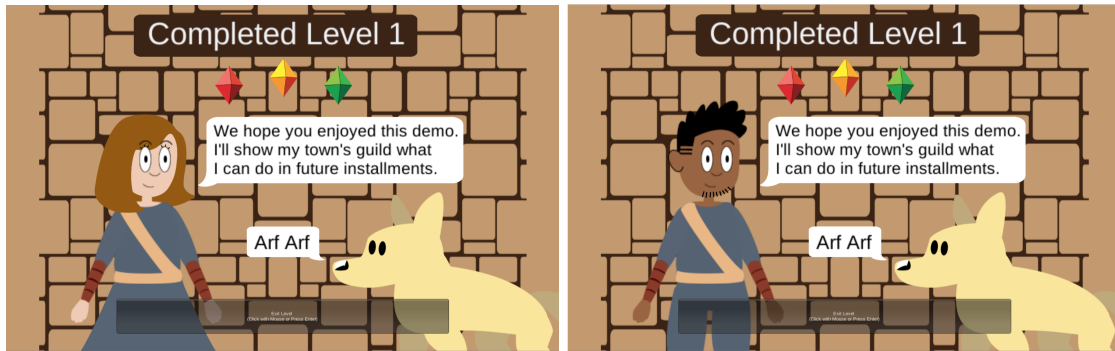
Figure 5.7: Screenshot examples of the end scene showing the player and companion characters.

the game and their identification with the player character. Before answering questions about the player character, participants are shown a visual reminder of the character to ensure participants are aware the questions are about the game's player avatar and not the player/participant themselves.

Participants then viewed and evaluated a LinkedIn profile. They were told the profile was part of an application for a hypothetical gaming industry position. To ensure that participants analyzed the application carefully they were asked to recount what they learned from the profile. Several questions asked participants to give examples of the applicants skills and academic history. They then evaluated the quality of the application to facilitate our analysis of perceived bias. Figure 5.8 provides a excerpt of the LinkedIn profile with the black male applicant. The participants were randomly assigned to one of the four between-subjects experimental applicant profiles that contain the same language and display the applicants' names and faces. The names and faces were validated to reflect similar levels of attraction and population representation [24, 52].

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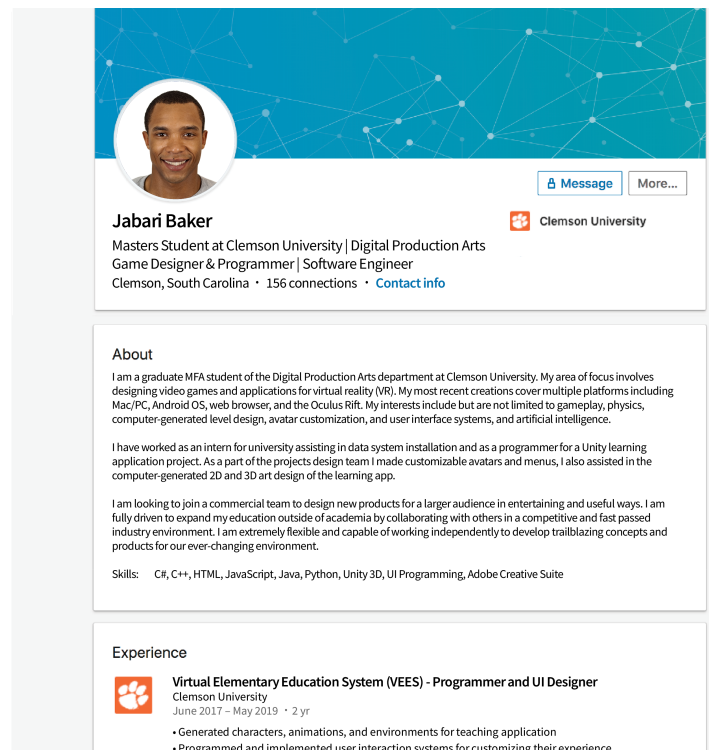
Figure 5.8: Excerpt of the LinkedIn profile (featuring the black male applicant) presented to participants.

5.4.2.1 Independent Variables

Participants were randomly assigned to the following game character set-ups:

- White Male Player, to test a non-underrepresented identity

- White Female Player, to test a gender-based underrepresented identity

- Black Male Player, to test a racially-based underrepresented identity

- Black Female Player, to test an intersectional (gender and race) underrepresented identity

In the second part of the study participants were randomly assigned to evaluate one of four LinkedIn profiles as part of a hypothetical job application:

- White Male Applicant, a non-underrepresented evaluation target

- White Female Applicant, an evaluation target from an underrepresented gender

- Black Male Applicant, an evaluation target from an underrepresented race

- Black Female Applicant, an evaluation target from an intersectionally underrepresented group (gender and race)

Besides the photo and name, the information in the LinkedIn profile is equal across the conditions. This information is gender- and race-neutral (e.g. no references to all-male fraternities), so each profile is deemed adequately paired with each representation.

5.4.2.2 Dependent Variables

After playing the game, participants answered questions relating to enjoyment, immersion, player identification via similarity to the player character, and player identification via shared embodied presence with the player character. Each of these constructs was measured with several 7-point scale items, mostly ranging from 1-Completely Disagree to 7-Completely Agree (Table 5.4.2.2. All scales were adapted from existing externally validated scales [2, 136, 139, 97].

They then reviewed a LinkedIn profile based off several real LinkedIn profiles by students and individuals from the same university mentioned in the fake profile. No actual positions names or affiliations were used to create the profile to protect all real individuals' privacy. The profile was for a student interested in game development. Moreover, after reviewing the LinkedIn profile,

Enjoyment [139] AVE: .923 Largest Correlation: .687	While I was playing the game I was thinking about how much I enjoyed it.	.883
	I found playing the game very interesting.	.920
	I enjoyed playing the game very much.	.934
	Playing the game was fun.	.938
	I thought playing the game was interesting.	.913
	I would describe playing the game as enjoyable.	.947
Immersion [136, 2] AVE: .757 Largest Correlation: .496	While playing the game I blocked out most of the distraction.	.680
	While playing the game I was immersed in the task I was performing.	.861
	While playing the game I was absorbed in what I was doing.	.890
	While playing the game, my attention did not get diverted very easily.	.596
Player character identification: similarity [97] AVE: .932 Largest Correlation: .806	The player character was like me in many ways.	.935
	The player character resembled me.	.933
	I identified with the player character.	.916
	The player character was similar to me.	.927
	I resembled the player character.	.947
Player character identification: embodied presence [97] AVE: .912 Largest Correlation: .806	While I was playing, it felt as if I was the player character.	.903
	I felt like I was inside the player character while I was playing.	.933
	While I was playing I was transported into the player character.	.941
	While playing, it felt as if the player character's body became my own.	.915
	It was as if I acted directly through the player character.	.870

Table 5.1: Participant/game related factors and questions

Applicant technical skills [82, 119] AVE: .875 Largest Correlation: .875	I believe that the applicant is competent when it comes to video game development.	.891
	I feel like the applicant knows what they are doing talking about.	.890
	The applicant seems capable to build this game.	.843
Application quality [23] AVE: .765 Largest Correlation: .875	The application had substance.	.720
	The application was thoughtful and in-depth.	.760
	The application was coherent and logical.	.803
	The application was able to hold my attention.	.735
	The application was able to communicate its point.	.766
	The application informed me adequately on the applicant.	.804
Applicant likability [147] AVE: .802 Largest Correlation: .790	The applicant has a warm personality.	.811
	How friendly did the applicant seem?	.810
	How personable does the applicant seem?	.765
	The applicant is the kind of person almost everyone likes.	.821
	The applicant is likely someone people really enjoy enjoy spending time with.	.805

Table 5.2: Game design applicant/LinkedIn profile related factors and questions

participants rated the applicant on their likability, technical skills, and profile application quality (Table 5.4.2.2). Since all profiles are identical save for their races and genders, an unbiased sample population should rate them equally across all factors. If not, we have evidence of bias towards or against one interviewee based on their race, gender, or an interaction of both. Each of these constructs was measured with 7-point scale items which were adapted from existing validated scales [82, 119, 23, 147].

To re-confirm the validity of the measurement scales we conducted a Confirmatory Factor Analysis (CFA) on all scales. All the factors show convergent validity (AVE > 0.50) and every factor except application quality shows discriminant validity ($\sqrt{}$ AVE > largest correlation). Moreover, the CFA had a good model fit: $\chi 2$ (539) = 1563.664, p < 0.001; RMSEA = 0.085, CFI = 0.969, TLI = 0.966 [89]. While our hypotheses revolve around embodied identification (i.e., "identification via shared embodied presence"), we included the other factors to examine alternative explanations and obscure the true focus of the study.

5.5 Results

5.5.1 Sample Restrictions

Participant Characteristics While we did not dismiss participants based on race or gender we did conduct analyses that limited our sample population further to the White/Caucasian male population (N = 265). This decision reflects past research which focused on white male participants when examining bias due to the population's increased susceptibility to racial and gender based prejudices. [16, 54, 123, 167, 166, 167]. Our statistical analysis supported these findings as our bias effects were weakened when non-white, non-male participants were included in our data sets. Consequently, we limit subsequent analysis to white male participants.

Deception Realization To test for desirability bias at the end of the study participants were asked if they realized the study was about racial and gender bias (the real goal of our study), rather than testing video game's effect of reading comprehension and decision making (the ostensible goal of our study). Most participants did not realize the true ramifications of the study (51%). To test if realization was encouraging participants cover their biases or answer in ways beneficial to the study, we compared the answers of those who realized the nature of the study to those who did not. Surprisingly, we found that participants who did not realize the nature of the study were actually *more* susceptible to gender and racial bias, and realization only prompted an overall *weakening* of the bias manipulation effects. This is elaborated on below in the sections on the overall presences of gender and racial bias, suggesting that the participants who realized were displaying social desirability bias [61]. Unfortunately, removing these participants left us with a pool of participants too small to analyze interaction effects of embodied identification (N = 135, Average group size = 8). However, since including those who realized the purpose of the experiment only weakened our effects, any significant results found in this study would likely only be stronger in a similarly sized sample of participants who did not realize.

5.5.2 The Gender and Race Bias Hypotheses (H1 - H2)

The racial and gender bias hypotheses suggests a main effect of LinkedIn profile gender or race on the ratings the applicant received in either technical skills or likability. Structural Equation Model (SEM) was used instead of a traditional t-test to keep the independent variables (technical skills/likability) as a standardized latent factor. White male participants who did not play as a female

Game Condition	White Applicants	Black Applicants
Overall Rating	2.05 (SD = 0.65)	1.76 (SD = 1.02)
Game Condition	Male Applicants	Female Applicants
Default (Male Player)	2.06 (SD = 0.81)	1.85 (SD = 0.69)
Female Player	1.74 (SD = 0.74)	2.04 (SD = 1.02)

Table 5.3: Technical Skill Rating from White Male Participants with no Realization of the Study's Purpose Sum Score Mean Averages of the Applicants by Race and Gender Player Character Conditions. (All conditions have a Dog Companion)

Game Condition	Estimate	SE	P
Black Applicant	-0.434	0.197	0.028
Female Applicant	-0.321	0.329	0.206
Female Player	-0.523	0.275	0.058
Female Player, Female Applicant	0.896	0.399	0.024

Table 5.4: Technical Skill Rating from White Male Participants with no Realization of the Study's Purpose Stat Breakdowns of the Applicants by Race and Gender Player Character Conditions. (All game conditions have a Dog Companion).

player character rated the female applicants' technical skills 0.348 standard deviations lower than the male applicants; a significant effect (SE = 0.289, z = 1.807, p one-tailed = 0.036). However, we did not immediately assume this was evidence supporting our hypothesis on gender bias. In order to account for participants answering the surveys in ways they might view consciously or unconsciously as desirable to our study we had participants report if they assumed the study was in anyway focused on analyzing race or gender. For the tests looking for the presence of race or gender related biases all participants who reported having any suspicion of the study's true purpose of analyzing racial and gender bias were removed from analysis.

When we analyzed white male participants who did not report suspecting the study was concerned with analyzing bias it was still found that participants who played as a female player character rated the female applicants' technical skills lower than the male applicants. In fact the 0.380 standard deviations lower rating was a greater difference and an even stronger significant effect for the unrealized group (SE = 0.409, z = 2.193, $p = .0.028$). Furthermore the presence of an overall racial bias effect was discovered. White male participants who did not report suspecting the study was focused on examining racial and gender biases rated the black applicants 0.399 standard deviations lower in technical skills than the white applicants; also a significant effect (SE = 0.197, z = -2.025, $p = .0.043$). Figure 5.9 shows the overall significant racial bias effect of the technical
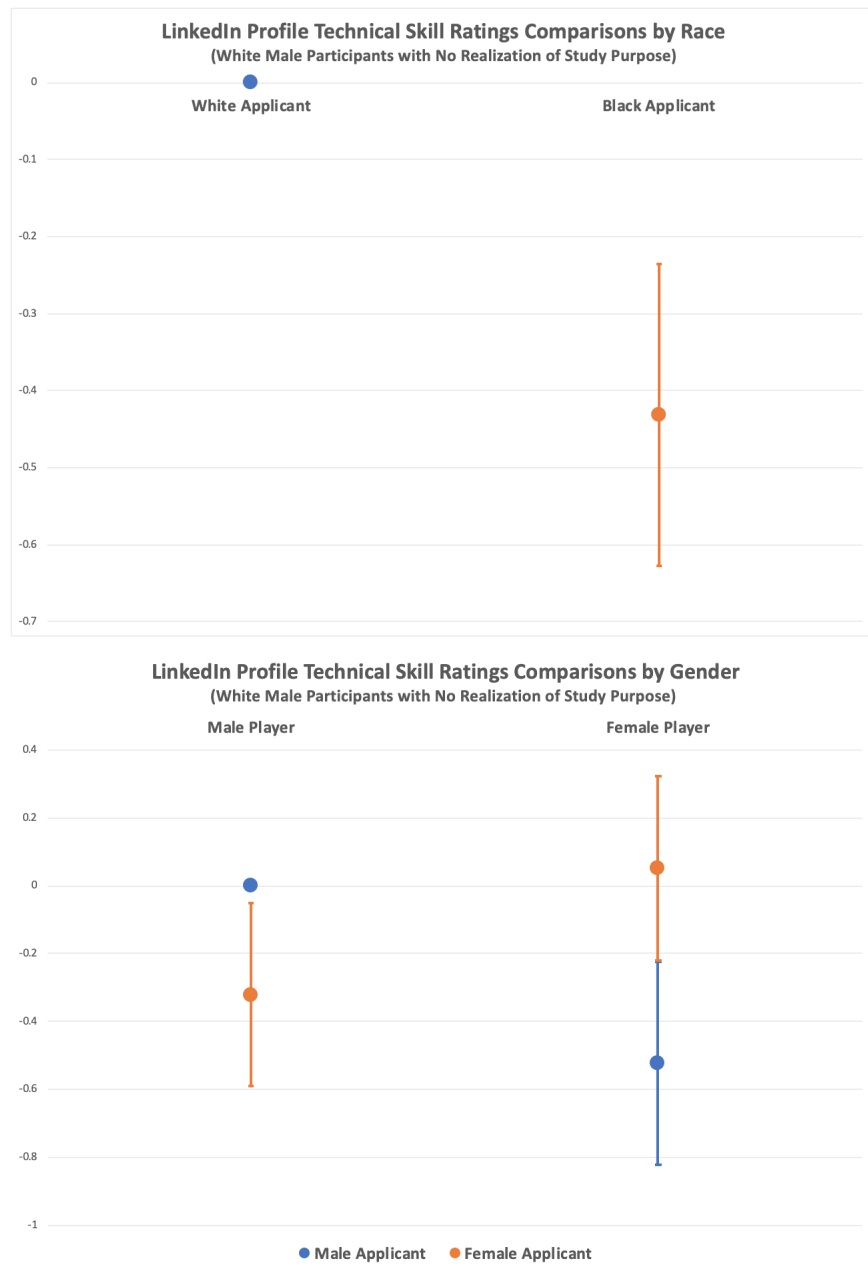
Figure 5.9: White and black applicant technical skill ratings SEM differences (left) male and female applicant technical skill ratings SEM differences (right) for white male participants who did not realize the purpose of the study.

skill construct which helps illustrate the real world implications the presence of the bias can have on black populations. Note that the mean technical skills of the white male participants are set to zero, in line with the latent nature of this construct in the SEM analysis.

These results show that an overall racial bias and overall gender bias exists among the white male participants that did not realize the nature of the study. As evidenced by their technical skill ratings (H1a and H2a confirmed) but not their likability ratings (H1b and H2b not confirmed). Now when we included white male participants that did realize the nature of the study involved examining gender and racial biases this weakened the applicant gender and applicant race bias effects. This suggests the white male participants who figured out the study was about examining societal biases were displaying social desirability bias and muting their internal biases. As we intended to analyze intersectionality, embodiment, and identification all interacted with these main bias effects we realized only looking at the participants that did not realize the nature of the study would not have been viable. This is because further dividing the sample by these factors would produce sample sizes too small to make any reliable conclusions. Thus, we decided to analyze all white male applicants regardless of if they realized we were studying societal biases or not. The reasoning being that any significant effects found with the sample of participants with mixed levels of study realization that displayed weaker societal biases would, similar to the gender bias effect, only be stronger in an equal sized sample of participants without any realization of the nature of the study.

5.5.3   Intersectional Bias Hypothesis (H3)

The intersectional bias hypothesis suggests that applicants with multiple underrepresented identities will suffer bias against them based on either both underrepresented identities simultaneously or that there will be an interaction effect between their two identities that will exponentially increase the bias against them. If there was an intersectional effect the black female applicant would experience both racial and gender bias where as the black male applicant would only experience racial bias and the white female applicant would only experience gender bias. That is unless the interaction of race and gender for the applicant somehow significantly negated one of the biases so the applicant only suffered either the racial or gender based bias. Both an applicant race and gender interaction effect and an embodied intersectional effect (player character race and gender x applicant race and gender) analysis were conducted. For the intersectional bias effect the race and the gender

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of the applicant did not play a significant role in either strengthening or reducing either racial or gender bias in our complete white male participant group. Meaning that while the black female applicant did not face an exponential increase in bias based on the unique interaction of their race and gender (a black female bias) they did still face both the black bias and the female bias while the black male applicant only faced the black bias and the white female applicant only face a female bias, supporting H3.

5.5.4   Embodiment Hypotheses (H4 - H6)

Meanwhile the embodiment hypothesis suggests that the biases participants display are significantly weaker for participants who play as the underrepresented player character that corresponds with said biases. The combined intersectional embodiment hypothesis suggests that biases against the underrepresented applicant who is both female and black is weakest when the participant played as the female black character in the game. This hypothesis was tested by examining the interactions between the player character's identities and the LinkedIn profile applicant's identity. The gender and racial bias embodiment effects would suggest playing as a female character would reduce gender bias and playing as a black character would reduce racial bias. If there is an intersectional embodied effect the gender and racial biases could separately be alleviated by a female or black player character respectively, but that only the black female player character would be sufficient for combating the racial *and* gender based bias the black female applicant was susceptible to that their white female and black male peers were not.

While, racial bias was discovered in white participants that did not realize the nature of the study there was no significant interaction between applicant race and player character race, (SE = 0.414, z = 0.537, p one-tailed = 0.296). When examining gender embodiment there was a significant interaction effect amongst the complete white male sample where compared to the baseline condition of playing the game with a male player character. The difference between the female applicants and the male applicants was significantly more positive in the female player conditions (SE = 0.281, z = 1.726, p one-tailed = 0.042). These results support H5 (H5a) but do not support H4. Figure 5.9 shows that while overall white male participants in the baseline conditions (male player) rated the technical skills of the female applicants 0.280 standard deviations lower than the male applicants; participants in the female player conditions rated the female applicants higher than the male applicants (0.205 standard deviations). However, there was no main interaction effect

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between gender embodiment and racial embodiment. The interaction between the race and gender of the player character with the race and gender of the applicant was not by itself found to produce a significant effect. Meaning just playing the game as a black female player character did not have a significant effect on participants' perceptions of the black female applicant, not supporting H6.

5.5.5   Identification Moderates Embodiment Hypothesis (H7)

Hypothesis 6 suggests that the effect of embodiment is stronger for participants who experience a high level of embodied identification with the player character than for participants who perceive a low level of embodied identification with the player character. This hypothesis was tested as a five-way interaction between embodied identification, player character race, player character gender, applicant race, and applicant gender. For this purpose, the "player character identification via embodied presence" scale (from hereon, "embodied identification") was turned into a sum score (range [–15, 15]) to allow for interactions with the independent variables. Embodied identification did significantly modify the effect black player characters had on the black female applicants technical skill (SE = 0.079, z = 1.768, $pone-tailed = .0039$), and likability (SE = 0.073, z = 2.814, $pone-tailed = .0003$) ratings in our complete white male group. Thus a participant playing with a black player character and experiencing high embodied identification rated the black female applicant significantly higher in perceived technical skill and likability than applicants who did not. There were several outliers in our data set however a boot strap examination of the data found the outliers were not significantly skewing our data. This supported our H6 (H6a-H6b) hypothesis and our H7 (H7a-H7b) hypothesis. This is because embodying a female character significantly reduced bias against female applicants and highly identifying with a black character while embodying them significantly reduced the bias black female applicants experienced. Meaning embodying and highly identifying with a black female player character created a significant additive bias reduction effect where the female status of the player character and the black status of the player character worked together to reduce the additive bias black female applicants experienced.

Figure 5.10 shows how embodiment and embodied identification moderate the effect of player character identity on racial and gender bias in regards to individuals perceived level of technical skill (SE = 0.079, z = 1.768, $pone-tailed = .0039$). The perceived technical skill of the black female applicant was highest amongst participants in the black female player condition who experience high levels of embodied identification. High identifying black female player applicants
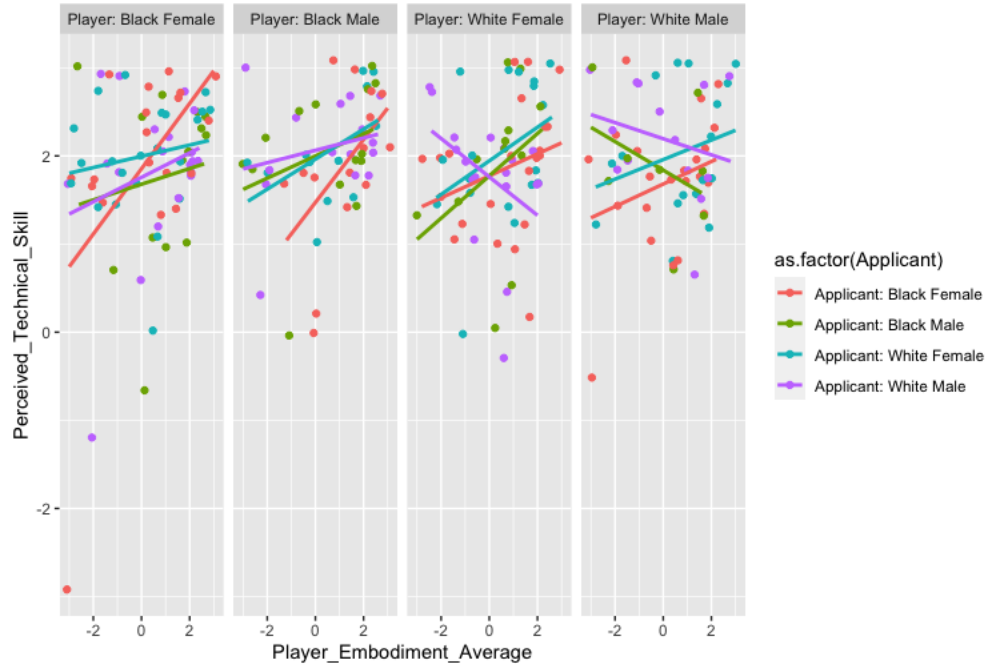
Figure 5.10: All white male participants' applicant technical skill ratings for the baseline (white male player), black male player, white female player, and black female player conditions, moderated by embodied identification.

Game Condition	WM App.	WF App.	BM App.	BF App.
WM Player, –Ave Iden.	2.43 (SD 0.45)	2.06 (SD 0.72)	2.13 (SD 0.60)	1.61 (SD 0.97)
WF Player, –Ave Iden.	2.06 (SD 0.54)	1.68 (SD 0.90)	1.19 (SD 0.85)	1.61 (SD 0.40)
BM Player, –Ave Iden.	1.90 (SD 0.95)	1.75 (SD 0.43)	1.83 (SD 0.94)	1.10 (SD 0.89)
BF Player, –Ave Iden.	1.54 (SD 1.50)	2.02 (SD 0.48)	1.38 (SD 1.71)	1.58 (SD 1.79)
WM Player, +Ave Iden.	1.96 (SD 0.77)	2.04 (SD 0.76)	1.63 (SD 0.85)	1.77 (SD 0.60)
WF Player, +Ave Iden.	1.47 (SD 0.79)	2.27 (SD 0.68)	2.19 (SD 0.79)	1.97 (SD 0.82)
BM Player, +Ave Iden.	2.20 (SD 0.37)	2.29 (SD 0.65)	2.22 (SD 0.51)	2.30 (SD 0.56)
BF Player, +Ave Iden.	2.00 (SD 0.38)	1.98 (SD 0.84)	1.93 (SD 0.68)	2.23 (SD 0.65)

Table 5.5: White Male Participants' Technical Skill Rating Sum Score Mean Averages of Player Character Conditions Modified by Level of Identification (Iden.) with Player Character. Results show below to average (–Ave) and above average (+Ave) mean scores. (All conditions have a Dog Companion). Legend: W = White, B = Black, M = Male, F = Female, App. = Applicant.

Game Condition	Estimate	SE	P one-tailed
Black Player	0.060	0.273	0.413
Female Player	-0.404	0.217	0.032
Black Applicant	-0.034	0.323	0.459
Female Applicant	-0.317	0.325	0.165
Black Female Applicant	-0.294	0.417	0.241
Black Player, Black Applicant	-0.119	0.426	0.390
Black Player, Female Applicant	-0.034	0.400	0.466
Female Player, Female Applicant	0.642	0.292	0.014
Black Player, Black Female Applicant	0.379	0.592	0.261
Player Identification	-0.045	0.027	0.050
Black Player, Player Identification	0.066	0.035	0.028
Black Applicant, Player Identification	0.063	0.047	0.091
Female Applicant, Player Identification	0.091	0.039	0.010
Black Female Applicant, Player Identification	-0.075	0.059	0.101
Black Player, Black Applicant, Player Identification	-0.068	0.058	0.122
Black Player, Female Applicant, Player Identification	-0.100	0.051	0.025
Black Player, Black Female Applicant, Player Identification	0.140	0.079	0.039

Table 5.6: White Male Participants' Technical Skill Rating Stat Breakdowns of Player Character Conditions Modified by Level of Identification with Player Character. (All game conditions have a Dog Companion).

were rated 0.988 standard deviations higher in technical skills than white male applicants under the same player character and identification level conditions. When experiencing average level of embodied identification but playing as a black female player character the high identifying black female applicant was 1.08 standard deviations higher than the average identifying black female applicant. Compared to the base conditions of playing as a white male character and experiencing average levels of embodied identification the high identifying black female player x black female applicant was rated 1.604 standard deviations higher than the base condition rating. Similarly, the high identifying black female player x black female applicant was rated 0.959 standard deviations higher than the baseline average identifying white male player x white male applicant. These numbers may seem small but 1 standard deviation is about the difference between our rating groups (average - somewhat skilled, skilled - very skilled). These reduction in bias results were not similar or greater in size for the white female or black male player character conditions suggesting that it was specifically the black and female combination of identities that resulted in this large significant reduction in bias. Meanwhile, in all cases but especially the black female player condition low levels of embodiment worsened the perceptions of the black female applicant.With high embodied individuals rating the doubly underrepresented black female applicant greater and low embodied individuals rating them

Game Condition	WM App.	WF App.	BM App.	BF App.
WM Player, –Ave Iden.	1.80 (SD 0.59)	1.70 (SD 1.04)	2.10 (SD 0.62)	1.38 (SD 1.05)
WF Player, –Ave Iden.	2.09 (SD 0.79)	1.37 (SD 0.59)	1.10 (SD 1.11)	1.46 (SD 0.78)
BM Player, –Ave Iden.	1.52 (SD 0.97)	1.88 (SD 0.73)	1.97 (SD 0.56)	1.08 (SD 0.72)
BF Player, –Ave Iden.	1.49 (SD 0.68)	2.09 (SD 0.64)	1.75 (SD 0.84)	1.36 (SD 1.15)
WM Player, +Ave Iden.	2.06 (SD 0.51)	1.74 (SD 0.73)	2.00 (SD 0.63)	1.80 (SD 0.44)
WF Player, +Ave Iden.	1.53 (SD 0.46)	2.13 (SD 0.67)	2.08 (SD 0.79)	1.92 (SD 0.72)
BM Player, +Ave Iden.	1.92 (SD 0.40)	2.03 (SD 0.48)	2.04 (SD 0.56)	2.24 (SD 0.52)
BF Player, +Ave Iden.	1.93 (SD 0.59)	1.78 (SD 0.97)	1.76 (SD 0.68)	2.16 (SD 0.43)

Table 5.7: White Male Participants' Likability Rating Sum Score Mean Averages of Player Character Conditions Modified by Level of Identification (Iden.) with Player Character. Results show below to average (–Ave) and above average (+Ave) mean scores. (All conditions have a Dog Companion). Legend: W = White, B = Black, M = Male, F = Female, App. = Applicant.

worse. In other words: as hypothesized, the bias-reducing effect of embodiment only occurs with high levels of embodied identification.

For the other underrepresented applicants (black male and white female) there were bias reduction effects. However, the white female player only had a significant effect on the bias female applicants experienced. Furthermore the bias reduction effect of embodying a female applicant was not significantly moderated by identification. The black male player as a black player character had a significant effect on the bias the black female applicant experienced but only when the participant experienced high levels of identification with the character. Plus, as a male player character the black male player character did not significantly effect the overall female bias female applicants experienced as the female player characters did. Still, in every underrepresented player character condition the technical skill ratings of each underrepresented applicant was increased. However, perceptions of all the underrepresented applicants compared to perception of the non-underrepresented applicant (white male) were not uniform either among a single player character condition nor across different character conditions. This suggests the perceptions of the underrepresented applicants were not uniform nor were the interaction effects of the various player character conditions. Our findings support past research noting gender and racial bias are not uniform nor are the bias manipulating effects of different underrepresented characters [34, 110, 123].

Figure 5.11 shows how embodiment and embodied identification moderate the effect of player character identity on racial and gender bias in regards to participants likability ratings of applicants (SE = 0.073, z = 2.814, $p_{one-tailed} = .0.003$). The perceived likability of the black female applicant was highest amongst participants in the black female player condition who experience high levels of
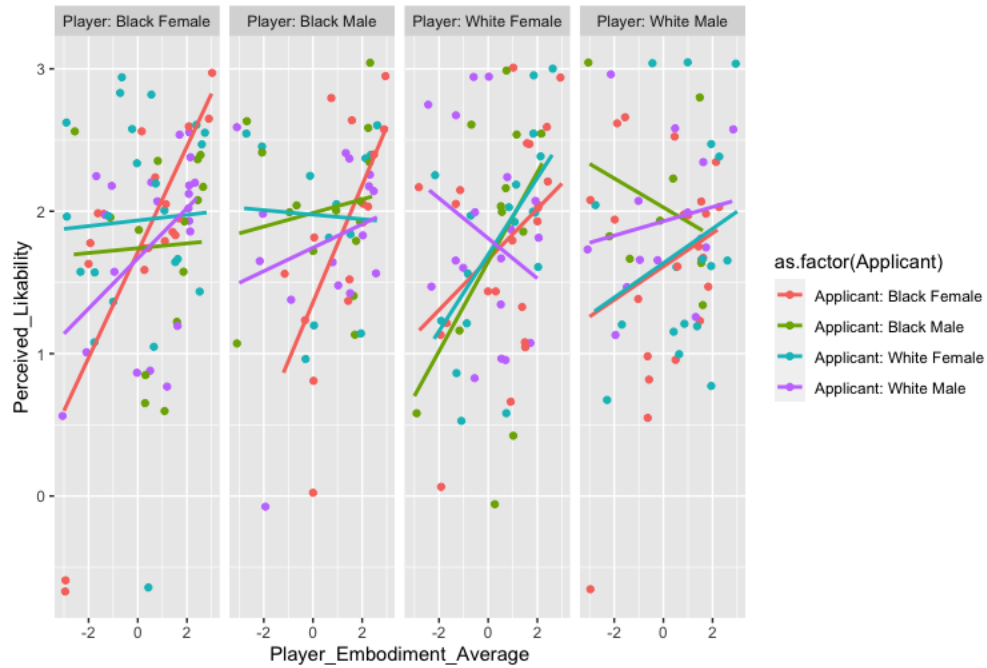
Figure 5.11: All white male participants' applicant likability ratings for the baseline (white male player), black male player, white female player, and black female player conditions, moderated by embodied identification.

Game Condition	Estimate	SE	P one-tailed
Black Player	-0.131	0.266	0.311
Female Player	-0.254	0.205	0.108
Black Applicant	0.092	0.317	0.386
Female Applicant	-0.433	0.325	0.092
Black Female Applicant	-0.184	0.420	0.331
Black Player, Black Applicant	0.123	0.424	0.386
Black Player, Female Applicant	0.462	0.404	0.127
Female Player, Female Applicant	0.480	0.281	0.044
Black Player, Black Female Applicant	-0.312	0.580	0.296
Player Identification	-0.010	0.023	0.336
Black Player, Player Identification	0.051	0.031	0.052
Black Applicant, Player Identification	0.042	0.039	0.137
Female Applicant, Player Identification	0.082	0.035	0.010
Black Female Applicant, Player Identification	-0.063	0.051	0.111
Black Player, Black Applicant, Player Identification	-0.076	0.052	0.074
Black Player, Female Applicant, Player Identification	-0.117	0.048	0.008
Black Player, Black Female Applicant, Player Identification	0.206	0.073	0.003

Table 5.8: White Male Participants' Likability Rating Stat Breakdowns of Player Character Conditions Modified by Level of Identification with Player Character. (All game conditions have a Dog Companion).

embodied identification. High identifying black female player applicants were rated 1.338 standard deviations higher in likability than white male applicants under the same player character and identification level conditions. When experiencing average level of embodied identification but playing as a black female player character the high identifying applicant was 1.725 standard deviations higher than the average identifying black female applicant. Compared to the base conditions of playing as a white male character and experiencing average levels of embodied identification the high identifying black female player x black female applicant was 2.093 standard deviations higher than the base condition rating. Lastly, the high identifying black female player x black female applicant was rated 1.568 standard deviations higher than the baseline average identifying white male player x white male applicant. Again these are large jumps between likability categories as 1 standard deviation is about the difference between our rating groups (average - somewhat likable, likable - very likable). Again the results were not replicated in the other underrepresented player conditions suggesting that it was specifically the black and female combination of identities that resulted in this large significant effect reduction in bias. However, while embodying a black female character low levels of embodiment correlated with the worst likability ratings for the black female applicant. Further supporting our hypothesis that embodied identification was a key driver behind embodiment's bias manipulation ability.

5.6   Discussion

Our study examined if embodiment of video game characters could be used to decrease racial and gender biases. This study stood out from past work by examining the phenomenon without the aid of empathetic narratives [135, 63] or fully immersive VR [7, 66, 45]. Furthermore, while most studies on identification in video games focus only on one type of bias [51, 159, 6, 63], in this investigation we considered intersectionality: we studied both race and gender biases to see how the two concepts affected individuals with multiple underrepresented statuses such as black women. Our results mirrored past studies on gender and racial bias in job application reviews with white male participants rating individuals as less technically skilled based on their race and gender [14, 140]. Furthermore, black female applicants faced the most bias against them as they experienced racial and gender bias against them. For female applicants playing as a female character significantly reduced the gender bias the applicants experienced. Yet, embodying a black player character did

not significantly reduce the overall racial bias against black applicants. Our results did show that high levels of embodied identification with a black playable character could significantly decrease bias against black female applicants. This was not the case when participants experienced high levels of embodied identification with a female playable character as it did not significantly decrease bias against black female applicants. Meaning the black female player character by being female offered a significant reduction in bias for female applicants and when individuals experienced high levels of identification with the character because the player character was also black the black female applicant saw a significant reduction of bias against them. This duo female embodiment black identification bias reduction effect was additive so for black female applicants participants who played as and experienced high levels of identification with the black female player character displayed the least amount of bias against the black female applicant. This bias reduction increased both technical skill ratings and likability ratings for the black female applicant. The use of LinkedIn job applications provided a real world example of how bias impacts the lives and opportunities of people, as different ratings in technical skill and likability could drastically impact an applicants chances of receiving employment. From this research we can see video games' real potential to combat the negative impacts of bias and advocate for highly disenfranchised of populations.

5.6.1 The Presence of Intersectional Bias

In our study white male participants displayed cognitive racial and gender biases by rating black applicants significantly lower than white applicants and female applicant's significantly lower than male applicants on technical skills. These differences in ratings occurred even though all applicants shared the exact same LinkedIn profile application with no variation between applications save for the profile image and name. While the names and pictures were different they were externally validated by the Chicago Face Database [24] and Gaddis' scientific analysis on the perception of race from names [52]. The presence of racial and gender bias despite the uniformity of the applications builds on past research into race and gender bias in job application evaluation [14, 109]. Furthermore, our application was for a computer science based game designer position which makes the presence of bias even more troubling. Both the gaming industry [155, 120] and computer science [57, 98] are known for having extremely low gender and racial diversity and being stereotyped as domains for white men. Furthermore, unlike their white female and black male peers the black female applicant was subjected to a simultaneous gender and race biased discrimination. Suggesting that

while a race based intervention could negate all known biases against the black male and a gender based intervention could negate all known biases against the white female only an intervention that incorporated both race and gender promotion could negate all the known biases the black female applicant experienced in the study.

5.6.2 Embodied Identification Strengthened by Intersectionalism

The power of intersectional intervention is the key finding of our results on embodiment and embodied identification. Participants who played as a female characters displayed less bias against the female applicants. However, embodiment of black characters alone did not have a significant effect on the bias against black applicants. These results go against past research which suggest embodying a black avatar can reduce racial bias against black people [45, 66]. Our results did find that high levels of embodied identification with a black player character had a unique significant effect on the bias black female applicants experienced. There are multiple explanations for these irregularities between underrepresented characters effects on bias. One explanation which does not favor any of our hypotheses is that our results may have suffered from the necessary reduction in sample size. While embodiment and identification have been found to significantly reduce bias [45, 63], these effects are subtle cognitive effects are easy to disrupt and might require a larger sample. For example, our results show that the realization of the study could significantly weaken perceived bias as desirability bias was able to circumvent the unrealized negative perceptions participants had towards black and female applicants. As is more research with a larger unrealized population is needed in order to grasp the differences in gender and racial bias.

Regardless, playing as a female character was enough to weaken gender bias against the white female applicant and playing as a black character and highly identifying with them significantly reduced bias against black female applicants. If intersectionality had absolutely no effect on a player character's ability to reduce bias then the race and gender of a character would offer no unique benefits for reducing bias especially for the doubly underrepresented black female applicant. Meaning playing as a black female character would offer no significant benefits to a black female applicant regardless of how much a player identified with the black female character. However, this was not the case. Experiencing high levels of embodied identification while playing as a black female character gave black female applicant the additive benefits of playing as a female character and identifying with a black character. Meaning playing as a black female character was not only significantly

different from playing as a black male or white female character but participants who played as the black female character while highly identifying with them displayed the most reduced bias against the black female applicant. This allowed the black female applicant the best chance of combating the gender and racial biases they alone experienced. Black female applicants rated by players who reported high levels of identification with a black female player character had by far the highest black female applicant technical skill and likability ratings. The differences were quite substantial with black female applicants being rated about 1.0 standard deviations higher in both technical skills and likability than their white male peers under the same player character and identification level conditions. If these applications were real it's not hard to imagine that an applicant perceived as very technically skilled and very likable might have a distinct advantage over and applicant that is technically skilled and likable. If applied to a real world setting this could aid black female applicants applying for computer science and video game related careers. As black women with the same level of qualifications are often wrongly perceived as less capable [78, 14], face higher levels of discrimination in education [132, 78], and are less represented in the computer science and video game development fields [155, 57], utilizing this effect to reduce bias against this population could have significant changes in the video game and computer science communities. However, as this additive reduction in bias towards the black female applicant was reliant on participants experiencing high levels of embodied identification with the player character.

5.6.3 The Dangers of Low Embodied Identification

Embodied identification's relationship with bias manipulation meant the psychological phenomenon could not only reduce bias but strengthen it under specific circumstances. In fact, playing as an underrepresented character could drastically increase biases against similar real world populations if players reported experiencing sufficiently low levels of embodied identification with the character. Participants who played as a black female player character and reported very low levels of embodied identification with the character rated the black female applicant's technical skills and likability substantially lower than any other player character group. This can be seen when one compares the left sides of each panel in Figure 5.10 and Figure 5.11. The results suggest several possibilities. For example, that participants who reported low ability to identify with the black female player were naturally more biased against black female applicants. In which case ones ability to identify with an underrepresented character could be a predictor for how biased against underrep-

resented people a person is. It is also possible that the presence of the black female player character primed our these individuals and since the game was unable to promote identification with the character this priming heightened biases against black women. This would support work by Groom et al. where participants embody black avatars during a perspective-taking virtual interview displayed increased signs of bias against black applicants [62]. It was theorized by Hasler et al. that heavily racially priming situations, such as the interviews Groom et al conducted, can trigger and enhance people's implicit biases [66].

From these results we see that embodied identification has the potential to be a double edged sword. If identification is low enough it can make conditions even worse for real world black women. Playing as an underrepresented character is not a cure all for discrimination as it alone does not guarantee bias reduction. Furthermore, since identification is integral toward the overall enjoyment of the game [87], these findings also suggest that low identification with the player character could negatively impact perceptions of the game they are in thus leading to backlash or poor sales. Still, if high identification can be achieved the game has the potential to advocate for an incomprehensible amount of positive change for extremely underrepresented communities. Identification can be used to persuade viewers opinions on highly controversial topics [37], can increase educational performance in the population it represents [84], can encourage individuals to apply for some of the most difficult and competitive employment opportunities such as working for NASA [141, 112]. Thus from our research we encourage game developers not to shy away from the task of creating games with underrepresented player characters but rather to take up the challenge while also putting their time and effort first and foremost into increasing the chances for audiences to connect to and identify with the characters in question. Audiences should be encouraged to the upmost degree to see the player character as an extension of their own mental model of personal identity.

5.7 Limitations and Future Work

This study has several limitations that can be resolved in future work. The largest being that while we hypothesized embodiment and identification would manipulate bias the results did not behave as we expected. We expected playing as a black character would reduce biases toward both black applicants and the same regarding female characters with gender. However, when we divided the player characters by their race and gender we found there may be more to how player

character identity interacts with multiple biases. For example, identification with the black male player character condition had a significant effect on perceptions of the black female but not the black male. Other non-significant trends enforced the idea that interactions between race and gender produced unique effects for each combination. Identification with the white female player character correlated with reductions in bias towards all underrepresented applicants *and* increased bias **against** the white male applicant for both technical skills and likability. The white female player character was the only underrepresented character where increased identification with the character increased bias against the white male applicant. While not all interactions were significant the drastic differences in data behavior and hypothesized effects shows how little we really know about player character identity's effect bias. Thus illustrating the need for more research that examines bias with intersectional framework.

Beyond this it must be noted that our means of representation relied on group generalizations and stereotypes. In the study gender was represented through clothing and hair differences. While race was indicated with skin tones and hair styles. We used one photo for each of our four gender x race applicant categories which had been screen by other people to be representative of their corresponding races and genders. Though our partnership with the university's office of Inclusion & Equity ensured our methods of representation were not offensive or dangerous neither our characters nor applicants can stand in for the whole of their population. It is problematic to consider individuals viable for representing their race and gender based on what other individuals believe is appropriate. There are many black individuals with light skin and many men with long hair for example. Though these people may not be viewed by society as representative of their gender or racial groups they are valid members of their corresponding communities. It would be helpful to conduct more research with more members of each community. Also we limit our research to specifically male v female and black v white biases but what of the many other identities and identity interactions. Further research could look at discrimination based on age, weight, sexuality, physical ability, or even culture to name a few. Either way there are many more underrepresented groups our work could analyze.

Finally, The study is also limited by the play style and set up of the experiment. Participants played a single level of a puzzle side-scroller for an average of four minutes per participant. The game and characters were incredibly simple and did not include typical features used to personify characters such as voice acting or facial animations for communicating different emotional states. Participants only played the game once and immediately were asked to evaluate the resume. This

does not reflect real world gaming experiences where a person may spend several hours with a game, multiple times over an extended period. The study was not able to examine possible time strengthening or weakening effects generated from extended play sessions with the game or time in between playing the game and evaluating the LinkedIn profile. The simplicity of the game was meant to provide a baseline featuring only the most basic of game play element. Our results suggest high levels of embodied identification is necessary for specific player embodied effects on bias to occur; so, a more polished game that better reflects higher quality gaming experiences would allow for a greater understanding of the phenomenon. Through the incorporation of features known to increase embodied identification such as engaging narratives, character modification systems, or more high intensity game play the link between embodied identification and bias manipulation could be better understood. Future work should investigate all of the above in terms of embodied identification and embodiment of underrepresented player characters as a means of manipulating societal biases.

5.8   Conclusion

The importance of representation in media can not be understated and video games offer a one of a kind contribution through embodiment and identification. When participants embody and identify with an underrepresented player character for even a few minutes their societal biases against real world people can be reduced by a significant margin. The effect is not certain as not every underrepresented group is affected the same way. Worse, low player character identification can increase biases against underrepresented applicants. However, the presence of an underrepresented playable character has the potential to profoundly impact audiences and their biases especially for populations that face multiple types of discrimination. An intersectional approach to video game embodiment and bias reduction has allowed our research illustrate how the biases some individuals face due to multiple parts of their identities can be best overcome with a similarly underrepresented character. We witnessed how identifying with a black female player character drastically increased how technically skilled and likable participants felt a black female applicant was. This occurred even though there were literally no differences between the content of the black female applicant's LinkedIn job profile and her white male, white female, and black male peers. This real world example of how bias can limit the social mobility of certain groups shows us the real world benefits of creating games that encourage individuals to connect with underrepresented people. If the effect

proves robust video games could not only have a place in reducing job application inequality but any other rating based assessment. The lack of fully immersive VR and an explicitly empathetic narrative also show that these changes can be promoted in even the simplest types of games and that developers are not bound by specific types of technology nor narrative. However, until more research has tested these findings with different characters and biases no universal conclusions about embodied identification and bias reduction can be formed.

Still, for populations facing multiple disadvantages and individuals seeking to advocate these groups this study should excite and inspire. Only a few sprites and a single color gradient separated our black female character form our white male as all characters used the exact same body base. The characters could not even express emotions or have voice acting with their dialogue. These were some of the simplest characters a game could have and yet when participants were able to identify with the black female player character it utterly reversed the baseline biases in race and gender a real life black female applicant was suffering under. If our applicant had been real this minor interaction could have been the difference between a new job and a rejection letter. Furthermore, the ramification of our results might extend even further than job applications or the computer science field. If this reduction in bias could apply to any bias against actual individuals this research would suggest that the best way to combat intersectional bias is with intersectional support. For example, if an industry wishes to reduce bias in their organization it would not be enough to high white women and black men. Rather to help black women the company would need to specifically focus on hiring black women as this representation would address both the racial and gender bias black women experience the most. While a white female or black male hire could be of aid the most effective means would still be a black woman. Furthermore, one could argue that a black female fire would still address the gender bias white female individuals are dealing with and the racial bias black male individuals experience. This is all mere conjecture but as our research is based on a wide variety of bias reduction studies that are not directly connected to video games or identification [34, 166, 84], it is possible the results of our study could help support bias research outside of video games as well.

Chapter 6

Conclusions and Discussion

6.1 The Importance of Play

From our three separate studies on embodiment and identification's bias manipulation abilities a greater understanding of how player character identity influences societal attitudes toward real world people has been gained. Not only have we learned more about reducing bias against specific populations, but we have gained insight into how the reverse may occur as well. The studies all focused on simplistic 2D side-scrolling game play that was designed to be completed in two to five minutes. These interactions were incredibly short and offered the most basic elements of game play and story. They were purposefully modelled after some of video game's earliest creations and most casual of experiences. Yet, even with these most simplistic of systems interactions with underrepresented playable characters showed significant correlations with bias reduction in our sample populations. The ratings of speakers and job applications not only illustrated the bias manipulating effects of the characters but presented real world examples of the impact of bias. They show how bias can negatively impact underrepresented people's opportunities and livelihoods.

Furthermore, while past research has examined the bias manipulation effects of embodiment in fully immersive VR experiences [7, 62, 66], empathetic narratively driven games [63], and even a few casual 2D social games [13] none of these studies examine the nuanced way intersectionality influences bias. They do not explore either a single player character's effects on different populations nor do they examine the use of different player character's with different identities to alleviate the bias a multi-underrepresented population experiences. In this section we summarize the overall findings

of the studies, talk about their broader implications for the gaming industry, explore how they can help society's overall efforts combating bias, and propose future work. This is all intended to expand on the findings presented and continue research into player embodiment, embodied identification, and intersectional representation.

6.2 Overview of Findings & Connections

From our research we sought to help bridge the gulf of knowledge between the interactions of identity and play in virtual spaces. Representation and diversity are central issues in the video gaming industry for fans, investors, and developers [111, 67, 155]. Thus, research focused on examining the benefits of representation in gaming is extremely useful for the medium. Our research helps highlight the cognitive importance of representation and it's ability to reduce biases against real world individuals. We expanded on past research by featuring game play that is not fully immersive and does not only feature narratives specifically designed to evoke empathy or promote tolerance. Both the use of fully immersive systems and games with empathetic narratives have been the standard for video game bias reduction research. Furthermore, our studies allow for comparisons between underrepresented identities and in the final study there is an examination of multiple underrepresented identities (race and gender) within the same study. This contrasts past research which to our knowledge only focuses on one underrepresented identity at a time and does not include intersectional comparisons. Instead past studies either only compare male characters to female characters [92] or black characters to white characters [6]. Though many studies have highlighted the need for more nuanced black female characters [55, 125], they do not analyze how playing as a black female character differs from playing as a black male character and/or a white female character. Our third study makes this comparison an explicit part of our analysis to see how all three conditions differ from playing as a white male character and from each other.

To summarize in our studies we examined if even without the aid of empathetic narratives or fully immersive VR, video games can be used to decrease societal biases against real world people. The first study focused on exposure to and/or embodiment of racially diverse characters. The second study examined the same phenomenon but in terms of gender bias. The second study also included comparisons between games featuring playable main female characters and non-playable companion female characters. The second study also looked at how the presence of a female char-

acter in a game with and without a narrative about the character overcoming gender bias in the game affected real world gender bias. Due to the different narratives the study examined player embodiment and narrative engagement as modifying factors. It also tried to look at bias in terms of individual personal discrimination and overall perceptions of women as a group and the importance of promoting gender equality. Finally, the last study of the paper incorporated racial and gender bias to allow us to examine the intersectional aspects of bias and player embodied identification. Specifically, since individuals with multiple underrepresented identities face biases on all their underrepresented identities simultaneously we try to see if a player character that shares all their identities is more effective at reducing the overall biases these individuals face. After all, these characters can manipulate biases based on each shared identity they have in common with the underrepresented individuals. Meanwhile, a character sharing only one underrepresented identity may only be able to effectively manipulate a single bias.

Our results from study one showed the cognitive racial biases white participants had were reduced when the participants played the game as a black character. This decrease in racial bias was not present for our mere exposure group. This finding suggests that in video games mere exposure is not a reliable means of manipulating bias. Instead embodying, or playing as a character, resulted in significant changes in how participants viewed a real life black individual as they rated a black speaker's technical skills more positively than players who played as a non-human character (anthropomorphic cat) or a white character. The first study also provided evidence that a player character's racial bias manipulation ability was modified by the level of embodied identification a player reported experiencing. Participants who reported experiencing high levels of embodied identification with the black player character were significantly less biased towards the black speaker than participants who did not.

The bias manipulation abilities of player embodiment and embodied identification were further extrapolated from our findings in study two. Here, embodiment alone had no significant effect on gender bias. Participants who played the game with a female player character did not rate the female speaker significantly differently than the male player character group. This was also the case for participants who played the game with a female player character and a narrative specifically written to promote women. In the empathetic narrative condition the female character specifically mentions they are traversing the dungeon to prove to an unseen sexist guild that girls can be adventures. However, when player embodied identification was included as a modification factor

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there was a significant reaction. Unfortunately, in terms of individual bias towards a female speaker high embodied identification with a female player character increased the bias against the female speaker and increased bias for the male speaker for US participants. However, when participants rated how important they perceived gender equality was high levels of embodied identification with a female character increased importance of gender equality ratings when the producer of the game was perceived to be female. When the game was believed to come from a male developer, aka when a male speaker spoke about the game, increasing player embodiment with a female character decreased gender equality importance ratings. Mere exposure was again analyzed with the aid of female companion characters. However, once again mere exposure conditions had no significant effect on bias. Furthermore, narrative engagement did not have a significant modification effect on bias regardless of the type of narrative (non-empathetic vs empathetic). Which could suggest that for video games player embodied identification is a more reliable means for manipulating bias rather than engagement with the game's narrative.

This second study unfortunately had several issues that lowered the reliability of our findings. For one our sample groups were uneven due to oversampling from the male player and companion character conditions. We also found a large number of participants realized the nature of our study which increased overall bias with participants who made that realization. We believe these results support past research on how in-group vs out-group threats can result in increased biases against members of the out group (which for the purpose of our study would place women as the out-group) [36]. This negativity may have played a significant role in our research negating the possible bias reduction aspects of the female player characters and empathetic narrative. Regardless the study revealed a key finding for us which became the focal point of our final study. Bias and bias manipulation in our gender based study did not behave in the same manor as they did in our race based study. High levels of player embodied identification with the underrepresented character in the first study decreased bias towards the underrepresented speaker. Meanwhile high levels of player embodied identification with the underrepresented character in the second study increased bias towards the underrepresented speaker.

Thus, in the third study we examined race and gender simultaneously. Since mere exposure had twice not significantly affected bias we only examined player embodiment's effects on bias manipulation. However, the main goal of study three was to examine how intersectionality interacted with player embodiment. There is already a plethora of evidence showing that individuals who are

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underrepresented in multiple ways face multiple types of discrimination; such as black women who face discrimination for both their race and gender [34, 150, 60]. If player embodiment could affect racial bias and gender bias then we sought to discover if it could affect both biases at the same time if a player character represented both underrepresented identities. If so, playing a video game with a black female character would be an effective way of reducing the unique combination of racial and gender biases black women face in the real world. Thus for this study we used player characters and LinkedIn profile applications featuring a two by two mix of gender and racial representation; white male, white female, black male, and black female. In this way we could test for racial and gender bias in a more holistic manner. In the previous studies we had black men and white women standing in for all black representation and all female representation. Though necessary at the time this monolithic view of race and gender inhibited our findings on racial and gender bias. By including members of different races and different genders in the two main biases we better acknowledge the diversity within each sub-population. Similar to the first study we again found evidence of racial bias. However, unlike the first study embodiment alone did not have a significant effect on racial bias. Meanwhile, unlike the second study this time embodiment of a female player character did significantly reduce gender bias against the female LinkedIn applicants. For the black and female applicant our results showed that the interaction of their race and gender did not protect them from either bias. The black female applicant faced significant bias against them due to their race and significant bias against them due to their gender. While, embodiment of the white female player and identification with black male player significantly reduced the bias the black female applicant face by far the best condition for reducing bias was the black female player character. As the black female player character received the gender bias reduction abilities all female player characters had and the unique reduction on bias black female applicants experienced all black player characters provided. Thus, the two biases black female applicants experienced were practically reversed in their favor compared to the white male applicant when participants experienced high levels of player embodiment while playing as a black female player character.

From these three studies our data showed that even without the aid of empathetic narratives or fully immersive VR, video games can be used to reduce racial and gender bias through embodiment of video game characters. However, in many cases the mere presence of an underrepresented player character is not enough to reduce a bias. Rather player embodied identification plays a key role in determining how biases are affected. Low levels of player embodied identification with

an underrepresented player character can actually increase biases against underrepresented people. Also of important note is the fact that biases against underrepresented groups and the bias manipulating affects of underrepresented player characters are not uniform. In our studies focusing on bias against black individuals and women we found gender and racial bias did not behave in the same manner. Furthermore, underrepresented player characters did not manipulate all biases in the same manner. A black male player character could not significantly reduce gender bias nor could a white female player character reduce racial bias. Finally, for our black female applicant who faced racial and gender bias simultaneously only participants experiencing high levels of player embodied identification with a black female player character produced the significant additive reduction in racial and gender bias that the female and black player characters offered. All of these results have important and broad implications for representation in video games, using video games as tools for promoting tolerance, and video game development as a whole.

6.3   Theoretical Implications

Since our studies focused on observable outcomes from the presence of bias, such as ratings for delivering the same speech or having the same job application and not results from implicit association tests, our results reveal the real world consequences playable characters can have on people's lives and opportunities. We found that participants displayed biases against black individuals and women. We also found that embodying and identifying with black and female player characters in video games could reduce the biases against these groups. In fact in some cases highly identifying with underrepresented characters flipped the bias and instilled a preference for the underrepresented individuals. We can not say how long the effect lasts and it is not guaranteed. When participants experienced low levels of identification with the player characters the bias against the underrepresented individuals worsened. The bias manipulation effect is also likely vulnerable to other cognitive effects such as perceiving threats based on in-group and out-group status. We can only hypothesize that the effect would remain robust for other underrepresented identities as our research only looked at black-white bias, male-female bias, and the interaction between the two biases.

If simply playing video games featuring underrepresented characters can reduce or increase societal biases towards real people then video games have both a unique opportunity and serious responsibility before them. Game developers could use this research in support of initiatives to

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create more playable underrepresented characters with stories that encourage audiences to identify with the people they are representing. Since, our research focused on games that did not feature fully immersive VR or empathetic narratives, developers have reason to believe that they can positively influence others without expensive VR equipment or stories that only focus on the struggles underrepresented people face. Our research suggest any game that presents a playable character and promotes identification with the character through game play can reduce bias. The developers do not have to dedicate themselves to creating games advocating for social change to make an impact. However, if the game does feature an underrepresented playable character our studies suggest developers should put the majority of their attention and effort into making sure audiences experience high levels of embodied identification with the player character. While many game developers spend a great deal of time and effort crafting high quality empathetic narratives to advocate for underrepresented groups [22, 148, 122], our research suggest story may not be as important as one might think. In our research the presence of an empathetic narrative and narrative engagement were not fount to have a significant effect on the individual based or overall biases of our participants. What we did find in each study was that player identification had a significant modification effect on participants' biases. With high levels of player identification often greatly reducing biases and low levels of player identification often worsening biases. Meaning developers could increase biases against underrepresented groups if their games are not able to encourage identification with the characters. However, this relationship is currently only recognized as a correlation.

Further studies need to be conducted to verify if raising player embodied identification lowers bias or if the types of people who are able to experience high levels of identification with underrepresented characters are also the types of people to display preferences for rather than biases against underrepresented people. If a causal relationship is found this suggests games could be used for tolerance and sensitivity training, or in extreme measures as a means of deradicalizing bigoted populations. Though this is only speculation and the limits of identification and player embodiment of underrepresented groups would need to be tested. After all, though mere exposure has found to have a causal effect in bias reduction [167, 166] it has also been found to be diminished or negated by personal aspects of the participant experiencing the exposure [19]. It is very likely that some individuals could be unaffected by the effect or even increase their societal biases. If the high identification–reduced bias relationship is instead correlative to another factor such as personal interest in promoting underrepresented people this means high identification can be used as a means

of testing for that factor. By testing for this third possible causal factor researchers would also gain a greater understanding of the multiple ways that factor affects population behavior. Meanwhile, in this hypothetical third causal factor situation developers could use this factor for audience targeting initiatives. As identification is integral to interactive media enjoyment [87] developers could reach out to people who exhibit this third factor. As developers would be assured these people would likely experience high levels of identification with the player character and thus experience high level of enjoyment with the game. In this way the developers could better obtain and build a stable audience for their games. Our first study included action fighting mechanics and puzzle mechanics and found no differences between the type of game play suggesting developers of any genre of game could possibly reach this hypothetical audience.

In either case with player identification as causal or correlative it plays some role in understanding media's effect on societal biases. It is a psychological phenomenon unique to interactive experiences such as video games and fully immersive VR. These experiences are already a highly prolific and profitable area of entertainment. Plus, with continuing development in technology and a constantly growing audience base it is certain these experiences will continue to grow in scope and influence as literature and film have. Going beyond entertainment the results of our third study on intersectionality have major implications for all sorts of diversity initiatives. By analyzing the effects white female, black male, and black female players had on the biases black women faced we found the black female character was the best option for reducing bias against this doubly underrepresented group. This was because the two underrepresented identities of the black female player character worked together to reduce bias. As the black female applicant in our study was dealing with the additive biases of being both a woman and a black individual they needed extra help to overcome the biases they faced. Our research suggest that any initiative trying to fight real world biases must remember there are members in every underrepresented group that are dealing with multiple types of discrimination. Being a black woman did not mean our applicant only dealt with gender bias or only dealt with racial bias they dealt with both. This finding was perfectly in line with fundamental research on intersectionality [34, 35]. The results illustrate why diversity initiatives need to take intersectionality into account as some members of the groups they seek to help need special attention. Our research also suggest that just having an advocate that shares one identity with an underrepresented person who is dealing with multiple biases may not be enough. While the white female and black male player conditions did help our black female applicant by far the best intervention

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involved the black female player character. If the core of our work on intersectionality holds true for other diversity initiatives this would mean that a system would not be providing enough support if it only focused on single identities like gender and race separately. If we were to use initiatives to hire more underrepresented employees as an example a diverse hiring initiative would not be doing enough if it just hired more white women and black men. The initiative would specifically need to focus on also increasing the presence of black women to address the intersectional prejudices against black women in the company. Encouraging such initiatives to specifically focus on intersectionality may require special attention and research but there have already been multiple cases where a lack of intersectional theory in both advocacy and civil rights protection have failed many individuals [34]. Thus it is vitally important for researchers and developers to study the impact all of these findings can have on society.

6.4   Proposal for Future Studies

We have presented an in-depth summarization of past research and analysis of our own explorations into using video games to manipulate biases. From our results the necessity for more research into the phenomenon of embodied identification and its influence on changing attitudes becomes apparent. The most gaping flaws in our three past studies have been their over simplification of identity. Both limiting representation to one singular representative as a stand in for whole groups. This decision was needed to create a foundation but future research needs to build upon it with more complex examinations of identity. We hypothesized that embodiment of an underrepresented character (black, female, and black female) would have an effect on the ratings of similar real life speakers and LinkedIn applicant profiles and found that to be the case. But there is more than one way to be black or a woman or a black woman. None of these groups is a monolith and there are even more aspects of their identities beyond race and gender that influence their lived realities such a class or sexuality.

Not to mention all studies focus on North American, specifically the United States of America, perceptions of race and gender. Also some of the studies specifically look at white and white male populations. Despite the research examining biases against underrepresented people we do not examine underrepresented people's reactions to playing these games. Similar to how we found different biases behaved differently when comparing them we can not assume the reactions of different

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underrepresented groups would function the same either. However, research into passive media such as children's television programming suggests underrepresented children who are able to identify with characters in educational programming exhibit a significant increase in their own educational performance[84]. If this effect is present in video games it could suggest that including identifiable underrepresented characters in games meant to teach or train individuals could increase the performance of the real world underrepresented people who play them. This is an exceptionally useful fact when you consider that according to one report game-based learning is poised to become a \$17 billion dollar industry by 2023, just three years away and across 122 countries [151]. These games are not only purchased by individual gaming enthusiasts but institutional organizations such as schools, businesses, and governments. What's more the source of this study, Metaari, sites Africa as the highest growing continent for game-based learning with a rate of about 60% over the next five years [151]. Though our work focuses on underrepresented populations it should be noted that attitudes towards the majority groups changed in the study as well. Identification and the positive preferences it can induce may be applied to any population underrepresented or over represented. So even if African students are not underrepresented in their own continent the presence of player characters that share their backgrounds/identities with whom they could identify with could in theory greatly improve their educational outcomes. This all helping to increase the continents' intellectual human capital in the face of a growing issue with "brain drain" [41]. In the past ten years alone there has been a 50% increase in highly educated Africans emigrating outside the continent [41]. Meanwhile, the United States, one of the top developers of educational video games, is the most popular destination for potential sub-Saharan African students [41, 151].

Thus, for this final section we propose a divergence from identification and bias manipulation into identification and educational stimulation. From Shih et al.'s research on internalized stereotypes and performance we know individual's educational performances can be influenced by the internal societal biases they have about people like themselves in positive and negative ways [142]. It is possible that playing as an underrepresented character could increase performance similar to how black students who watched *Sesame Street* and identified with the black characters in the show saw increases in their educational success [84]. It could also decrease performance as was the case for a group of Asian women who performed worse on math tests after reading a survey that included gender related questions [142]. This could be conducted using our intersectional video game by having a group of black and white people of various genders play as the four characters. We

could then see if playing as a character that matched a participants race and/or gender identities affected their results on a math test same as Shin et al.'s work [142]. From this we could see if underrepresented individuals display internal biases against their own populations that affect their educational performance and if video games could be used to reduce these internal biases. As interest in video games among women and people of color increases [117, 58], the video game industry has the potential to promote real positive societal change for these underrepresented groups in numerous nuanced but impactful ways. Thus, we advocate for research that seeks to uncover this hidden potential and utilize video games as one of many tools for reducing bias, promoting tolerance, and offering support towards the underrepresented.

Bibliography

[1] Haleh Afshar and Mary Maynard. *The dynamics of" race" and gender: some feminist interventions.* Taylor & Francis, 1994.

[2] Ritu Agarwal and Elena Karahanna. Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*, 24(4):665–694, 2000.

[3] AllAgesofGeek TV. Detroit Become Human (Part 2) KARA, ALICE AND TEARS!, June 2018.

[4] AllAgesofGeek TV. My Mom's Thank You to Quantic Dream (Detroit Become Human), May 2018.

[5] Craig A Anderson and Brad J Bushman. Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological science*, 12(5):353–359, 2001.

[6] Erin Ash. Priming or Proteus Effect? Examining the Effects of Avatar Race on In-Game Behavior and Post-Play Aggressive Cognition and Affect in Video Games. *Games and Culture*, 11(4):422–440, June 2016.

[7] Domna Banakou, Parasuram D. Hanumanthu, and Mel Slater. Virtual Embodiment of White People in a Black Virtual Body Leads to a Sustained Reduction in Their Implicit Racial Bias. *Frontiers in Human Neuroscience*, 10, November 2016.

[8] Domna Banakou, Sameer Kishore, and Mel Slater. Virtually being einstein results in an improvement in cognitive task performance and a decrease in age bias. *Frontiers in psychology*, 9, 2018. Publisher: Frontiers.

[9] BBC. The white Southerners who fought US segregation. *BBC News*, March 2019.

[10] Steve Bearman, Neill Korobov, and Avril Thorne. The fabric of internalized sexism. *Journal of Integrated Social Sciences*, 1(1):10–47, 2009.

[11] Berrin Beasley and Tracy Collins Standley. Shirts vs. Skins: Clothing as an Indicator of Gender Role Stereotyping in Video Games. *Mass Communication and Society*, 5(3):279–293, August 2002.

[12] Clare Beckett and Marie Macey. Race, gender and sexuality: The oppression of multiculturalism. *Women's Studies International Forum*, 24(3):309–319, May 2001.

[13] Elizabeth Behm-Morawitz, Hillary Pennell, and Ashton Gerding Speno. The effects of virtual racial embodiment in a gaming app on reducing prejudice. *Communication Monographs*, 83(3):396–418, July 2016.

[14] Marianne Bertrand and Sendhil Mullainathan. Are emily and greg more employable than lakisha and jamal? a field experiment on labor market discrimination. Series: Working Paper Series.

[15] Gayle R Bessenoff. Can the media affect us? social comparison, self-discrepancy, and the thin ideal. *Psychology of women quarterly*, 30(3):239–251, 2006.

[16] Catherine I. Bolzendahl and Daniel J. Myers. Feminist Attitudes and Support for Gender Equality: Opinion Change in Women and Men, 1974–1998. *Social Forces*, 83(2):759–789, December 2004.

[17] Robert F. Bornstein. Exposure and affect: Overview and meta-analysis of research, 1968–1987. *Psychological Bulletin*, 106(2):265–289, September 1989.

[18] Robert F. Bornstein and Paul R. D'Agostino. Stimulus recognition and the mere exposure effect. *Journal of personality and social psychology*, 63(4):545–552, 1992.

[19] Robert F. Bornstein, Amy R. Kale, and Karen R. Cornell. Boredom as a limiting condition on the mere exposure effect. *Journal of Personality and Social Psychology*, 58(5):791–800, May 1990.

[20] Robert F. Bornstein, Dean R. Leone, and Donna J. Galley. The Generalizability of Subliminal Mere Exposure Effects : Influence of Stimuli Perceived Without Awareness on Social Behavior. In *Journal of personality and social*, 2004.

[21] Colin Campbell. Game companies are failing on diversity, according to new report. *Polygon*, January 2018.

[22] CBC Radio. 286: Empathy games, intangible art and more | CBC Radio. *CBC*, May 2015.

[23] Xiao-Ping Chen, Xin Yao, and Suresh Kotha. Entrepreneur Passion And Preparedness In Business Plan Presentations: A Persuasion Analysis Of Venture Capitalists' Funding Decisions. *Academy of Management Journal*, 52(1):199–214, February 2009.

[24] Chicago Face Database. CFD | chicago face database. *Chicago Face Database*, 2020.

[25] Yu-Jen Chou, Shao-Kang Lo, and Ching-I. Teng. Reasons for Avatar Gender Swapping by Online Game Players: A Qualitative Interview-Based Study. In *Discrimination and Diversity: Concepts, Methodologies, Tools, and Applications*, pages 202–219. IGI Global, Hershey, Pennsylvania, 2017.

[26] Maria Christofi and Despina Michael-Grigoriou. Virtual reality for inducing empathy and reducing prejudice towards stigmatized groups: A survey. In *2017 23rd International Conference on Virtual System Multimedia (VSMM)*, pages 1–8, October 2017. ISSN: 2474-1485.

[27] Alexis Clark. How 'The Birth of a Nation' Revived the Ku Klux Klan. *HISTORY*, January 2020.

[28] Jane Coaston. The intersectionality wars. *Vox*, May 2019.

[29] Andy Cockburn and Carl Gutwin. Anchoring Effects and Troublesome Asymmetric Transfer in Subjective Ratings. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI '19, pages 362:1–362:12, New York, NY, USA, 2019. ACM. event-place: Glasgow, Scotland Uk.

[30] Jonathan Cohen. Defining Identification: A Theoretical Look at the Identification of Audiences With Media Characters. *Mass Communication and Society*, 4(3):245–264, August 2001.

[31] Dave Cook. BioShock: Infinite team wanted to remove Elizabeth entirely, says Levine. *VG247*, March 2013.

[32] J. E. Cook. What does a transgender player character look like? | Part two | Character creators. *Medium*, May 2018.

[33] Brian Crecente. How 'Control' Became Remedy's First Female Lead Video Game. *Variety*, October 2018.

[34] Kimberle Crenshaw. Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum*, 1989:139–168, 1989.

[35] Kimberle Crenshaw. Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*, 43(6):1241–1299, 1991.

[36] Richard Crisp, Russell Hutter, and Bryony Young. When mere exposure leads to less liking: The incremental threat effect in intergroup contexts. *British journal of psychology (London, England : 1953)*, 100:133–49, July 2008.

[37] Anneke de Graaf, Hans Hoeken, José Sanders, and Johannes W. J. Beentjes. Identification as a Mechanism of Narrative Persuasion. *Communication Research*, 39(6):802–823, December 2012.

[38] Charles Dickerman, Jeff Christensen, and Stella Beatríz Kerl-McClain. Big Breasts and Bad Guys: Depictions of Gender and Race in Video Games. *Journal of Creativity in Mental Health*, 3(1):20–29, May 2008.

[39] Karen E. Dill and Kathryn P. Thill. Video Game Characters and the Socialization of Gender Roles: Young People's Perceptions Mirror Sexist Media Depictions. *Sex Roles*, 57(11):851–864, December 2007.

[40] Matthew S. Eastin, Osei Appiah, and Vincent Cicchirllo. Identification and the Influence of Cultural Stereotyping on Postvideogame Play Hostility. *Human Communication Research*, 35(3):337–356, July 2009.

[41] Blog Editor. How severe is africa's brain drain? *LSE*, January 2016.

[42] Wes Enzinna. Inside the radical, uncomfortable movement to reform white supremacists. *Mother Jones*, July 2018.

[43] Anna Everett and S. Craig Watkins. The power of play: The portrayal and performance of race in video games. *The ecology of games: Connecting youth, games, and learning.*, pages 141–164, 2007.

[44] Xiang Fang, Surendra Singh, and Rohini Ahluwalia. An Examination of Different Explanations for the Mere Exposure Effect. *Journal of Consumer Research*, 34(1):97–103, June 2007.

[45] Harry Farmer and Lara Maister. Putting Ourselves in Another's Skin: Using the Plasticity of Self-Perception to Enhance Empathy and Decrease Prejudice. *Social Justice Research*, 30(4):323–354, December 2017.

[46] Lily. Ford. Nilin cartier-wells/gallery. *Remember Me Wiki*, 2016.

[47] Martha Foschi. Chapter 11 - Hypotheses, Operationalizations, and Manipulation Checks. In Murray Webster and Jane Sell, editors, *Laboratory Experiments in the Social Sciences (Second Edition)*, pages 247–268. Academic Press, San Diego, January 2014.

[48] Jesse Fox and Wai Yen Tang. Sexism in online video games: The role of conformity to masculine norms and social dominance orientation. *Computers in Human Behavior*, 33:314–320, April 2014.

[49] Jared Friedberg. Gender Games: A Content Analysis Of Gender Portrayals In Modern, Narrative Video Games. *Sociology Theses*, May 2015.

[50] Immo Fritsche, Eva Jonas, and Thomas Fankhänel. The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology*, 95(3):524, September 2008.

[51] Alessandro Gabbiadini, Paolo Riva, Luca Andrighetto, Chiara Volpato, and Brad J. Bushman. Acting like a Tough Guy: Violent-Sexist Video Games, Identification with Game Characters, Masculine Beliefs, & Empathy for Female Violence Victims. *PLOS ONE*, 11(4):e0152121, April 2016.

[52] S. Michael Gaddis. How black are lakisha and jamal? racial perceptions from names used in correspondence audit studies. *Sociological Science*, 4:469–489, September 2017.

[53] Nancy L Galambos, Anne C Petersen, Maryse Richards, and Idy B Gitelson. The attitudes toward women scale for adolescents (awsa): A study of reliability and validity. *Sex roles*, 13(5-6):343–356, 1985.

[54] Judit García-González, Patricia Forcén, and Maria Jimenez-Sanchez. Men and women differ in their perception of gender bias in research institutions. *PLOS ONE*, 14(12):e0225763, December 2019.

[55] Christina R. Glaubke, Patti Miller, McCrae A. Parker, and Eileen Espejo. Fair Play? Violence, Gender and Race in Video Games. *Children NOW*, 2001.

[56] Cristina Gonzalez-Liencres, Luis E. Zapata, Guillermo Iruretagoyena, Sofia Seinfeld, Lorena Perez-Mendez, Jorge Arroyo-Palacios, David Borland, Mel Slater, and Maria V. Sanchez-Vives. Being the victim of intimate partner violence in virtual reality: First- versus third-person perspective. *Frontiers in psychology*, 11, 2020. Publisher: Frontiers.

[57] Google Inc. & Gallup Inc. Diversity gaps in computer science: Exploring the underrepresentation of girls, blacks and hispanics. *Google's Computer Science Education Research*, 2016.

[58] Christina Gough. Distribution of computer and video gamers in the united states from 2006 to 2019, by gender. *Statista*, 2019.

[59] Melanie C. Green and Timothy C. Brock. The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79(5):701–721, 2000.

[60] Kadeen Griffiths. 'Moana's Lack Of Romance May Not Be Good. *Bustle*, August 2016.

[61] Pamela Grimm. Social desirability bias. In *Wiley International Encyclopedia of Marketing*. American Cancer Society, December 2010. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781444316568.wiem02057.

[62] Victoria Groom, Jeremy N. Bailenson, and Clifford Nass. The influence of racial embodiment on racial bias in immersive virtual environments. *Social Influence*, 4(3):231–248, July 2009.

[63] Belinda Gutierrez, Anna Kaatz, Sarah Chu, Dennis Ramirez, Clem Samson-Samuel, and Molly Carnes. "Fair Play": A Videogame Designed to Address Implicit Race Bias Through Active Perspective Taking. *Games for Health Journal*, 3(6):371–378, September 2014.

[64] Eddie Harmon-Jones and John J. B. Allen. The Role of Affect in the Mere Exposure Effect: Evidence from Psychophysiological and Individual Differences Approaches. *Personality and Social Psychology Bulletin*, 27(7):889–898, July 2001.

[65] Alison Harvey and Stephanie Fisher. "Everyone Can Make Games!": The post-feminist context of women in digital game production. *Feminist Media Studies*, 15(4):576–592, July 2015.

[66] Béatrice S. Hasler, Bernhard Spanlang, and Mel Slater. Virtual race transformation reverses racial in-group bias. *PLOS ONE*, 12(4):e0174965, April 2017.

[67] Aisha Hassan. Video game companies are leaving a lot more than money on the table if they lack diversity. *Quartz*, 2018.

[68] Dorothée Hefner, Christoph Klimmt, and Peter Vorderer. Identification with the Player Character as Determinant of Video Game Enjoyment. In Lizhuang Ma, Matthias Rauterberg, and Ryohei Nakatsu, editors, *Entertainment Computing – ICEC 2007*, Lecture Notes in Computer Science, pages 39–48, Berlin, Heidelberg, 2007. Springer.

[69] Peter Hellman. Street Smart: How Big Bird & Co. Do It. *New York Magazine*, 20(46):48–53, November 1987.

[70] Kelly M. Hoffman, Sophie Trawalter, Jordan R. Axt, and M. Norman Oliver. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proceedings of the National Academy of Sciences*, 113(16):4296–4301, April 2016.

[71] Daniel Horowitz. Rethinking Betty Friedan and the Feminine Mystique: Labor Union Radicalism and Feminism in Cold War America. *American Quarterly*, 48(1):1–42, 1996.

[72] Jane C. Hu. To deradicalize extremists, former neo-Nazis use a radical method: empathy. *Quartz*, November 2018.

[73] Tamoor Hussain. This War of Mine review | PC Gamer. *PC Gamer*, November 2014.

[74] Lara Jackson. The Internet Needs To Stop Talking About Tifa's Breasts. *Gamebyte*, July 2019.

[75] Jeroen Jansz and Raynel G Martis. 21. the representation of gender and ethnicity in digital interactive games, 2003.

[76] Jeroen Jansz and Raynel G. Martis. The Lara Phenomenon: Powerful Female Characters in Video Games. *Sex Roles*, 56(3):141–148, February 2007.

[77] Jasynergy, CruelBus, Memegaman03, and more. Legendary dwellers - fallout shelter wiki guide - IGN. *IGN*, January 2017.

[78] Gaetane Jean-Marie, Vicki A. Williams, and Sheila L. Sherman. Black Women's Leadership Experiences: Examining the Intersectionality of Race and Gender. *Advances in Developing Human Resources*, 11(5):562–581, October 2009.

[79] Jennifer Jenson and Suzanne de Castell. Tipping Points: Marginality, Misogyny and Videogames. *Journal of Curriculum Theorizing*, 29(2), December 2013.

[80] W. Brad Johnson and David G. Smith. How Men Can Become Better Allies to Women. *Harvard Business Review*, October 2018.

[81] Mark Juddery. How Superman Defeated the Ku Klux Klan. *mentalfloss*, October 2009.

[82] Uma R. Karmarkar and Zakary L. Tormala. Believe Me, I Have No Idea What I'm Talking About: The Effects of Source Certainty on Consumer Involvement and Persuasion. *Journal of Consumer Research*, 36(6):1033–1049, April 2010.

[83] Kristi Kates. Mario: Bigger even than Mickey Mouse, the Little Plumber from Japan is a World-wide Superstar. *The Northern Express*, December 2004.

[84] Melissa S Kearney and Phillip B Levine. Early Childhood Education by MOOC: Lessons from Sesame Street. *National Bureau of Economic Research*, No.w21229, June 2015.

[85] Briley Kenney. Oculus rift touch virtual reality system deals, coupons & reviews. *Ideaing*, 2020.

[86] Anna Kere. APPG on social integration minutes for meeting on monday, 23 may, 4-6pm, in boothroyd room, portcullis house. *All Party Parliamentary Group on Social Integration*, March 2016.

[87] Christoph Klimmt, Dorothée Hefner, and Peter Vorderer. The Video Game Experience as "True" Identification: A Theory of Enjoyable Alterations of Players' Self-Perception. *Communication Theory*, 19(4):351–373, November 2009.

[88] Christoph Klimmt, Dorothée Hefner, Peter Vorderer, Christian Roth, and Christopher Blake. Identification With Video Game Characters as Automatic Shift of Self-Perceptions. *Media Psychology*, 13(4):323–338, November 2010.

[89] Rex B Kline. *Principles and practice of structural equation modeling*. Guilford publications, New York, NY, USA, 2015.

[90] Xeniya Kondrat. Gender and video games: How is female gender generally represented in various genres of video games? *Journal of Comparative Research in Anthropology and Sociology*, 6(01):171–193, 2015.

[91] Elly A. Konijn, Marije Nije Bijvank, and Brad J. Bushman. I wish I were a warrior: The role of wishful identification in the effects of violent video games on aggression in adolescent boys. *Developmental Psychology*, 43(4):1038–1044, 2007.

[92] Mika Lehdonvirta, Yosuke Nagashima, Vili Lehdonvirta, and Akira Baba. The Stoic Male: How Avatar Gender Affects Help-Seeking Behavior in an Online Game. *Games and Culture*, 7(1):29–47, January 2012.

[93] Dick Lehr. Birth of a nation fearmongering reconstruction scene. *C-SPAN*, September 2015.

[94] Amanada Lenhart. Chapter 3: Video games are key elements in friendships for many boys. *Pew Research Center: Internet, Science & Tech*, August 2015.

[95] David J. Leonard. Not a Hater, Just Keepin' It Real: The Importance of Race- and Gender-Based Game Studies. *Games and Culture*, 1(1):83–88, January 2006.

[96] P. Andrew Leynes and Richard J. Addante. Neurophysiological evidence that perceptions of fluency produce mere exposure effects. *Cognitive, Affective, & Behavioral Neuroscience*, 16(4):754–767, August 2016.

[97] Jan Van Looy, Cédric Courtois, Melanie De Vocht, and Lieven De Marez. Player Identification in Online Games: Validation of a Scale for Measuring Identification in MMOGs. *Media Psychology*, 15(2):197–221, May 2012.

[98] Antonio M Lopez, Kun Zhang, and Frederick G Lopez. Gender and race: Stereotyping, coping selfefficacy and collective self-esteem in the cset undergraduate pipeline. In *2008 38th Annual Frontiers in Education Conference*, pages F4B–20, Washington, DC, USA, 2008. IEEE, IEEE Computer Society.

[99] Jing-Kai Lou, Kunwoo Park, Meeyoung Cha, Juyong Park, Chin-Laung Lei, and Kuan-Ta Chen. Gender Swapping and User Behaviors in Online Social Games. In *Proceedings of the 22Nd International Conference on World Wide Web*, WWW '13, pages 827–836, New York, NY, USA, 2013. ACM. event-place: Rio de Janeiro, Brazil.

[100] Lou Lumenick. Why 'birth of a nation' is still the most racist movie ever. *New York Post*, February 2015.

[101] Michael Lynn and Bibb Latané. The Psychology of Restaurant Tipping1. *Journal of Applied Social Psychology*, 14(6):549–561, 1984.

[102] Monalisa M. Rise of Christianity with Fall of Roman Empire. *Political Science Notes*, July 2016.

[103] Esther MacCallum-Stewart. "Take That, Bitches!" Refiguring Lara Croft in Feminist Game Narratives. *Game Studies*, 14(2), December 2014.

[104] Michel Marriott. Blood, Gore, Sex and Now: Race. *The New York Times*, October 1999.

[105] Matt McGloin. Mortal Kombat 11 Backlash Erupts Over Female Characters. *Cosmic Book News*, April 2019.

[106] Alex McDavid. Feminism for Men: 101 Educating Men in "Women's Studies". *Feminist Teacher*, 3(3):25–33, 1988.

[107] Denis McQuail. *McQuail's mass communication theory*. Sage publications, 2010.

[108] Monica K. Miller and Alicia Summers. Gender Differences in Video Game Characters' Roles, Appearances, and Attire as Portrayed in Video Game Magazines. *Sex Roles*, 57(9):733–742, November 2007.

[109] Corinne A Moss-Racusin, John F Dovidio, Victoria L Brescoll, Mark J Graham, and Jo Handelsman. Science faculty's subtle gender biases favor male students. *Proceedings of the national academy of sciences*, 109(41):16474–16479, 2012.

[110] Yi Mou and Wei Peng. Gender and Racial Stereotypes in Popular Video Games. *Handbook of Research on Effective Electronic Gaming in Education*, pages 922–937, 2009.

[111] Evan Narcisse. The Natural: The Trouble Portraying Blackness in Video Games. *Kotaku*, 2017.

[112] NASA Archives. Space History Photo: Nichelle Nichols, NASA Recruiter | Space. *Space*, January 2014.

[113] Christopher Neff. The Jaws Effect: How movie narratives are used to influence policy responses to shark bites in Western Australia. *Australian Journal of Political Science*, 50(1):114–127, January 2015.

[114] nesmark. Super mario bros. (1985) for the nintendo entertainment system (nes). *imgur*, August 2017.

[115] Solène Neyret, Xavi Navarro, Alejandro Beacco, Ramon Oliva, Pierre Bourdin, Jose Valenzuela, Itxaso Barberia, and Mel Slater. An embodied perspective as a victim of sexual harassment in virtual reality reduces action conformity in a later milgram obedience scenario. *Scientific reports*, 10(1):6207, 2020. Number: 1 Publisher: Nature Publishing Group.

[116] Nielsen. True Prioritization is Key to Cultivating Multicultural Success. *Nielsen*, June 2012.

[117] Nielsen. For Us By Us? The Mainstream Appeal of Black Content. *Nielsen*, February 2017.

[118] Soo Youn Oh, Jeremy Bailenson, Erika Weisz, and Jamil Zaki. Virtually old: Embodied perspective taking and the reduction of ageism under threat. *Computers in Human Behavior*, 60:398–410, 2016.

[119] Roobina Ohanian. Construction and Validation of a Scale to Measure Celebrity Endorsers' Perceived Expertise, Trustworthiness, and Attractiveness. *Journal of Advertising*, 19(3):39–52, October 1990.

[120] Benjamin Paaßen, Thekla Morgenroth, and Michelle Stratemeyer. What is a true gamer? the male gamer stereotype and the marginalization of women in video game culture. *Sex Roles*, 76(7-8):421–435, 2017.

[121] Damon Packwood. The era of white male games for white male gamers is ending. *Quartz*, 2018.

[122] Simon Parkin. Zoe Quinn's Depression Quest. *The New Yorker*, September 2014.

[123] Cale J. Passmore, Max V. Birk, and Regan L. Mandryk. The Privilege of Immersion: Racial and Ethnic Experiences, Perceptions, and Beliefs in Digital Gaming. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, CHI '18, pages 383:1–383:19, New York, NY, USA, 2018. ACM. event-place: Montreal QC, Canada.

[124] Cale J Passmore and Regan Mandryk. An about face: Diverse representation in games. In *Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play*, pages 365–380. ACM, 2018.

[125] Cale J. Passmore, Rowan Yates, Max V. Birk, and Regan L. Mandryk. Racial Diversity in Indie Games: Patterns, Challenges, and Opportunities. In *Extended Abstracts Publication of the Annual Symposium on Computer-Human Interaction in Play*, CHI PLAY '17 Extended Abstracts, pages 137–151, New York, NY, USA, 2017. ACM. event-place: Amsterdam, The Netherlands.

[126] Cale J Passmore, Rowan Yates, Max V Birk, and Regan L Mandryk. Racial diversity in indie games: patterns, challenges, and opportunities. In *Extended abstracts publication of the annual symposium on computer-human interaction in play*, pages 137–151. ACM, 2017.

[127] Ivan Patané, Anne Lelgouarch, Domna Banakou, Gregoire Verdelet, Clement Desoche, Eric Koun, Romeo Salemme, Mel Slater, and Alessandro Farnè. Exploring the effect of cooperation in reducing implicit racial bias and its relationship with dispositional empathy and political attitudes. *Frontiers in Psychology*, 11, 2020. Publisher: Frontiers.

[128] paulruskeaton. Neverwinter nights - 'nymph'. *Tumblr*, September 2017.

[129] Eric Peckham. Confronting racial bias in video games. *TechCrunch*, June 2020.

[130] Patrick M. Polasek. A Critical Race Review of Grand Theft Auto V. *Humanity & Society*, 38(2):216–218, May 2014.

[131] Felicia Pratto and Demis E. Glasford. Ethnocentrism and the value of a human life. *Journal of Personality and Social Psychology*, 95(6):1411–1428, 2008.

[132] Hyun Kyoung Ro and Karla I. Loya. The Effect of Gender and Race Intersectionality on Student Learning Outcomes In Engineering. *The Review of Higher Education*, 38(3):359–396, March 2015.

[133] Tomi-Ann Roberts and Jennifer Y. Gettman. Mere Exposure: Gender Differences in the Negative Effects of Priming a State of Self-Objectification. *Sex Roles*, 51(1):17–27, July 2004.

[134] Mike Rougeau. The value of playing gay in videogames | game/show | pbs digital studios.

[135] Dana N. Ruggiero. Spent: Changing Students' Affective Learning Toward Homelessness Through Persuasive Video Game Play. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '14, pages 3423–3432, New York, NY, USA, 2014. ACM. event-place: Toronto, Ontario, Canada.

[136] Carol Saunders, Anne F. Rutkowski, Michiel Genuchten van, Doug Vogel, and Julio Molina Orrego. Virtual Space and Place: Theory And Test. *MIS Quarterly*, 35(4):1079–1098, 2011.

[137] Maria N Scaptura and Kaitlin M Boyle. Masculinity threat, "incel" traits, and violent fantasies among heterosexual men in the united states. *Feminist Criminology*, 15(3):278–298, 2020.

[138] Lauren Schiller. "put down your male fragility": How men can talk about gender and sexism productively. Section: Culture.

[139] Mike Schmierbach, Qian Xu, Anne Oeldorf-Hirsch, and Frank E. Dardis. Electronic Friend or Virtual Foe: Exploring the Role of Competitive and Cooperative Multiplayer Video Game Modes in Fostering Enjoyment. *Media Psychology*, 15(3):356–371, July 2012.

[140] Sharon L. Segrest Purkiss, Pamela L. Perrewé, Treena L. Gillespie, Bronston T. Mayes, and Gerald R. Ferris. Implicit sources of bias in employment interview judgments and decisions. *Organizational Behavior and Human Decision Processes*, 101(2):152–167, November 2006.

[141] Adrienne Shaw. Identity, Identification, and Media Representation in Video Game Play: An audience reception study. *Publicly Accessible Penn Dissertations*, December 2010.

[142] Margaret Shih, Todd L. Pittinsky, and Amy Trahan. Domain-specific effects of stereotypes on performance. *Self and Identity*, 5(1):1–14, January 2006. Publisher: Routledge _eprint: https://doi.org/10.1080/15298860500338534.

[143] Marsha Silva. Grand Theft Auto V Is the Highest-Grossing Entertainment Release Ever — In the History of Mankind. *Digital Music News*, April 2018.

[144] Dominique Simons, Sandy K Wurtele, and Peggy Heil. Childhood victimization and lack of empathy as predictors of sexual offending against women and children. *Journal of Interpersonal Violence*, 17(12):1291–1307, 2002.

[145] Sharon Smith. Black feminism and intersectionality. *International Socialist Review*, 91(11), 2014.

[146] Chris Solarski. The Aesthetics of Game Art and Game Design. *Gamasutra*, January 2013.

[147] Sanjay Srivastava, Maya Tamir, Kelly M. McGonigal, Oliver P. John, and James J. Gross. The social costs of emotional suppression: A prospective study of the transition to college. *Journal of Personality and Social Psychology*, 96(4):883–897, 2009.

[148] Peter Swann. Gaymergate: The Best LGBTQ+ Characters in Gaming. *ComicsVerse*, January 2017.

[149] U. S. Census Bureau. Acs demographic and housing estimates. *U. S. Census Bureau*, 2016.

[150] U.S. National Park Service. Sojourner Truth: Ain't I A Woman? (U.S. National Park Service). *U.S. National Park Service*, January 2020.

[151] Rebekah Valentine. Metaari: Game-based learning market will reach $17 billion by 2023. *GamesIndustry.biz*, August 2019.

[152] Ivo Vlaev, Nick Chater, Neil Stewart, and Gordon D. A. Brown. Does the brain calculate value? *Trends in Cognitive Sciences*, 15(11):546–554, November 2011.

[153] Rachel Weber. Dontnod: Publishers said you can't have a female character. *GamesIndustry.biz*, March 2013.

[154] William A. Weeks, Justin G. Longenecker, Joseph A. McKinney, and Carlos W. Moore. The Role of Mere Exposure Effect on Ethical Tolerance: a Two-Study Approach. *Journal of Business Ethics*, 58(4):281–294, June 2005.

[155] Johanna Weststar, Victoria O'Meara, and Marie-Josée Legault. Developer Satisfaction Survey 2017 Summary Report. *The International Game Developers Association (IGDA)*, 2018.

[156] Dmitri Williams, Nicole Martins, Mia Consalvo, and James D. Ivory. The virtual census: representations of gender, race and age in video games. *New Media & Society*, 11(5):815–834, August 2009.

[157] Kevin D Williams. The effects of homophily, identification, and violent video games on players. *Mass Communication and Society*, 14(1):3–24, 2010.

[158] Xavier Harding. Black character creator options in video games still have a long way to go. *Mic*, 2017.

[159] Grace S. Yang, L. Rowell Huesmann, and Brad J. Bushman. Effects of playing a violent video game as male versus female avatar on subsequent aggression in male and female players. *Aggressive Behavior*, 40(6):537–541, 2014.

[160] Nick Yee. The Surprisingly Unsurprising Reason Why Men Choose Female Avatars in World of Warcraft. *Slate Magazine*, May 2014.

[161] Nick Yee and Jeremy Bailenson. The Proteus Effect: The Effect of Transformed Self-Representation on Behavior. *Human Communication Research*, 33(3):271–290, July 2007.

[162] Nick Yee, Nicolas Ducheneaut, Mike Yao, and Les Nelson. Do Men Heal More when in Drag?: Conflicting Identity Cues Between User and Avatar. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '11, pages 773–776, New York, NY, USA, 2011. ACM. event-place: Vancouver, BC, Canada.

[163] Judith Lynne Zaichkowsky. The personal involvement inventory: Reduction, revision, and application to advertising. *Journal of advertising*, 23(4):59–70, 1994.

[164] Robert B. Zajonc. Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, 9(2, Pt.2):1–27, 1968.

[165] Catherine Zanbaka, Paula Goolkasian, and Larry Hodges. Can a virtual cat persuade you? the role of gender and realism in speaker persuasiveness. In *Proceedings of the SIGCHI conference on Human Factors in computing systems*, pages 1153–1162, 2006.

[166] Leslie A. Zebrowitz, Benjamin White, and Kristin Wieneke. Mere Exposure and Racial Prejudice: Exposure to Other-Race Faces Increases Liking for Strangers of that Race. *Social Cognition*, 26(3):259–275, June 2008.

[167] Leslie A. Zebrowitz and Yi Zhang. Neural evidence for reduced apprehensiveness of familiarized stimuli in a mere exposure paradigm. *Social Neuroscience*, 7(4):347–358, July 2012.

[168] Zelda Central. Majora's mask: Maps. *Zelda Central*, 2019.

[169] Zelda Dungeon. The legend of zelda walkthrough. *Zelda Dungeon*, December 2017.