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THE EFFECTS OF VIDEO GAME AVATAR RACE ON IN-GAME BEHAVIORS AND POST-PLAY AGGRESSION

A Thesis in
Media Studies

by

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ABSTRACT

Video game researchers have begun to examine the effects of the avatar on gameplay, a phenomenon referred to as the Proteus effect. Effects of in-game behavior have been found for several attributes, including height, attractiveness, gender, and race. The study revealing a Proteus effect for race found that White game players using Black avatars demonstrated higher levels of hostile thoughts compared to White players using White avatars and concluded this effect was a result of participants’ embodiment of stereotypes associating African Americans with violence, leading to an increase in aggressive in-game behavior and, subsequently, aggressive cognition. This research uses a 2 X 2 factorial experiment to further investigate the effects observed in that study by measuring in-game behavior and the use of stereotypes to describe the avatar. Participants played Fight Night, a video game simulating a boxing match, as a White or Black avatar playing against a White or Black avatar, creating 4 conditions. Results revealed no significant effect of avatar race on the use of Black stereotypes to describe the characteristics of the avatar and no effects for in-game aggressive behavior or post-game aggressive cognition and affect. Conversely, the use of Black stereotypes to describe ones’ avatar, regardless of the avatar’s race, led to greater levels of aggressive affect and lower levels of aggressive cognition. An Avatar X Opponent race effect was also observed. However, contrary to what was predicted, participants in same-race (White or Black) conditions behaved more aggressively compared to those in opposite-race conditions. Implications of these findings for the Proteus effect and the understanding of racial priming in the context of video games are discussed.
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Chapter 1

Introduction and Literature Review

Video games offer users a significant amount of interactivity and customization options compared to more traditional forms of media, such as television. While immersed in video game worlds, players take on the role of a character, or avatar, and play the game through the eyes of this avatar. A substantial amount of research has been devoted to determining whether violence in these video game worlds increases aggression in players; and, if so, what particular features of games produce aggressive affect, cognition, and behaviors. Previous research has also demonstrated that cues derived from a player’s avatar can lead to attitudinal and behavioral changes based on stereotypical qualities inferred from those cues. The purpose of this study is to determine whether identity characteristics of the avatar used for game play, particularly the avatar’s race, impact individuals’ in-game behavior, a phenomenon referred to as the Proteus effect (Yee, Bailenson, & Ducheneaut, 2009). More specifically, this research investigates whether racial stereotypes that associate African Americans with aggression might be attributed to Black avatars, leading to increased levels of aggressive in-game behavior and post-game feelings and cognitions. This paper also examines video games as a medium through which negative attitudes toward African Americans are expressed through behavior in a virtual setting. That is, we investigate individuals’ experience of embodiment of the avatar during game play, in which they “take on” the characteristics
they ascribe to the avatar, as a state in which stereotypes they associate with the avatar’s racial group are revealed.

**Literature Review**

**Racial Attitudes and Aggression**

Black males have been stereotyped as criminal, aggressive, and violence-prone throughout American history (Collins, 2005; Ferber, 2007; Hoberman, 1997). The stereotype stems from the slavery era, when Black males were required to perform manual labor but were controlled by Whites. Collins (2005) argues, “justifying the harsh conditions forced upon them required objectifying their bodies as big, strong, and stupid” (p. 56). Thus, African Americans have always been portrayed as a threat in American society, but have been allowed to perform roles that entertain or serve Whites that have control over them (Ferber, 2007). Black men were perceived as “beasts” and were put into service as a means of taming and controlling them (Collins, 2005).

These stereotypes continue to flourish today; and fear of the Black criminal is still prevalent in our society (Ferber, 2007). Research demonstrates that individuals are more fearful of African Americans and are more likely to associate Blacks than Whites with crime (Oliver, Jackson, Moses, & Dangerfield, 2004). Other research has demonstrated that darker skin tones are positively associated with perceived criminality and aggressiveness (Maddox & Gray, 2002). This relationship between race and crime is not limited to skin color, but has also been demonstrated for more Afrocentric traits (Blair,
Judd, Sadler, & Jenkins, 2002; Oliver, et. al, 2004). Whites perceive a connection between Blackness and aggressiveness, as well (Feagin, et. al, 2001). “Aggressive” was listed by Whites as one of the five most common characteristics of Blacks in one study (Madon, et. al, 2001) and was one of the traits most frequently used to describe Blacks in another (Murphy, 1998). The results of a national television survey published in 1990 concluded that African Americans are identified as violent more often than any other racial group (Smith, 1990).

A fear of African Americans due to the association of Blackness with aggression has been well documented in studies of racial composition and perceived risk and fear of victimization. The perceived Black population of one’s residential area affects Whites’ perceptions of their safety and risk of victimization of crime. This relationship is referred to as “race coding” (Gilens, 1996), and provides evidence of “a shorthand between Blacks and crime” (Chiricos, McEntire, & Gertz, 2001).

Evidence of the stereotype that links African Americans to aggression can also be found in the media. A great deal of recent research has supported the idea that Blacks are represented in the media as criminal and as associated with drugs, gang violence, and teen pregnancy, among other negative issues (Gray, 1989; Graves 1999; Entman & Rojecki, 2000; Dixon, 2008). In local television news stories, African Americans dominate the population of criminal suspects presented, as numerous studies have demonstrated (Dixon & Linz, 2000; Entman, 1990; Romer, Jamieson, & de Couteau, 1998; Oliver, 1994).

Racial stereotyping is not limited to traditional media, however. Little empirical research has been conducted to examine the effects of race portrayals in more interactive
forms of media, particularly in games. The effect of stereotyping in games is an important avenue of research considering their popularity; 40% of adults and 83% of teenagers are regular players, and the video game industry had $7.4 billion in sales in 2006 (Entertainment Software Association, 2007). Therefore, interactive media, like games, may be as important to models that include stereotype exposure than traditional media because of their increasing popularity.

Children Now, a community-based organization in Oakland, California conducted a study in 2002 to quantify the proliferation of stereotypes in video games. The study found that Black game characters were well represented overall (40% of characters from sample of games), but that this was due to their overrepresentation in sports-oriented athletic competition games. Over 80% of Black characters were athletic competitors (Children Now, 2002). Further, when presented in sports video games, Black characters were more likely than White characters to display aggressive behavior, such as trash-talking and pushing, 79% compared to 57%, respectively. Another problematic finding from the study was that 61% of Black characters were unaffected by violence. In fact, only 15% displayed physical pain or bodily harm when they were the victims of violence.

Leonard (2003; 2006) has argued video games are a site for the acceptance of racial cues that confirm the status quo through the embodiment of racial stereotypes in many popular games. He makes a case for problematic representations in games, such as Grand Theft Auto, in which players take on the persona of a White male battling the “bad guys,” who ironically are mostly composed of “other” races. Even when playing as a character from a non-White race, White video game players have the opportunity to derive pleasure from enacting racial stereotypes and experience the “dangerous,
unknown, sexual, and unlawful” (p. 5). Further, he suggests that the virtual, and therefore anonymous, space video games provide an outlet for racial discourse and stereotype endorsement not socially acceptable in the real world. Racial experiences within video games may elicit even greater implicit attitudes towards African Americans because the stereotypical portrayals are being enacted, rather than simply consumed as with other types of media, such as television. Moreover, stereotypes might be more likely to be activated during video game play because the contexts that are usually chosen by game developers (criminal activity, violence, and particularly raced sports, such as basketball or boxing, for example) are, as the proceeding sections will address, likely associated with African Americans.

Black Athletes in Media

Portrayals of Black males as violence-prone are not limited to news reports and video games, however. Black athletes have historically been presented as aggressive and threatening; and scholars argue that the Black athlete and Black criminal images have been intertwined into a “single racial syndrome” (Hoberman, 1997, p. 214; Andrews, 2000). Scholars have emphasized the importance of sports in understanding American culture and have situated sports as a place to study the social hierarchies of our society as a whole (Leonard, 2004; DePauw, 1997). Moreover, because the sports world is full of images of Black males, sports are viewed as principle site for the production and enactment of Blackness (Moorti, 2002) and, due to the popularity of sports, a site where
dominant ideologies about Blackness and Black culture are expressed (Andrews, 2000; Cole, 2001).

It would seem paradoxical that a racial hierarchy that disadvantages Blacks can survive in sports, an area in which Blacks have achieved many successes and seemingly “dominate” the playing field. The hierarchy is maintained through an insidious type of racism known as color-blind ideology or new racism (Bonilla-Silva, 2003). The promotion of colorblindness can be found in many aspects of our culture, and sports are no exception. One component of the colorblind ideology in the context of sports is the admiration of Black athletes by White audience members. Whites are able to feel as if they are not racist because they celebrate the success of Black athletes (Leonard, 2004; Ferber, 2007). Another aspect of new racism is the use of Black accomplishments in sports as evidence that discrimination no longer exists (Hartmann, 2003; Hoberman, 1997). Furthermore, this belief in the elimination of discrimination leads to the belief that any and all inequalities are explained by cultural differences, specifically a deficient Black culture (Bonilla-Silva, 2003). This allows racial differences and inequality to continue to be naturalized.

Ferber’s (2007) analysis of constructions of Black masculinity in sports focuses on the “continued emphasis on Black bodies and essential racial differences” and portrayals of African Americans as “aggressive, hypersexual, threatening, and potentially violent” (p. 16). The “essential racial differences” she brings up refers to the belief in the natural athletic ability of African-Americans and is arguably the most common racial difference advanced by sports coverage (Ferber, 2007; Hoberman, 1997; Andrews, 2001; Miller & Wiggins, 2004). Half of the respondents to a 1991 poll agreed with the belief
that African Americans have more athletic ability (Hoberman, 1997). Hoberman’s 
(1997) *Darwin’s Athletes: How Sport Has Damaged Black America and Preserved the 
Myth of Race*, documents the evolution of this stereotype of athletic superiority in 
scientific communities throughout history. His book demonstrates that, because of 
sports, some beliefs about biological difference between Whites and Blacks have been 
maintained; and, as Ferber (2007) argues, these believed differences serve to “reinforce 
the traditional hierarchy by reifying stereotypes of their animal-like nature… 
aggressiveness, and physical power” (p. 19).

Andrews (2000) argues ideas of superior Black physical abilities allow a 
dominant ideology of Black criminality to be perpetuates. Other scholars agree, and have 
observed that media coverage seems to increase when athletes who commit crimes are 
Black (Leonard, 2004; Katz, 2006). Media reports suggest that athletes, especially Black 
male athletes, are committing crimes at alarming rates; entire books have been devoted to 
exposing the problem of criminal athletes (Leonard, 2004; Benedict, 1999). Leonard 
(2004) argues, “From the political pulpit to the constant articles about the epidemic of 
crime within sports, the White imagination locates crime and bodies to fear within the 
Black male population” (p. 299). Sports are a site where Black men are expected to 
behave aggressively, and these displays of aggression cause the “violent Black male” to 
become the “dangerous twin” of the successful Black athlete (Hoberman, 1997). The 
promotion of successful Black athletes as criminal offers evidence of the criminality of 
all Black men (Leonard, 2004).
In understanding the relationship between avatar race and video game play, an important theoretical domain to consider is that of priming and its potential to activate existing schema associating Black individuals with negative concepts and attributes. Scholars in the fields of communication and psychology have long noted the impact media can have on individuals’ perceptions of social groups. Several theories that have originated from this line of research have either directly test the effects of media portrayals on racial beliefs or could be used as a paradigm for understanding the media’s impact on racial beliefs. Media priming is one such explanation and refers to the idea that exposure to one set of stimuli can activate or bring to mind related cognitions, with these activated cognitions affecting the way new information is processed (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2002). Jo and Berkowitz (1994) explain that this occurs through the connecting of nodes in our brains that link certain thoughts, emotions and action tendencies and create associative networks that connect particular images and concepts in an individual’s mind. Most research on media priming has focused, due to experimental design constraints, on short-term effects, but research by Berkowitz (1984) and others have suggested that, with repeated exposure, media portrayals associated with specific cues can cause long-term effects. Concepts and social objects can potentially become linked, leading several scholars to suggest that associative networks also have implications for long-term exposure to stereotypical media images of African Americans that so often link Blackness to unfavorable conditions, such as criminality and poverty (Devine, 1989; Bargh, 1999; Dovidio, Kawakami, Johnson,
Johnson, & Howard, 1997). Additionally, knowledge structures that have been shaped by negative media portrayals of African Americans may induce an automatic categorization of all African Americans that associates them with negative traits, such as aggression and hostility (Gaertner & Dovidio, 1986; Devine, 1989).

Studies have shown that prevalent portrayals of race in the media can lead to explicit stereotype endorsement, as well. News exposure that includes negative portrayals of Blacks causes viewers to be less supportive of policies that will support African Americans and reduce inequality (Peffley, Shields, and Williams, 1996). Gilliam and Iyengar (2000) conducted a series of experiments and demonstrated that repeated exposure to violent African American perpetrators makes people more likely to endorse stereotypes about African Americans and support harsh judicial treatment, such as the death penalty. Dixon (2007) found that frequent network news viewers who saw a crime story with a race unidentified officer in an experiment he conducted were more likely to think the officer was White. Both frequent and infrequent news viewers were more likely to think the perpetrator of the crime was African American. In a subsequent study, Dixon (2008) conducted telephone interviews and found that network news exposure is negatively related to estimates of African American income and positively related to African American stereotype endorsement.

Research has also pointed to the existence of schema associating African Americans with athletic ability. A study conducted by Buffington and Fraley (2008) demonstrated that the brains versus brawn dichotomy presented in media coverage of White and Black athletes has indeed affected the way individuals view athletes of each race. Participants in the study were asked to match quotes from announcers to photos of
athletes and offer an explanation for their choice. As the researchers hypothesized, individuals were more likely to match Black athletes with physical ability. Furthermore, participants gave explanations that supported racial stereotypes for their choices, even when they matched a Black athlete with a mental ability. For example, when selecting a Black athlete to match a quote referring to a player’s speed, one participant offered the following explanation:

He looks as though he would be quicker based on what I know about the speed that African Americans have (p. 302).

Another participant, explaining why she chose a Black athlete to match a quote about leadership, a mental ability, suggested:

Usually Black men [are] better basketball players. Looks strong, confident (p. 303).

These findings provide evidence of schema that associates African Americans with physical superiority and strength, in addition to the negative attributes previously discussed.

**Video Game Avatar Identification and Embodiment**

Identification, a concept studied in the context of interactive and traditional media, is important to understanding how racial attitudes and stereotypes can manifest themselves in virtual environments. Cohen (2001) suggests: “Identification requires that we forget ourselves and become the other – that we assume for ourselves the identity of the target of our identification” (p. 247). Identification is especially important in the
context of video games, because users act “as,” as opposed to “with,” a media character (Cohen, 2001). Research exploring players’ gratifications from video games has suggested that identification with game characters is an important aspect of game enjoyment. In a survey of video game players, it was found that 58% of players consider the ability to customize your character “important” and rate components related to character development as the most important structural characteristics of games for players (Wood, Griffiths, Chappell, & Davies, 2004). Similarly, other studies have found that character customization and identification with game characters lead to a greater sense of immersion and, subsequently, enjoyment (Yee, 2006; Smahel, Blinka, & Ledabyl, 2008; Bailey, Wise, & Bolls, 2008).

Other research has explored differences between the typical conceptualization of identification in media studies and the meaning of identification in video games and other virtual worlds. Klimmt, Hefner, and Vorderer (2007) argue that traditional theories of identification are not applicable to identification with video game characters; rather than capturing the degree to which an individual perceives the avatar is like him/her, identification in video games is better described as a “temporary alteration of self-perception by inclusion of properties of the target media character” (p. 2). Recent research from Van Looy, Courtois, and De Vocht (2010) further explicates the concept of player identification in role-playing games and offers three main dimensions of identification: avatar identification, group identification, and game identification, with avatar identification consisting of perceived similarity, wishful identification, and embodied presence. The latter, embodied presence or embodiment of the avatar, is the identification component stressed by Klimmt, et. al, and the one that is most useful for
understanding how individuals’ perceptions of the characteristics of the avatar would lead them to behave differently within a game.

Because identification is an important factor of media enjoyment, individuals may use shortcuts when attempting to identify with or, in the context of interactive media embody, a character dissimilar to them. Thus, the social identity of the avatar leads individuals unfamiliar with the avatar and the environment to behave based on stereotypes about the avatar’s identity and social group. In other words, enacting social identities leads to self-stereotyping on the part of the avatar user who acts perceived stereotypes out (Simon & Hamilton, 1994).

Studies of avatars in the human computer interaction (HCI) literature have demonstrated that people use uncertainty reduction mechanisms to infer information in virtual worlds. This research suggests that identification with an avatar dissimilar from the virtual reality user is achieved through the use of visual cues to make social judgments about the avatars (Nowak, 2004; Nowak & Rauh, 2005). Following this interpretation of the mechanism explaining avatar identification, race, a very salient identity characteristics that, as the previous discussion of race-based schemas demonstrates, that has generated strong associations between African Americans and a variety of attributes, would be an avatar identity characteristic that would more easily allow individuals to experience embodiment, because the stereotypes one might use to identify with a Black avatar are potentially highly accessible. Contrary to the idea of deliberate uncertainty reduction accomplished through the use stereotypes, a study investigating the effect of racial embodiment on racial bias found that the embodiment of a Black avatar led to increases in implicit racial bias. The authors conclude that racial
embodiment activated individuals’ race-based schema and influenced their implicit negative racial attitudes (Groom, Bailenson, & Nass, 2009). The implicit nature of the differences produced suggests that the social judgments used to embody an avatar may not be a conscious process by which individuals deliberately make inferences about expected behavior based on visual cues, but that embodying an avatar of a different social identity may unconsciously activate stereotypes that influence behavior in ways the individual is not aware of.

*The Proteus Effect*

The identification with characters through the use of stereotypes is explained by the Proteus effect. Conceptualized in computer-mediated communication (CMC) research by Yee and his colleagues, (Yee & Bailenson, 2007), the theory “expects users to make inferences about their expected dispositions from their avatar’s appearance and then conform to the expected attitudes and behavior” (Yee, Bailenson, & Ducheneaut, 2009, p. 294). Thus, the theory predicts individuals will embody expected characteristics of an avatar with a particular set of identity characteristics, leading to changes in behavior.

The theory stems from self-perception theory, which postulates that individuals make decisions about their attitudes and behavior by taking on the perspective of a third party observer (Bem, 1972). This phenomenon has been demonstrated in real-world environments, for example an extensive content analysis of sporting events found that
athletes behave more aggressively when wearing Black uniforms (Frank & Gilovich, 1988).

The Proteus Effect has been examined in several direct empirical investigations. One such study determined that individuals with an attractive avatar walk closer and disclose more personal information to a confederate (Yee & Bailenson, 2007). Similarly, individuals using a tall avatar behave more confidently, as would be predicted in a real-world setting (Yee & Bailenson, 2007). Other research has investigated the existence of the Proteus effect within video games. Pena, Hancock, and Merola (2009) found that participants whose video game avatar was Black-cloaked displayed more aggressive intentions and attitudes, compared to those using White-cloaked avatars in the game. In a second experiment, participants using a KKK-affiliated avatar demonstrated less affiliative behavior than participants using avatars dressed as doctors. Eastin and his colleagues (2006; Eastin, Appiah, & Cicchirillo, 2009) have also investigated the Proteus effect in the context of video games. He found that, consistent with gender norms that discourage male against female aggression, individuals playing as a female avatar against a male opponent showed an increase in aggressive thoughts, whereas playing as a male character against a female opponent led to a decrease in aggressive thoughts (Eastin, 2006). Also, in a study examining the applicability of the Proteus effect to avatar race, Eastin, et. al (2009) found that White participants using a Black avatar in a violent role-playing game had more hostile thoughts than White participants who played the game with a White avatar. Questions remain, however, about the process by which the Proteus effect occurs and the mechanisms involved in that process.
Conceptualizing Aggression

Research exploring the relationship between video game exposure and aggression is extant (for reviews see Anderson, 2004; Griffiths, 1999; Sherry, 2001) and has indicated a positive relationship between game play and aggression. This line of research conceptualizes aggressive outcomes as increases in hostility in the form of hostile or violent thoughts and feelings occurring as a result of the violence present in video games. The General Aggression Model (GAM), conceived of by Bushman and Anderson (2002), explains that individuals experience increased levels of aggression, defined as actions toward another individual and with the intention of inflicting harm and operationalized as increases in aggressive or hostile cognition, affect, behavior, and arousal subsequent to playing violent video games. They offer social learning as one potential mechanism speculating that repeated exposure to violence in games makes aggressive knowledge structures chronically accessible such that exposure to even ambiguous stimuli may activate aggression-related thoughts, feelings, and behavior. Another mechanism employed in the GAM is that of priming, such that priming of aggression via exposure to violence or aggressive acts causes increases in aggressive thoughts, feelings, and behavior, and, importantly, that performing aggression may make these relationships even stronger.

Research by Eastin and colleagues has begun to investigate the Proteus effect of avatar characteristics on aggressive outcomes in video games. Two recent studies have demonstrated effects for avatar gender and race on post-game hostile thoughts, or aggressive cognition (Eastin, 2006 & Eastin, Appiah, & Cicchirillo, 2009). In the latter
study, Eastin et. al (2009) found that White participants who played a violent game as a Black avatar showed higher levels of hostile thoughts after game play compared to White participants playing as a White avatar. For Black participants, post-game hostile thoughts did not differ between participants using Black and White avatars. The authors discussed this finding as support for the Proteus effect, concluding that the increase in aggressive thoughts for Whites playing as a Black avatar is explained by those participants’ embodiment of the avatar leading, in a manifestation of negative stereotypes about African-Americans that associate the group with aggression-related concepts, to an increase in aggressive behavior in the game, citing the GAM and its association with the cognitive neoassociation model (Berkowitz, 1984) as their framework for that the aggressive thoughts measured were a product of the level of aggression enacted in game play. Essentially, they are arguing that game play leads to the activation of aggression-related ideas, such that any differences in thoughts would be a direct result of differences of in-game behavior. This led them to conclude that players using Black avatars showed greater levels of hostile thoughts because, in support of the Proteus effect, they had associated African Americans with hostility and, thus, behaved more aggressively in the game.

The current study will examine the validity of the conclusions drawn by Eastin et. al by measuring in-game aggressive behavior. We believe this is an important first step in drawing conclusions about the Proteus effect’s applicability to race for several reasons. For one, “aggression” is defined in the GAM and most research on video games and aggression as an outcome that results from the violence present in games; the GAM predicts both short-term and eventual long-term effects caused by learning processes and
the development of violence-associated scripts over time. In short, the violence in game content leads to increases in aggression both in and subsequent to game play (Anderson & Bushman, 2002). The Proteus effect, conversely, involves predicting in-game behavior and attitudes based on identity cues derived from the avatar. Thus, if the in-game behavior under examination is “aggression,” a Proteus effect would be supported if individuals playing with an avatar whose group identity is associated with greater levels of aggression behaved more aggressively in the game. That is, it is only a Proteus effect if individuals embodying the avatar that would be stereotyped as aggressive show an increase in aggressive in-game actions (Yee, Bailenson, & Duchenaut, 2009).

While it may be the case that Eastin et. al’s assumption that aggressive cognition is derived from aggressive behavior, it is also possible that playing as a Black avatar primed cognitions that did not affect behavior. Aggressive cognition was measured in the Eastin et. al study using a word-completion test developed by Anderson (1999) in which participants fill in letter blanks to form a words that are later coded as aggressive and non-aggressive. Using this measure alone to test the effects of avatar race on “aggression” is especially problematic, because many of the words in the task are associated with crime which, as previously discussed, is strongly associated with Black individuals, (for example, murder, mugger, prison, rapist, shoot). Thus, it is not entirely unlikely the finding that Black avatars were associated with aggression, operationalized as hostile thoughts, was actually an artifact of the priming effect of Black avatars on the activation of crime-related ideas. In that case, in-game behavior may not have been the determinant of aggression and no Proteus effect observed.
Therefore, the current research builds on Eastin’s (2009) research with the goal of determining whether there exists a distinction between the Proteus effect and associative priming as explanations for the effects of avatar race on aggression. We accomplish this by examining differences for in-game behavior and post-game cognition and affect resulting from avatar race. If increases in aggressive in-game actions are found for individuals playing as a Black avatar, the Proteus effect and priming remain plausible explanations of avatar race effects. However, if no differences for in-game behavior are revealed, the Proteus effect can, essentially, be ruled out as the mechanism through which avatar race affects aggression in this study.

As a first step in investigating the Proteus effect in this study, the use of stereotypes to describe the avatar, an important tenant of the effect, will be examined. The documented existence of race-based schemas that associate Black individuals with certain traits leads us to predict that individuals will describe Black avatars in the game using stereotypical characteristics of each group. We will also attempt to measure the use of White stereotypes, so that the two conditions can be compared.

H1: (a) Players in Black avatar conditions will describe their avatar through the use of Black stereotypes, and (b) players in White avatar conditions will describe their avatar through the use of White stereotypes.

We also expect, based on evidence of schema associating African Americans with athletic talent and physical strength, that when playing a sports-related video game as a Black character, individuals will perceived they performed better, regardless of their actual performance in the game, compared to participants playing with a White avatar.
H2: Participants in the Black avatar condition will perceive they performed better in the game, controlling for actual game performance.

We also expect, based on the racial stereotyping that can be found within many video game genres previously discussed, that those who play video games on a regular basis are likely exposed to within-game negative portrayals of non-White groups. Thus, if frequent gamers are influenced by game stereotypes about African Americans, game play as a Black avatar may be more likely to prime those stereotypes. Additionally, game-associated primes may also increase the accessibility of Black stereotypes.

H3: The positive relationship between playing with a Black avatar and the use of stereotypes to describe one’s avatar will be stronger for frequent video game players.

We also expect that playing the game as a Black avatar will lead to differences in game play, through the embodiment of aggression-related characteristics associated with Black identity, finding support for the Proteus effect of avatar race. Additionally, assumptions of the GAM using the cognitive neoassociation model used by Eastin et. al (2009) to interpret their hostile thoughts finding as a Proteus effect and the potential for avatar race to prime aggression-related concepts will also be tested by measuring individuals’ aggressive cognition and aggressive affect following game play.

H4: Playing with a Black avatar will be positively related to a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect.

A potential limitation of some studies examining the Proteus effect is that the embodied characteristics are assumed, rather than determined. Therefore, we will test the identification of characteristics of Black avatars as potentially moderating the effects of avatar race on aggression, We predict that participants playing with a Black avatar that
have inferred appropriate behavior through the use of stereotypes about African Americans, will demonstrate greater effects for avatar race on aggression.

H5: The positive relationship between playing with a Black avatar and, a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect will be stronger for individuals who use Black stereotypes to describe their avatar.

The expected moderation of video game experience on the effects of avatar race on stereotype use also lead us to predict video game experience will strengthen the relationship between avatar race and aggression, because many of the stereotypes present in video games are related to aggression and violence. Furthermore, game exposure may lead to greater levels of aggression for those using Black avatars because aggression-related traits associated with Blacks are more easily primed in an aggressive game context because they are more accessible.

H6: The positive relationship between playing with a Black avatar and, a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect will be stronger for frequent video game players.

Because avatar identification has been demonstrated to positively influence enjoyment of video games, we will examine whether the embodiment feature of identification through the use of stereotypes is associated with enjoyment of the game. We expect that those who use stereotypes to describe their avatar to a greater extent will more easily embody their avatars and that the experiment of embodiment will lead to greater levels of reported enjoyment of the game.

H7: Identification with the avatar through embodiment will mediate the positive relationship between stereotype use and game enjoyment.
Effects of Social Identity

Social identities have implications for perceptions of others, as well. Social identities are often cued by social comparisons between groups to which we belong and other (out) groups. Because we strive to be a member of a valued group, in an effort to increase our self-worth, we are likely to focus on distinct characteristics of our own group and view our own groups as “better” than others (Hogg, et. al, 2005). Differing perceptions of self and other may emerge depending on which identity is most salient in that particular context or at any specific point in time (Ellemers, et. al, 2002). Thus, when self and others’ identities are different, social identities, such as race, may be more salient and race-based schema may be more likely to be activated as a means to infer appropriate behavior for the avatar. In that case, playing the game as a Black avatar against a White opponent would lead to the highest levels of in-game and post-game aggression. The following hypotheses are offered to test this for possible effects, using the framework of social identity, resulting from the race of the opponent:

H8: Black stereotype use in describing ones’ avatar will be stronger for participants playing as a Black avatar against a White opponent.

H9: (a) Aggressive behavior, (b) aggressive cognition, and (c) aggressive affect will be greater for participants playing as a Black avatar against a White opponent, controlling for gender.
Chapter 2

Experimental Methods

Participants were students (n = 84) from undergraduate communications courses at a large northeastern university and were awarded a small amount of extra credit for their participation. Participants were majority female (60.7%) and ranged in age from 18 to 25 ($M = 20.93$, $SD = .49$). A large majority were White (85.7%), followed by Asian (7.1%), Hispanic or Latino, and African American (each 3.6%).

Procedure and Manipulation

Stimulus

A video game produced by EA Sports, *Fight Night 4*, was used for this study. The game simulates boxing matches between two opponents and has several modes that allow players to compete in a single match or develop the career of a chosen boxer. Participants played in the game’s single match mode, called “Fight Now.” Participants competed in 3, 3-minute rounds, a first round being completed as a practice round, and 2 subsequent matches for which data was collected. *Fight Night 4* allows users to select a venue for their match. The venue chosen for the experiment was the “Training Gym,” because it was a neutral setting with no crowd; other venues that could be chosen in the
game were arenas with large audiences. Game play was conducted through an Xbox 360 console and wireless controller and was displayed on a 42-inch high definition television.

*Manipulation*

The game allows users to customize their own boxers, allowing the race of customized boxers to be easily manipulated. Four avatars (boxers) were designed by the researcher. The first two boxers designed were used as the participant’s avatar. The two avatars, both named “Jimmy Bennett” are identical in ability, skill level, and features, except for skin color, hair color and style, and eye color. One version of Jimmy Bennett is White; the other is Black. The other two boxers, named “Donny Davidson,” were used as the participant’s opponent, and, like the Jimmy Bennett avatars, are identical in every feature, except for skin color, hair color and style, and eye color, such that one avatar is White and the other is Black. The ability and skill levels of Bennett and Davidson also matched and were set to a medium ability with the expectation that this would prevent participants from being easily beaten or easily winning.

*Study design*

The study employed a 2 (Avatar Race) X 2 (Opponent Race) experimental design. Each participant was randomly assigned to play as a White or Black boxer against a White or Black boxer, creating four conditions: Black avatar, White opponent; Black
avatar, Black opponent; White avatar, White opponent; and White avatar, Black opponent. Twenty-one participants were assigned to each condition.

Procedure

Participants first signed and receive a copy of the informed consent form upon arriving at the lab. Before entering the lab, they completed a pencil and paper questionnaire to determine their video game play experience and demographic characteristics. When completed, they entered the lab and were seated in front of the game. The avatar and opponent were selected prior to participant entry. The researcher first gave the participant a tutorial on how to use the game’s controls and allowed him/her to complete one 3 minute round of play as a practice round. Specifically, participants were read the following directions from an experimenter script:

You are going to be using the LEFT STICK for BOXER MOVEMENT – move it up and down to move side to side, and left and right to move side to side. You will use the RIGHT STICK to PUNCH – flick to the left for left punch or flick to the right for right punch. In order to LEAN AND EVADE PUNCHES, you will press the LEFT TRIGGER and LEFT STICK at the same time – the direction you push the left stick will determine the direction you lean. To BLOCK, you hold the RIGHT TRIGGER and the LEFT STICK at the same time – again, the direction you press the left stick will the determine the are of the body you block.
The participant then played two 3-minute rounds to complete a match and his/her performance was recorded by the researcher. After completing game play, participants exited the lab and Part 2 of the questionnaire was administered to assess participants’ aggressive affect and cognition, avatar identification, stereotype endorsement, and enjoyment. After completion of Part 2, he or she was thanked and debriefed.

**Study Measures**

*Aggression*

This study measured both cognitive and affective aggression post-game play. Cognitive aggression was measured using the word completion task developed and used by Anderson and his colleagues (Anderson, Carnagey & Eubanks, 2003; Anderson, Carnagey, Flanagan, Benjamin, Eubanks, & Valentine, 2004). The task consists of a set of 98 word fragments with blanks between specific letters. Most of the fragments have several possible solutions for completing the word; about half have a solution that is aggression-related. For this study, 20 of the words from the original word-completion task were chosen at random; 11 of the 20 could be completed as aggressive words. Participants were asked to fill out each word immediately following game play. Each word was then coded as aggressive or non-aggressive (neutral, ambiguous, or non-words), using the coding key provided by Anderson and colleagues. Aggressive cognition was then computed as the sum of aggressive words, with a possible range of 0 to 11, for each participant, \((M = 5.46, SD = 1.85)\).
Aggressive affect was measured using Anderson, Deuser, and DeNeve’s (1995) state hostility scale on a 5-point scale. The items in the scale were developed from earlier studies of aggression (Zuckerman, Lubin, Vogel, & Valerius, 1964; Spielberger, Jacobs, Russell, & Crane, 1983) and have been validated in many studies over the past decade (see Anderson & Carnagey, 2009 for a complete list). The scale determines participants’ current mood by asking them how much they agree with feeling statements, such as “I feel furious,” “I feel good-natured,” and “I feel vexed.” The scale is composed of 35 total items ($\alpha = .93, M = 2.23, SD = .50$) and can be found in the Appendix.

Within-game aggression was also measured in this study. Aggressive acts were operationalized as making contact with the opponent through punching. During game instruction, participants were given specific directions regarding how to make aggressive and defensive plays. Aggressive moves are performed using the left side of the game controller, whereas defensive moves are performed using the right side of the controller. This was explained with the expectation that it would make each type of move more distinct for participants. Information was displayed on-screen after each match that indicated how many punches were thrown by each participant ($M = 235.15, SD = 36.12$).

Enjoyment

Enjoyment was measured using a modified subscale of the Intrinsic Motivation Inventory (IMI) based on studies by McAuley, Duncan, and Tammen (1989) and Deci, Eghrari, Patrick, and Leone (1994). The scale ($\alpha = .91, M = 3.33, SD = .85$) consists of 7 items measured on a 5-point scale that determine how much participants agree with a
series of statements related to enjoyment: “While I was playing Fight Night 4 I was thinking about how much I enjoyed it,” “I found playing Fight Night 4 very interesting,” “Playing Fight Night 4 was fun,” “I enjoyed playing Fight Night 4 very much,” “I thought playing Fight Night 4 was boring,” “I would describe playing Fight Night 4 as enjoyable,” and “I would recommend playing Fight Night 4 to a friend.”

Describing the Avatar

Participants’ use of stereotypes in perceiving their avatar was measured using a scale developed by Kawakami and Dovidio (2001) to examine the reliability of latent response times in measuring implicit stereotyping. Although the present study does not measure participant response time to assess implicit attitudes, may be an effective measurement tool for capturing to what extent participants responded to their avatar in stereotypical ways, thus reducing social desirability effects because participants were asked to describe their own avatar, rather than respond to some target individual of a particular racial group.

The scale consists of 48 adjectives, determined through pilot testing by its developers, which can be used to describe a stereotypically positive or negative quality of Whites or Blacks. Negative Black stereotypes include: “poor,” “loud,” “angry,” “tough,” “bitter,” “hostile,” “unemployed,” and “intimidating.” Positive Black stereotypes in the scale are: “musical,” “athletic,” “strong,” “colorful,” “muscular,” “humorous,” “religious,” and “rhythmic.” Negative White stereotypes used are: “weak,” “boring,” “greedy,” uptight,” “arrogant,” “gullible,” “conventional,” and “materialistic.”
Positive White stereotypes include: “educated,” “patriotic,” “hopeful,” “wealthy,” “ambitious,” “practical,” “trusting,” and “industrious.” The scale also includes filter items: “kind,” “loyal,” “sincere,” “outgoing,” “pleasant,” “friendly,” “independent,” “enthusiastic,” “sad,” “nasty,” “weird,” “lonely,” “confused,” “cautious,” “careless,” and “irresponsible.” Participants were asked to indicate how well each adjective described their avatar on a scale ranging from 1 (describes very poorly) to 5 (describes very well).

To construct scales for stereotype endorsement, the mean of the aforementioned negative Black stereotypical characteristics was first computed to represent negative stereotype endorsement ($\alpha = .67, M = 2.92, SD = .55$). A scale representing Black stereotype endorsement ($\alpha = .74, M = 3.00, SD = .44$) was created by computing the mean for all of the Black stereotypes indicated by Kawakami and Dovidio (2001), the 8 negative adjective already mentioned and 8 positive characteristics associated with African Americans. These two scales were highly correlated, $r = .89, p < .01$; therefore it was decided that only the general Black stereotypes scale would be used for analysis.

Next, all of the “White” characteristics indicated by Kawakami and Dovidio (2001) were included to create a scale ($\alpha = .82, M = 2.39, SD = .52$) of White stereotype endorsement.

*Avatar Identification*

Identification with one’s avatar was measured using a 4-item identification scale ($\alpha = .84, M = 2.70, SD = 1.00$) developed by Klimmt and Vorderer (unpublished). The scale consists of the following items, measured on a 5-point scale ranging from 1
(strongly disagree) to 5 (strongly agree): “I literally had the feeling I was in the character’s skin,” “I sometimes completely forgot about myself because I was so focused on the strategy of the character in the game,” “The game character’s goals became my own goals,” and “I almost had the feeling of actually being the character.”

Perceived Performance

Participants’ perceived performance in the match was measured using a modified version of the “Postgame Perception” scale from a study of women and competition (Bateup, Booth, Shirtcliff, and Granger, 2002). The scale consists of three items: (1) “Regardless of the outcome, how would you rate your performance today?” measured on a 5-point scale ranging from 1 (very poor) to 5 (very good); (2) “How much do you feel that your play contributed to or caused the outcome of the match?” measured on a 5-point scale ranging from 1 (did not contribute) to 5 (contributed greatly); and (3) “Was your opponent as good as you thought he would be?” (Bateup, et. al, p. 63). The current study added a fourth item to capture how well participants thought their avatar would perform, just as the third item captures how well participants believed their opponent would play the game. (4) “Was your avatar as good as you thought he would be?” Items 3 and 4 were each measured on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Reliability analysis indicated that these items did not create a reliable scale; therefore, only the first question asking participants to rate their performance was used to assess their perceived performance in the match ($M = 3.39$, $SD = .79$).
**Actual Performance**

Performance was assessed by recording whether each participant won the match (n = 63, 75%) and the number of punches connected ($M = 159.75, SD = 27.40$) by each participant. This information was displayed on the screen at the end of the match and recorded by the experimenter.

It was observed during data collection that most of the participants won their match. Descriptive statistics for the variable “won” confirm this observation; 75 percent (n = 63) of participants were winners in the game, suggesting that winning the match may not be the best indicator of actual performance. Thus a new variable, “punch ratio,” was computed as the ratio between number of punches thrown and number of punches connected, with the assumption that those who connected more of the punches they attempted were performing better in the game ($M = .68, SD = .05$).

**Control Measures**

Participants’ experience with video games was also measured. The questionnaire included items that determine how often participants play the game consoles Playstation 2, Playstation 3, PSP, Nintendo DS, Xbox, Xbox 360, Nintendo Wii, and PC. Participants were asked how often they play particular genres or types of games, including first-person shooter, driving, role-playing/adventure, real-time strategy, other action, and puzzle/word games. They were also asked how often they play the stimulus game used for the study, Fight Night 4. Responses consisted of: “Didn’t play in last year,” “Less than once a month,” “1-2 times per month,” “3-4 times per month,” “1-2
times per week,” “3-4 times per week,” and “More than 4 times a week,” reported by participants using a scale from 1 to 7 with “Didn’t play last year” as 1 and “More than 4 times a week” as 7. Frequency of video game play ($M = 2.13, SD = 1.19$) was determined by computing the mean for participants’ reported time spent playing first-person shooter games, role-playing games, real-time strategy games, and sports games ($\alpha = .75$). Personal computer and driving games were not included in the construction of this variable because of the low likelihood that this type of play activates or produces stereotypes because they most often do not include human characters.

Demographic information, specifically gender, age, and ethnicity, as potential control measures, was also collected.
Chapter 3

Data Analysis and Results

Only video game play frequency showed significant differences for condition, \( t(67.49) = -3.12, p < .01 \). Participants playing with White avatars had significantly greater video game experience \( (M = 2.52, SD = 1.37) \) than did participants playing with Black avatars \( (M = 1.73, SD = .83) \). Therefore, video game play frequency is controlled for throughout data analysis.

Gender was also controlled for in each model, because significant gender differences for video game effects have been reported (see Lucas & Sherry, 2004).

A series of regression tests were conducted using SPSS to determine whether support was found for each hypothesis. None of the hypotheses were supported. The analysis and results of each test of the hypotheses are discussed in detail below; tables presenting the statistics associated with each analysis are included at the end of this chapter. The first of these, Table 1, presents the means of the dependent variables for each avatar race condition.

\( H1: \ (a) \) Players in Black avatar conditions will describe their avatar through the use of Black stereotypes, and \( (b) \) players in White avatar conditions will describe their avatar through the use of White stereotypes.
A regression model examining avatar race as a predictor of Black stereotype use was tested. This analysis revealed avatar race was not associated with Black stereotypes, $\beta = .08$, Adjusted $R^2 = .03$, $p = .13$. A second regression model was conducted to determine whether avatar race predicts White stereotype use and was non-significant, $\beta = -.02$, Adjusted $R^2 = -.02$, $p = .74$. These models predicting Black and White stereotype use are reported in Tables 2 and 3, respectively.

A subsequent paired sample t-test showed that Black stereotype use ($M = 3.00$, $SD = .44$) was significantly higher than was White stereotype use ($M = 2.39$, $SD = .52$), $t(82) = 12.96$, $p < .001$, suggesting that, contrary to the prediction in Hypothesis 1, the boxing avatars, regardless of race, were described by participants as having more Black stereotypes than White stereotypes.

$H2$: Participants in the Black avatar condition will perceive they performed better in the game, controlling for actual game performance.

To test this hypothesis, multiple regression was employed to examine avatar race as a predictor of perceived performance, controlling for actual game performance. Actual performance was operationalized in two different ways, as whether or not the participant won the match and as a calculation of the number of punches connected relative to the number of punches thrown. Four models examining the avatar race as a predictor of perceived performance without controlling for actual performance, $\beta = -.17$, Adjusted $R^2 = .01$, $p = .16$; with victory (won versus didn’t win) included as a control in the model, $\beta = -.17$, Adjusted $R^2 = .08$, $p = .14$; with punch accuracy as a control in the model, $\beta = -$
.17, Adjusted $R^2 = .00, p = .15$; and with victory and punch accuracy both controlled for, $\beta = -.17, Adjusted R^2 = .08, p = .28$. The statistics associated with each of these models are reported in Table 4 and clearly demonstrate that, regardless of their actual performance, participants playing with a Black avatar did not perceive they performed better in the game. Thus, Hypothesis 2 is not supported.

**H3:** The positive relationship between playing with a Black avatar and the use of stereotypes to describe one’s avatar will be stronger for frequent video game players.

Hierarchical regression was employed to examine avatar race, frequency of video game play, and the control (gender) in the first block and the interaction between avatar race and game play frequency in the second block as predictors of Black stereotype use. The main effects associated with this analysis are addressed in Hypothesis 1 and reported in Table 2. Including an interaction term between avatar race and game frequency did not explain any additional variance in predicting the use of Black stereotypes, $\beta = -.02, R^2$ change = .00, $p = .98$, in predicting Black stereotype use. This result is also included in Table 2 as Step 2. Hypothesis 3 is not supported.

**H4:** Playing with a Black avatar will be positively related to, a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect.

Hierarchical regression models testing avatar race as a predictor of aggressive behavior, cognition, and affect. As mentioned at the start of this chapter, gender and
video game experience were controlled for in all analyses. The statistics associated with each analysis are reported in the Hypothesis 4 columns of Table 5 (behavior), Table 6 (cognition), and Table 7 (affect).

Analysis of the model predicting aggressive behavior revealed no significant effect for avatar race; however, avatar race and the control variables gender and game experience together accounted for a marginally significant portion of the variance in aggressive behavior, Adjusted $R^2 = .04, p < .10$.

Analysis of the model predicting aggressive cognition revealed avatar race as a non-significant predictor of cognition, as well, Adjusted $R^2 = -.07, p = .47$. Playing with a Black avatar is not associated with increased levels of aggressive cognition.

Regression was again employed to examine avatar race as a predictor of aggressive affect. Analysis revealed avatar race was not a significant predictor of aggressive affect, Adjusted $R^2 = -.04, p = .98$. Participants playing with a Black avatar did not report greater aggressive affect.

Hypotheses 4a, 4b, and 4c are not supported. Playing the game with a Black avatar did not lead to increases in aggressive behavior, cognition, or affect.

$H5$: The positive relationship between playing with a Black avatar and, a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect will be stronger for frequent video game players.

Hierarchical regression models including avatar race and frequency of video game play in the first block and an Avatar Race X Game Experience interaction term in a
second block were tested for aggressive behavior, cognition, and affect. The statistics associated with each of these models are reported in the column labeled Hypothesis 5 included in Table 5 (behavior), Table 6 (cognition), and Table 7 (affect).

Results of the model predicting aggressive behavior show that the interaction between avatar race and video game experience is not associated with aggressive in-game behavior, $R^2$ change = .01, $p = .41$. The model as a whole, including the first block of variables, is also non-significant, $F = 1.80, p = .14$.

The model employed to examine the interaction between avatar race and video game experience as a predictor of aggressive cognition revealed the interaction as non-significant, $R^2$ change = .00, $p = .82$. Furthermore, the overall model does not significantly predict aggressive cognition, $F = .64, p = .63$.

Finally, the model testing the Avatar Race X Game Experience interaction as a predictor of aggressive affect was tested and results show is not significant, $R^2$ change = .00, $p = .73$; the overall model is also non-significant, $F = .64, p = .63$.

Hypotheses 5a, 5b, and 5c are not supported. Results reveal there is no relationship between avatar race, game experience, and aggression such that increased levels of video game play lead to increased aggression if playing the game as a Black avatar.

$H6$: The positive relationship between playing with a Black avatar and, a) aggressive in-game behavior, b) aggressive cognition, and c) aggressive affect will be stronger for individuals who use Black stereotypes to describe their avatar.
Hierarchical regression was employed to examine the Black Avatar X Stereotype Use interaction as a predictor of aggressive behavior, cognition, and affect. The model consisted of three blocks: the first including avatar race and the control variables, the second introducing Black stereotype use, and the third including the interaction term between avatar race and stereotype use. The statistics associated with the analysis of these models are reported in the Hypothesis 6 column of the tables representing aggressive behavior, aggressive cognition, and aggressive affect at the end of this chapter.

Analysis of the model predicting aggressive behavior indicated that the interaction between avatar race and stereotyping does not significantly predict behavior, $R^2$ change = .00, $p = .63$. The overall model is also non-significant, $F = 1.31, p = .27$.

A model examining the avatar race and stereotyping interaction as a predictor of aggressive cognition was then tested. The interaction was not significant, $R^2$ change = .01, $p = .35$. However, use of Black stereotypes to describe ones’ avatar does emerge as a significant predictor of aggressive behavior, $R^2$ change = .07, $p = .01$. The standardized coefficient is negative ($\beta = -0.24$), indicating that participants who played as a Black avatar behaved less aggressively. The overall model containing all three blocks was marginally significant, $F = 1.98, p = .09$, with Black stereotype use continuing to be the only significant individual predictor in the model.

The interaction between avatar race and stereotype use was then examined as a predictor of aggressive affect. Once again, the interaction term is not significant, $R^2$ change = -.01, $p = .69$. A main effect for Black stereotype use is again revealed, $R^2$ change = .05, $p = .051$; however, the standardized coefficient is positive ($\beta = .23$),
revealing that, contrary to the negative relationship between Black avatar play and aggressive cognition, Black avatars were associated with increased levels of aggressive affect. In spite of this finding, the overall model with inclusion of the interaction term is non-significant, \( F = .85, p = .52 \).

Hypotheses 6a through 6c are not supported. Results indicate that avatar race did not interact with Black stereotype use to predict aggressive cognition, affect, and behavior. Instead, those who associated their avatar with stereotypically Black characteristics experienced lower levels of aggressive cognition and greater levels of aggressive affect.

*H7: Identification with the avatar though embodiment will mediate the positive relationship between stereotype use and game enjoyment.*

Hypothesis 7 was tested using a macro testing mediation in regression developed by Preacher and Hayes (2008) to examine Black stereotype use and White stereotype use as mediating the prediction of enjoyment by embodiment. Each test employed bootstrapping procedures using 2000 bootstrap samples and bias-corrected and accelerated confidence intervals. The first model included Black stereotype use as the predictor, embodiment as the mediator, and enjoyment as the outcome variable and, as with the other analyses in this study, controlled for gender and game frequency. Analysis revealed no significant indirect effect, \( b = .10, SE = .07 \) (95% confidence interval: -.01 -.28). In addition, no direct effect of Black stereotype use on enjoyment was found, \( b = -.22, SE = .19, p = .25 \), but a direct effect of embodiment on enjoyment was revealed, \( b = \)
.27, SE = .08, \( p < .01 \), indicating a positive association between identification through embodiment and enjoyment. A similar pattern was revealed for White stereotype use as the mediator between embodiment and enjoyment. No indirect effects, \( b = .08, \ SE = .06 \) (95% confidence interval: -.01 - .27) or main effects of White stereotype use, \( b = -.13, \ SE = .16, \ p = .42 \), were revealed. Hypothesis 7 is not supported; identification does not significantly mediate the relationship between stereotype use and enjoyment.

**H8**: Black stereotype use in describing ones’ avatar will be stronger for participants playing as a Black avatar against a White opponent.

In order to test Hypothesis 8, the avatar and opponent race conditions were dummy coded to determine whether each condition differed significantly from the black avatar, white opponent condition. Regression was employed to examine whether the dummy variable predicted endorsement of Black stereotypes. Results, reported in Table 5, revealed no significant differences for black avatar, white opponent game play, Adjusted \( R^2 = .01, \ p = .34 \). Hypothesis 8 is not supported.

**H9**: (a) Aggressive behavior, (b) aggressive cognition, and (c) aggressive affect will be greater for participants playing as a Black avatar against a White opponent.

A series of multiple regression models using the dummy codes created for Hypothesis 8 were employed to examine differences between Black avatar, White
opponent game play and all other conditions for aggressive behavior, cognition, and affect. The statistics associated with each analysis are reported in Table 6.

The regression model predicting aggressive behavior was marginally significant, Adjusted $R^2 = .05$, $p = .10$. There were marginally significant differences for the White avatar, White opponent ($\beta = .27, p = .052$), and the Black avatar, Black opponent conditions ($\beta = .23, p = .09$). The Eastin et. al (2009) study found that playing with a Black avatar led to greater levels of aggression. However, these results demonstrate participants in the Black avatar, White opponent condition behaved less aggressively than participants in all other conditions.

The model predicting aggressive cognition was non-significant, Adjusted $R^2 = -.03$, $p = .71$; playing as a Black avatar against a White opponent was not associated with higher levels of aggressive cognition.

The model for aggressive affect also found no significant effect of the Black avatar, White opponent condition compared to other conditions, Adjusted $R^2 = -.06$, $p = .99$. Hypotheses 8a through 8c are not supported.
Table 1: Means of Aggression and Stereotype Use

<table>
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<tr>
<th></th>
<th>Black avatar M (SD)</th>
<th>White avatar M (SD)</th>
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<tbody>
<tr>
<td>Black stereotypes</td>
<td>2.98 (.44)</td>
<td>3.02 (.45)</td>
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<tr>
<td>White stereotypes</td>
<td>2.38 (.47)</td>
<td>2.40 (.56)</td>
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<tr>
<td>Aggressive behavior</td>
<td>227.88 (34.80)</td>
<td>242.43 (36.35)</td>
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<td>Aggressive cognition</td>
<td>5.60 (1.82)</td>
<td>5.33 (1.90)</td>
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<td>Aggressive affect</td>
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<td>Perceived Performance</td>
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<tr>
<td>Punch Ratio</td>
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<td>.67 (.05)</td>
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<tr>
<td>% Won</td>
<td>76.2</td>
<td>73.8</td>
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<tr>
<td>Embodiment</td>
<td>2.62 (.96)</td>
<td>2.78 (1.05)</td>
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<tr>
<td>Enjoyment</td>
<td>3.23 (.97)</td>
<td>3.42 (.71)</td>
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Table 2: Avatar Race Predicting Black Stereotype Use

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<tr>
<th></th>
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<td>Avatar Race</td>
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<td>.03</td>
<td>--</td>
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<tr>
<td>Gender</td>
<td>.33*</td>
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<td>Hypothesis 3</td>
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<td>Race X Game Frequency</td>
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<td>.02</td>
<td>.00</td>
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Note: Gender was coded as females = 1; males = 0
Avatar Race was coded as Black = 1; White = 2.
*p < .05
Table 3: Avatar Race Predicting White Stereotype Use

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<tr>
<th>Hypothesis 1b</th>
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<tr>
<td>Gender</td>
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<td>Video Game Frequency</td>
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Note: Gender was coded as females = 1; males = 0
Avatar Race was coded as Black = 1; White = 2.
*p < .05

Table 4: Avatar Race Predicting Perceived Performance

<table>
<thead>
<tr>
<th>Not controlling for performance</th>
<th>β</th>
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<th>R² change</th>
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<tr>
<td>Avatar Race</td>
<td>-.17</td>
<td>.01</td>
<td>--</td>
<td>1.35</td>
</tr>
<tr>
<td>Video Game Frequency</td>
<td>.27*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Controlling for victory

| Won                                  | -.28 | .08 | .08       | 2.80*|
| Controlling for punch accuracy        | -.04 | .00 | .00       | 1.04 |
| Punch ratio                          | -.03 |     |           |     |

Controlling for both

| Won                                  | -.28* | .07 | .08       | 2.23*|
| Punch ratio                          |       |     |           |     |

Note: Gender was coded as females = 1; males = 0
Avatar Race was coded as Black = 1; White = 2
Won was coded as Won = 1; Didn’t win = 2.
*p < .10; p < .05
Table 5: Avatar Race, Video Game Experience, and Stereotype Use Predicting Aggressive Behavior

<table>
<thead>
<tr>
<th></th>
<th>H4</th>
<th>H5</th>
<th>H6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effect for avatar race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.04</td>
<td>-.06</td>
<td>-.05</td>
</tr>
<tr>
<td>Avatar Race</td>
<td>.14</td>
<td>-.04</td>
<td>.35</td>
</tr>
<tr>
<td>Video Game Experience</td>
<td>.17</td>
<td>-.22</td>
<td>.14</td>
</tr>
<tr>
<td>Game experience interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avatar Race X Experience</td>
<td>--</td>
<td>.48</td>
<td>--</td>
</tr>
<tr>
<td>$R^2$ change</td>
<td>--</td>
<td>.01</td>
<td>--</td>
</tr>
<tr>
<td>Main effect for Black stereotypes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stereotype Use</td>
<td>--</td>
<td>--</td>
<td>.02</td>
</tr>
<tr>
<td>$R^2$ change</td>
<td>--</td>
<td>--</td>
<td>.00</td>
</tr>
<tr>
<td>Black stereotype use interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avatar Race X Stereotype Use</td>
<td>--</td>
<td>--</td>
<td>-.24</td>
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<td>--</td>
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<tr>
<td>Overall Adjusted $R^2$</td>
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<td>.04</td>
<td>.02</td>
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<tr>
<td>$F$</td>
<td>2.17$^*$</td>
<td>1.80</td>
<td>1.31</td>
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Note: $R^2$ change reported is from Step 1 to Step 2 and Step 3 in each model.
Gender was coded as females = 1; males = 0. Avatar Race was coded as Black = 1; White = 2.

$^*$p < .10

H4 column reports statistics for Avatar Race predicting behavior.
H5 column reports statistics for Avatar Race X Game Experience interaction predicting behavior.
H6 column reports statistics for Black Stereotype Use predicting behavior and Avatar Race X Stereotype Use predicting behavior. The Avatar Race X Game Experience block was not included in analysis for column H6.
Table 6: Avatar Race, Video Game Experience, and Stereotype Use Predicting Aggressive Cognition

<table>
<thead>
<tr>
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<th>H4</th>
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<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td>-.22</td>
<td>-.10</td>
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<tr>
<td>Avatar Race</td>
<td>-.07</td>
<td>-.12</td>
<td>-.45</td>
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<tr>
<td>Video Game Experience</td>
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<td>-.22</td>
<td>-.04</td>
</tr>
<tr>
<td><strong>Game experience interaction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avatar Race X Experience</td>
<td></td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>( R^2 ) change</td>
<td>--</td>
<td>.00</td>
<td>--</td>
</tr>
<tr>
<td><strong>Main effect for Black stereotypes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stereotype Use</td>
<td>--</td>
<td>--</td>
<td>-.28*</td>
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<tr>
<td>( R^2 ) change</td>
<td>--</td>
<td>--</td>
<td>.07</td>
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<td><strong>Black stereotype use interaction</strong></td>
<td></td>
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<td></td>
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<td>.01</td>
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<td><strong>Overall Adjusted ( R^2 )</strong></td>
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<td>.06</td>
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<tr>
<td>( F )</td>
<td>.85</td>
<td>.64</td>
<td>1.98*</td>
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Note: \( R^2 \) change reported is from Step 1 to Step 2 and Step 3 in each model.
Gender was coded as females = 1; males = 0. Avatar Race was coded as Black = 1; White = 2.
* \( p < .10 \), * \( p < .05 \)
H4 column reports statistics for Avatar Race predicting behavior.
H5 column reports statistics for Avatar Race X Game Experience interaction predicting behavior.
H6 column reports statistics for Black Stereotype Use predicting behavior and Avatar Race X Stereotype Use predicting behavior. The Avatar Race X Game Experience block was not included in analysis for column H6.
Table 7: Avatar Race, Video Game Experience, and Stereotype Use Predicting Aggressive Affect

<table>
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<th>H6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effect for avatar race</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.05</td>
<td>-.04</td>
<td>-.11</td>
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<td>Avatar Race</td>
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<td>.08</td>
<td>-.19</td>
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<td>Video Game Experience</td>
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<td>.17</td>
<td>-.01</td>
</tr>
<tr>
<td>Game experience interaction</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Avatar Race X Experience</td>
<td>--</td>
<td>-.21</td>
<td>--</td>
</tr>
<tr>
<td>$R^2$ change</td>
<td>--</td>
<td>.00</td>
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</tr>
<tr>
<td>Main effect for Black stereotypes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stereotype Use</td>
<td>--</td>
<td>--</td>
<td>.23*</td>
</tr>
<tr>
<td>$R^2$ change</td>
<td>--</td>
<td>--</td>
<td>.05</td>
</tr>
<tr>
<td>Black stereotype use interaction</td>
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<td></td>
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</tr>
<tr>
<td>Avatar Race X Stereotype Use</td>
<td></td>
<td></td>
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<td>.00</td>
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<td>Overall Adjusted $R^2$</td>
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<td>-.05</td>
<td>-.01</td>
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<tr>
<td>$F$</td>
<td>.06</td>
<td>.08</td>
<td>.52</td>
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Note: $R^2$ change reported is from Step 1 to Step 2 and Step 3 in each model.
Gender was coded as females = 1; males = 0. Avatar Race was coded as Black = 1; White = 2.

*p < .10

H4 column reports statistics for Avatar Race predicting behavior.
H5 column reports statistics for Avatar Race X Game Experience interaction predicting behavior.
H6 column reports statistics for Black Stereotype Use predicting behavior and Avatar Race X Stereotype Use predicting behavior. The Avatar Race X Game Experience block was not included in analysis for column H6.
Table 8: Avatar and Opponent Race Predicting Black Stereotype Use

<table>
<thead>
<tr>
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</tr>
</thead>
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<tr>
<td>Gender</td>
<td>.33*</td>
<td>.02</td>
</tr>
<tr>
<td>Game experience</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Black avatar, Black opponent</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>White avatar, White opponent</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>White avatar, Black opponent</td>
<td>.08</td>
<td></td>
</tr>
</tbody>
</table>

Note: Gender was coded as females = 1; males = 0

*p < .0

Table 9: Avatar and Opponent Race Predicting Aggressive Behavior, Cognition, and Affect

<table>
<thead>
<tr>
<th></th>
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<th>$R^2$</th>
</tr>
</thead>
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<tr>
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<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Game experience</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Black avatar, Black opponent</td>
<td>.23*</td>
<td></td>
</tr>
<tr>
<td>White avatar, White opponent</td>
<td>.27*</td>
<td></td>
</tr>
<tr>
<td>White avatar, Black opponent</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>-.03</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.22</td>
<td></td>
</tr>
<tr>
<td>Game experience</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>Black avatar, Black opponent</td>
<td>-.02</td>
<td></td>
</tr>
<tr>
<td>White avatar, White opponent</td>
<td>-.03</td>
<td></td>
</tr>
<tr>
<td>White avatar, Black opponent</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>-.06</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.06</td>
<td></td>
</tr>
<tr>
<td>Game experience</td>
<td>-.01</td>
<td></td>
</tr>
<tr>
<td>Black avatar, Black opponent</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>White avatar, White opponent</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>White avatar, Black opponent</td>
<td>.06</td>
<td></td>
</tr>
</tbody>
</table>

Note: Gender was coded as females = 1; males = 0

*p < .10
Chapter 4

Interpretation and Discussion

To summarize, none of the hypotheses were supported. Participants playing the video game with a Black avatar did not perceive they performed better in the game, characterize the avatar using Black stereotypes to a greater degree than those with a White avatar, or show increased levels of aggressive behavior, cognition, or affect. Experience playing video games did not lead to increased stereotyping of the Black avatar or interact with having a Black avatar in a way that led to increased aggression. Characterizing Black avatars using Black stereotypes did not produce higher levels of aggression; but describing the avatar, White or Black, with Black stereotypes was associated with decreased aggressive cognition and increased aggressive affect. An effect of avatar race was found when the opponent’s race was considered. However, the opposite of what was hypothesized was observed, such that individuals playing against a same-race opponent behaved more aggressively than individuals playing as a Black avatar against a White opponent. Finally, identification with the avatar did not serve as a mediator between using stereotypes to characterize the avatar and enjoyment as expected, rather identification and Black stereotype use had direct effects on enjoyment; identification with the avatar was associated with higher levels of enjoyment.
Role of Priming

Before discussing possible explanations for each finding (or lack thereof) in this study, it is important to acknowledge what may have been the primary force accounting for the absence of an effect of avatar race on stereotyping and aggression: racial priming. Priming, defined as the effect of exposure to some stimulus on an individual's interpretation of and response to subsequent stimuli, may have occurred, thus influencing participants' perceptions of the avatar and game play. (Roskos-Ewoldsen, Roskos-Ewoldsen & Carpentier, 2002). Racial stereotypes may have been primed in several ways. First, boxing as a sport is itself “raced,” because a majority of the most well-known boxers (for example, Muhammad Ali, Evander Holyfield, Mike Tyson) are Black. Boxing can also be described as a sport where negative racial stereotypes, such as hostile, aggressive, muscular, or intimidating, can be displayed and reinforced (Hoberman, 1997). Therefore, it may have been the case that all of the boxing avatars, regardless of race, were understood as representing Blackness.

One priming device present in the game used for the study was the setting for the boxing match. A training gym was chosen as the “venue” for the experiment with the expectation that it would be a neutral environment; other choices of venue in the game were public arenas. However, in retrospect, the training gym may have have primed race for participants because of mental associations with training gyms in Black neighborhoods.

Another game characteristic that may have primed Blackness for participants was the music that played before and after each match. Hip-hop, which is typically associated
with African-Americans, is the primary music genre present in *Fight Night*. Each of these game characteristics may have activated Black stereotypes for participants even before they were exposed to their avatar or began to play the game, which would explain why the strength of these stereotypes alone, rather than the race of the avatar, was associated with aggression and enjoyment.

*Perceived Performance*

As previously mentioned, avatar race had no effect on how well individuals thought they performed in the game. It was expected that playing with a Black avatar would lead individuals to perceive they performed well in the game relative to those playing with a White avatar because of the prevailing stereotype of the natural Black athlete (Hoberman, 1997). This lack of finding may be explained by participants’ ability to objectively evaluate how well they had done, such that evaluations of self-performance were separate from perceptions of performance of the avatar. To test this assumption, an independent samples t-test was conducted to examine ratings of whether the avatar was “as good as I thought he would be.” The test revealed a significant difference, $t(81) = -2.24, p < .05$, with those in the Black avatar condition scoring lower ($M = 2.95, SD = .74$) than those in the White avatar condition ($M = 3.31, SD = .72$), suggesting that Black avatars were less likely to meet performance expectations and supporting the idea behind this hypothesis—that higher expectations for the athletic ability of Black athletes exist. Also, although it was not hypothesized, a Proteus effect for actual performance based on avatar race was tested and revealed that, although participants playing as a Black avatar
did perform better based on punch accuracy than those with a White avatar, this effect was not significant. Collectively, these results suggest that participants’ stereotypes about African Americans and athletic ability were primed but not enacted or perceived as enacted.

*Stereotyping and Aggression*

The stereotyping measure did not function as anticipated: participants playing with a Black avatar did not use describe their avatar with greater use of stereotypically Black characteristics and those with a White avatar did not describe their avatars using White stereotypes. The concept of boxing being a raced sport has already been discussed and most likely explains why this hypothesis was not supported. This is evidenced by the finding that participants were more likely to use Black stereotypes to describe their avatars—both White and Black. Poor measurement of stereotypes was also an issue that contributed to the findings. Many of the adjectives from the Black stereotype list are words that could be used to describe any boxer or athlete (athletic, strong, muscular, tough, and intimidating, for example). Therefore the concept of Black stereotyping may have been confounded with concepts of being a good athlete and boxer.

In spite of these issues, however, main effects of Black stereotype use were revealed. The use of Black stereotypes to describe one’s avatar led to a decrease in aggressive cognition, but an increase in aggressive affect. This is a peculiar finding, because one would expect for aggressive cognition and affect to be related. One possible explanation is that game play and subsequent stereotyping actually had no effect on
aggression. Instead, participants who described their avatar in ways consistent with being a good boxer would have fewer aggressive thoughts because they understood the match as a sporting event rather than an act of aggression. Furthermore, the competition, rather than the violence, would lead them to describe their own mood as “hostile” and to characterize their avatar the same way. This supports previous research indicating that when a particular social identity is made salient to individuals, they are more likely to describe themselves as having the characteristics stereotypically associated with that group (Smith & Henry, 1996). Thus, for those participants for whom the avatar made salient Black stereotypes, they may have been more likely to describe their own mood in those terms.

The results of this study provide mixed support for the General Aggression Model offered by Bushman and Anderson (2002). This study did not measure aggression prior to video game play, so conclusions about the effect of aggressive play itself cannot be drawn, but a positive relationship between video game experience and aggressive behavior was revealed, which would support the GAM’s proposal of long-term effects of (violent) video game play on aggression. However, aggressive behavior was operationalized as the number of punches thrown, so skill, rather than aggressive scripts, may explain the finding. This idea was further examined, and it was revealed that video game experience was also a significant predictor of punch accuracy, in favor of skill as the explanation for the effect on in-game behavior. The GAM also predicts a positive relationship between aggressive play (in-game behavior) and aggressive thoughts and feelings when the game has ended. This component of the model was not specifically tested by the hypotheses, but subsequent analyses show that it is partially supported in
this study; aggressive behavior was associated with an increase in aggressive affect ($\beta = .24, p < .05$), but did not predict aggressive cognition ($\beta = .10, p = .42$). However, this finding should be interpreted in light of the operationalization of aggressive behavior, which was defined as the number of punches thrown by the participant, offering further support for competitiveness as the explanation for increased levels of aggressive affect. Nonetheless, implications of the lack of an association between aggressive in-game behavior and post-game aggressive thoughts for verifying the occurrence of a Proteus effect will be later discussed.

*Predicting Enjoyment*

It was predicted that using stereotypes in an effort to reduce uncertainty about the appropriate behavior for their avatar would make it easier for players to embody their avatars, which would to a more enjoyable game experience. This was not supported; as the indirect effect of stereotyping on enjoyment through embodiment was not significant; however, it is worth noting that it was close enough (95% confidence interval: -.01 - .27) to warrant future research, especially in light finding that embodiment feature of avatar identification was associated with higher levels of enjoyment, which is consistent with previous research that has found a relationship between identification and enjoyment in video games (Hefner, Klimmt & Vorderer, 2007). Hefner, Klimmt and Vorderer posit that this relationship is the result of the reduction of self-discrepancy. They give the example of a media user who does not identify him/herself as being courageous: that individual, by playing a video game as a courageous game character (e.g. James Bond)
alters the self-perception of courageousness during game play; such discrepancies, they argue, are “accompanied by positive experiences,” thus leading to enjoyment (p. 42). Hefner et. al also state that perceived competence in the game is a necessary component of the identification-enjoyment relationship. As earlier stated, most participants in the study won their match, which supports the assumption that most felt a feeling of competence (in boxing or sports or video games or however each individual perceived the game situation) that served to strengthen the embodiment-enjoyment relationship.

Social Identity Theory

The assumptions of social identity theory led to the hypothesis that stereotyping and aggression would be greater for participants with Black avatars playing against a White opponent. The results proved otherwise; participants in same-race conditions actually showed higher levels of aggressive behavior. If aggressive behavior is interpreted as a function of perceived competitiveness of the match, as discussed above, it may have been the case that participants in same-race conditions were more invested in the match when playing against a “like” other because they perceived the opponent as a peer. Thus, this investment caused them to punch more frequently in an effort to be successful in the match.

Another explanation is the possibility that participants in the Black avatar, White opponent condition were more likely to have an idea of what was being studied. It is common knowledge that African Americans are stereotyped as being more aggressive; this knowledge may have been cued for participants playing against a White avatar.
Being cognizant of this stereotype may have caused these participants to make an effort not to act it out, thus endorsing it. Whereas racial difference and the social factors associated with the concept of difference was not primed for participants in same-race conditions making them more able to act in the game without any cultural considerations or restraints.

Implications for the Proteus Effect

One of the implications of this experiment involves the theory it was testing, the Proteus effect. Although no differences in behavior, cognition or affect based on the physical characteristics (race) of the avatar, this does not demonstrate a lack of support for the Proteus effect, per se. Participants who used a greater number of Black stereotypes, which included a number of aggressive attributes, to describe their Black or White avatar did show increased levels of aggression, suggesting that the perceived characteristics of the avatar were embodied but were not derived from race alone. Eastin, et. al (2009) previously was able to demonstrate a Proteus effect of race on cognition—participants in their study who were assigned Black avatars showed an increase in hostile thoughts in comparison to players with White avatars. No effect for avatar race on aggressive thoughts was revealed in this study. However, it is possible that in that study as well, aggression-related traits associated with African Americans, in the absence of other prominent cues such as those present in the game chosen for this study and previously discussed, made hostile words more accessible. Ultimately, future research examining the effects of avatar race is both warranted and necessary.
Tests of the Proteus effect typically include assumptions about what characteristics of an avatar will be most salient and how those characteristics then lead to behavior changes within a virtual world, for example that individuals with tall or attractive avatars will display greater confidence than those with short avatars, or that concepts measured post-play are indicative of in-game behavior. However, to better test this effect and improve our understanding of the mechanisms that explain it, we should continue to explore novel research designs that will determine more accurately what stereotypes individuals use when making decisions about how to behave in a game world and, ultimately, how to apply those findings to the operationalization and measurement of in-game behavior as it relates to the avatar’s identity.

One major difference between prior Proteus effect studies, including the Eastin, et. al study, is the game chosen for study; previous research on the effect has typically used non-real game worlds as stimuli. It might be considered both one of the strengths and one of the weaknesses of this study that a more realistic setting was chosen for game play; the strength being that any results found are more applicable to real-world environments and the weakness being that more realistic games, such as sports games, bring with them considerable sets of cultural baggage. To elaborate, in a completely virtual fantasy game environment, the only cues to infer appropriate behavior would be avatar identity characteristics, causing traits such as race to be extremely salient. As previously discussed, the game environment in Fight Night was filled with cues, other than the color of the avatar’s skin, that might become salient to a player and influence play. The question, then, is whether the Proteus effect can occur in a more realistic context with competing cues or it is a phenomenon only observed in truly virtual settings.
Furthermore, if it is the latter, what is the application, if any, for understanding identity, embodiment, and stereotypes in the real world?

Limitations and Future Research

The limitations of this study are many, which can be typical of video game research. First and foremost, the task of choosing an appropriate game to use as the stimulus is always a challenging, as video games are not easily customized for manipulation as would be the case with a news story, website, or video clip. As evidenced in the results, the choice of a boxing game was not a perfect one. The researcher wanted to examine racial stereotyping both in general and in sports; thus Fight Night seemed like the best choice compared to possible alternatives. Most sports-related video games are team-oriented, making with the experience of embodiment of the avatar or avatars unlikely and testing the Proteus effect impossible. However, the abundance of other potential priming devices; such as racial stereotypes associated with boxing, the setting of the match, or the simple fact that the game features a physically violent sport; could possibly have overridden any potential effect of the race of the avatar on aggression, identification, or enjoyment. Another limit of this study and of video game research in general is the limited exposure to the stimulus. Most video game players, for whom any effects would be most likely to apply outside the lab, play for hours at a time; thus the external validity of this study is questionable at best.

Measurement issues were also a limitation of this study. Asking participants to describe their avatars using a pre-determined list of adjectives stereotypical of Whites and
Blacks did not capture the way avatars were stereotyped in the manner predicted, as evidenced in the lack of a relationship between avatar race and stereotype use. As previously addressed, the items measuring Black stereotypes may have just as frequently been capturing stereotypes about boxers in general. This confounding of Black and boxer stereotyping should have been expected, and an additional stereotyping measure should have been included. Conversely, the findings may actually reflect a lack of stereotyping of Black avatars on the part of participants. The question of whether measurement challenges, social desirability, or a truly low level of racism and stereotype endorsement is an enduring one in research examining the effects of race in media.

Another concept with measurement problems was that of aggressive behavior. In-game aggression was operationalized as the number of times a participant threw a punch at the opponent, but in a boxing match punching may not be perceived as aggressive. Furthermore, punching is the means through which one wins the match. Thus the aggressive behavior measure may have also (or entirely) been an assessment of each participant’s investment and level of competitiveness in the match. Subsequent studies should consider the importance of measuring non-aggressive in-game behavioral acts, such as number of dodges or other defensive moves in the current study, as having the potential to distinguish between concepts—like competitiveness and aggression and hostility toward others—that have such a strong tendency to overlap in the context of video games.

The sample used in this study was also a limitation. It was relatively small, with only about 20 participants assigned to each condition. Also, the participants were college students who were completing the study for extra credit in their courses. One problem
experienced during the experiment was the use of cell phones by participants. It was not uncommon for a participant to be texting in between phases of the experiment or while completing questionnaires. This is especially problematic for a study measuring cognition and affect, because the content or tone of a text could affect both measures, preventing the scores to be solely reflective of game play experience.

Research examining the effects of video games is valuable because of their popularity and the amount of time individuals are spending engaged in video game play. Although a multitude of studies have examined the effects of violent game content on aggression, there are many other aspects of video games that have yet to be explored. This study sought to determine whether the Proteus effect would allow us to examine individuals’ racial stereotypes based on their behavior and post-game affect and cognition. Although this was not supported, it is a question worthy of further examination. One way to achieve this is the development of measures for assessing individuals’ identification with and embodiment of avatars and the mechanisms through which avatar embodiment is attained. Video games and virtual reality settings could be a fruitful site for investigating self-identity and the perceived identity of others. As such, media effects researchers should continue to examine their role in society and develop new and innovative ways to use interactive media to assess individuals’ “real-world” perceptions and attitudes.
References


Appendix A

Stimulus Material

Figure 2: Venue for match (Training Gym 2)

Figure 3: Participant avatar
(Jimmy Bennett)

Figure 4: Opponent avatar
(Donnie Davidson)
Appendix B

Questionnaires

Questionnaire I

A. Please mark your response.

Gender: Male ___ Female ___

What is your ethnicity?
___ African-American/Black
___ American Indian
___ Asian or Pacific Islander
___ Caucasian
___ Hispanic or Latino
___ Other

What is your age? ___

B. The following are some common gaming platforms. For each, indicate how often you have played this system in the last year, or if you haven’t played it at all. Circle your answer.

1. Playstation 2
   a. Didn’t play in last year
   b. Less than once a month
   c. 1-2 times per month
   d. 3-4 times per month
   e. 1-2 times per week
   f. 3-4 times per week
   g. More than 4 times a week

3. PSP
   a. Didn’t play in last year
   b. Less than once a month
   c. 1-2 times per month
   d. 3-4 times per month
   e. 1-2 times per week
   f. 3-4 times per week
   g. More than 4 times a week

4. Xbox
   a. Didn’t play in last year
   b. Less than once a month
   c. 1-2 times per month
   d. 3-4 times per month
   e. 1-2 times per week
   f. 3-4 times per week
   g. More than 4 times a week
<table>
<thead>
<tr>
<th>5. Xbox 360</th>
<th>7. Nintendo DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Didn’t play in last year</td>
<td>a. Didn’t play in last year</td>
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<tr>
<td>b. Less than once a month</td>
<td>b. Less than once a month</td>
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<td>c. 1-2 times per month</td>
<td>c. 1-2 times per month</td>
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<td>d. 3-4 times per month</td>
<td>d. 3-4 times per month</td>
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<tr>
<td>e. 1-2 times per week</td>
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<td>f. 3-4 times per week</td>
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<td>g. More than 4 times a week</td>
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<thead>
<tr>
<th>6. Nintendo Wii</th>
<th>8. PC used for playing games</th>
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</thead>
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<tr>
<td>a. Didn’t play in last year</td>
<td>a. Didn’t play in last year</td>
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<td>b. Less than once a month</td>
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<td>c. 1-2 times per month</td>
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<td>d. 3-4 times per month</td>
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<td>f. 3-4 times per week</td>
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<td>g. More than 4 times a week</td>
<td>g. More than 4 times a week</td>
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</table>

C. The following are some specific genres or types of games. For each type of game, please indicate how frequently you have played it in the last year. Circle your answer.

<table>
<thead>
<tr>
<th>1. First-person shooter</th>
<th>4. Real-time strategy</th>
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</thead>
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<tr>
<td>a. Didn’t play in last year</td>
<td>a. Didn’t play in last year</td>
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<td>b. Less than once a month</td>
<td>b. Less than once a month</td>
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<td>c. 1-2 times per month</td>
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<td>f. 3-4 times per week</td>
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<td>g. More than 4 times a week</td>
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<th>2. Driving</th>
<th>5. Sports games</th>
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<td>a. Didn’t play in last year</td>
<td>a. Didn’t play in last year</td>
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<td>b. Less than once a month</td>
<td>b. Less than once a month</td>
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<td>c. 1-2 times per month</td>
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<td>d. 3-4 times per month</td>
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<td>e. 1-2 times per week</td>
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<td>f. 3-4 times per week</td>
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<td>g. More than 4 times a week</td>
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<tr>
<th>3. Role-playing/adventure</th>
<th>6. The Sims for PC</th>
</tr>
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<tbody>
<tr>
<td>a. Didn’t play in last year</td>
<td>a. Didn’t play in last year</td>
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<td>b. Less than once a month</td>
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<td>c. 1-2 times per month</td>
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<td>f. 3-4 times per week</td>
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<td>g. More than 4 times a week</td>
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</table>
7. Fight Night on Xbox 360

a. Didn’t play in last year  
b. Less than once a month  
c. 1-2 times per month  
d. 3-4 times per month  
e. 1-2 times per week  
f. 3-4 times per week  
g. More than 4 times a week

B. The following is a list of sports. For each, indicate to what degree you follow the sport regularly during its season (i.e. Watch it on television, listen to it on the radio, read about it in the sports section, browse the Internet for scores or information, etc.). Circle your answer.

<table>
<thead>
<tr>
<th>Never Follow</th>
<th>Sometimes Follow</th>
<th>Follow Regularly</th>
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<tr>
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<td>4</td>
<td>5</td>
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</table>

| _____ Football | _____ Cycling |
| _____ Basketball | _____ Baseball |
| _____ Tennis | _____ Boxing |
| _____ Hockey | _____ Mixed Martial Arts |
| _____ Soccer | _____ Swimming |
Questionnaire II (Post-play)

A. Please fill in the blanks using letters that will complete the word.

1. e x _ e _ 
2. m u _ _ e r
3. p r _ _ e
4. e x p l _ _ e
5. k i _ 
6. h _ r _
7. a _ t _ r
8. c h o _ e
9. s _ m p _ _
10. a t t _ c _
11. s h _ l _
12. s h o _ t
13. b l _ n d
14. h _ t
15. s m _ c k
16. h a _ e
17. a _ t
18. w _ n
19. b _ k
20. c _ n t _ _ l
B. Please indicate how well you agree or disagree with each of the following mood statements. Use the following 5-point rating scale. Write the number corresponding to your rating on the blank line in front of each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
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<td>1</td>
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</table>

___ I feel furious.       ___ I feel like I’m about to explode.
___ I feel willful.       ___ I feel friendly.
___ I feel aggravated.    ___ I feel understanding.
___ I feel tender.        ___ I feel amiable.
___ I feel stormy.        ___ I feel mad.
___ I feel polite.         ___ I feel mean.
___ I feel discontented.  ___ I feel bitter.
___ I feel like banging on a table. ___ I feel burned up.
___ I feel irritated.     ___ I feel like yelling at somebody.
___ I feel frustrated.    ___ I feel cooperative.
___ I feel kindly.         ___ I feel like swearing.
___ I feel unsociable.    ___ I feel cruel.
___ I feel outraged.       ___ I feel good-natured.
___ I feel agreeable.     ___ I feel disagreeable.
___ I feel angry.          ___ I feel enraged.
___ I feel offended.      ___ I feel sympathetic.
___ I feel disgusted.     ___ I feel vexed.
___ I feel tame.
C. Use the following 5-point rating scale to indicate how much you agree or disagree with each statement. Write the number corresponding to your rating on the blank line in front of each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree</th>
<th>Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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</table>

____ I literally had the feeling I was in the character’s skin.

____ I sometimes completely forgot about myself because I was so focused on the strategy of the character in the game.

____ The game character’s goals became my own goals.

____ I almost had the feeling of actually being the character.

D. Use the following 5-point rating scale to indicate how much you agree or disagree with each statement. Write the number corresponding to your rating on the blank line in front of each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree</th>
<th>Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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____ While I was playing I was thinking about how much I enjoyed it.

____ I found playing very interesting.

____ Playing this game was fun.

____ I enjoyed playing very much.

____ I thought play was boring.

____ I would describe playing as enjoyable.

____ I would recommend playing this game to a friend.
E. Answer the following questions by using the 5-point rating scale located above each statement. Write the number corresponding to your rating on the blank line in front of each statement.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Very Good</th>
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_____ Regardless of the outcome, how would you rate your performance today?

Did Not Contribute | Contributed Greatly
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_____ How much do you feel that your play contributed to or caused the outcome of the match?

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<th>Rating</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree</th>
<th>Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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_____ My opponent was as good as I thought he would be.

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<th>Rating</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree</th>
<th>Nor Disagree</th>
<th>Agree</th>
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_____ My avatar was as good as I thought he would be.
F. Please indicate how well each adjective describes the character you used in the video game. Use the following 5-point rating scale. Write the number corresponding to your rating on the blank line in front of each statement.

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Describes Very Poorly

1  2  3

Describes Very Well

4  5

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____ rhythmic

____ sad

____ sincere

____ strong

____ tough

____ trusting

____ unemployed

____ uptight

____ weak

____ wealthy

____ weird