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THE PROTEUS EFFECT AND GAMING: THE IMPACT OF DIGITAL ACTORS AND
RACE IN A VIRTUAL ENVIRONMENT

by

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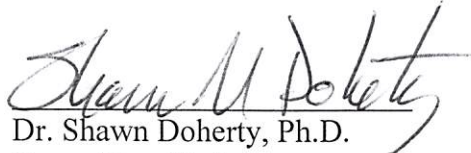
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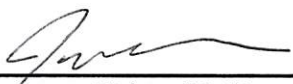
The Proteus Effect and Gaming: The Impact of Digital Actors and Race in a Virtual Environment


By

Christopher Michael Via


This dissertation was prepared under the direction of the candidate's Dissertation Committee Chair, Dr. Shawn Doherty, and has been approved by the members of the dissertation committee. It was submitted to the College of Arts and Sciences and was accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Human Factors Psychology



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Abstract

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Race and racial identity is a frequently discussed topic in the media today. This topic is driven by what oftentimes amounts to culture clashes, and a system that claims impartiality yet is rampant with implicit bias demonstrating favorable treatment of one race over another. An example of this favoritism resides within video game design, where over 50% of player-controlled game characters are White, and less than 40% are Black (Leonard, 2007). Leonard also wrote that Black game characters are more likely to conform to Black stereotypes (e.g. play sports, or involved in gangs) than Whites (e.g. middle class citizen or unhygienic). Minimal research exists on understanding what information a video game character, or avatar, conveys to a game player, and whether this information is platform dependent or not. Furthermore, limited information exists on what the personification of agency really means within a digital environment. The purpose of this study was to examine the relationship that race may exert within video game play and, by extension, video game design in regards to the control of in-game avatars. Moreover, the goal is to determine if the Proteus effect, the central psychological theory under analysis, exists for console video game players in regards to race and skin color. Originating from the world of virtual reality, the Proteus effect emphasizes conformity to an avatar's identity cues (Yee & Bailenson, 2007). Specifically, this study examines how the

similarity or mismatch between in game avatars and the individual controlling them affects game-world behaviors.

Ninety male university students comprised of 3 different races (Middle Eastern, African American, and Caucasian American) played *Grand Theft Auto V* (GTAV) on PlayStation 3 with an assignment of either White (Michael) or Black (Franklin) game character condition. Data were collected on a behavioral metric with two primary categories: Crime against people and crimes against property. They also completed a personality inventory (HEXACO), and performed an implicit association task to further scientific exploration of the Proteus effect.

The results indicated that behavioral outcomes between the Middle-Eastern and Caucasian Americans contained significant differences, and this was regardless of their digital actor (DA) assignment. However, African American gamers had significant performance differences between the two DA conditions (White, Black); there were more crimes committed against in-game people and in-game property when playing as a White DA than when playing as a Black DA when compared against the other two groups. For the game play itself, no significant performance differences were observed between the White and Black DA conditions when collapsed across race conditions indicating that the platform selected offered equal opportunity for all gamers, and that one DA did not facilitate extra crimes above and beyond the other DA. Personality factors were controlled for through the use of the HEXACO model and demonstrated that the three faces did not significantly differ in terms of personality. However, when considering game play and crime specifically, individuals scoring high in the Honesty-Humility dimension of the personality inventory committed fewer crimes against property during their gameplay as indicated by a significant regression analysis.

The Proteus effect exists for console video games, and was observed within this study because a change in self representation via the DA caused an observable change in behavior. The African American participants experimentally depicted this in that they committed significantly less crimes while playing as a Black DA than the crimes they committed while playing as a White DA that did not occur for the other two races. The significance of this finding lies in the fact that this discovery bolsters understanding of DA-man relationships, and the nature of agency within digital environments. This study also demonstrates that DAs can alter gameplay, and the gaming community needs richer designs incorporating racial inclusivity within video games.

Keywords: Proteus effect, race, video game, crime, behavior

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List of Abbreviations

AI – Artificial Intelligence

ANOVA- Analysis of Variance

CAPE- Crimes Against People

CAPETOT- Crimes Against People Total (total rating score used for analysis)

CAPR- Crimes Against Property

CAPRTOT- Crimes Against Property Total (total rating score used for analysis)

CVE- Collaborative Virtual Environment

COTS- Commercial Off-the-Shelf

DA- Digital Actor

EMG- Electromyography

ESA- Entertainment Software Association

fMRI- Functional Magnetic Resonance Imaging

GNAT- Go/No-Go Association Task

GTAV- Grand Theft Auto 5

HEXACO- Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness,
and Openness to new Experience

HEXACO-PI-R- HEXACO Personality-Inventory Revised

HMD- Head-Mounted Display

IAT- Implicit Association Test

IVR- Immersive Virtual Reality

LSD – Fisher’s Least Significant Difference; statistical test

MMORPG- Massively Multiplayer Online Role Playing Game

NAACP- National Association for the Advancement of Colored People

NEO-PI-R- NEO Personality Inventory-Revised

NPC – Non-Player Character

OMB – Office of Management and Budget

PC – Personal Computer

RPG- Rocket Propelled Grenade

SC-IAT- Single Category IATs

VR- Virtual Reality

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“The soul becomes dyed with the color of its thoughts.”

~Marcus Aurelius

Introduction

In 2014, the video game industry retailed over 135 million games; generating profits in excess of \$22 billion. Directly and indirectly employing over 146,000 people among 36 states, computer and video game companies are a large driving force of the economic engine within the United States (ESA; Entertainment Software Association, 2015b). The Entertainment Software Association claims that over 150 million Americans play video games and these gamers are 56% male and 44% female. They also report that women over the age of 18 (33%) play more than boys under the age of 18 (15%); a statistic which destroys the stereotype that game players are predominately young and male, yet raises the question “what are the ethnic composition of these players?” If the gender-based stereotype for “who is a gamer” no longer stands, what does the race-based stereotype look like for gamers today? Despite these statistics, when it comes to gaming there is one form of data which is lacking, and that data involves game player ethnicity figures, which has remarkably been underreported in an “official” capacity (Entertainment Software Association, 2015a). Surveying relevant papers on ethnicity, racism, and gaming yielded no quantitative figures on race among video game consumers for many years (e.g. Barrett, 2006; Chan, 2005; Gray, 2012; Leonard, 2007; Nakamura, 2009). While academic gaming research may have yielded limited (or no) quantitative data on race among video games and consumers in the past, it has not been until very recently, however, that some empirical research data on race has begun to surface.

For example, Lenhart (2015) presented data from the Pew Research Institute which shows that among boys aged 13-17, Blacks (non-Hispanic) were the largest racial group that played video games at 83%. A greater number of Blacks play games in this age range than Whites (non-Hispanic; 71%) and Hispanics (69%). The Kaiser Family Foundation has found that African American youths aged 8-18 play 30 minutes more per day than Caucasian American youths (Packwood, 2011). Statistical data on adults

aged 18-65 and older is slightly outdated yet reflects equality among Blacks and Whites at 51% of their respective populations admitting to being considered as gamers, with 63% of Hispanics considering themselves to be gamers (Lenhart, Jones, & Macgill, 2008). Interestingly enough, in a survey of 1,127 gamers, 66% say that video games need more ethnic and gender inclusivity (Thomsen, 2015). This perspective could be reflective of the fact that video game developers are approximately 79% Caucasian, as reported from a survey of 2,202 developers conducted by the International Game Developer's Association (Edwards, Weststar, Meloni, Pearce, & Legault, 2014). There is scholarly acknowledgement that academic research has centered on adolescence and violence focused on video games, gender and sexuality within games, and recently has a newfound interest in ethnicity within video games; however, the latter subject has received the least amount of scientific attention (Gray, 2012).

Primarily because race and ethnicity within or surrounding video games remains empirically under-examined, this study aims at exploring the psychological relationship between video game players and the possible effects which personification of their digital video game representation (avatar) could have on their gameplay through a psychological theory called the Proteus effect. In order to do this, it is important to provide an overview of what is known about the Proteus effect and gaming, and discuss the topics related to knowledge within these domains. For this study, race and ethnicity will be introduced to the reader as separate subjects. Following this will be descriptions of how these concepts are relevant to the field of psychology, and the roles that race and ethnicity play on important psychological topics such as explicit and implicit biases and stereotypes. Furthermore, race and ethnicity with respect to video games and avatar creation will be discussed as they are critical components associated with the concept of the Proteus effect.

Literature Review

Race and Ethnicity

Stemming from the Greek word “ethnos,” ethnicity is a term which can “be translated as a people or nation” (Mohseni, 2015). Ethnicity can be described as a term, which suggests cultural formation; defined as a sharing of practices, artifacts, values and norms, and geographic characteristics which are seen as such by members of outside groups as well as members within a group. As an example, a group of Caucasian Americans can be ethnically divided into Polish Americans, Italian Americans, or German Americans based upon their cultural customs (Walker, Spohn, & Delone, 2012). Ethnicity is connected to race, but is viewed as more cultural: centering on beliefs and practices (especially religious) rather than physical characteristics, or phenotypic traits, which the term ‘race’ implies (“Ethnicity,” 2004; Gunaratnam, 2003; Mohseni, 2015). For centuries, however, humans have used phenotypic traits such as the coloring of hair, the iris, and skin to discern ethnicity, and by extension, group membership (Gunaratnam, 2003).

Ethnicity appears to be the favored word symbolizing the race of a group of peoples within research studies. In social science, race is often used synonymously with ethnicity and is termed “race/ethnicity” or “race and/or ethnicity” within studies, but the rationale for this categorization of participants is not explained (Baylor, 2011; Kiviniemi, Orom, & Giovino, 2011; Liu & Pompper, 2012; Sherrick, Hoewe, & Waddell, 2014; Stepanikova, Triplett, & Simpson, 2011). These conceptual categorizations, however, are mutually exclusive. They are terms that are representative of an existing rigid scientific dichotomy between ethnicity and the present-day American vernacular that “race” embodies. In short, it appears that our culture has managed to combine the two terms and treat them as the same, whereas there is no evidence available to support the rationale for this perspective. Gunaratnam (2003) wrote that ‘race’ is a political and social construct; and as such, it is not a scientific category.

Social constructs (those which make up the social structure of a society) reveal “patterned relationships between groups of people:” patterns which are related to income, residence, religion, employment, gender, and race (Walker et al., 2012). As far as physiological differences between the two primary racial groups compared within this study, Goldberg (1990) wrote that African Americans have greater physical prowess in comparison to Caucasian Americans via significantly more fast-twitch muscle fibers within their bodies, but no evidence could be found to support the existence of any other differences between the racial groups. He also argued that because of the muscular differences, African Americans are the one racial group that is significantly overrepresented within professional sports.

According to Wimmer (2015), “race is the primary principle of stratification in the USA”, and is operationally categorized into five distinct groups within the United States (Wimmer, 2015). The United States Census Bureau collects data based on these categories which were originally developed in 1977 in accordance with guidelines set forth by the United States Office of Management and Budget (OMB) in a policy known as Directive No. 15 (Office of Management and Budget, 1977; Walker et al., 2012). These five groups and their definitions used today are:

- **White** – A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- **Black or African American** – A person having origins in any of the Black racial groups of Africa.
- **American Indian or Alaska Native** – A person having origins in any of the original peoples of North, Central and South America, and who maintains tribal affiliation or community attachment.
- **Asian** – A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

- **Native Hawaiian or Other Pacific Islander** – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands (U.S. Census Bureau, 2013).

Admittedly, all reported data from all federal agencies within the United States stems from the operational definitions set forth by the OMB, which “are not anthropologically or scientifically based” (Walker et al., 2012). Furthermore, people within the United States are classified based on self-identification: When individuals are questioned, their identity is often whatever they claim it to be. Unfortunately, there are no categories representative of the multiculturalism that is an aspect of the American saga. Because of this, bi-racial individuals with one White parent and one Black parent can choose which race they wish to identify with. Most then select the race that best suits them (situationally dependent), which subsequently skews corporate and national data sets in the process.

To operationalize the racial categorization of participants for this project, individuals were selected based on the ‘race’ they identify with. This is due to many factors, including legal terminology, and heuristics used within the literature. The American criminal justice system thrives on subjectively assessed data (race and ethnicity) and treats this data as representative of hard facts: a concept which will be explained in detail later. The racial categories within this study will be defined as:

- **White, not of Hispanic origin** – A person with European origins, identifying their ethnicity to be as such.
- **Black, not of Hispanic origin** – A person having origins in any of the Black racial groups of Africa, and identifying their ethnicity to be as such.
- **American Indian or Alaska Native** – A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment.

- **Asian** – A person having origins in any of the original peoples of the Far East, Southeast Asia, Cambodia, China, Japan, Korea, Malaysia, the Philippine Islands, Thailand, and Vietnam.
- **Native Hawaiian or Other Pacific Islander** – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **Middle Eastern** – A person having origins in the Middle East to include the Indian subcontinent including Afghanistan, Nepal, Turkmenistan, Uzbekistan, and Pakistan.
- **Hispanic** – A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.
- **Two or more Races** – An individual that identifies as a member of at least two or more of the above racial groups.

For this study, and to ensure that the individuals involved in it self-identified as coming from homogenous racial groups, Hispanics were not used for this particular study. “Hispanic” refers to an *ethnicity*, and it does not afford an opportunity for a researcher to infer the *race* of those selecting this option (Office of Management and Budget, 1995). Hispanic people are the only peoples on the aforementioned list that are referred to by their ethnicity as opposed to a race, which are what the remaining options on the list are composed of. Hispanics within the United States are an ethnic group of peoples collectively representing Mexico, Central and South America; including most islands of the Caribbean in which Spanish is the commonly spoken language of their respective countries of origin. Furthermore, through this classification system, bi-racial information was collected for participants who identify with mixed-race backgrounds. Individuals self-identifying as “two or more races” were not allowed to participate within this research study, as the inclusion of additional identifying races could

potentially confound results since the focus is specifically on a single race, which most likely will decrease internal validity for the race measure among the participants.

In summation, race was used within this study exclusively to identify participants based on their respective countries of origin, as there are no scientific ways to identify an individual participant and efficiently categorize them as members of a particular group. Religion could be an alternative way to categorize a person and assign them as a member of a particular group (ethnicity). For example, while the people of Vietnam can be racially categorized as “Asian,” they can ethnically be categorized as Buddhist (50% of the population), Roman Catholic (8 - 10% of the population), or Cao Dai (new religious movement followed by 1.5 - 3% of the population) to name a few of the top religious categories (State, 2006). With the inclusion of so many religious options for so many various countries which could be represented within an American college sample (from which the participants for this study originate), religion would be an overly sensitive discriminator variable, with too many categories to assess for a practical purpose. Moreover, this study involves the use of a specific video game, and the video game characters within this study do not identify as “religious” in accordance with the storyline, or through the available artifacts within the video game itself. Of course, it is possible that a video game player will potentially identify as belonging to the same group as an in-game character based solely upon the observed phenotypic traits of that character. Either this congruent-member identity may influence the gamer to perform in ways that would endorse their real-world behaviors, or their real-world behaviors may endorse the way in which the game is played. Non-congruent member identity may be detrimental to gameplay in that it could possibly be aversive, and may hinder in-game capabilities either explicitly or implicitly. However, it would be best to talk about the importance of the perception of congruent and non-congruent member identity through the acknowledgement of the existence of racial biases.

Racial Bias. Explicit and implicit concepts exist for several cognitive constructs such as memory (Chechile, Sloboda, & Chamberland, 2012; Shanks & Berry, 2012), attention (Strobel, Fleischhauer, Enge, & Strobel, 2015), and attitudes (Fazio & Olson, 2003; Schnabel, Asendorpf, & Greenwald, 2008;

Stepanikova et al., 2011). Explicit constructs, bias in this case, simply means that the belief which is held is consciously endorsed (Greenwald & Krieger, 2006). Implicit biases, on the other hand, are unintentional and stem from “attitudes or stereotypes that affect our understanding, decision-making, and behavior, without our even realizing it” (Kang & Lane, 2010). Lee (2013) wrote about an instruction that U.S. District Court Judge Mark Bennett explained to jurors on the subject of implicit biases: that everyone has perceptions, feelings, fears, assumptions, and stereotypes known as “implicit biases,” of which we are not consciously aware. They influence how decisions are made, and they impact what people see and hear along with what is remembered about what was seen and heard (p.15). Judge Bennett's instructions serve as a reminder that stereotypes exist, and in a court of law, all facts presented must be judged objectively. These implicit biases are associations that distort heuristics used on judgements and behaviors such that individuals display a lack of impartiality for some groups. Best exhibited in the studies conducted using identical curricula vitae, save for a difference in race implicated by the name at the top of the document. The outcomes were that judgements on competency in job performance was based on the name at the top of the curriculum vitae, and the associated racial membership assigned to that individual (Holroyd, 2014).

There is considerable research that exists relating to race, ethnicity, and implicit bias, and that research is focused on the discussion of racial stereotypes and stereotype perpetuation (Dietrich, 2013). Stereotypes can be defined as the judgment of “someone on the basis of one’s perception of the group to which that person belongs” (Robbins & Judge, 2013). Stereotypes make up a considerably large part of the implicit bias literature because not only do they have the ability to affect decision-making processes in a large way, but they are typically performed *prima facie*, and stereotype activation is correlated with stereotype endorsement (Kawakami, Dion, & Dovidio, 1998; Patterson, 2011). Stereotypes are known to make information processing easier, and they are developed to justify the status quo in response to group conflicts, changes in social roles, and differences in power (Hilton & von Hippel, 1996). Stereotypes and

ethnic attitudes are part of a society's social heritage; the learning of which are inescapable, though not necessarily completely endorsed by all individuals within a cultural group (Devine, 1989).

Implicit bias was not known to exist when societal laws were developed. Implicit attitudes and judgments are automatically activated when evaluating an object, and they often occur without a person's awareness of the causation (Greenwald, McGhee, & Schwartz, 1998). Greenwald and Kreiger (2006) wrote that "implicit biases are discriminatory biases based on implicit attitudes or implicit stereotypes." They went on to say that, the existence of implicit biases is a direct challenge to legal theory and practice, primarily because discrimination doctrine within the United States is centered on the fact that humans are guided by their *explicit* attitudes, beliefs, and intentions under the assumption that the humans in question are competent and sane individuals. Michael Selmi (1997) not only critiqued the doctrine as archaic nine years prior to Greenwald and Kreiger's work, but he addressed discrimination best when he brought up the facts that antidiscrimination laws were divided between constitutional and statutory realms, and further divided into varying circumstances such as education, employment, housing, and criminal law. Each subdivision of the antidiscrimination law has its own obscure version of a dividing line between what facts the courts were willing to determine met the requirements to be considered as discriminatory. The division between constitutional and statutory discrimination stems from *Washington v. Davis* (1976), when the Supreme Court said the Equal Protection Clause (part of the Fourteenth Amendment to the Constitution of the United States) only prohibited *intentional* (explicit) discrimination (*Personnel Adm'r of Massachusetts v. Feeney*, 1979). There has been scholarly pushback against the legal status quo (and the way in which the Courts operate) since the mid-1990s. Currently, antidiscrimination laws are intent-based, as a result the scholarly community made up of social psychologists and lawyers advocating for modernization of our archaic laws are pushing for a causation-based antidiscrimination principle (Krieger & Fiske, 2006). In summation, the scientific discovery of implicit bias and its legal relationship (or present lack thereof, due to acceptance issues) with discrimination laws could irrefutably be used to

modernize our legal system. Implicit bias exists and the best counter for it is to acknowledge it and educate others on its origin and nature in an effort to minimize discrimination.

According to Patterson (2011), it is critical that social science research on implicit bias be used in the courtroom as evidence to prove instances of discriminatory injustices. Recently, the implication of this was seen in the Sanford, Florida case from 2012 of George Zimmerman and Trayvon Martin. In this case, Zimmerman, a Hispanic American man, was accused of tracking, harassing, and subsequently murdering Trayvon, an unarmed black teenager, because the defendant felt the teen may have been responsible for recent neighborhood break-ins due to his “suspicious behavior” in the moments leading up to the death of Mr. Martin. Legal decision makers are largely unaware of the extent to which implicit bias can influence an individual’s perceptions of fear and reasonableness, especially in self-defense cases (Lee, 2013). Therefore, a greater understanding of implicit bias and its relation to behavior is needed, especially within game play.

Racial bias is affected by embodiment. Researchers using light-skinned participants experiencing embodiment through the use of immersive virtual reality (IVR) have demonstrated a reduction in implicit racial bias scores against dark-skinned participants (Peck, Seinfeld, Aglioti, & Slater, 2013). Maister, Sebanz, Knoblich, & Tsakiris, (2013) utilized the “Rubber Hand Illusion” on light-skinned Caucasian participants to see what affect body ownership would have on racial bias. They reported that the greater the illusion of ownership (the participants were made to believe that the fake hand was their actual hand) their Caucasian participants had over a rubber dark-skinned hand, the greater the reduction of racial bias they were able to quantify within their study. Racial bias is affected by race salience as well. Race salience in a courtroom involves ensuring that jurors are aware of racial issues which have the ability to affect their decision making capabilities, such as stereotypes (Lee, 2013). White jurors are more likely to convict Black defendants, however, racial bias has the ability to adversely, albeit counterintuitively, affect the response a mock jury has toward a defendant who is part of a racial outgroup (belongs to another race) (Sommers & Ellsworth, 2009). If a case is racially charged or becomes racially charged, racial bias

becomes more salient, and White jurors seem to do whatever they can to ensure race neutrality in a trial (prejudice avoidance), even among those who initially scored high on tests of racism (Kang et al., 2012; Lee, 2013). Kang et al., (2012) wrote that the results of a meta-analysis conducted on White jurors revealed a conviction rate for Black defendants to be 83.8%, whereas the rate for White defendants was 76.2%. In totality with all things being equal, of 100 cases 8 more Blacks than Whites would be found guilty. Racial bias is enhanced by pervasive structural and institutional inequalities which perpetuate existing stereotypical associations for minority groups (Grant-Thomas, 2011). These institutional and structural inequalities provide self-reinforcing repercussions for the minorities who experience them.

Racial bias is known to affect how various situations are viewed. Word, Zanna, & Cooper (1974) performed a study demonstrating self-fulfilling prophecy by looking at attitudes and expectations between White and Black applicants and White interviewers. The interviewers gave less immediacy, had shorter interview times, and had higher rates of speech errors when interviewing the Black applicants. In their second experiment, they had White applicants interviewed by White interviewers, but the interviewers were trained to treat some of the applicants as though they were the Blacks from experiment 1. For those who were treated like the Blacks of experiment 1, they were judged by the interviewers to be more nervous, and judged to perform less adequately than those interviewees who were treated as the Whites were within the first experiment. The participants who received the treatment condition also reciprocated less immediacy and found their interviewers to be less adequate. In a study by McConnell & Leibold (2001), participants who indicated a strong implicit preference for White relative to Black made fewer speech errors when speaking to a White interviewer in comparison to a Black one. Those participants (with a preference for White) also hesitated less when speaking to the White interviewer. The McConnell and Leibold study also found support for the nonverbal behaviors linked to implicit bias, much like Dovidio et al. (1997) found when they assessed these factors (nonverbal behaviors between interracial interactions) within their study. The counter argument to racial bias is that it has primarily been studied in contexts involving hypothetical scenarios as opposed to observed, real-world behaviors. One study

looking at resource allocation and racial bias through the use of a “dictator game” found that anti-Black implicit bias was negatively related with generosity toward Blacks (Stepanikova et al., 2011).

When applied to ethnicity, bias may indicate favorable or unfavorable attitudes or identification toward a particular ethnicity. When queried through a self-report (explicit) measure, an individual could express equality toward an ethnic group to which they do not identify for a number of reasons which include impression management (Kang & Lane, 2010). Impression management has been shown to undermine the validity of self-report measures in addition to introspection (Greenwald & Krieger, 2006; Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Kang & Lane, 2010). Largely due to these issues with validity and the requirement to measure mental associations without introspection, researchers constructed a way to measure implicit bias, or unconscious mental processes, primarily through assessing the strength of an association between a concept objective, and an attribute via the measurement of response latency (Nosek, Greenwald, & Banaji, 2005).

The measurement of implicit bias stems from the measurement of the speed of activation during which the strength of an association can be inferred. This strength is best exemplified by the association of two concepts in our minds, and the speed in which those associations are paired together during a timed task. As an example, when presented with the category “office,” if an associated word such as “desk” were presented, it would be faster to evaluate an object like a “desk” as belonging to an “office” in comparison to an object like a “chandelier”. Because the strength of the association between a desk and an office is stronger than that of a chandelier and an office, the timed response to the former would be faster than the response time for the latter. The initial empirical research efforts to uncover implicit bias began in the mid-1980s and lasted until the late 1990s with the use of priming techniques (or some variant thereof) which were developed to assess implicit bias. The research on priming was very successful in demonstrating that stereotypes do, in fact, operate at the automatic processing level for paradigms such as ageism, in-groups versus out-groups, and racial stereotypes (Fazio, Jackson, Dunton, & Williams, 1995). Cognitive priming procedures involved the measurement of implicit memory activation and unconscious

affect through the presentation of an attitude object (Greenwald et al., 1998). A participants' primary task during priming procedures was to determine (as quickly as possible) if a primed photo (target) matched an adjective such as "pleasant" or "awful" (Fazio & Olson, 2003). Response latencies were used as dependent measures.

Greenwald, McGhee and Schwartz (1998), developed the Implicit Association Test (IAT), which is similar in intent to the priming procedures because it assesses automatic processing of participant responses. The most widely used IAT is that which assesses implicit attitudes toward African Americans relative to Caucasian Americans, and is called the "Race IAT" (Greenwald & Krieger, 2006). The IAT uses a series of five discrimination tasks, the first of which involves the introduction of target-concept discrimination. This first procedure involves pairing first names, which are identifiable in North America as African American or Caucasian American. One category may be assigned to respond with a keystroke on the left hand whereas the other category would involve a keystroke response with the right hand. For example, the presented name may be "Latonya" and the assigned category may be African American on the left side, which would require a keystroke on the left hand to properly assign "Latonya" to the African American category. "Heather" may be next name presented, requiring a right-handed keystroke to correctly assign "Heather" to the Caucasian American category. The second discrimination task involves associated attribute discrimination in which pleasant and unpleasant are the categories, and the task is to assign words such as "lucky" and "poison" to their respective categories using the left or right hand accordingly. For the third task known as the initial combined task, African American is assigned to one hand (left or right) and is paired with a "pleasant" category, whereas Caucasian American is paired with an "unpleasant" category and is assigned to the other hand. Words involving names and feelings such as "pleasure" and "Heather" are presented with the intention of participants assigning them to their respective categories as correctly and expediently as possible. The fourth task is a reversed target-concept discrimination task. This task is similar to the first, except that the left and right sides which were previously African American and Caucasian American (respectively) are now reversed so that African

American is now the category on the right. A new bank of names is presented, such as “Shereen” for African American, and “Stephanie” for Caucasian American. The fifth and final task is a reversed combined task that is similar to the third task. However, for the fifth task, African American and ‘unpleasant’ words are grouped together on the right side while the Caucasian American and “pleasant” categories are located together on the left. The purpose is to evaluate the association between target-concept discernment and attribute discrimination. As previously mentioned, the speed of the target-concept discernment is used to derive response calculations, which are further used to determine values for implicit bias, and the racial category which is most favored by a particular participant.

The Go/No-Go Association Task (GNAT; Nosek & Banaji, 2001) was developed as an alternative to the IAT, but with a focus on the evaluative side (attitude) of the implicit measures without requiring the involvement of complementary or contrasting categories. The GNAT has a response deadline in its procedure as opposed to the latency measure used in the IAT. GNAT procedures involve participants responding to target category stimuli with the attribute category “good” though they do nothing else for other stimuli (Fazio & Olson, 2003). The GNAT is rather recent, and not as well validated as the IAT therefore it is not selected for use within this study, but introduced nonetheless as a member of the implicit association testing family.

Single Category IATs (SC-IAT) were developed as an alternative to the IAT, using both a unipolar (single attitude object) and a bipolar concept (ex. positive and negative evaluations) to determine how consumers feel about brands and brand associations. One such study looked at brand associations between Coke (Coke, Diet Coke) and Pepsi (Pepsi, Pepsi One) products (Karpinsky & Steinman, 2006). Participants in that study completed a Coke – Pepsi IAT, a Coke SC-IAT, a Pepsi SC-IAT, and explicit measures of soft drink preferences. The results revealed significantly higher error rates for both the Coke and Pepsi SC-IATs compared to the IAT. Furthermore, the soda IAT scores weren’t related explicitly to Coke or to Pepsi attitudes, but the SC-IAT scores were positively related to their respective brands (for example, Coke SC-IAT scores positively correlated with Coke attitudes, and were not correlated with

Pepsi attitudes). However, the fear is that the output of the SC-IAT most likely is displaying identification speed of the single category construct, and not the associations between the joint categories. Therefore, more testing is needed before it could be considered as a replacement for the IAT. (Schnabel et al., 2008).

During the development of these computer-based implicit association procedures, various physiological tests were conducted to assess implicit attitudes. Facial electromyography (EMG), eyeblink startle response, amygdala activation strength as seen through functional magnetic resonance imaging (fMRI), and cardiovascular reactivity measures (challenge vs. threat) have been deployed in the past to assess racial prejudice. The IAT is the least invasive and arguably the most inexpensive measure most commonly used in psychological research to assess implicit stereotypes, and as such it was used within this research project as a control variable to ensure group membership was correctly assigned. Implicit bias is being measured within this study as a grouping variable to ensure that participants are correctly assigned to their respective racial categories; those categorized as Caucasian American implicitly align with “Whites”, and those categorized as African American implicitly align with “Blacks.”

Hypothesis - Player race and game play

It was unknown what effect player race would have, if any, on the game play of the participants. No scholarly research was found for video game play differences, though there are certainly trends towards criminal differences within society.

Ethnicity and Criminal Behavior. A common example of a racial stereotype is that African Americans are prone to violence and criminality; a stereotype which some researchers have highlighted as being held by Caucasian Americans (Pickett, Chiricos, Golden, & Gertz, 2012). One of the most interesting datasets the United States produces are the figures on prisons and the count of incarcerated individuals. In 1991 when the war on drugs was a prevalent part of American culture, there were almost seven times more incarcerated African Americans (1,895 in jail per 100,000 population) than Caucasian Americans (293 incarcerated per 100,000) (Tonry, 1995). In 2010, the proportion was roughly the same

as it was 20 years prior: 4,347 African American males and 678 Caucasian American males incarcerated per 100,000 (Wagner, 2012). The interesting aspect of this dataset stems from the origination of the information. Within the criminal justice system of America, different agencies (local, state, federal) do not always use the same racial and ethnic categories when classifying perpetrator information, which is by and large recorded subjectively by the arresting officer or based on self-report of the alleged offending party. Some data systems, in fact, only use the classifications of “White” and “Nonwhite” which is inflationary and detrimental to the records of “Hispanics” and “non-Hispanic White” coming from other districts (Walker et al., 2012). This lack of standardization when booking suspects could be deleterious to the incarceration records (through weakened internal, and subsequently, external validity), and provides aid for extremist organizational interpretation and propagandizing of the skewed datasets; datasets which are produced to reflect upon the state of the American prison system, and are extended to represent facts about American society overall.

Otu and Horton (2005), wrote that crime is a social construct – stemming from a nexus of social conditions, ethnic choice and legislative action – and they went on to say that the relationship between criminality (behavior) and ethnicity appears to be strengthening as opposed to weakening; a fact they noted as contradictory to the expected byproduct of ethnic assimilation (p. 72). The U.S. was initially founded and built by a colonial system, which embraced African slaves and later prospered under waves of Irish, Italian, and Jewish immigrants. The “melting pot” that is the United States is a place where multiculturalism is beginning to flourish as opposed to the principle of assimilation (Millet, n.d.). The current emphasis on ethnicity within the U.S. is affecting the criminal justice system of today in ways that were previously never viewed to be quite as prevalent as they are now. This is especially true when considering that most of the data originates from grossly under-representative samples (approximately 750 agencies out of 17,000 law enforcement units throughout the United States offer data to the FBI) (Russia Today, 2014).

Criminal justice researchers, politicians, the media, and clinicians have long asserted that criminal behavioral differences among mutually exclusive ethnicities were the resulting product of social and economic inequalities (Sampson, Morenoff, & Raudenbush, 2005). In fact, numerous criminal behavioral theories all make attempts at explaining the relationship between inequality and illegal behavior, but these theories tend to stick to assumptions primarily involving the poor and groups of racial and ethnic minorities within the United States (Walker et al., 2012). One theory on criminality, which appears to hold within the United States, is the racial invariance hypothesis of crime. For example, Sampson and Wilson (1995) discussed the fact that the subculture of crime wasn't three times as potent in San Francisco as it was in Baltimore where black homicide differed by a 3:1 ratio (in 1995). Caucasian American homicide rates at the state level were on par with African American rates in that California's values were three time those of Maryland for both races. The sources of crime appeared (to them) to be invariant across racial groups, stemming from structural differences in local communities, cities, and states in terms of family organization and economic variables. Hannon & DeFina (2005) found support for the racial invariance hypothesis when they used a reweighted least squares regression model to estimate race-specific effects within Cleveland. They found that cutbacks in neighborhood poverty seemed to produce similar cutbacks in violent crime for both Caucasian American and African American neighborhoods, providing support for the hypothesis.

Another theory of criminality is the racial disadvantage hypothesis. It states that disadvantage affects all races equally, and the cause for excessive violent crime rates stems from some groups receiving greater exposure to disadvantaged conditions than other groups (Laurence, 2015). All too frequently, however, the observations are that one ethnicity (oftentimes a minority) has a disproportionate lack of positive role models along with a lack of opportunities, educational underachievement, and a poorly funded single parenting style which directly results in anomie, and a culture supporting the glorification, and subsequently higher rates, of criminality (McMahon & Roberts, 2011). Another factor affecting the

racial disadvantage hypothesis is that research shows that in terms of residences, Blacks are predominately (and Latinos, to a lesser degree) highly segregated.

Sampson, Morenoff, & Raudenbush (2005) wrote a paper on the public health of the United States with respect to ethnicity and the role ethnicity plays in the crimes committed by Caucasian, African, and Latin Americans. They acknowledged that Blacks are 6 times more likely to die by homicide than Whites: a crime that has been largely recognized to be intraracial. Looking at over 180 Chicago neighborhoods from 1995 to 2002, they found that African Americans were 85% more likely than Caucasian Americans to commit violence and that in terms of ethnicity, the marital status of an individual's parents was the single most important predictor of violence with respect to familial structure. They discovered that violent offenses for participants with married parents were .81 times those from unmarried parents or single parent households. Socioeconomic status is commonly correlated with violence, but this study did not find that to be the case, instead offering the fact that controlling for immigrant generation reduces the regression coefficient between African Americans and Caucasian Americans by 14%. This suggests that Caucasian Americans have lower levels of violence than African Americans because they may be more likely to be recent immigrants. Crimes committed may be a piece of a greater ethnic issue stemming from a lack of parenting and generational differences between ethnic groups residing within the United States. In fact, generational differences and a lack of parenting appear to act as predictors of violent offenses more than socioeconomic status does, which has been the traditional explanation offered for offenses in violence research.

Recently, however, social psychologists in Ireland using the Five Factor Model of personality traits (Agreeableness, Conscientiousness, Extraversion, Intellect and Neuroticism) have found that personality measures are better predictors of crime involvement than socio-economic measures (O'Riordan & O'Connell, 2014). With all of these different factors in mind, looking at the situation from an individual level, and extending that to communities and states, there appears to be a plethora of variables present in the composition of violent offenders (ex: socio-economic status, upbringing,

prevalence of disadvantage, personality disorders, and personality composition). Some of these variables, such as those involved in personality, appear to be ample predictors of criminal offenders (Rolison et al., 2013).

HEXACO Model of Personality

Stone (2007) wrote that persons committing violent crime are more likely to display a personality disorder. As previously mentioned, O’Riordan and O’Connell (2014) found that four of five personality traits were more significant predictors of crime in a regression model than the traditional approach of socio-economic status was. With this in mind, coupled with the fact that the crimes committed within game play are the dependent variables of this study, it is important to take a look at personality and its potential role within game play. Starting with a brief history of personality measurement and its origin, this section will introduce the reader to personality and racial differences/similarities as well as personality and game play.

Goldberg (1981) produced a key paper stemming from research that originated in the early 1960s and spanned until his publication in the 1980s about five important personality dimensions that are collectively known as the Big Five. Specifically, these dimensions are Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Intellect/Imagination (Solomos & Back, 1999). The Big Five factors are generally assessed through the use of the NEO Personality-Inventory Revised (NEO-PI-R) and the abbreviated version, the NEO Five Factor Inventory (Gaughan, Miller, & Lynam, 2012).

Collins and Gleaves (1998) conducted a study using the five factor model of personality and noted the factors of agreeableness and conscientiousness aligned with the characteristics of cooperation and responsibility, characteristics which they cited as being dominant within the African American community. In spite of what would appear to be a fundamental difference between the two races, their study on the fit of the five factor model of personality did not find support differentiating African Americans from Caucasian Americans, noting the five factor model fit equally well for both races. One

study which was conducted by Lecci & Johnson (2008) used the NEO-FFI to assess in-group-directed and outgroup-directed biases among Blacks. They found the factors which predicted anti-White views among Blacks (low agreeableness, low conscientiousness, and low openness) were different from the factors that produced anti-Black views among Whites (extraversion and openness). Up until the time of Collins and Gleaves' study, limited research was conducted on personality development and measurement between races, and since that time even less information can be found to support or disconfirm the existence of racial differences.

Personality structure research underwent a re-birth through the use of lexical studies when researchers worked to ensure the lexical patterns of the English language would transfer to other native languages around the world. Six factors across at least 12 languages began to rotate out of the lexical studies which were subsequently conducted; a slight diversion from the factors upon which the Big Five was built (Ashton & Lee, 2007, 2008; de Vries, Lee, & Ashton, 2008). Out of this research emerged the six-factor HEXACO structure of personality, containing the factors of Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness to new Experience. The six factors of the HEXACO framework are generally assessed through the use of the HEXACO Personality Inventory – Revised (HEXACO-PI-R), or the HEXACO-60 which is a validated shorter version lasting just under 10 minutes to complete. The HEXACO-PI-R was utilized within this study because it contains a more reliable assessment of the scale's factors compared to the shorter inventory, and provides scores for the facets that define the factors. In short: more questions are answered by participants taking more time to complete, which results in greater construct validity for the personality assessment measure; a core component within this research project.

The Honesty-Humility (H) factor of the HEXACO model measures the personality subscales of sincerity, fairness, modesty, and greed-avoidance. Emotionality (E) is similar to the Big Five Emotional Stability, though it doesn't include irritability. The emotionality factor contains the facets of fearfulness, anxiety, dependence, and sentimentality. Extraversion (X) is made up of expressiveness, social boldness,

sociability and liveliness. Agreeableness (A), representing tolerance and good-naturedness, contains the personality measures of forgiveness, gentleness, flexibility, and patience. Conscientiousness (C) has the subscales of organization, diligence, perfectionism, and prudence, whereas Openness to experience (O) contains aesthetic appreciation, inquisitiveness, creativity, and unconventionality. Quick definitions for these individual facets can be found in Rolison et al. (2013), with detailed definitions located in the seminal paper on HEXACO by Lee & Ashton (2004). The intentions behind this study are to look at the global factors of the HEXACO model as opposed to incorporating their respective facets. Gaughan et al. (2012) found a relationship between HEXACO and the Big Five with a predominately Caucasian American participant pool, and briefly addressed the fact that future studies should also look at the role which race could possibly play for the HEXACO model. However, in terms of personality and behavior, much work is still needed especially for video game play. Some limited work with the HEXACO and game play behavior has already begun.

For example, in a study conducted by Worth & Book (2014), an analysis was conducted on personality and behavior for gamers playing *World of Warcraft*, a massively multiplayer online role-playing game (MMORPG). The Extraversion factor was positively correlated with social player/environment interactions, helping and immersion were correlated with Openness to Experience, and working activities were correlated with Conscientiousness. Worth & Book (2015) also found that “helping” was positively correlated with Agreeableness, “aggressing” and “creating” were negatively correlated with Honesty-Humility and Conscientiousness (respectively) when controlling for participant gender. These constructs (helping, aggressing, and creating) were three of four behavioral factors stemming from the General Video Game Behavioral Questionnaire, which they developed and used in their study to assess personality, and gaming behavior. Zeigler-Hill & Monica (2015) explored the role of personality via the HEXACO-60, and preferences for gaming experiences among video game players. A path analysis was used to discover that all components of the HEXACO model were able to significantly explain the relationship between the HEXACO and any one of the seven gaming preference behaviors.

The only exception being the Honesty-Humility factor of which there were no hypotheses for within their study (due to it being a novel personality measure). In all, they reported that personality is linked with preferences for gaming experiences, but little research has been conducted on the HEXACO and how it is linked to video games, especially behavior within video game.

In terms of personality and crimes, a study was conducted with the HEXACO model of personality by Rolison et al. (2013) looking at criminal offenders and non-offenders. They found that of the 6 personality dimensions within the model, five were significantly different between their independent variables. Extraversion and Emotionality contained the greatest differences between the two groups, followed by Openness to New Experience, Honesty-Humility, and Conscientiousness: ranked by order of effect sizes using Cohen's *d*. According to the five factor model, on the other hand, agreeableness, extraversion, conscientiousness, intellect and emotional stability are linked to crime by criminologists (O'Riordan & O'Connell, 2014). High extraversion is noted by both models to be an indicator of criminal behavior, and is known to be a marker for antisocial behavior (Ozer & Benet-Martínez, 2006). In a study by Worth & Book (2015), in-game behaviors which involve player-versus-player attacks are negatively correlated with agreeableness, conscientiousness, and the honesty-humility facet. Honesty-Humility has also been associated with an ability to predict criminality. It is also capable of predicting job performance, ethical violations, and sexual harassment tendency; which would suggest that the Honesty-Humility scale would be correlated with crimes (Ashton & Lee, 2008; Johnson, Rowatt, & Petrini, 2011).

Hypothesis a- Race and Honesty-Humility

Hypothesis b- Race and Emotionality

Hypothesis c- Race and Extroversion

Hypothesis d- Race and Agreeableness

Hypothesis e- Race and Conscientiousness

Hypothesis f- Race and Openness to Experience

It was expected that the facets of the HEXACO model would be identical across racial groups (no group differences) because of the relative newness of the HEXACO model and the limited information related to it for either race or video game playing behavior.

Hypothesis - Extraversion and Crimes

It was expected that the Extraversion subscale of the HEXACO model would have a relationship with the behavioral component (crimes committed) within the game based on existing literature demonstrating that relationship to exist within the real world.

Video Game Avatars

There is a stark difference between the majority of games built for the PC (e.g. *The Sims*, *Second Life*, *World of Warcraft*) and the games built for game consoles such as the PlayStation 4, and Xbox One, and Nintendo Wii U. That difference between PC games and console games lies in the nomenclature for the primary character, often called a protagonist, which is the digital actor (DA) controlled by the video game enthusiast. Protagonist in this case is defined as a leading character, even though (from a literary interpretation) many games are antagonist-centered. The implication is that for games on consoles, the DA is generally called a “character” or a “creature” among gamers (depending on the type of game being played), whereas the actor in PC games is most likely called an “avatar.” The assumption is that the term “avatar” denotes the fact that the actor is customizable. DAs are used in every game as a way to virtually represent the human game player. As previously mentioned, they can be controlled by humans (avatars) or controlled by the computer and associated algorithms (agents) (Fox, Bailenson, & Tricase, 2013). No matter the mechanism, the point remains that DAs are important, but the degree of that importance is not well known because DA customization is a new development in the world of gaming. In fact, *Call of Duty: Ghosts* (2013) was one of the first games that provided players with the option to make their DA either masculine or feminine, and there is limited selection of available skin tones (in multiplayer mode,

as opposed to storyline mode). Even though the gameplay is in first-person and the game player cannot personally see the results of their selection (DAs wear gloves and have full camouflaged sleeves covering skin color). Also of note, DA gender is becoming more of a choice, which is a stark contrast from the video games of the past with definitive characters like Mario from *Super Mario Brothers* (1985) and Laura Croft from *Tomb Raider* (1996). *Call of Duty: Black Ops III* (2015) features a playable female protagonist, similar to the character Commander Shepard in the *Mass Effect* video game series, complete with an androgynous dialog (Makuch, 2015). To that extent, gameplay among militaristic first-person shooters is becoming more customizable, yet in terms of ethnicity, video game DA development is still lagging.

In an article addressing ethnicity within games, Damon Packwood (2011) wrote about the lack of inclusion of Hispanic game characters (less than 3% and all were non-playable), bi-racial characters and Native Americans (none existed) and African Americans (10.74%). African American video game characters were mainly portrayed as gangsters or athletes. Moreover, African American looking video game characters are known to depict greater amounts of aggressive behaviors (pushing and trash talking) in sports games compared to Caucasian characters (Leonard, 2007). There is quite a bit of literature which addresses the problem with these exaggerated stereotypical depictions of DAs, stating that the stereotypes were reinforcing and perpetuating White ideologies in the real world because of their influence and audience via media (Larson, 2006; Wilson II, Guitierrez, & Chao, 2003). Stereotypical actions and racial representations played out within a video game have the ability to influence the negative associations which are attributed to members of these groups (Cicchirillo, 2015).

Unfortunately, race, and the inclusion of racial identity (especially representative of minorities within American society) is rarely considered in video game character development. Dietrich (2013) developed a study examining the way in which race is presented in video games because he found that many role playing games existed which lacked appropriate non-white character development options. He wrote that many games had skin color choices, but suitable hairstyles or facial features were lacking. One

console video game which is an exception is the *Saints Row* series where the digital actor is customizable in terms of gender, race (Caucasian, African, and Asian), voice, and body (emaciated, athletic, overweight), but this is not indicative of “the norm.” Nine years after the release of the first *Saints Row* (2006) it appears that the DA development initiated by Volition, Inc. on the *Saints Row* project has not really taken root within the console video game development community. This could be due to the aforementioned lack of minority video game developers within the industry. It could also be due to a lack of applying psychological research within this particular industry with respect to agency and autonomy, among others. One thing is for sure, the backlash for being racially indiscriminate in PC game design has caused some serious issues within the gaming community.

Fairly recently, one popular video game became hotly debated when the developers deviated from the norm with respect to character creation. Gamers were enjoying *Rust* (2013), a survival game, when their developers released an update in which a player’s DA was assigned to a race. This assignment was a randomization of black or white and in the future may include every shade in between, with the hope that no two characters will ever look alike (Grayson, 2015). In this game, actor skins are tied to user accounts, and there is no possibility of the player changing an actor’s ethnicity. Gamers were deeply upset with this move brought on by the game developers, many stating they do not want their actor to represent an ethnicity different from their real life ethnicity (Hall, 2015). Yet many gamers do openly choose to play as something which is different from their real-world identity. This makes it appear as though gamers rather enjoy a sense of autonomy when it comes to selecting a DA to represent themselves within game play.

Fox, Bailenson, & Tricase (2013) wrote that the investigation of the effects of virtual representation was important because virtual humans are generally developed to be as engaging as possible, and to respond to gamer’s inputs, thereby enhancing the sense of presence within the virtual environment. Furthermore, the enhanced realism that video games provide along with a gamer’s experience of embodiment (the sensation of ownership of a DA’s body within a game) make it possible

for the DAs to have effects on users' behaviors, beliefs and attitudes as well. In fact, a 5-minute gaming experience has been discussed as being enough to reverse behavior patterns among gamers, partly due to the motivational concept of immersion or arousal (Ryan, Rigby, & Przybylski, 2006; Yoon & Vargas, 2014). Through immersion, gamers are embedded in their game play, allowing them to lose track of time in the real world.

Eastwick & Gardner (2009) wrote that even though the avatars within a game they were studying had the ability to ignore gravity, time, and space, they were not exempt from social influence. On the subject of race within video game play, the study they conducted looked at social interactions within the unstructured virtual world *There.com*. The researchers found that light-skinned DAs were treated more positively than dark-skinned DAs during social interactions. In another example, researchers looked at implicit and explicit racial bias, finding support for the fact that prejudice and stereotypes do indeed play a powerful role within digital environments. These are just a couple of examples known about the effects of DA and race but the extent of the literature is severely limited (Groom, Bailenson, & Nass, 2009)

The next section of this paper addresses the relationship between humans and their DAs as viewed through a small selection of game-play interfaces. Oftentimes the results show that DAs can and do have an influence on the actions of the game player. However, thus far the explorations have been primarily within social contexts in virtual environments. Limited studies have looked at the consequences of a DA's physical features on the actions of a gamer.

The Proteus Effect

The name Proteus comes from that of the mythical Greek water god who could assume many different forms, and would do so to escape capture (Christou & Michael, 2014; Yee & Bailenson, 2007). The Proteus effect is defined as "the phenomenon of avatar users acting in accordance with their avatar's characteristics" (Ratan & Sah, 2015). One of the central premises of the Proteus effect is that people make third-person evaluations of their DAs before selecting an appropriate behavioral choice (Sherrick et

al., 2014). The Proteus effect was originally explained through self-perception theory, which proposes that changes in an avatar's characteristics can lead to changes in a gamer's real-world habits (Baylor, 2011). A DA is an example of self-representation within a virtual environment; the "primary identity cue in online environments" and is "not simply a uniform... (but) our entire self-representation" (Yee & Bailenson, 2007).

Yee & Bailenson (2007) postulated that individuals would modify their behavior based on the appearance of their DAs: that modifications in self-representation also modifies the self. In their seminal research study, Yee and Bailenson used a between-subjects design and a collaborative virtual environment (CVE: experienced through a head mounted display, or HMD) to explore the Proteus effect. They found that participants who were given more visually attractive DAs within an immersive virtual environment shared more information with confederates (blind to the attractiveness manipulation) during a self-disclosure task than those assigned to less attractive DAs. Also, those participants with good-looking DAs were more willing to approach strangers of the opposite sex after the completion of their study, alluding to the possibility that the DAs were able to alter participants' self-respect. Moreover, in an interpersonal distance assessment (tracked within the virtual reality (VR) system), it was found that attractive DAs walked significantly closer to the confederate. Furthermore, for the second part of the study, participants who were assigned taller DAs negotiated with greater confidence during a negotiation task than other participants who were assigned shorter DAs. These outcomes were all observed to occur in the "real world" (outside of VR), and were replicated within this study. A direct result in the digital world that correlated with the real world results.

Research is beginning to shed some light on the relationships people have with their DAs, and the extent to which appearance and stereotypes may play in a gamer's conformity with their DA. The Proteus effect has been discovered in original research on body transformation within Immersive Virtual Reality (IVR; Kilteni, Bergstrom, & Slater, 2013). There, it has been shown that the environment leads to attitude and behavioral changes within IVR. The between-groups study that discovered this looked at

thirty-six Caucasians playing a virtual drum in first-person view as a (formally dressed) light-skinned or a (casually dressed) dark-skinned DA. The finding was that the perception of body ownership over a digital agent could potentially lead to significant behavioral and even cognitive deviations such as greater frequency of movement and greater variations in a drumming task on an African drum, depending on the appearance of the DA. The stronger the illusion of DA ownership, especially in the casual dark-skinned condition within this study, the greater the observed behavioral change as was revealed through a path analysis (Kilteni et al., 2013).

According to Sherrick et al. (2014), the consensus is that behavior modification through the Proteus effect is only likely as long as the DA manages to activate a stereotype upon which the gamer can act. The presumption is that people with stronger opinions involving a stereotype will show stronger effects stemming from a stereotyped DA's presence. To better understand the relationship between gender stereotypes and the Proteus effect, Sherrick, Hoewe, and Waddell (2014) devised a study using interactive fiction to determine if gamers were consciously aware of the Proteus-like effects when controlling their DA. In their study, participants were told they were a female/male detective and their purpose was to investigate a murder at a mansion. As the story unfolded, participants were given two options to pick from when interviewing suspects (male and female choices), and these choices along with the gender of the detective were completely randomized. They did not find support for the Proteus effect, ultimately finding instead that female DAs did not elicit more female choices, and male DAs did not elicit more masculine behavioral choices. Furthermore, among users with high feminine stereotypic beliefs, it was found that their female DAs elicited fewer gender consistent actions. Moreover, participants performed actions which were in line with their own self-reported genders: supporting the claim that self-identification, and the stereotypes involved in that, is more powerful than stereotypes associated with the DA. However, the results they found may not be applicable to CVEs or IVR simulations due to the fostering of embodiment which these graphically-intensive environments can provide.

Research on the Proteus effect and gaming has involved virtual reality and the embodiment of normal-looking (human) DAs along with more physically-imposing alien-looking DAs. The rationale for this was to see if there was a way to vary avatar appearance, and effectively establish a link between DA appearance and non-verbal responses of participants. Participants in a study by Christou and Michael (2014) were instructed to don an Oculus Rift HMD and block incoming warheads (physical body movement was picked up with a Microsoft Kinect) with the “hands” of their DA (one DA condition was visually human looking, the other was “alien;” A male and female DA was available for both species). The number of times a participant’s DA was hit by an incoming warhead, and the force with which the participant contacted the digital warheads (while deflecting) were recorded with results showing clear differences in performance based on the type of DA. A within-subjects analysis of variance (ANOVA) revealed that there was a significant effect on the number of body blows the DAs received, with males receiving significantly less, and performance was significantly better for the alien condition as opposed to the humanoid. In terms of the impact velocity for the DAs, males exhibited a significant difference between the alien and humanoid conditions. The alien DA for males outperformed the human DA: females had no significant differences. Post-test questionnaires revealed that participants were immersed and felt a sense of embodiment with both types of DAs. One of the proposed reasons for the obtained results was that the participants may have felt more capable with the alien DA due to the physical appearance. Interestingly enough, all of the DAs had similar height and comparable within-species characteristics; however, there weren’t many female participants within this study so the data may have been skewed. Of course, the extent to which stereotypes may have played within this study was not explored, but would have been incredibly interesting nonetheless if it were included.

Another study involving the Proteus effect looked at changes in female self-perception both on- and offline stemming from the features (IV; sexualized or non-sexualized) or behaviors (DV; assessed via rape myth acceptance) of a participant’s DA. This study was completed in IVR with an HMD and found support for the Proteus effect. Participants wearing sexualized digital actors adopted the DA’s appearance

and reported more body-related thoughts (nondescript; originating from participants' writing about their thoughts, post-experiment, and rated by independent raters for content) than those with non-sexualized DAs, indicating that DAs could promote self-objectification (Fox et al., 2013).

Through these research studies, more knowledge has been gained on the effect a digital agent can have on a video game player, but more research is still necessary on the phenotypic traits that humans use to classify themselves. The most salient of these phenotypic traits being that of race via skin color. Scientific literature on the possible effect of a digital actor's race with respect to the everyday video game player could have an immediate and impactful result on the video game development community. To date, no attempts have been made to capture the Proteus effect using a console video game. If the Proteus effect does exist for console gamers, then the implications on video game design could be quite profound, especially when considering that DAs are purported to have the ability to affect real-world behavior within a matter of minutes of in-game exposure, and video game consoles are the most prevalent platform used to play (Yee & Bailenson, 2007).

Hypothesis - DA race and game play

It was expected that the race of the DA would make a difference in game play due to the effect of stereotypes; personified through the Proteus effect.

Grand Theft Auto

While research has shown that DAs are a key component in the explanation of player behavior outside of the game, not all game developers consider the known ramifications on player behavior in the creation of their digital media content. One example where DA construction may have an impact on player behavior is through the game *Grand Theft Auto V* (GTAV; 2013). GTAV is a monumental video game within the video game industry, for a number of reasons. Originally released on September 17, 2013 for PlayStation 3, and Xbox 360 consoles. Within 24 hours GTAV broke 6 world records including "best-selling videogame in 24 hours," "fastest entertainment property to gross \$1 billion," and "highest

revenue generated by an entertainment product in 24 hours” (Lynch, 2013). As of July 2015, GTAV is released on five major platforms: PlayStation 3, PlayStation 4, Xbox 360, Xbox One, and most recently, Windows PC. Take-Two Interactive, the publisher for the game, has reported shipping nearly 52 million units since the debut in 2013 (Sarkar, 2015). In comparison, Grand Theft Auto IV originally released in May, 2008, has globally sold 10.4 million units as of June 2015 (VGChartz.com, 2015).

GTAV is considered to be an open-world, action-adventure genre game with actions performed from the third-person perspective. Third person point of view allows the player to see the actor they are controlling from another person’s perspective, as opposed to first person in which all activities a gamer performs are conducted through the “eyes” of the actor they are controlling. The “open world” style of this game allows players to explore the entire game map of the fictional state called San Andreas which features the city of Los Santos (based on Los Angeles, California) and its counties: Los Santos in the south, and Blaine County in the north. Los Santos County contains the cities of Del Perro (Santa Monica), Davis (Compton), and Rockford Hills (Beverly Hills) along with various mountains and valleys such as Mount Haan (Mount Lee), and places of interest like the Vinewood Sign (Hollywood Sign) (“Los Santos County- GTA Wiki,” 2015). Blaine County in the north is sparsely populated and contains thick forests, an open desert and large mountains along with smaller towns and two airfields (Workman, 2013).

Successful completion of the game requires the game player to complete the story lines of the three anti-hero actors as they engage in many scripted (or at the player’s discretion game play can be unscripted) criminal offenses. Many illegal and unscrupulous activities are scripted for the game player to engage in; from completing heists like robbing a jewelry store and illegally acquiring a submersible vehicle, to delivering in-game characters to an Altruist Cult for \$1,000 per head. This game is also replete with examples of morally questionable elements such as filming a male “teenager” engaging in sodomy with an adult female movie star in the back of a hotel. All of these are pieces of main missions (69 in total), side missions (known as Strangers/Freaks; all 18 strangers have from 1-7 missions for the player to complete for them), and “hobbies and past times” (17 in total; playing tennis, hunting, yoga, etc.).

Through these, the player can boost the “character attributes” (e.g. stamina, shooting, strength) of each playable protagonist.

GTAV contains some unique facets, which permit the game to truly stand out from among its 14 earlier versions of the Grand Theft Auto franchise, and various other open-world genre games that are deemed to be its competition. These unique components include wider in-game streets that provide easier navigation and less “collateral damage” from erroneous driving. There is also a larger game map presenting more opportunities for gamer exploration, fewer citizens (in-game agents) walking about and a police presence which is more “intelligent and aggressive” than the previous GTA games. The police presence alone could cause players to become more cognizant of their in-game actions in comparison to previous GTA games. Primarily due to of the scripting for the police presence in GTAV coupled with the graphics of the video game, the internet was abuzz with the possibility that the game developers coded the Los Santos police (agents) to racially profile the DAs. Meaning that when gamers played as the character Franklin (Black), there were more likely to be arrested by the police for in-game deviance than if they were to play the game as Michael (White) (Bernstein, 2013; Hernandez, 2015). This was later proven not to be the case.

Crimes during Video Game Play

Michael Tonry (1995) wrote that “crime is part of all human societies and is shaped by the ways in which societies organize themselves” (p. 39). A crime is an act performed by an individual in violation of a duty they owe to society, and for breaching the law, the law provides that the wrongdoer shall make amends to the public. Of course, in the United States a person is presumed innocent until proven guilty in a court of law, and the burden of proof is on the government to demonstrate the guilt of the accused. Crimes can be classified as either a felony, misdemeanor, or violation. Felonies are the most serious types of crimes; *mala in se*- or inherently evil. Misdemeanors are *mala prohibitum*; not as serious as felonies, but still considered to be prohibited by society (Cheeseman, 2010).

Behavioral measures are integral to a study such as this, especially when looking at the Proteus effect, and to explain the metrics involved some terms must first be defined. “*Actus non facit reum nisi mens sit rea*- the act does not make a person guilty unless the mind is also guilty” (Heller, 2009). To prove someone has committed a crime, two elements must be proven: criminal act (*actus reus*) and criminal intent (*mens rea*) (Cheeseman, 2010). *Mens rea*, often misunderstood to be the “state of mind,” and in the extreme, is often categorized as negligence or recklessness as in a quality of behavior. As a researcher, it is impossible to determine the origin of the quality of participant behavior short of asking said participant, and as such, certain felonies could be assuaged or intensified per the *mens rea* assessment of the criminal act itself. There are also defenses for mitigating fault related to *mens rea*, such as moments of duress and self-defense to explain why a particular *actus reus* was selected (Chan & Simester, 2011). Because of the element of intent, and the inability to properly assess it, certain “charges” during gameplay are summarily given based on assessments of viewed game play behavior.

Crimes within this study are subdivided into two main groups: crimes against people and crimes against property. Both of these crime categories contain a grouping of criminal offenses within gameplay, which could reasonably be encountered by video game players while playing Grand Theft Auto V. Not everyone’s gaming experience is the same, or similar in nature, and it is in that differentiation between experiences that major differences in crimes committed within the gameplay by various peoples (Black, White, Middle Eastern) playing as either White or Black avatars are expected to be seen. To quantify the virtual criminal offenses within this gameplay, special considerations are required, to include the operationalization of the crime types into the categorical definitions that follow. Of note, misdemeanors and felonies are not differentiated within this study due to the low levels of granularity in discerning among their respective crimes. Additionally, the fact remains that variations delineating the difference between a misdemeanor and a felony does indeed vary from jurisdiction to jurisdiction within the United States.

Crimes against Property. Certain crimes against property are expected to occur through casual gameplay. These crimes are theft, vandalism, trespassing, and arson, the latter being a crime which is a result of the use of rocket propelled grenades (RPGs) and hand grenades within the game.

Vandalism is another crime within this category. Defined by Garner (2009) as “willful or ignorant destruction of public or private property,” vandalism is a charge levied against the video game players primarily for damage or destruction of the property of in-game artificial intelligence (AI). Of course, given the nature of the game, certain public properties do not count as in-game violations such as fire hydrants, telephone poles, and newspaper stands. The reason for this is that the video game player could be a horrible driver, or they could be more concerned about not driving into other vehicles as they travel from Location A to Location B. Either way, this crime is difficult to determine if the player has criminal intent (*mens rea*) towards driving into the objects on the side of the road, or if the objects are collateral damage resulting from high rates of speed and player perceptions of task urgency.

Theft is defined as “the felonious taking and removing of another’s property with the intent of depriving the true owner of it” (Garner, 2009). Theft occurs within the game when a player takes a vehicle from the side of the road. Within the State of Florida (where the study is taking place), the criminal charge of theft (larceny) is split between grand (as in grand theft) and petit (petty theft) when the object which is feloniously taken has a value of at least \$300; degrees of theft are excluded from analysis (The Florida Legislature, 2015). Drivable vehicles within the game are the objects of this criminal charge during game play assessment.

Black’s Law Dictionary (2009) defines the crime of trespass as the “unlawful act committed against the person or property of another.” Within this particular game, there are only a couple of places which are considered to be worthy of the crime of trespass. These places are the large international airport south of the city of Los Santos, the prison to the northeast of the city, and the military base located in Blaine County within the game (unmarked on the in-game map). These locations are the only places within the game in which the AI law enforcement response to the DA’s presence is swift and aggressive.

Arson is defined as “the intentional and wrongful burning of someone else’s property or one’s own property” (Garner, 2009). When a rocket propelled grenade (RPG) or a hand grenade is released within the confines of the game, the subsequent damage that occurs explodes and destroys nearby vehicles, often incinerating the people inside them, as well as nearby pedestrians. The initial explosion has the potential to spur disastrous results in the form of a chain-reaction of explosions depending on nearby objects (vehicles, gas stations, propane canisters, etc.). The game does not contain scripts to allow buildings to incinerate so for video assessment purposes, it is safe to say that each explosion caused by a game player establishes a criminal charge of one count of arson.

Crimes against People. The non-player characters (NPCs) within the game are considered “people” too, especially in the game play analysis. These NPCs are the digital citizens of Los Santos, and the rural Blaine County to the north, and the game developers have these citizens “living” in communities largely based on their ethnicity (Polasek, 2014). Within the game, the characters played by the gamers can develop adverse relations with individual NPCs or certain groups of AIs (such as in game gangs of people or animals), leading the NPCs and/or AIs to lash out against a player’s character. There are specific crimes against people, which are used within this study to assess violence against NPCs within the game. These crimes against people are categorized as assault/battery, murder/manslaughter, kidnapping, and robbery.

There are different classifications of the criminal charge of battery, which is defined as “the use of force against another, resulting in harmful or offensive contact” (Garner, 2009). These classifications are exemplified by terms such as aggravated battery (use of deadly weapon while committing battery), sexual battery (forced penetration or contact with another’s genitals), and simple battery (not resulting in serious harm). Sexual battery does not occur within the game, though lascivious conduct occurs on a handful of scripted occasions. Simple battery can occur at the discretion of the gamer, along with aggravated battery. The difference between these two charges largely stems from the presence of a deadly weapon; an in-game object held by the DA, which the gamer may or may not actually be aware. Because of the

nature of this condition within the game play, the two different types of potential battery offenses (simple and aggravated) are grouped together under the title “battery” for video coding.

Assault is defined as “an attempt to commit battery, requiring the specific intent to cause physical harm” (Garner, 2009). Much like the charge of battery, assault has accompanying classifications such as aggravated assault and the catch-all “assault with intent...” which also contains assault with intent to rob, assault with intent to commit murder, assault with intent to rape, and assault with intent to inflict great bodily injury. Because of the close association between assault and battery, the two criminal offenses have been grouped together as “Assault/Battery” for video coding purposes within this study.

The assessment category of “murder” is defined as “the killing of a human being *with* malice aforethought.” Murder also includes the charges of felony murder (murder during the commission of a felony), first-degree murder (willful, deliberate, and premeditated) second degree murder (all other types of murder which are not deliberate, willful, or premeditated), and mass murder (in which an individual kills a large number of people at the same time) (Garner, 2009). Manslaughter, on the other hand, is defined as the killing of another person *without* malice aforethought. Intent cannot be established as for the game players. Therefore, it is easiest to group these two major criminal charges together as “Murder/Manslaughter” and catalog every attempt made, “successful” or otherwise, at taking the life of an AI within the game.

Black’s Law Dictionary (2009) defines kidnapping as “the crime of seizing and taking away a person by force or fraud.” Within the game, some NPCs are driving their vehicles in traffic with no passengers, whereas other NPCs do have passengers; a random result of scripting. When a gamer directs his DA to forcibly eject a driver and take over the controls of their vehicle, the criminal charge of kidnapping is imposed against the gamer when there is a passenger within the vehicle they take, and they manage to successfully drive off in their newly acquired vehicle with the passenger along for the ride.

Robbery is defined as “the illegal taking of property from the person of another, or in the person’s presence, by violence or intimidation” (Garner, 2009). Just like previously mentioned charges, there is no

differentiation made between armed, aggravated, or simple robbery within the game, and robbery is operationally defined as the taking of something (car) with force (imagine a car jacking). In summation, there is a plethora of crimes, which can be committed within typical game play with GTAV. The crimes presented here are those that an average participant can reasonably expect to encounter within their 20 minutes of game play in the study.

There are other open-world, crime-genre games such as *L.A. Noire*, *Watchdogs*, *Red Dead Redemption*, *Batman: Arkham Origins*, *Assassins' Creed* (series), *Saints Row* (series), and *Just Cause*. However, most of the open-world crime genre games are historically based (*Assassins' Creed IV: Black Flag* set in early 1700s and *Red Dead Redemption* set in US/Mexico border circa 1911), and the capability to commit wide-ranging crimes are not as extensive or “modern” as they are in the *Grand Theft Auto* series. *Watchdogs*, for example, is a modern game centered on hacking, theft (digital) and espionage. In the *Batman* games, gamers playing as Batman (character) don't actually hack computer systems or “murder” AI citizens or prisoners within the game, but the game player does have the option to extract information through the use of threats/threatening behavior (which exists in GTAV during certain scripted events, though is not a predominant part of casual game play).

In terms of criminal activities within video games, The *Saints Row* series is quite possibly the closest fit to the *Grand Theft Auto* series, however, the *Saints Row* games center on a fictional street gang called the Third Street Saints, led by the game player. Street gangs overall bring an additional level of measure to the committance of crimes especially with respect to the charges of organized crime and racketeering, along with other social psychology constructs such as in-group/out-group, social norms, and membership, roles, and identity. *Grand Theft Auto* had better mechanics in terms of game play and repeatability, and the crime potential and range was much better, especially when compared to *Saints Row*. This is why *Grand Theft Auto V* was selected to investigate race and violence issues based on the Proteus effect. With a prevalence rate of roughly 3.9%, gang fighting is sensationalized in video games, but makes up less than 5% of personal violence crimes within the city of Chicago, in the aforementioned

longitudinal study by Sampson et al., (2005). Therefore, while “just a game,” we can see exaggerated abnormal behaviors (crimes) play out within a digital world, which would not be conducted within real life, in an effort to explore the Proteus effect.

The Present Study

The primary purpose for this research project was to examine the Proteus effect and gamer race in an unprecedented way, resulting in a greater understanding about the impact the race of a digital actor may have on a gamer’s play. A secondary purpose of this research project was to examine the role which personality plays in the relationship between personality and virtual crimes. Of particular interest is the Honesty-Humility personality construct within the HEXACO model, and the link this variable may have to crimes committed within a video game. Specifically, this research asks, “How important is the appearance of a digital actor, and can that actor, in fact, influence player behaviors within a digital environment?”

The hypotheses listed above were tested as null models using multivariate analysis of variance (MANOVA): The first hypothesis (MANOVA main effect) was that a player’s race would have no significant effect on the game play (crimes committed) of the participants regardless of the digital actor’s involvement. No supporting research could be found otherwise which suggested that African Americans would perform better or worse at playing a video game than their Caucasian American counterparts, “winning/losing” aside, and strictly in terms of game play and the mechanics of video game performance. The second hypothesis (MANOVA main effect) was that DA race was expected to make a difference in crimes committed during game play (regardless of the race of the game player). There was an acknowledged lack of diversity among video game characters, but to what extent that does, or could, affect game play is largely unknown (Chan, 2005; Packwood, 2011). The third hypothesis comes from the MANOVA interaction effect of the independent variables of gamer race and DA race acting upon the dependent variables. This hypothesis comes from the literature review performed on the Proteus effect,

which alludes to the reasonable assumption that African American game players would commit fewer crimes with a skin-congruent DA (Black) than they would with a non-skin congruent DA (White) and vice-versa for Caucasian American gamers.

The fourth hypothesis (HEXACO and race) was broken down into six parts: examining the relationship of the six facets of the HEXACO personality dimensions to the racial groups involved within this study. This hypothesis was analyzed through the use of multiple ANOVA tests in which the three levels of participant race were analyzed as an independent variable against each of the six HEXACO subscales individually.

Personality and race factors were studied off and on within psychology leading up to the mid-1990s and since then research in this area has not been as prevalent. The intentions behind revitalizing this segment of research stems from achieving stronger internal validity for the constructs involved within this study, especially across racial groups; therefore, the expectation was that there would be no significant differences between the three racial groups under assessment within this study. The fifth hypothesis (Personality and Gameplay) was that the Honesty-Humility subscale of the HEXACO personality measure would have an inverse relationship with virtual crimes committed within the game; the expectation being that as the count for crimes committed increases, the Honesty-Humility values would decrease. There is a reasonable expectation to see a relationship between in-game behaviors and personality, a relationship that may not be predicated on racial membership, but rather superseded by the game play.

Hypothesis - Skin congruence and crimes

It was expected that skin congruent configurations between gamers and their DAs (Caucasian American gamers playing with White DAs, and African American gamers playing with Black DAs) would have fewer behavioral counts than skin incongruent configurations in keeping with the Proteus effect.

Method

Participants

Ninety male participants at a small private university located in the southeastern U.S. They volunteered one hour of their time, individually, in exchange for \$15 USD. The 90 male students were comprised of three different racial groups, each group containing 30 members. The groups were Caucasian Americans ($M = 20.57$, range 18-33), African Americans ($M = 20.38$, range 18-28), and Middle Eastern ($M = 22.17$, range 18-30). One participant in the African American racial group declined to state their age. When asked how much experience they had with GTAV, 74.4% reported they have owned and played at least one of the 14 released titles, the other 26.6% reported they have played at least one before. 74.4% of these participants reported that they know without looking where the X, Δ, O, and □ buttons are on the controller for the PlayStation, an answer which (for this study) was used to indicate expertise in handling the gaming console.

Participants were selected by pitching the research requirements (experience with GTAV, and identification with one of the 3 racial groups of interest) in front of several classes of psychology students. Participants were also recruited from the atrium of several buildings on campus in much the same way they were recruited from the classroom in an effort to reach the participant requirement set forth by the dissertation committee. Participation in the study was voluntary, and the ability to withdraw at any time was available to the participants.

Apparatus

To complete this work, the required equipment list contained A Sony PlayStation 3 video game console with a “stock” DualShock® 3 controller, and the viewing medium for the game was a Sony Bravia 42-inch television. The game played by participants was *Grand Theft Auto V* made by RockStar North (2013), and all participants started at the same arbitrary point in the game. Because participants were playing the game from the disk content (storyline) as opposed to online game play, the researcher

first played the game until all three main characters were unlocked. In addition, sufficient in-game cash was necessary to de-incentivize intentional violence toward in-game characters. Participant timing occurred with an Apple iPhone 5 using the “timer” portion of the “Clock” application.



Figure 1. A ring in the center of the image depicts the starting location for all game players within this study.

The in-game characters known as “Michael” (White) and “Franklin” (Black) were used for this study. The researcher depleted all existing ammo and twice entered the cheat code “△, R2, ◀, L1, X, ▶, △, ↓, □, L1, L1, L1” which provided the game character with assault rifles, rocket launchers, grenades, hand guns, and sniper rifle with “sufficient” ammunition for game play. Once the code was entered, the game was saved to prevent the need to consistently re-enter the code for each participant. The secondary reasoning behind the use of the cheat code was to lessen the “need” that a gamer may have to kill an NPC in order to obtain their cash and purchase guns and/or ammunition for game play, thereby hyper inflating the murder/manslaughter or Crimes against People (CAPE) charges. The physical location denoting the starting point of the gamers is depicted in Figure 1, above. The native view for gamers playing as black, at the actual start point is shown in detail in Figure 2. Moreover, the participants were told not to switch characters once they started playing the game, thus ensuring they would stick to the assigned character.



Figure 2. This is the location all players started with, for both game characters (Franklin depicted here, and Michael).

Measures

Personality Inventory. Obtained from *hexaco.org*, the HEXACO psychometric test came from the HEXACO-PI-R website. The HEXACO test is a 100 question personality inventory which accounts for 6 facets of personality such as honesty-humility (H), emotionality (E), extroversion (X), agreeableness (A), conscientiousness (C), and openness to new experience (O).

Gamer Questionnaire. The Gamer Questionnaire was compiled with an in-house gaming metric designed to uncover the video gaming habits of the students within the university, and to assess the familiarity of the potential participants with the game GTAV as potential control variables to account for gaming preferences and playing behavior.

Implicit Association. Implicit bias is a moderating variable within this study. Millisecond Software™ developed the Implicit Association Test (IAT) used in this study, and ran on the Inquisit 4 software package, version 4.0.8.0. This was done to add construct validity to the categorization of gamers as either correctly matched or mismatched with the DAs within this study (African American participant playing White avatar; African American participant playing Black avatar, etc.), as the implicitly-biased racial orientation of the gamer was taken into consideration via the IAT instead of the self-reported race

of the gamer. Recent news events demonstrated the importance of this through the circumstances surrounding Rachel Dolezal, formerly the President of the Seattle National Association for the Advancement of Colored People (NAACP). The race she identified with was incongruent with how the public perceived her, and having an exemplar like her (appears to be Caucasian American, identifies as African American) in this study would most likely be a confounding variable (Botelho, 2015).

As previously mentioned, Greenwald, McGhee, & Schwartz (1998), developed IATs for use in assessing a participant's implicit reactions (automatic evaluation) which pertain to various polarizing constructs of scientific interest. The IAT measures the strength of associations between various concepts by measuring response latencies in categorization tasks (Greenwald et al., 2009). In terms of scoring, the IAT score which is used is generated through the Inquisit 4 software package. Inquisit calculates d-scores using the scoring algorithm reported in Greenwald et. al., 2003. Positive d-scores support a stronger association between "White American – Good" and "Black American – Bad." Negative d-scores support a stronger association between "Black American – Good" and White American – Bad." IAT reliability measures show internal consistencies between 0.70 and 0.90 (Schnabel et al., 2008) and the median value of test-retest reliability of IAT measures is $r = .56$ across nine reports (Greenwald et al., 2009). The output of the IAT showed which race (Caucasian American or African American) a participant had an implicit connection with, and the strength of that connection was displayed in terms of a decimal value, with higher scores indicating favor of Whites over Blacks.

Criminal behavior during game play. Game play was captured using an El Gato Game Capture HD video game capture card. This device was used to split and copy the signal coming from the gaming console, expediently sending one signal to a laptop (and subsequently, a hard drive) while routing the other signal to the screen so the gamer does not perceive a drop in frame rate or experience a change in the fidelity of the controls. Game Capture 3.2 was the free software that was available to run the capture card, taken from the manufacturer's website at <https://www.elgato.com/en/game-capture-hd-support>.

Experimental Design

The independent variables within this study are the game players selected for inclusion and the DAs used. For the game players: Caucasian American, African American, and Middle Eastern American were the three levels of interest in the race independent variable. For the DAs: Black and White were the independent variable levels of interest, as no other alternatives were available within this video game. Selected for inclusion in this study, Middle Eastern IAT scores were unknown (as they might be commingled with the scores of “White” in other experiments). Of the minorities available on the researcher’s campus, Middle Eastern is the one racial group that is most prevalent and readily available. Individuals representative of this population, in effect, performed as a control group.

The race of the DA was also an independent variable within this study. Each racial group’s participants were assigned to play either a.) White DA, Michael, or b.) Black DA, Franklin, within the storyline of the video game Grand Theft Auto V.

The dependent variables within this study were the crimes against people, and crimes against property, which are defined and outlined within Appendix A. Researchers watched participants’ free-roaming gameplay and quantified the crimes these individuals committed within their 20 minutes of assigned game play. An additional set of dependent measures included responses from the HEXACO personality inventory and the responses on the IAT computer-based program.

Procedure

All participants completed the Consent Form (Appendix B) and the Gamer Questionnaire (Appendix C) in addition to the first copy of the Basic Psychological Needs Scale (BPNS; Appendix D). The instruction given to participants for the first BPNS was to think about their favorite game when answering the statements. Doing so projected an outward appearance to the participants that the researcher was interested in the BPNS as a primary goal for this research project, because the instructions

for the second BPNS focused on their perception of the video game they played. The first package containing the Consent Form, Gamer Questionnaire, and BPNS took approximately 10 minutes to complete. Next, participants had 20 minutes of free-roam game play. The instructions given to them were that they should play the game as though they were playing it at home. During game play, the researcher sat behind a privacy screen within the same room as the participants and matter-of-factly told them that they were to game as though they were at home. When the 20-minute timer went off, they were to proceed to the second BPNS, and the rest of package 2.

After the second BPNS, participants completed the HEXACO (Appendix E), along with a battery of additional psychological tests, which were also administered to investigate other components outside of the focus of this study. After the questionnaires, participants completed the Implicit Association Test on a laptop, which took approximately 10 minutes. In total, the study took around one hour from start to finish, and all participants received a post-study debrief in person. The researcher thanked them for their participation after their time in the lab concluded.

Study Analyses

The analyses conducted for this study were as follows:

Hypothesis 1 involved a main effect from a multivariate analysis of variance (MANOVA) by investigating the role which player race (Caucasian American/African American/Middle Eastern: IVs) has on the virtual crimes (crimes against people, crimes against property: DVs) committed within game play. Alpha level determining significance for hypotheses 1 was set at .05.

Hypothesis 2 comprised the use of the same MANOVA from hypothesis 1 and another main effect from it in analyzing the differences among the White and Black video game digital actors (IVs) in an effort to determine if there were quantitative differences in the game play (crimes committed against people and against property: DVs). The alpha level determining significance for hypotheses 2 was set at .05.

Hypothesis 3 included the interaction from the MANOVA from hypothesis 1. The expectation was that skin congruence configurations would have fewer behavioral counts (crimes against people and crimes against property) than skin incongruent configurations in keeping with the Proteus effect. Significance for hypothesis 3 was determined using an alpha level set at .05.

Hypothesis 4 involved six analysis of variance (ANOVA) tests in total, with a Bonferroni correction factor in place. Each one was a one-way ANOVA looking at the three races of interest, and each one of the six facets within the HEXACO personality inventory to determine if any particular race (of the three races involved within this study) was statistically differentiated from the other races involved within this research project. The alpha level determining significance for hypotheses 4 was set at .01. The lower alpha rate was to account for potential familywise error that may have occurred because of the multiple analyses.

Hypothesis 5 involved the use of a multiple regression analysis to analyze the relationship between the Honesty-Humility subscale of the HEXACO model and the crimes committed within the game. It was expected that there would be a strong correlation between the deviant behaviors (crimes committed) captured within this study and low scores of Honesty-Humility as captured by the HEXACO personality inventory. The Pearson correlation was used to analyze the relationship in hypothesis 5, with an alpha level set at .05.

Results

The present study assessed 90 male college students on their personality, racial identity, and crimes committed while playing Grand Theft Auto V in an effort to determine if the Proteus effect can exist on a console video game. Results from the IAT can be viewed by race, in Figure 3, below. Looking at this figure, it appears Caucasian American IAT scores ($\bar{x} = .44$, min = $-.31$, max = 1.3) contained the highest mean, followed by Middle Eastern ($\bar{x} = .32$, min = $-.33$, max = $.94$), and African American means were the lowest ($\bar{x} = .04$, min = $-.78$, max = 1.04). Also depicted is one African American outlier (participant 80). Since there was only one outlier, for one race, and it was not a significant outlier (greater

than three standard deviations above the mean; < 1.26) it was not thrown out. The lower whisker for the African American group which represents the bottom 25% of the scores for that group are stretched over a greater area than the upper whisker is, indicating that the bottom 25% of scores for this group tend to cover a wider range of lower values. The opposite of which is depicted by the Caucasian American scores, which indicate a greater spread for the upper quartile of that group. These results are consistent with expectations as higher scores indicate “hypothesis consistent pairings,” or affiliation with Caucasian Americans whereas lower scores indicate hypothesis inconsistent pairings,” or affiliation with African Americans. As can be viewed in Figure 3, participant scores were in line with their identified race.

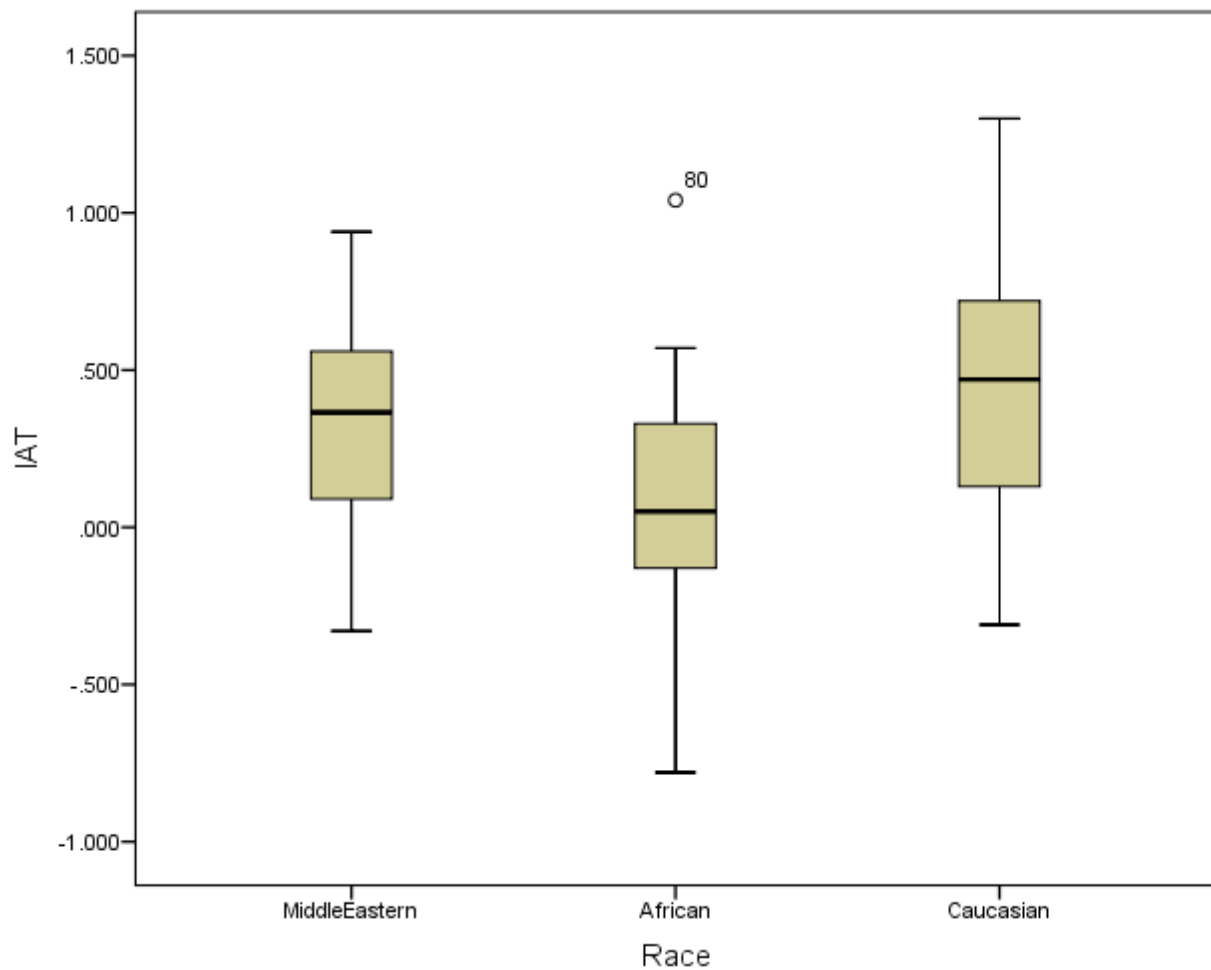


Figure 3. A box-and-whisker plot providing a visual depiction of variation within the sample’s IAT scores by race.

An independent samples t-test was conducted to compare the IAT scores for African Americans and Caucasian Americans. There was a significant difference in the scores for African Americans ($\bar{x} = .04$, $SE = .07$) and Caucasian Americans ($\bar{x} = .44$, $SE = .07$; $t(58) = -4.03$, $p = .000$, two-tailed). The magnitude of the differences in the means (mean difference = $-.4$, 95% CI: $-.598$ to $-.201$) was really large with Cohen's $d = 1.04$. Another independent samples t-test was conducted to compare the IAT scores for African Americans and Middle Eastern ($\bar{x} = .32$, $SE = .06$) participants. There was a significant difference in the scores for these groups as well with $t(58) = 2.88$, $p = .01$, two-tailed. The magnitude of the differences in the means (mean difference = $.278$, 95% CI: $.085$ to $.472$) was large with Cohen's $d = .74$. Effect size calculations were computed through the use of G*Power, which is freely available at <http://www.gpower.hhu.de/en.html>. A t-test conducted between Caucasian Americans and Middle Eastern participants yielded no significant differences in the means with a two-tailed $p = .19$. In general, given the extreme differences in the means between the two primary groups of interest, it is safe to say that each group had a central tendency to identify with their own respective race, even though the African American mean was slightly positive, indicating Caucasian American favorability.

The IAT was one measure utilized within this study as a way to describe group membership, and ensure that the three racial groups were not identical to one another with respect to implicit racial association. Another measure within this study was the HEXACO personality inventory. Somewhat like the IAT, the HEXACO was used to describe the characteristics of the racial groups involved, to ensure that in terms of personality expression one group was not significantly different from another, which could have a serious effect on video game play. To determine the reliability of the HEXACO measure a Chronbach's Alpha statistic was computed for the HEXACO dimensions, and internal reliability ranged from $.60$ to $.75$. This indicates that, statistically, there was an acceptable level of internal consistency for the personality constructs that make up the HEXACO model across participants independent of race.

This study also contained a manipulation check, which was located at the end of one of the psychological tests. The manipulation check contained the question "what race was your character within

the game (Circle one)” and then provided the two options of either White or Black. The purpose behind the manipulation check was to determine if the gamers were paying attention enough to state correctly which game character they were playing as during the study. This question returned a correct response from 96% of the participants in this study for identifying which character they played as during their game play. This indicates almost all of the game players were explicitly aware of the race of their character in world. The 4% who were incorrect were Middle Eastern, and evenly split between the White and Black gaming conditions. Since this occurred within the control variable, and was even for both conditions, the interpretation is that the response was not causing undue influence on the principle components within the Proteus analysis. Taken further, this demonstrated that the control group selected for inclusion was an excellent choice for this study. It could be that for those individuals, race was not an important artifact, explicitly, and due to this, there was a failure to recall racial information. This could also mean that their gameplay was least likely to contain explicit racial bias, also demonstrated in the IAT results by this group’s mean values falling between the other two racial groups.

Viewing and assessing participant gameplay was a central component of this study. When the scenario was setup and participants were completing forms, there were moments where the video game capture card was recording unnecessary data. Due to this, the first chunk of the recording was useless to the researcher because it contained nothing but the pause screen as participants were not yet engaged in the game. Therefore, all recorded game play was edited to remove the lengthy segments containing the pause screens both at the beginning of each video feed, and at the end of the free-roam game play. In all, each video contained 20 minutes of game play that was watched and rated by two different coders. These video coders (research assistants) were trained to use the Video Game Assessment Form (Appendix A) to rate the illegal, albeit digital, activities performed by the study participants (crimes committed within game play).

The El Gato Game Capture software allowed the research assistants to pause the video playback feature, as well as advance the video one frame at a time, for maximum clarity when assessing the more

chaotic elements of some participants' video game play. The game play activities were rated in accordance with the parameters for each crime listed in Appendix A, allowing the researcher to break crimes into the two categories of "crime against property" (CAPR) and "crime against people" (CAPE). The time for each video started when the participant pressed the Start button on the controller, and the screen changed from the in-game menu to the view depicted in Figure 2 (showing the gamers DA).

Six undergraduate students were paired in groups of two to review 30 videos each, for the complete collection of 90 videos. Each set of 30 videos was comprised of participant game play representing all racial identities (Caucasian American, African American, and Middle Eastern American. and both of the avatar conditions (White/Black) because the gamers were randomly assigned to an avatar when they entered the study. This means that roughly 15 hours (given pauses) of analysis was required for each reviewer, including the time during training they received. Because two coders were used for each video, there was a need to establish reliability of the video rating metrics. To do this, several Cohen's kappa analyses were run to determine if there was agreement between the two raters' judgements on their assigned participants' videos ($n = 30$). Table 1, below, contains the kappa values for each rater pair per crime assessed, and asterisks denote significance levels.

Table 1

Cohen's Kappa values for each rater group by crime category

	RaterGroup			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Arson	Group1**	Measure of Agreement	Kappa	.448	.094	5.861	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.360	.091	3.920	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.377	.097	7.007	.000
		N of Valid Cases		30			
Trespassing	Group1**	Measure of Agreement	Kappa	.525	.133	3.587	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.433	.121	3.447	.001
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.350	.121	3.318	.001
		N of Valid Cases		30			
Vandalism	Group1*	Measure of Agreement	Kappa	.051	.043	2.202	.028
		N of Valid Cases		30			
	Group2	Measure of Agreement	Kappa	-.015	.006	-.691	.489
		N of Valid Cases		30			
	Group3	Measure of Agreement	Kappa	.016	.032	.672	.502
		N of Valid Cases		30			
Theft	Group1**	Measure of Agreement	Kappa	.263	.105	3.261	.001
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.582	.105	6.942	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.264	.097	3.759	.000
		N of Valid Cases		30			
Murder/Manslaughter	Group1**	Measure of Agreement	Kappa	.164	.068	4.462	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.165	.072	4.481	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.106	.058	3.364	.001
		N of Valid Cases		30			
Assault/Battery	Group1**	Measure of Agreement	Kappa	.692	.105	6.371	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.440	.123	4.186	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.533	.101	6.324	.000
		N of Valid Cases		30			

Table 1 cont'd

	RaterGroup			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Robbery	Group1**	Measure of Agreement	Kappa	.395	.093	6.281	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.605	.099	8.060	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.320	.104	4.243	.000
		N of Valid Cases		30			
Stars	Group1**	Measure of Agreement	Kappa	.527	.091	9.987	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.627	.092	10.315	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.390	.093	7.892	.000
		N of Valid Cases		30			
Killed	Group1**	Measure of Agreement	Kappa	.527	.091	9.987	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.627	.092	10.315	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.390	.093	7.892	.000
		N of Valid Cases		30			
Animals	Group1**	Measure of Agreement	Kappa	.684	.176	4.461	.000
		N of Valid Cases		30			
	Group2**	Measure of Agreement	Kappa	.571	.213	3.741	.000
		N of Valid Cases		30			
	Group3**	Measure of Agreement	Kappa	.839	.157	4.655	.000
		N of Valid Cases		30			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. * Indicates interrater significance at the 0.05 level.

d. ** Indicates interrater significance at the 0.001 level.

In total, there was significant agreement across all rated categories except for “Vandalism.” Significance measurements (kappa) from the three teams, when ranked from least to most, ranged from .11 (slight agreement) to .84 (almost perfect agreement) across the ten rated categories. These high rates of agreement mean that an in-game action viewed and annotated by person A was also noticed and subsequently rated by person B, effectively strengthening the validity of the assessment for that particular crime.

The CAPR and CAPE values that were used within this study were the product of an average taken from the two raters for each participant on every one of the 12 categories that received ratings. The individual categories were subsequently grouped based on the nature of the crimes, with four (Murder/Manslaughter, Assault/Battery, Kidnapping, Robbery) assigned to CAPE and four (Arson, Trespassing, Vandalism, Theft) assigned to CAPR. The output of this process were two variables listed as CAPETOT and CAPRTOT which represent the total CAPE and CAPR (respectively) values for a given player. The values within these categories came from the average figures which were assessed by the raters for each gamer, and rounded up (as needed) to the next whole number.

Four rated assessments were not included in with the CAPE/CAPR superordinate categories, and those sub-categories were “Stars” (wanted stars obtained by the player), “Arrested” (number of times the player was arrested by in-game police), “Killed” (times in which the player died in game) and “Animals” (number of animals killed by the gamer). Cohen’s kappa was not conducted for “Kidnapping” because of the low frequency count of that crime within GTAV gameplay (n = 3 participants). Kappa was also not calculated for the category “Arrested” for exactly the same reason (n = 0 participants). Cohen’s kappa is reported for “stars,” “killed,” and “animals” in Table 1, above. An investigation of player race on the crimes committed leads the reader into the hypothesis testing results, as follows.

Hypothesis 1

A two-way, multivariate analysis of variance was conducted to investigate the role of player race on virtual crimes committed during game play. The independent variable for this hypothesis was race, and it contained three levels: Caucasian American, African American, and Middle Eastern participant (self-reported). The dependent variables in this analysis were the total crimes against people (CAPETOT) and total crimes against property (CAPRTOT) which contained respective crimes that were previously defined. Preliminary assumption testing was conducted to check for linearity, normality, univariate and multivariate outliers, and multicollinearity, with no serious violations noted. Preliminary assumption testing was also conducted for homogeneity of variance-covariance matrices, and a violation of the assumption occurred. There was a maximum Mahalanobis Distance of 21.624 reported in the general linear model output of SPSS with a maximum critical value of 13.82 given the number of dependent variables. Upon further review, one participant was solely responsible for this violation, however, the decision was not to transform the data because the score was not that far from the critical value score, and there were no other outliers. Multicollinearity testing revealed a significant correlation between the DVs at .70 ($p = .01$). A list containing the means and standard deviations of the groups involved is located in **Error! Reference source not found.**, below. Table 3 contains the source table of the analysis utilized for Hypothesis 1 and 2, and the interaction addressed in Hypothesis 3.

Table 2

*Means and Standard Deviations for the MANOVA within Hypothesis**1,2, & 3*

	PlayerRace	Avatar	Mean	Std. Deviation	N
CAPRTOT	MiddleEastern	Black	28.00	19.541	15
		White	32.47	24.911	15
		Total	30.23	22.115	30
	AfricanAmerican	Black	22.93	20.697	15
		White	58.13	31.055	15
		Total	40.53	31.509	30
	CaucasianAmerican	Black	60.60	50.111	15
		White	53.00	46.183	15
		Total	56.80	47.506	30
	Total	Black	37.18	36.629	45
		White	47.87	36.176	45
		Total	42.52	36.595	90
CAPETOT	MiddleEastern	Black	53.53	26.978	15
		White	48.40	28.687	15
		Total	50.97	27.486	30
	AfricanAmerican	Black	53.53	22.068	15
		White	79.40	35.472	15
		Total	66.47	31.868	30
	CaucasianAmerican	Black	68.87	31.450	15
		White	81.33	40.952	15
		Total	75.10	36.433	30
	Total	Black	58.64	27.472	45
		White	69.71	37.798	45
		Total	64.18	33.323	90

Table 3

Tests of Between-Subjects Effects for the MANOVA for Hypotheses 1-3

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^c
Corrected Model	CAPRTOT	20640.456 ^a	5	4128.091	3.519	.006	.173	17.593	.900
	CAPETOT	15353.422 ^b	5	3070.684	3.090	.013	.155	15.451	.852
Intercept	CAPRTOT	162732.544	1	162732.544	138.709	.000	.623	138.709	1.000
	CAPETOT	370690.844	1	370690.844	373.037	.000	.816	373.037	1.000
Race	CAPRTOT	10764.822	2	5382.411	4.588	.013	.098	9.176	.763
	CAPETOT	8972.022	2	4486.011	4.514	.014	.097	9.029	.756
Avatar	CAPRTOT	2570.678	1	2570.678	2.191	.143	.025	2.191	.310
	CAPETOT	2755.600	1	2755.600	2.773	.100	.032	2.773	.377
Race * Avatar	CAPRTOT	7304.956	2	3652.478	3.113	.050	.069	6.227	.585
	CAPETOT	3625.800	2	1812.900	1.824	.168	.042	3.649	.371
Error	CAPRTOT	98548.000	84	1173.190					
	CAPETOT	83471.733	84	993.711					
Total	CAPRTOT	281921.000	90						
	CAPETOT	469516.000	90						
Corrected Total	CAPRTOT	119188.456	89						
	CAPETOT	98825.156	89						

a. R Squared = .173 (Adjusted R Squared = .124)

b. R Squared = .155 (Adjusted R Squared = .105)

c. Computed using alpha = .05

Also included is Figure 4, located below, which contains a visual depiction of the means contained within Table 2. A visual inspection of this figure shows that the means are higher for the CAPETOT categorical variables compared to CAPRTOT. In addition, Middle Eastern participants appeared to generate fewer crimes than the African American and Caucasian American participants in both categories did. With the use of a Wilks' criterion, multivariate tests showed the combined DVs were significantly affected by Race $F(4, 166) = 2.86, p = .03$; Wilks' Lambda = .88; partial $\eta^2 = .06$, observed power = .77.

Univariate testing indicated an effect for Race and CAPRTOT $F(2, 84) = 4.59, p = .01$; partial $\eta^2 = .10$, observed power = .76, as well as Race and CAPETOT $F(2, 84) = 4.51, p = .01$; partial $\eta^2 = .10$,

observed power = .76. Pairwise comparisons yielded significant differences in CAPRTOT scores between Middle Eastern and Caucasian American participants ($p = .004$), and differences in CAPETOT scores between Middle Eastern and Caucasian American participants ($p = .004$). In both cases, Caucasian American participants had significantly higher counts of in-game crimes than Middle Eastern participants did. Caucasian Americans and African Americans were not significantly different from one another. Thus, support for the alternative hypothesis was observed: that some fundamental differences exist in gamer performance based on player race. The following analysis explores differences in the DAs, to see if they could explain some of the performance differences uncovered between Middle Eastern and Caucasian American gamers.

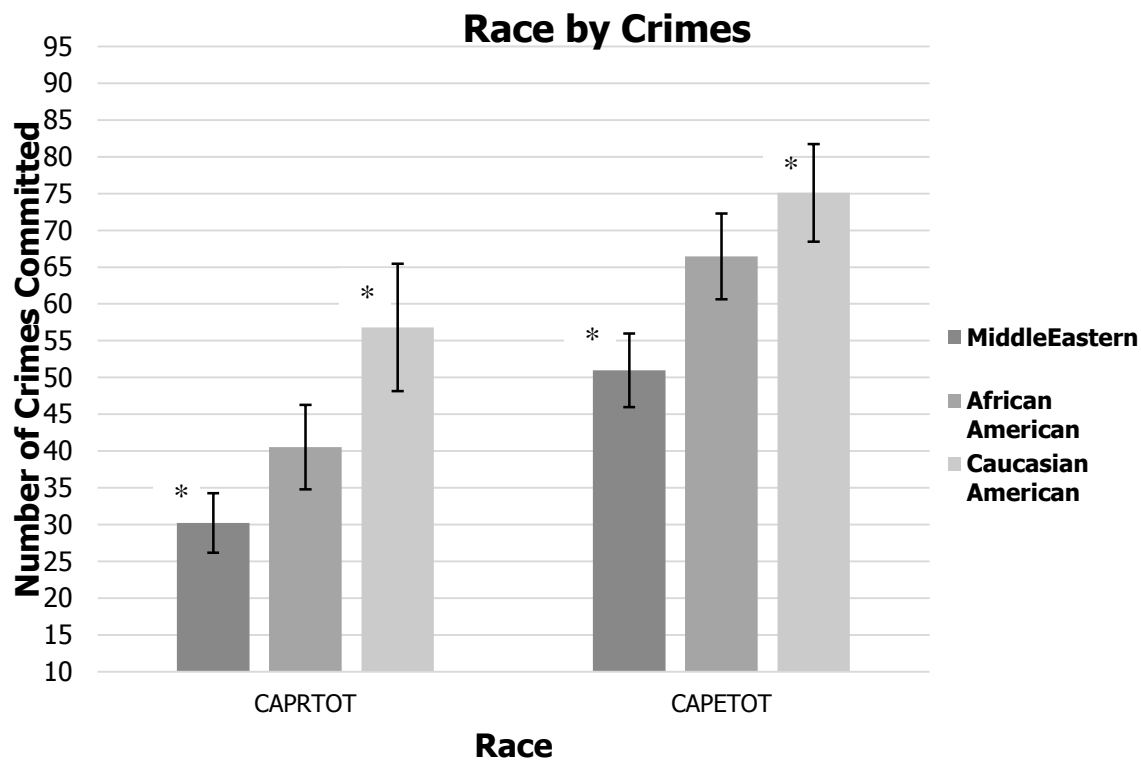


Figure 4. A figure depicting the means and standard error by race involved in Hypothesis 1, separated by criminal categories. Significant differences within crime categories are marked with *.

Hypothesis 2

An investigation of hypothesis 2 was accomplished using a MANOVA to analyze potential differences between the independent variables of White and Black video game digital actors (DAs) in an effort to determine if the DAs provided quantitative differences in game play. Crimes committed against people (CAPETOT) and crimes committed against property (CAPRTOT) were the dependent variables in this analysis. The means and standard deviations of the crimes committed based on their respective DA groups can be found above, in Table 2.

Alpha level determining significance for hypothesis 2 was set at .05, and no significance was present. The multivariate test for DA condition (White/Black) yielded $F(2, 83) = 1.48, p = .233$; with a Wilks' Lambda = .97; partial $\eta^2 = .04$; observed power = .31. Thus, Hypothesis 2 was not supported.

Hypothesis 3

In order to investigate the Proteus effect that states that player behavior is influenced by avatar appearance, the interaction between player race and avatar race was investigated. The three (Race: Middle Eastern, African American, and Caucasian American) by two (Avatar: White and Black) multivariate analysis of variance was analyzed to investigate the role of skin congruence on crimes committed within game play. The dependent variables in this analysis were those of CAPRTOT and CAPETOT. Preliminary assumption testing was conducted to check for linearity, normality, univariate and multivariate outliers, multicollinearity, and homogeneity of variance-covariance matrices with no serious violations noted, or in the case of outliers, addressed as they were in Hypothesis 1.

Figure 5 contains a means plot for CAPRTOT depicting the relationship between gamer races and their assigned avatar condition. Figure 6 contains a means plot for CAPETOT, also depicting the relationship between gamer races and avatar condition. Both figures are located below.

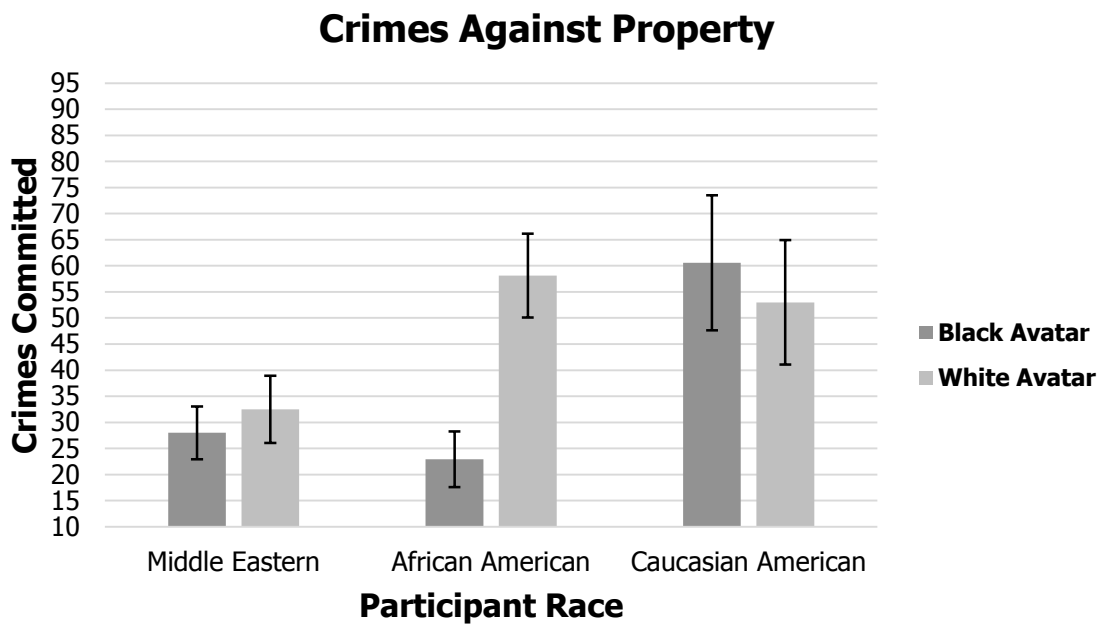


Figure 5. Means and standard error plot displaying the Avatar by Race interaction within Crimes against Property.

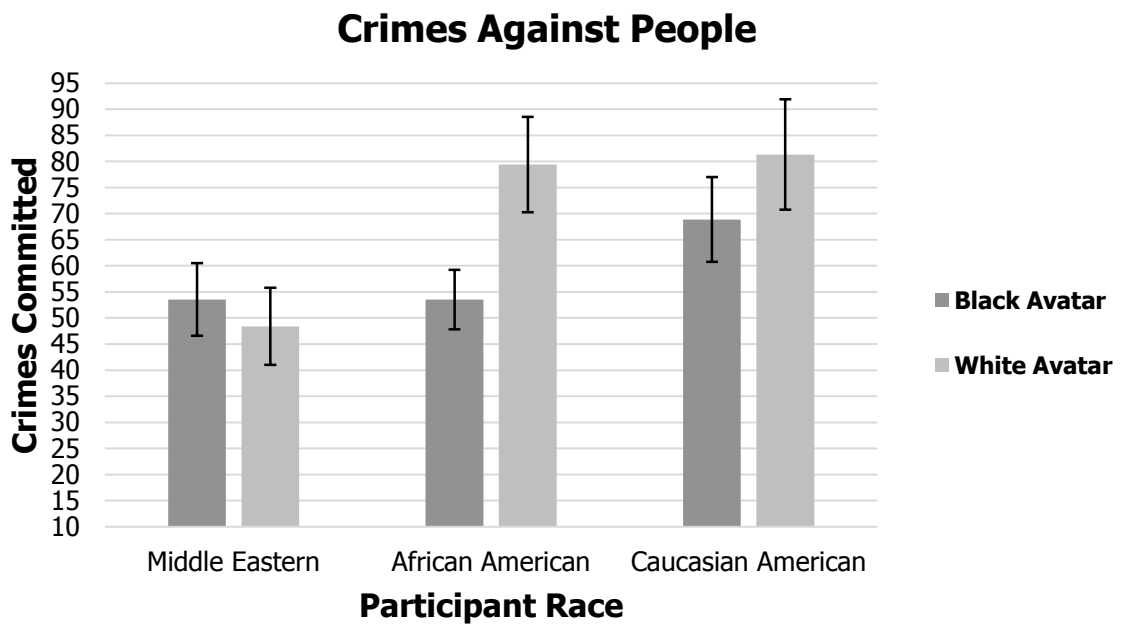


Figure 6. Means and standard error plot displaying the Avatar by Race relationships within Crimes against People.

Table 4

Post hoc pairwise comparisons for the race by avatar interaction.

Dependent Variable	Race	(I) Avatar	(J) Avatar	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
							Lower Bound	Upper Bound
CAPRTOT	MiddleEastern	Black	White	-4.467	12.507	.722	-29.338	20.405
		White	Black	4.467	12.507	.722	-20.405	29.338
	AfricanAmerican	Black	White	-35.200*	12.507	.006	-60.072	-10.328
		White	Black	35.200*	12.507	.006	10.328	60.072
	CaucasianAmerican	Black	White	7.600	12.507	.545	-17.272	32.472
		White	Black	-7.600	12.507	.545	-32.472	17.272
CAPETOT	MiddleEastern	Black	White	5.133	11.511	.657	-17.757	28.024
		White	Black	-5.133	11.511	.657	-28.024	17.757
	AfricanAmerican	Black	White	-25.867*	11.511	.027	-48.757	-2.976
		White	Black	25.867*	11.511	.027	2.976	48.757
	CaucasianAmerican	Black	White	-12.467	11.511	.282	-35.357	10.424
		White	Black	12.467	11.511	.282	-10.424	35.357

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Taken together, partial support exists to confirm the third hypothesis. With support for the Proteus effect confirmed for African American gamers, it was necessary to look at the role that personality may play within the races, as gameplay could have been modified by personality. To reiterate, much research had been conducted on personality and the dimensions of it, what those dimensions consist of, and in many studies, scientists often report that examining racial differences within personality should be explored next.

Hypothesis 4

This analysis contained six analysis of variance (ANOVA) tests in total. Each analysis is a one-way ANOVA looking at the three races and each one of the six subscales within the HEXACO personality inventory to determine if any race (of the three participant races involved within this study) was statistically different from the other races for these personality scales. The alpha level determining significance for hypothesis 4 was set at .01. Table 5, below, contains the means, standard deviations, and minimum and maximum values for each of the three races across the six primary personality facets.

Table 5

Descriptive Statistics for Each HEXACO Facet by Race

	Race		Statistic	Std. Error
Hon_Hum	MiddleEastern	Mean	50.80	1.884
		Std. Deviation	10.320	
		Minimum	34	
		Maximum	72	
	AfricanAmerican	Mean	52.17	1.853
		Std. Deviation	10.151	
		Minimum	34	
		Maximum	73	
	CaucasianAmerican	Mean	50.00	1.828
		Std. Deviation	10.010	
		Minimum	33	
		Maximum	69	
Emotionality	MiddleEastern	Mean	45.97	1.475
		Std. Deviation	8.079	
		Minimum	30	
		Maximum	65	
	AfricanAmerican	Mean	45.90	1.539
		Std. Deviation	8.430	
		Minimum	31	
		Maximum	63	
	CaucasianAmerican	Mean	45.10	1.870
		Std. Deviation	10.240	
		Minimum	29	
		Maximum	68	
Extraversion	MiddleEastern	Mean	56.87	1.251
		Std. Deviation	6.852	
		Minimum	46	
		Maximum	72	
	AfricanAmerican	Mean	57.13	1.511
		Std. Deviation	8.274	
		Minimum	42	
		Maximum	76	
	CaucasianAmerican	Mean	55.13	1.841
		Std. Deviation	10.085	

		Minimum	32	
		Maximum	73	
Agreeableness	MiddleEastern	Mean	51.77	1.550
		Std. Deviation	8.488	
		Minimum	29	
		Maximum	67	
	AfricanAmerican	Mean	50.97	1.646
		Std. Deviation	9.015	
		Minimum	35	
		Maximum	72	
	CaucasianAmerican	Mean	46.57	1.893
		Std. Deviation	10.368	
		Minimum	31	
		Maximum	69	
Conscientiousness	MiddleEastern	Mean	58.47	1.105
		Std. Deviation	6.050	
		Minimum	47	
		Maximum	69	
	AfricanAmerican	Mean	57.33	1.276
		Std. Deviation	6.989	
		Minimum	43	
		Maximum	75	
	CaucasianAmerican	Mean	59.53	1.576
		Std. Deviation	8.633	
		Minimum	34	
		Maximum	74	
Openness_Experience	MiddleEastern	Mean	53.37	1.623
		Std. Deviation	8.892	
		Minimum	32	
		Maximum	73	
	AfricanAmerican	Mean	55.47	1.525
		Std. Deviation	8.353	
		Minimum	38	
		Maximum	71	
	CaucasianAmerican	Mean	54.63	1.486
		Std. Deviation	8.139	
		Minimum	36	
		Maximum	66	

When looking at each of the six ANOVAs that were conducted, no significant relationships were found. Honesty-Humility is composed of four additional subscales of Sincerity, Fairness, Greed-avoidance, and Modesty. Honesty-Humility was nonsignificant ($p = .71$), as Table 6, below, shows.

Table 6

Between-Subjects Effects tests for the ANOVA conducted on Honesty-Humility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	72.022 ^a	2	36.011	.349	.707	.008
Intercept	233988.011	1	233988.011	2266.173	.000	.963
Race	72.022	2	36.011	.349	.707	.008
Error	8982.967	87	103.252			
Total	243043.000	90				
Corrected Total	9054.989	89				

a. R Squared = .008 (Adjusted R Squared = -.015)

Emotionality ($p = .92$) had the same, non-significant outcome, and is depicted below in Table 7. The Emotionality construct contains the Fearfulness, Anxiety, Dependence, and Sentimentality subscales within the HEXACO personality model.

Table 7

Between-Subjects Effects tests for the ANOVA conducted on Emotionality

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	13.956 ^a	2	6.978	.087	.917	.002
Intercept	187598.678	1	187598.678	2333.461	.000	.964
Race	13.956	2	6.978	.087	.917	.002
Error	6994.367	87	80.395			
Total	194607.000	90				
Corrected Total	7008.322	89				

a. R Squared = .002 (Adjusted R Squared = -.021)

Extraversion was also non-significant ($p = .62$). Extraversion contains the subscales of Social Self-esteem, Social Boldness, Sociability, and Liveliness. The results of the ANOVA that was conducted on Extraversion can be found below in Table 8.

Table 8

Between-Subjects Effects tests for the ANOVA conducted on Extraversion

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	70.756 ^a	2	35.378	.489	.615	.011
Intercept	286060.844	1	286060.844	3952.623	.000	.978
Race	70.756	2	35.378	.489	.615	.011
Error	6296.400	87	72.372			
Total	292428.000	90				
Corrected Total	6367.156	89				

a. R Squared = .011 (Adjusted R Squared = -.012)

The closest facet to approaching significance was that of Agreeableness. The means for Agreeableness listed in ascending order: Caucasian American ($m = 46.56$), African American ($m = 50.97$), and Middle Eastern ($m = 51.77$), $p = .072$. Agreeableness is comprised of the Forgiveness, Gentleness, Flexibility, and Patience subscales, and the ANOVA results can be viewed below in Table 9.

Table 9

Between-Subjects Effects tests for the ANOVA conducted on Agreeableness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	470.400 ^a	2	235.200	2.705	.072	.059
Intercept	222904.900	1	222904.900	2563.921	.000	.967
Race	470.400	2	235.200	2.705	.072	.059
Error	7563.700	87	86.939			
Total	230939.000	90				
Corrected Total	8034.100	89				

a. R Squared = .059 (Adjusted R Squared = .037)

Conscientiousness ($p = .51$) was also non-significant. Conscientiousness contains the subscales of Organization, Diligence, Perfectionism, and Prudence. The results of the ANOVA conducted on the Conscientiousness personality factor can be viewed below in Table 10.

Table 10

Between-Subjects Effects tests for the ANOVA conducted on Conscientiousness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	72.622 ^a	2	36.311	.681	.509	.015
Intercept	307417.778	1	307417.778	5764.580	.000	.985
Race	72.622	2	36.311	.681	.509	.015
Error	4639.600	87	53.329			
Total	312130.000	90				
Corrected Total	4712.222	89				

a. R Squared = .015 (Adjusted R Squared = -.007)

Openness to Experience was also non-significant ($p = .63$). This category contains the Aesthetic Appreciation, Inquisitiveness, Creativity and Unconventionality subscales. The between-subjects effects table for the ANOVA that was conducted can be found below in Table 11.

Table 11

Between-Subjects Effects tests for the ANOVA conducted on Openness to Experience

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	67.089 ^a	2	33.544	.468	.628	.011
Intercept	267213.511	1	267213.511	3727.126	.000	.977
Race	67.089	2	33.544	.468	.628	.011
Error	6237.400	87	71.694			
Total	273518.000	90				
Corrected Total	6304.489	89				

a. R Squared = .011 (Adjusted R Squared = -.012)

Accordingly, support for the null hypothesis was upheld as there were no fundamental differences between the races and personality constructs involved. In the first hypothesis, we saw that race was related to crimes – that different races played the game *differently*. This hypothesis has shown that personality is not different among the races involved as measured by the HEXACO scales. The next analysis will make an attempt to determine if a specific personality feature (that of Honesty-Humility) is related to a crime type, notwithstanding the race of the gamer.

Hypothesis 5

Analysis of Hypothesis 5 involved using two standard regression analyses to explore the relationship between the Honesty-Humility subscale of the HEXACO model as the independent variable, and the crimes committed within the game (CAPETOT and CAPRTOT) as the dependent variables. It was expected that there would be a strong correlation between the low scores of Honesty-Humility as captured by the HEXACO personality inventory, and the deviant behaviors (crimes committed) captured within this study. The Pearson correlation was used to analyze the relationship in hypothesis 5, with an alpha level set at .05.

The first standard regression model looked at the relationship between the personality facet of Honesty-Humility as the independent variable and CAPETOT as the dependent variable. No cases had missing data, and there was one univariate outlier. Cook's Distance maximum value was .124, so the solitary outlier did not have an influence on the rest of the regression model. Linearity and Multicollinearity were non-issues as the tolerance and variance inflation factor values were both 1, and the P-P plot did not show extraneous scores. R for regression was not significantly different from zero, $F(1, 88) = .693, p = .407$. The R^2 value is .01, suggesting that virtually no variability in CAPETOT was predicted by honesty-humility. The regression line for CAPETOT, along with its equation and a depiction of the 95% confidence interval can be viewed below in Figure 7.

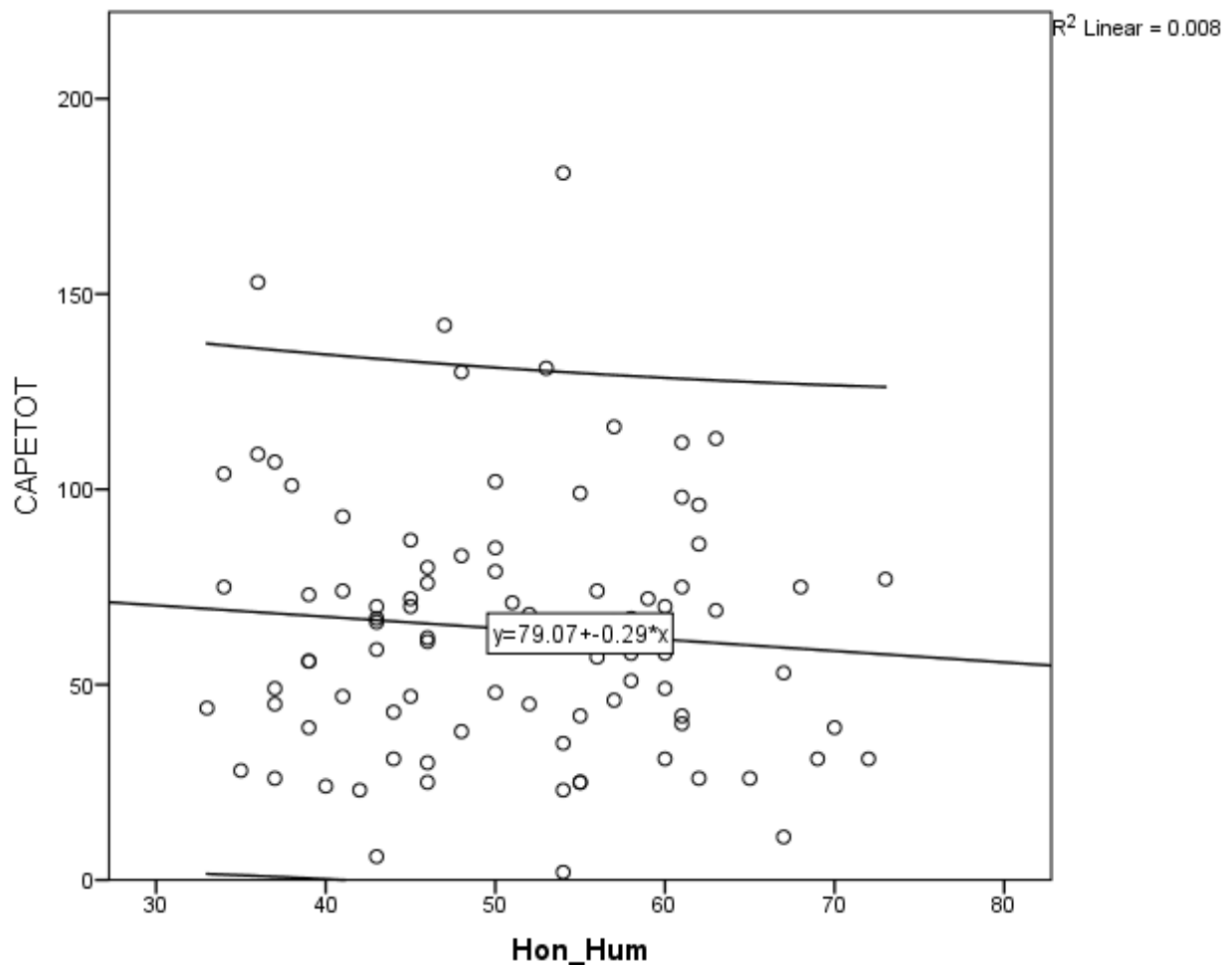


Figure 7. A visual depiction of the regression line, its equation and the 95% confidence interval for crimes against people with respect to Honesty-Humility.

The second standard regression model looked at the Honesty-Humility personality facet as an independent variable, and CAPRTOT as the dependent variable. No cases had missing data, and two cases were univariate outliers; Cooks' Distance maximum value was .223, suggesting the outliers did not present a problem (undue influence) on the results for the regression model. Multicollinearity was not an issue with only one IV entering the regression model; Tolerance and variance inflation factor values are 1. R for regression was significantly different from zero, $F(1, 88) = 5.1, p = .026$ with R^2 at .06 and 95% confidence limits from 47 to 125. The size and direction of the significant relationship between Honesty-Humility and CAPR indicates that for individuals scoring high in Honesty-Humility, fewer crimes against property were committed during their 20 minutes of game play. Figure 8, below, contains the equation of the regression line along with the 95% confidence interval for CAPRTOT.

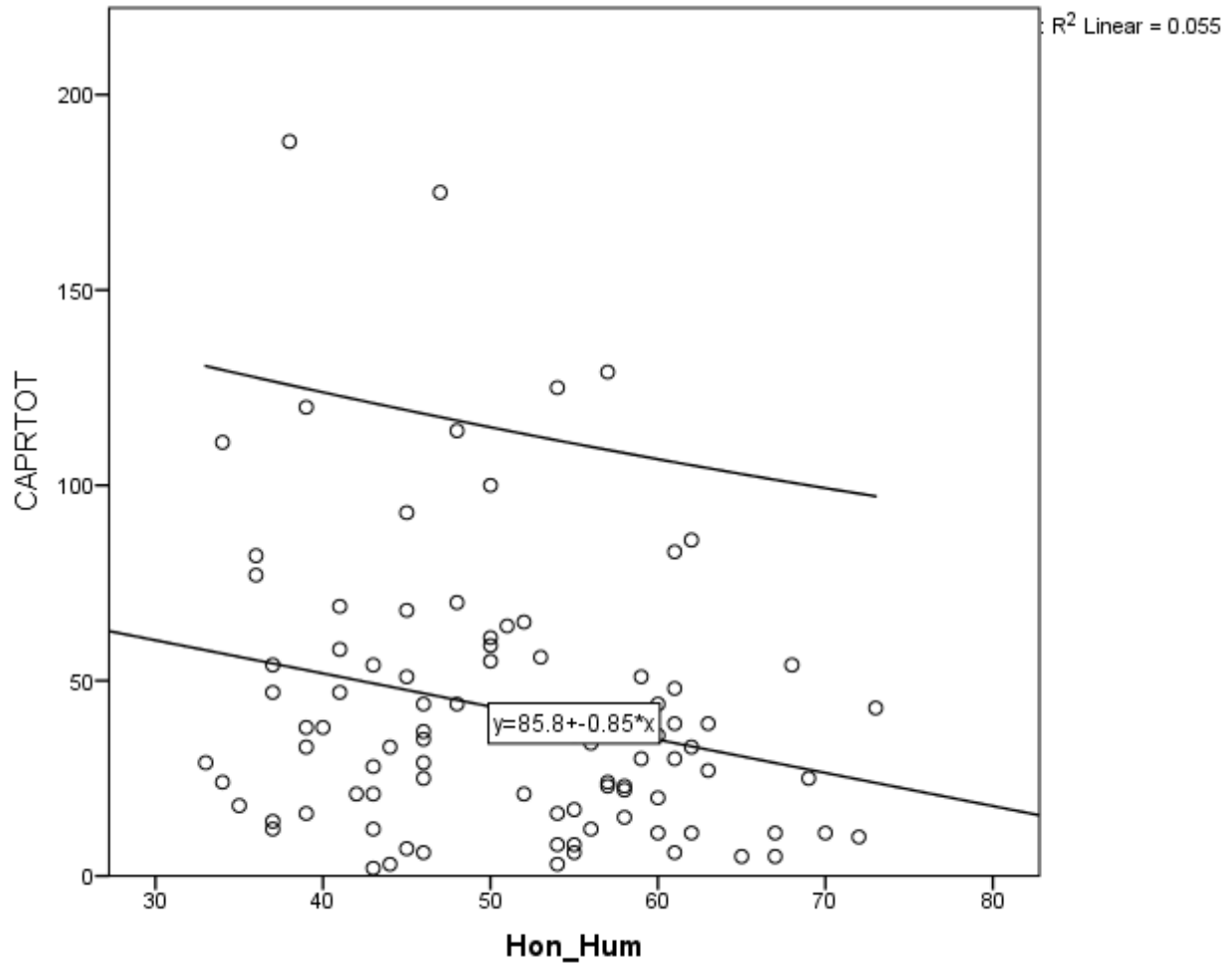


Figure 8. A visual depiction of the regression line, its equation and the 95% confidence interval for crimes against people with respect to Honesty-Humility.

Altogether, the Honesty-Humility personality facet predicted 6% of the variability in crimes committed against people. Therefore, support for the third hypothesis, in favor of the alternative, was partially confirmed.

Discussion

The IAT appears to depict three distinct means representing the races involved within this study. It appears to describe the populations represented as favoring “White American – Good” and “Black

American – Bad” for all three races, especially considering their mean IAT values are above zero. As the literature review covered, arguably this IAT is the best measure available to quantify a participant’s implicit association with respect to race in favor over another. The results of this IAT are not surprising, and conform to existing literature especially in terms of African American performance which implicates anti-Black bias among Blacks (Stepanikova et al., 2011). Discussion of the interpretations, limitations, and findings from the 5 hypotheses that were analyzed in this project are discussed in the following sections which also addresses key constituents within this study. These components focus on the law, the gameplay, the Proteus effect and its discovery, and conclude with a discussion of personality.

Law

Country of origin was not accounted for within this study. This was a limitation only in that data was not captured for the number of African (American or otherwise) or Caucasian American participants coming from Africa, or Europe (respectively). Not knowing these figures slightly undermines construct validity for the self-identified groups within this study. Moreover, for the Middle Eastern category, many participants came from various places such as Saudi Arabia, Israel, India, and Egypt: places known for their differing intra-country cultures in addition to oftentimes-dissimilar tolerances and expectations for societal behavior and daily values. However, as country of origin was not a primary focus, it is easy to say that while having the information would be nice it really does not matter unless there are fundamental differences in legalities associated with these countries. These differences must be related to the study, and none were identified other than time spent under U.S. legal jurisdiction.

Time spent under U.S. law was not annotated within this study. This could have been a confounding variable primarily for the Middle Eastern participants, and the extent to which it really matters is speculative, at best. Especially since the racial groups of central focus were primarily made up of members born and raised within the United States. Driving on the right hand side of the road, and stopping at stop signs are not a requirement within game play (nor is staying on the road), and driving

deviations were not counted or accounted for. Research alludes to driving behavioral differences between rural and urban participants based on a number of factors, which summate to what could easily be described as cultural differences (Eiksund, 2009; Nordfjærner et al., 2010). Knowing that city drivers differ in driving behaviors when compared to rural drivers would attest to these cultural differences in much the same way that a Caribbean driver would differ from a European driver. The only driving crimes that were counted in this study were contained within an unknown percentage of the vandalism crimes, a category that was comprised of counts of damaged vehicles resulting from gunfire in addition to horrible driving examples.

Gameplay

In terms of game play, there is a possibility that the category “crimes against people” was unfairly balanced within this game as opposed to Grand Theft Auto IV, which was the game used to develop the crime variables. As previously mentioned, police are more aggressive within GTAV than they were in GTAIV. Also, “Kidnapping” charges were considerably lower within this game as opposed to its predecessor (Via, 2014). The reason kidnapping counts are drastically lower is that the NPCs which are riding as passengers pretty much bail out of any vehicle while the gamer is robbing the NPC driver. In GTAIV, this process was not as automatic as the scripting in GTAV appears to play out.

As far as coding and rating gameplay is concerned, the assessment values for the category “Vandalism,” which is nested within CAPR, provided the lowest and most non-significant outcome for the Cohen’s Kappa values. Quite literally, every other category contained significant Cohen’s kappa scores with the exception of Vandalism, which could explain some of the high counts, or in-game violations, across the board for this category. In the end, Vandalism counts appear to be fairly even across the 3 main races, even though the kappa values were low, they were low for two thirds of the rater pairs, as can be viewed in Table 1, above. Had this not been the case, the extent to which the “true” values matter is completely debatable. The origin of the issues with the count stem from the raters

themselves. A number of varying factors such as rater compensation (or lack, thereof), boredom, fatigue, and possibly general disinterest could have modified the variable count along with the display used (laptop, television, desktop) to make the rating. Watching 30 videos, which take a minimum of 20 minutes each, can be an onerous task. These issues could easily be exacerbated by display type, a variable that likely could have been a primary culprit in the variable count discrepancy issue. Due to display type, the rater may not have been able to view all possible damage accrued while observing the game play. All trainers received the same message for rating, and the same rating sheets. All trainers viewed at least 4 videos with a trainer (2-3 of which were consecutive) before being allowed to code on their own, and after they rated a couple, they came back to code 1-2 more with supervision to ensure their performance was up to the par with the requirements. One action, which would help to alleviate this ambiguity issue, would be to incorporate the use of the third rater, and analyze the results with Fleiss' kappa. With the addition of a third video rater, the quantitative values, which a third individual could provide would likely supply a greater amount of collinearity, bolstering construct coherence and, by extension, validity. Of course, if the raters used were senior undergraduate students, primarily applied psychology majors, or had been involved in other research projects (at a minimum) then there is a possibility that internal validity would be greatly improved. In the future, it would be nice to consider reaching out to criminal justice or police academy students or graduates for assistance in rating the videos. These individuals would likely have a deeper, familiar understanding of which actions are being considered for rating and why. In doing so, these raters could receive an introduction into stereotype formations and beliefs using a modern medium, which would likely cause them to challenge their own beliefs.

Stereotypes were a key component involved in the game play for this study. Of course, the characters were dressed in clothes that were close to "neutral" as possible. Clothes that were not extraordinarily baggy or otherwise stereotypical for the ethnicities involved. The game designers did not make this easy, however, because the available clothing options were not identical for the characters

within the game. For example, the character Trevor can purchase a dress, or run around within the game in a pair of white underwear, whereas neither the dress nor the underwear is an option for character attire for the other two protagonists selected for inclusion within this study. Of course, this extends out from clothing style (jeans, saggy or fitted) to accessories such as footwear (boots or sneakers), sunglasses, hats, and hairstyles for all three characters. Clothing use within the game is a great way for the game developers to elicit feelings of stereotypes and assign stereotype attributions to the DAs.

Due to the results in the interaction of Hypothesis 3, it clearly looks as though stereotypes played their part in the behavior of the participants as well, especially in terms of the crimes they committed. This lends credence to the existence of the Proteus effect within the console video game. The fact that African American gamers within this study committed significantly more crimes while playing as the White character than they did as the Black character demonstrates this while this reversal was not significantly different for White or Middle Eastern players based on their DA appearance, it still strengthens the argument that stereotypes really are at play when we play. The fact that there were next-to-no differences between the avatar conditions for the Middle Eastern control group also shows the existence of the Proteus effect, because those individuals didn't conform to the same gameplay means as the Caucasian American participants. This non-conformity for Middle Eastern participants most likely originates from the fact that they themselves do not identify as either White or Black. When looking at Figures 5 and 6, it appears as though the gameplay means for the crimes committed by Middle Eastern participants does not align well with either the African American or the Caucasian American groups. For example, Middle Eastern CAPE means were greater for the Black than the White DA, the opposite of the African American and Caucasian American groups. Moreover, the CAPR values of the Middle Eastern group indicate that they were smaller for the Black as opposed to the White DA, which is in line with the African American group, but not the Caucasian American group.

The Proteus Effect

Hypothesis 3 addressed the Proteus effect by investigating the race by avatar interaction on the dependent variables of the superordinate crime categories committed in gameplay, yielding significance. The interaction found in the Proteus effect analysis shows that DA assignment is significantly different within the African American racial group while this effect was not seen in the other two race conditions.

Post hoc comparisons returned significant differences for CAPRTOT and CAPETOT in African American gamers between White & Black conditions. Upon further review of the data, it appears African Americans playing as White committed more crimes than African Americans playing as Black within the categories of Assault/Battery, Theft, Murder/Manslaughter, Trespassing, Vandalism, and Arson.

Caucasian Americans playing as Black outperformed Caucasian Americans playing as White in the categories Murder/Manslaughter, Assault/Battery, and Robbery. Anecdotally, these crimes appear to allude to negative, racial stereotypes that Caucasian Americans have toward African Americans, which alludes to enhancing evidence of the Proteus effect's existence within console game play (Lee, 2013).

The fascinating part pertaining to the scores lie in the performance of these groups when playing in the race incongruent configurations. With this in mind, it is worthwhile to point out that while all modern literature points to the Middle Eastern population to identify them as "White" their performance suggests otherwise. If the Middle Eastern population actually identified as White, the Proteus effect likely would be revealed in their performance, as there potentially would have been statistical significance between the crimes those participants could have committed while playing as Black and those committed while playing as White had this have been the case. Due to the actual lack of significance, and the mean values for crimes committed in game play for the Middle Eastern group's performance, it is safe to say that their game play was fairly even in terms of crime counts for both DA conditions. This is especially true when compared to the results of the African American and Caucasian American gamers as depicted in Figure 4, above. That said, it appears the Middle Eastern gamers do not relate to the White or Black game character; in fact, the one crime category they appeared to excel in was Robbery. Middle Eastern

participants had the highest group mean when committing robbery with the Black character, and their robbery mean with the White character was higher than the other two races were within that condition (White character) as well. This suggests that the Middle Eastern gamers appeared to be taking vehicles within the game at a higher percentage than the two races in an effort to get from one place to another within the game. The lack of a difference in this group for most crimes also speaks well towards the choice to utilize them as a control group within the study.

One question stemming from the Proteus analysis is, “Why did the African American gamers have higher criminal means with the White character as opposed to the Black?” An acceptable explanation would be that it is the Proteus effect playing out within their game play. Simply put, that the different results stem from the stereotypes associated with the characters. The White character, Michael, is in his mid-to late 40s and he has every stereotypical making of a “white, privileged” individual. Michael has a rather large, lavish home with a tennis court and swimming pool, and his persona appears to be that of a “typical” affluent, married, middle-aged White male. This stands in stark contrast to that of Franklin, who is a Black, mid-20s man living in his aunt’s home. Franklin’s home, neighborhood, and friends are all people you would expect to see had that place been a digital sample of reality. While the story line introduces this information, and the vast majority of the gamers did not expose themselves to the story, the fact is that all of the gamers indicated familiarity with the game. All of the gamers had previous experiences playing GTAV, so prior exposure could have played a part in the game, though the effects of this prior exposure is unknown. One thing is for certain, that the game’s aesthetics, design, and attention to detail served so well as a digital representation of reality that the Proteus effect was observed within participant game play. However, a second possible explanation is that the race of the experimenter (white male) might have also influenced these results. While efforts were made to minimize any influence this might also explain why only the African American group was affected.

The interaction viewed in the Proteus effect analysis suggests that African American players are more influenced by their DA, while the effect of the DA on Middle Eastern and Caucasian American

participants remained relatively similar. If the race of the agent is ignored, however, the main effect for race found in this study appears to be largely due to the significant performance difference between the Middle Eastern and Caucasian American groups. Through the analysis of player race and crimes, it was discovered that race and CAPRTOT had differences, and pairwise comparisons yielded information that differences existed between Middle Eastern and Caucasian American participants for this criminal category. The analysis also yielded racial differences in CAPETOT, and pairwise comparisons yielded significant differences between Middle Eastern and Caucasian American participants for this criminal category as well.

When attempting to understand the nature of the means for CAPE and CAPR, all crimes were averaged by category for each participant between Rater A and Rater B, collapsing values through the three different rater sets. Two pie graphs were built for CAPE and CAPR, and can be viewed below as Figure 9 and Figure 10, respectively. It looks like the percentage counts within the overall categories were approximately similar as far as crime load is concerned. The similarity in the crime pie graphs alludes to high construct validity for the behavioral assessments.

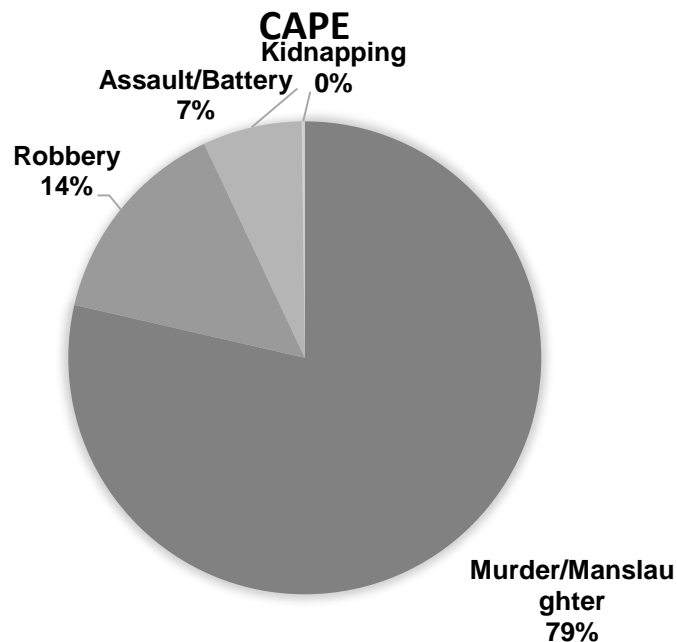


Figure 9. A pie graph depicting the composition of crimes against people within gameplay.

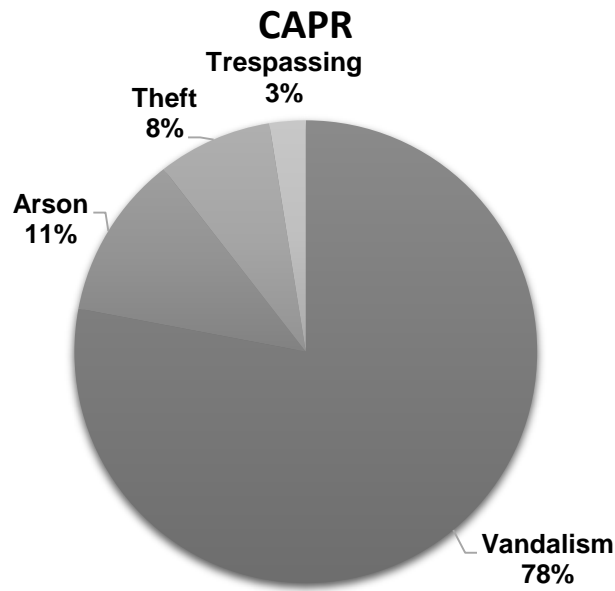


Figure 10. A pie graph depicting the composition of crimes against property within gameplay.

Though participants were instructed to play as they would play if they were at home, the laboratory setting with its limited gaming time did not offer much in terms of construct validity for the gamers. The participants did not receive instructions to “advance the storyline” or “continue the game” so for a majority of the gamers, there was nothing better for them to do other than cause damage and try to “have fun” with the game for the time they had in the lab. It is a strong possibility that the observed differences between the races comes primarily from identification, or in the following example, a lack thereof. The central premise of this study involved the Proteus effect, and based on the means depicted for Middle Eastern gamers within Figure 5 and Figure 6, it is possible that Middle Eastern gamers did not specifically identify as neither White nor Black. Because of this, their criminal means were visually similar between the two primary criminal categories, suggesting gameplay that was extreme especially when compared to the other racial groups.

As far as intra categorical crime counts are concerned, the data shows that African Americans playing as White had a higher mean for “arson” and “trespassing” than any other group did. Middle Eastern players committed more assault than the African Americans did, indicating that there were racial variations within the crimes committed that did not speak to the overall categorizations (CAPE and

CAPR) which were analyzed for this hypothesis. Culture could account for these variations within gameplay, but the extent of the role of culture within the crimes committed is largely unknown and speculative at best. Another similar examination of crimes either through a replication or through a secondary, yet comparable study would be best to provide more data points, and explain some of the potential artifacts within the crimes committed in the game play.

One way to attempt to control for the criminal opportunities would be to design a scenario for gamers to play on a PC. Another way to control the criminal opportunities within this console game would have been to start participants at the end. With the entire story line played out, this would have forced all of the participants to “explore” a game that had no missions, and no primary or secondary objectives. Unfortunately, without these objectives, it is nigh impossible to convince participants to “game how they would at home” when the game is already completed. The fear is that doing so would have massively hyper-inflated criminal counts.

Speculating on this given my insight of the game play, it is safe to say that in all probability the White character had the highest crime counts because gamers playing as the White character made more mission attempts (anecdotally, as this was not officially tallied) than gamers playing as the Black character. The relevance in playing the storyline as opposed to actually roaming the map could very well be a function of a racist stereotype at play, that White people are more inclined to follow the rules than Black people. Missions were most assuredly available for both characters to play, in an effort to advance the story line should the participant have selected to do so. Unfortunately, the nature and content of those missions were not entirely similar.

It is interesting to note that if the crimes are collapsed across three races, there is no effect of the DA alone as outlined in Hypothesis 2. The result of the investigation of the DA as a main effect indicated that there were no significant differences in gameplay given the conditional assignment of either the White (Michael) or Black (Franklin) digital actor within the video game GTAV, when collapsed across the races. With that said, it appears that there is no support for the argument that one DA supposedly

“lead” the participants within this study to characteristically differ their game play because of the conditional assignment of the DA except for the African American group. For example, one argument is that given the starting point of the game play, whether geographically within the game or temporally within the storyline, there may have been a chance that one DA could lead a gamer to play the storyline whereas the other DA would lead a gamer to not play the story line. In-game opportunities such as main missions and side missions could lead one DA to have fundamental differences within in-game behaviors solely based on the opportunities available to gamers within their 20 minutes of game play. Again, there were no significant differences between the criminal outcomes of the selected DAs when you collapse across the 3 races within this study. While it can be ruled out that one DA provided slightly more criminally favorable opportunities over the other, there is some statistical support coming from the interaction of the Proteus effect analysis that performance is significantly different for one racial group depending on the Avatar involved in their gameplay.

Personality

The importance gleaned from the results of the personality scale series of ANOVAs lies in the fact that the six HEXACO facets of personality (Honesty-Humility, Extraversion, Excitability, Agreeableness, Conscientiousness, and Openness to new experience) are not significantly different between the races for crimes committed in the game. The results of this analysis appear to support the previously mentioned work of Collins and Gleaves (1998), when they revealed that the five-factor model was a good fit for both African American and Caucasian Americans alike. This stands in direct contrast to the position taken by Gaines & Reed (1995), who felt that “Black Psychology” should be an exclusive field which would require an altogether separate line of research (from Caucasians, and especially involving personality, ethnical, and social and behavioral research). As mentioned previously, many of the facets of the HEXACO model come from the five-factor model, and this study is the first to assess potential racial differences in the responses to the HEXACO-PI-R. Predominantly White samples have

been cited as limiting study generalizability, and the suggestion has fairly recently been offered that future research should examine samples with greater racial diversity (Gaughan et al., 2012). It was alarming to read that racial information goes unreported within the majority of studies that explore differences in personality and other psychological constructs (Cale, 2006). Because of this, it was necessary to ensure that there were no fundamental personality differences among the participants within this study, as personality has been linked to gameplay (Via, 2014).

The regression analysis of the final hypothesis indicated that Honesty-Humility and CAPRTOT have a significant relationship and that for individuals scoring high in Honesty-Humility, fewer crimes against property were committed during their 20 minutes of game play. When averaged across the raters, the total crimes committed were 4,804: this figure equates to roughly 2.7 crimes per participant, per minute, for the 1800 minutes of video that was assessed. Crimes against property were significantly associated with the personality dimension of Honesty-Humility, and they were committed in total at approximately 1.5 times the amount of crimes against people. These results, stemming from game play within the digital environment, indicate a significant relationship between a real-world measure of personality and an in-game behavioral display. The correlation between Honesty-Humility and crimes in the real world looks much the same as it does in this study as offenders in real life scored lower than non-offenders did for the Honesty-Humility dimension of personality (Rolinson et al., 2013). The Rolinson et. al. study used the HEXACO 60, and looked at the difference between offenders and non-, therefore, the relationship was discovered with independent samples t-tests as opposed to the regression utilized in this study. The importance in my discovery lies in the fact that the relationship between Honesty-Humility and deviant behavior has not been seen within video game play before, because it was never tested. In addition, the rates of the crimes within the game GTAV were unknown until this study was conducted. Furthermore, this study has similarities to the work completed by Rolinson et. al. (2013) and it certainly looks like this study has provided some validation of the game play mimicking real world events in that Honesty-Humility is significantly inversely related to deviant in-game behavior.

High counts of CAPR could come from the reckless nature of some game players. Driving around town and crashing into other vehicles, stealing vehicles from the roadside, and destroying property with RPGs and hand grenades are all responsible for criminal counts within this category. Additionally, it was noticed by the video reviewers that many game players were “sloppy” in their game play. When the participant selected a weapon (most likely an automatic rifle) they sighted in and let rounds “down range” without taking the time to aim first. This led to more strafing fire, which inflated counts of vandalism as other vehicles were shot at whilst attempting to aim for one specific target.

Honesty-Humility is comprised of sincerity, fairness, greed-avoidance, and modesty. While these constructs deal with the manipulation of others, the ability to display privilege over others, and the ability to steal from others, they are critical aspects of the personalities of offenders (Rohlfson et al., 2013). In short, the constructs that make up Honesty-Humility do not directly relate to the types of crimes that are outlined within this study as CAPE. It appears that Honesty-Humility is more related to deviant behavior against things, as opposed to people. Additionally, CAPR counts were higher, overall, and more likely to occur than CAPE so this may account of the lack of a correlation for the CAPE data. Another explanation for why no significance was seen in the CAPE criminal category is that the distribution for CAPE charges was positively skewed. With higher counts of CAPE, the nonsignificant relationship with Honesty-Humility would likely continue with the negative slope that is the status quo, but the relationship would be strengthened, the significance of the resulting regression is speculative. High counts for Murder/Manslaughter (within the CAPE category) could exist because of the nature of the game (city at your disposal for domestic terrorism). In addition, overall unusually high counts in this category could come from the short time in the lab (and subsequently no “buy in” from participants to advance the game by playing the storyline) leading some game players to commit in-game domestic terrorism (greater counts of CAPE and CAPR) at a higher rate than other players. Moreover, the in-game police presence and their aggressive response as well as comments (sidebar) from NPCs could be responsible for upsetting or irritating some game players (due to their antagonistic nature), leading to unnatural spikes in

within this criminal category. Of course, Robbery and Assault/Battery could also be at fault for disrupting a potential relationship between Honesty-Humility and CAPE. However, it could be the general nature of the gameplay (and the crimes themselves) and the way in which the crimes manifest within the game, which explains the significant relationship between Honesty-Humility and CAPR.

Conclusion

As no research exists on in-game characters or avatars, one purpose of this study was to understand the extent to which they could help or hinder a consumer's gameplay based on their digital appearance for a COTS console video game. Another purpose of this study was to better understand the Proteus effect, and to see if it extends to video game players of console video games. Console video games are the primary gaming platform with the greatest market share, at present. Aside from expanding knowledge on the Proteus effect, this study has also provided some insight on the HEXACO model of personality. Through the analysis of the Honesty-Humility personality facet, more information has been present to deliver additional understanding on the relationship between this personality factor, and antisocial behavior stemming from the dependent variables outlined within this study. Virtual crimes and their measurement within this study have made for a wonderful proxy to assess personality, racial bias, and level of violence within this, and previous studies.

Of course, familial and/or individual socioeconomic data were not collected for this study though it would have been nice to have to see if that information could be used as a marker in the prediction of video game performance. Also, knowledge of the generational position of the participants would have been wonderful to have as well, especially to see if the work completed by Sampson et al., (2005) could be looked at similarly within this game, as opposed to performing a 10-12 year longitudinal study. Extending this study to include Asian people, and seeing how their gameplay compares to Caucasian Americans and African Americans, as well as the Middle Eastern participants would allow for research to gain a better understanding of what Black and White polarization within game design does for all game

players. Furthermore, research studies much like this one could potentially better explain or expose a special quality (or set of qualities), which are intrinsic to the present-day dichotomization of these primary racial groups. These qualities, discovered through game play, could potentially transcend the atypical socioeconomic status delineation for group membership with respect to behavior.

Based on the significant interaction between the DA types within the African American gamers, the Proteus effect was found within the console video game. African American gamers playing as a Black DA committed significantly less crimes within the game when compared to African American gamers playing as a White DA. Of course, more studies with crimes need to be completed to determine if students from a community college with inner-city backgrounds would have similar or wildly differing game play from what was observed within this study. With additional supplemental information, we would be able to formulate what takes place when African Americans game as White, and we will be able to outline differences and similarities in their gameplay when compared to that of Caucasian Americans. Now that researchers know an interaction exists between the DA types and the race of the gamers, it would be important to keep this in mind when analyzing subsequent information on gaming, especially for Black and other minority characters and gamers. It would be interesting to obtain the behavioral observations through replication or similar scientific inquiry, and find out if the observations from this study carry over into future studies. In the end, the work completed here was critical to uncovering some of the underlying fundamental aspects of the perception of the DA, and the role the DA has within a gamer's in-world persona.

The next steps are to design a scenario for gamers to play on a PC. The Proteus effect hasn't been examined on this platform before, the difference between PC and console game play is the game controller, and the mechanics involved in using a keyboard and mouse as opposed to a console controller. Of course, with modern technology, it is possible to play a game on PC with a console controller, and that would be an excellent place to start with future research studies. Some additional behavioral metrics, which could be collected using this approach, would be key deflection for the acceleration button (right

trigger button) in addition to the usage of vehicle handbrakes (“X” and “R1” keys), and the cumulative time these keys are utilized while driving. Furthermore, some type of expertise information should be gleaned from participants to determine if these new metrics are affected by gamer skill or proficiency with a specific game. Completing future studies with a PC and a console controller would allow researchers to compile supplemental information such as generating a shot count, and enable special features like producing a heat map displaying travel within the digital world.

The results of this study appear to allude to the fact that game design should consider race as an inclusive element of play. Not everyone truly identifies as the character they are presented with when they game, and it appears that certain DA choices have the ability to significantly affect game play. Through a greater understanding of identification, and the man-DA relationship, game designers will be able to make a better product. This product would should contain relevant options for consumers that appeals to race and culture in an all-encompassing package in an effort to improve user satisfaction.

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Appendix A
GTA 5 CRIME CODING

GTA 5 CRIME CODING						
Crime	Definition			Number of Occurrences		
Arson	Setting fire to property, regardless of intent					
Trespassing	Airport, golf course, construction sites, rooftops					
Vandalism	Destruction of public/private property					
Theft	Taking a vehicle from roadside w/no driver					
Murder/Manslaughter	Successful/attempted taking of a life					
Assault/Battery	Physically attacking another character					
Kidnapping	Taking an individual against their will					
Robbery	Taking something (car) with force (person in it)					
Stars						
Killed						
Arrested						
Animals						

Appendix B

CONSENT FORM

Embry-Riddle Aeronautical University

I consent to participating in the research project entitled:

THE PROTEUS EFFECT AND GAMING

The principle investigator of the study is:

Dr. Shawn Doherty (386) 226-6249

This research will examine the Proteus effect of video game play. You will receive three assessment questionnaires which will account for your personality (HEXACO), your familiarity with the game, and a basic psychological needs questionnaire to better understand your game play habits. You, the participant, can expect to receive 20 minutes of video recorded game play, after which the expectation is that you will complete the IAT intrinsic attitude assessment test. Playing this game, like all video games, may have the potential to cause epileptic seizures, motion sickness or dizziness. If at any time, you experience symptoms such as these, please notify the experimenter at once and discontinue game play immediately. This study will take approximately 50 minutes of time. Your participation is completely voluntary and you may leave the study at any time if you so choose. Your video game play performance in the study will be confidential and any results based on your performance will only be reported in the aggregate such that you cannot be identified individually. Participation in this study will be rewarded with extra credit at the discretion of your instructor. If you have any questions after the end of the study you may contact the researcher or the Teri Gabriel with the Institutional Review Board at 386-226-7179.

Statement of Consent

The individual above, or their research assistants, have explained the purpose of the study, the procedures to be followed, and the expected duration of my participation. Possible benefits of the study have been described to me, as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form is available upon request from via6e2@my.erau.edu or dohertsh@erau.edu.

Date: _____

Name (*please print*): _____

(Participant)

Signed: _____

(Participant)

Signed: _____

(Researcher/Assistant)

Appendix C

Gamer Questionnaire

- 1) What is your gender?
 - A. Male
 - B. Female
 - C. Transgender
- 2) Which Race and/or ethnicity do you most identify with?
 - A. Asian – A person having origins in any of the original peoples of the Far East, Southeast Asia, Cambodia, China, Japan, Korea, Malaysia, the Philippine Islands, Thailand, and Vietnam.
 - B. Middle Eastern – A person having origins in the Middle East to include the Indian subcontinent including Afghanistan, Nepal, Turkmenistan, Uzbekistan, and Pakistan.
 - C. Native Hawaiian or Other Pacific Islander – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
 - D. American Indian or Alaska Native – A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment.
 - E. Hispanic – A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.
 - F. White, not of Hispanic origin – A person with European origins, identifying their ethnicity to be as such.
 - G. Black, not of Hispanic origin – A person having origins in any of the Black racial groups of Africa, and identifying their ethnicity to be as such.
 - H. Two or more races – An individual which identifies as a member of at least two or more of the above racial groups.
- 3) Of the 15 Grand Theft Auto video games,
 - A. I have owned and played at least one
 - B. I have played at least one
 - C. I have never played any
- 4) Experience with PlayStation 3
 - A. I saw it in a magazine once.
 - B. I have watched others play on the PlayStation 3 before.
 - C. I play on the PlayStation 3 on the weekends, and when the semester ends.
 - D. I know without looking where the X, Δ, O, and □ buttons are.
 - E. Never really bother

Appendix D

BPNSMod Questionnaire

Listed below are a number of statements. Each represents a commonly held opinion and there is no right or wrong answers. You will probably disagree with some items and agree with others. Please read each statement carefully and answer with the number which best describes the extent to which you agree or disagree with each statement, or the extent to which each statement applies to you with respect to your favorite video game.

1	2	3	4	5	6	7
Not at all true				Somewha t True		Very True

1. I feel incompetent when I look at the buttons on video game controllers.
2. I really like the other characters I interact with on games.
3. Often, I do not feel very competent while playing games.
4. When I start new games I do not need to use “boot camp” like features or tutorials.
5. People I know tell me I’m good at playing video games.
6. I get along with characters I come into contact with in the games.
7. I feel time-pressured during my gameplay.
8. I generally feel free to express my ideas and opinions within the construct of video games.
9. I consider characters (in games) I regularly interact with to be my friends.
10. I have been able to learn interesting new skills recently.
11. In my gameplay, I frequently have to do what I am told.
12. Other characters in games appear to care about my character.
13. After playing, I feel a sense of accomplishment from what I do.
14. In the game, I don’t get a chance to show how capable I am.

15. There are not many characters I am close to.
16. I feel like I can pretty much be myself in my gameplay.
17. My gameplay is more about the experience than the points/money/mission/goal.
18. I often do not feel very capable as a gamer.
19. There is never an opportunity for me to decide for myself how to do things within the game.
20. Characters in games are generally pretty friendly towards me.
21. I am confident in my ability to play games according to my expectations.
22. I often select which route I want to take when pursuing an objective in a game.
23. I search the internet for tips and tricks to make me a better player.
24. I enjoy moving about within games as I please.
25. I seldom need to use cheats in my gameplay.
26. I enjoy being able to change my character's appearance in games.
27. Sometimes, my gaming skills are not up to the pace of the gameplay.
28. In my gameplay, I feel pressured to behave in certain ways.

Appendix E

HEXACO-PI-R

(Self-Report Form)

DIRECTIONS

On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement. Then write your response in the space next to the statement using the following scale:

- 5 = strongly agree
- 4 = agree
- 3 = neutral (neither agree nor disagree)
- 2 = disagree
- 1 = strongly disagree

Please answer every statement, even if you are not completely sure of your response.

Please provide the following information about yourself.

- 1 _____ I would be quite bored by a visit to an art gallery.
- 2 _____ I clean my office or home quite frequently.
- 3 _____ I rarely hold a grudge, even against people who have badly wronged me.
- 4 _____ I feel reasonably satisfied with myself overall.
- 5 _____ I would feel afraid if I had to travel in bad weather conditions.
- 6 _____ If I want something from a person I dislike, I will act very nicely toward that person in order to get it.
- 7 _____ I'm interested in learning about the history and politics of other countries.
- 8 _____ When working, I often set ambitious goals for myself.
- 9 _____ People sometimes tell me that I am too critical of others.
- 10 _____ I rarely express my opinions in group meetings.
- 11 _____ I sometimes can't help worrying about little things.
- 12 _____ If I knew that I could never get caught, I would be willing to steal a million dollars.
- 13 _____ I would like a job that requires following a routine rather than being creative.
- 14 _____ I often check my work over repeatedly to find any mistakes.
- 15 _____ People sometimes tell me that I'm too stubborn.
- 16 _____ I avoid making "small talk" with people.
- 17 _____ When I suffer from a painful experience, I need someone to make me feel comfortable.
- 18 _____ Having a lot of money is not especially important to me.
- 19 _____ I think that paying attention to radical ideas is a waste of time.
- 20 _____ I make decisions based on the feeling of the moment rather than on careful thought.
- 21 _____ People think of me as someone who has a quick temper.
- 22 _____ I am energetic nearly all the time.
- 23 _____ I feel like crying when I see other people crying.
- 24 _____ I am an ordinary person who is no better than others.
- 25 _____ I wouldn't spend my time reading a book of poetry.
- 26 _____ I plan ahead and organize things, to avoid scrambling at the last minute.
- 27 _____ My attitude toward people who have treated me badly is "forgive and forget".
- 28 _____ I think that most people like some aspects of my personality.
- 29 _____ I don't mind doing jobs that involve dangerous work.
- 30 _____ I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed.

Continue...

- 31 _____ I enjoy looking at maps of different places.
- 32 _____ I often push myself very hard when trying to achieve a goal.
- 33 _____ I generally accept people's faults without complaining about them.
- 34 _____ In social situations, I'm usually the one who makes the first move.
- 35 _____ I worry a lot less than most people do.
- 36 _____ I would be tempted to buy stolen property if I were financially tight.
- 37 _____ I would enjoy creating a work of art, such as a novel, a song, or a painting.
- 38 _____ When working on something, I don't pay much attention to small details.
- 39 _____ I am usually quite flexible in my opinions when people disagree with me.
- 40 _____ I enjoy having lots of people around to talk with.
- 41 _____ I can handle difficult situations without needing emotional support from anyone else.
- 42 _____ I would like to live in a very expensive, high-class neighborhood.
- 43 _____ I like people who have unconventional views.
- 44 _____ I make a lot of mistakes because I don't think before I act.
- 45 _____ I rarely feel anger, even when people treat me quite badly.
- 46 _____ On most days, I feel cheerful and optimistic.
- 47 _____ When someone I know well is unhappy, I can almost feel that person's pain myself.
- 48 _____ I wouldn't want people to treat me as though I were superior to them.
- 49 _____ If I had the opportunity, I would like to attend a classical music concert.
- 50 _____ People often joke with me about the messiness of my room or desk.
- 51 _____ If someone has cheated me once, I will always feel suspicious of that person.
- 52 _____ I feel that I am an unpopular person.
- 53 _____ When it comes to physical danger, I am very fearful.
- 54 _____ If I want something from someone, I will laugh at that person's worst jokes.
- 55 _____ I would be very bored by a book about the history of science and technology.
- 56 _____ Often when I set a goal, I end up quitting without having reached it.
- 57 _____ I tend to be lenient in judging other people.
- 58 _____ When I'm in a group of people, I'm often the one who speaks on behalf of the group.
- 59 _____ I rarely, if ever, have trouble sleeping due to stress or anxiety.
- 60 _____ I would never accept a bribe, even if it were very large.

Continue...

- 61 _____ People have often told me that I have a good imagination.
- 62 _____ I always try to be accurate in my work, even at the expense of time.
- 63 _____ When people tell me that I'm wrong, my first reaction is to argue with them.
- 64 _____ I prefer jobs that involve active social interaction to those that involve working alone.
- 65 _____ Whenever I feel worried about something, I want to share my concern with another person.
- 66 _____ I would like to be seen driving around in a very expensive car.
- 67 _____ I think of myself as a somewhat eccentric person.
- 68 _____ I don't allow my impulses to govern my behavior.
- 69 _____ Most people tend to get angry more quickly than I do.
- 70 _____ People often tell me that I should try to cheer up.
- 71 _____ I feel strong emotions when someone close to me is going away for a long time.
- 72 _____ I think that I am entitled to more respect than the average person is.
- 73 _____ Sometimes I like to just watch the wind as it blows through the trees.
- 74 _____ When working, I sometimes have difficulties due to being disorganized.
- 75 _____ I find it hard to fully forgive someone who has done something mean to me.
- 76 _____ I sometimes feel that I am a worthless person.
- 77 _____ Even in an emergency I wouldn't feel like panicking.
- 78 _____ I wouldn't pretend to like someone just to get that person to do favors for me.
- 79 _____ I've never really enjoyed looking through an encyclopedia.
- 80 _____ I do only the minimum amount of work needed to get by.
- 81 _____ Even when people make a lot of mistakes, I rarely say anything negative.
- 82 _____ I tend to feel quite self-conscious when speaking in front of a group of people.
- 83 _____ I get very anxious when waiting to hear about an important decision.
- 84 _____ I'd be tempted to use counterfeit money, if I were sure I could get away with it.
- 85 _____ I don't think of myself as the artistic or creative type.
- 86 _____ People often call me a perfectionist.
- 87 _____ I find it hard to compromise with people when I really think I'm right.
- 88 _____ The first thing that I always do in a new place is to make friends.
- 89 _____ I rarely discuss my problems with other people.
- 90 _____ I would get a lot of pleasure from owning expensive luxury goods.

Continue...

- 91 _____ I find it boring to discuss philosophy.
- 92 _____ I prefer to do whatever comes to mind, rather than stick to a plan.
- 93 _____ I find it hard to keep my temper when people insult me.
- 94 _____ Most people are more upbeat and dynamic than I generally am.
- 95 _____ I remain unemotional even in situations where most people get very sentimental.
- 96 _____ I want people to know that I am an important person of high status.
- 97 _____ I have sympathy for people who are less fortunate than I am.
- 98 _____ I try to give generously to those in need.
- 99 _____ It wouldn't bother me to harm someone I didn't like.
- 100 _____ People see me as a hard-hearted person.
- _____