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SOCIAL REJECTION, AVATAR CREATION, & SELF-ESTEEM

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF PSYCHOLOGY

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Table of Contents

Abstract.....v
Introduction.....1
Method.....13
Analyses.....19
Discussion.....21
Table 1.....26
References.....27
Appendix A: Rosenberg Self-Esteem Scale.....40
Appendix B: State Self-Esteem Scale.....41
Appendix C: IPIP-NEO-60 Instructions.....42
Appendix D: IPIP-NEO-60 Scale 43
Appendix E: Self-Similarity Scale.....44
Appendix F: Attractiveness Rating.....45
Appendix G: Self-Esteem Manipulations.....46
Appendix H: Creation Task Instructions.....47

Abstract

Individuals use avatars as a means to interact with the virtual world. Self-affirmation theory (Steele, 1988) would suggest that creating an avatar could allow individuals to focus on their positive traits to mitigate threats to self-worth. Yet, a negative correlation exists between self-esteem and idealized avatars (Bessière et al., 2007; Pringle, 2015; Wang et al., 2014). To resolve this discrepancy, a 2 (Threat/No Threat) x 2 (Avatar/No Avatar) design was implemented to simultaneously explore the effect of social rejection on avatar creation and the effect that avatar creation may hold in buffering against losses in self-esteem. It was predicted that individuals who experience social rejection will create avatars that are more idealized (more similar to the ideal self and more attractive) relative to those in the control condition. It was also predicted that the act of creating an avatar would mitigate the loss in self-esteem experienced by those faced with social rejection compared to control and that this effect would be mediated by avatar idealization.

Introduction

Avatars exist as a vehicle through which individuals interact within virtual spaces (Coleman, 2011). More specifically, they are a "perceptible digital representation whose behaviors reflect those executed, typically in real time, by a specific human being" (Bailenson & Blascovich, 2004, p. 65). These avatars may take a variety of forms ranging from human standard to anthropomorphized animals and fictional creatures (Ahn et al., 2012). The extensive tools commonly available to customize these avatars are not superfluous, but a component of the gameplay experience itself, with research demonstrating that individuals spend a significant amount of time tweaking and altering their digital self (Ducheneaut et al. 2009; Neustaedter & Fedorovskaya 2009; Ratan & Hasler, 2011). The influence of avatars on beliefs, attitudes, and behaviors has been studied across an array of contexts, such as health communication (Ahn, 2015; Fox, 2012), interpersonal communication (Kotlyar & Ariely, 2013; Waddell & Ivory, 2015), and advertising (Ahn & Bailenson, 2011). The purpose of the current study was to determine the causal impact of threatened self-esteem on avatar creation and the buffering effect that the avatar creation process may have on self-esteem, in response to a social threat.

Avatars and the Self

Much of the research surrounding avatars as a representation of the self has been done through the lens of self-discrepancy theory (SDT; Higgins, 1987, 1989). In its primary conception of self-representations, SDT posits that individuals possess an actual self, the user's perception of themselves, and an ideal self, the user's perception of how they would like to be. When these two representations differ dramatically, individuals may experience negative affect (Barnett et al., 2017) and lower self-esteem (Barnett & Womack, 2015; Bosson et al., 2010). Furthermore, individuals with diagnosed anxiety or depressive disorders demonstrate greater

levels of self-discrepancy (Scott & O'Hara, 1993). Individuals high in neuroticism were also prone to a larger disparity between actual and ideal selves (Thomson, 2016). This discrepancy, between the ideal and actual, even corresponds to brain regions known to be important for the desire for external rewards (Shi et al., 2016) and can be generally conceived as motivating for an individual to take steps towards the minimization of this distance between the selves (Higgins, 1987; Rogers, 1959). Furthermore, self-discrepancy, specifically the ideal self, can be used to explain goal-directed behavior (Freitas & Higgins, 2002).

With the introduction of virtual worlds, people now have a new way to represent themselves in the form of the "avatar self," or the perception of their virtual self (Bessière et al., 2007; Mancini & Sibilla, 2017). An avatar may allow a user to idealize themselves in ways that would otherwise be impossible in the real world (Przybylski et al. 2012). Self-report has been the primary method by which researchers have compared the ideal and actual selves on a variety of traits, with measures ranging from personality inventories (Benet-Martínez & John, 1998; John et al., 1991) to bidimensional image matrices using different axes for muscularity and body fat (Cacioli & Mussap, 2014; Cafri & Thompson, 2004; Gruber et al., 1999) for which participants are answering for their actual self and ideal self, and more recently, their avatar self. Third-party raters have also been used to evaluate the attractiveness of created avatars in comparison to the attractiveness of their creators (Dunn & Guadagno, 2012; Messinger et al., 2019). Discrepancies between these three forms of the self (actual, ideal, & avatar) have been identified both in terms of personality (Bessière et al., 2007) and physical appearance (Duchenaut et al., 2009).

The participants examined by Bessière, and colleagues (2007) were self-identified World of Warcraft (WoW) players. Players of WoW are able to create and use a number of characters within the game, but for this study, participants were asked about the character they primarily

played with. Participants completed the Big Five Inventory for themself, their ideal self, and their primary character. Using paired *t*-tests, the researchers determined that there was a significant difference between the self-discrepancy (actual versus ideal selves) and the character discrepancy (character vs ideal selves) on three personality dimensions: conscientiousness, extraversion, and neuroticism. For each of these personality traits, an interaction was found between players' psychological well-being and their discrepancy scores, such that those with a higher depression score showed a larger disparity between self-discrepancy and character discrepancy. A similar pattern was found when using self-esteem as the moderator for the personality dimensions of conscientiousness, neuroticism, agreeableness, and openness to experience. These personality traits displayed a pattern in which the character self score fell between the scores for the actual and ideal selves.

In a similar vein, Duchenaut and colleagues (2009) asked current players of WoW, Maple Story, or Second Life to upload an image of the avatar they used; details about the physical appearance of the participants were also collected (e.g., height, weight, hair color). When asked about the extent to which the participants recreated aspects of themselves within their character, the researchers identified three factors: *idealized self* ("I make avatars that have features that I wish I could have in real life"), *standing out* ("I make avatars that have an unconventional look"), and *following a trend* ("I make avatars that look like a particular celebrity or person that I like"). Results indicate that there was a gender difference along the *idealized self* dimension such that female users were more likely than male users to create an idealized character. Participant's Body Mass Index (BMI) was calculated based on the supplied physical details and those with a BMI > 30 were significantly more likely to create idealized avatars than those with lower BMIs. Exploring these differences further, high BMI participants tended to create avatars that differed

from themselves in terms of physical fitness, weight, and attractiveness. These studies demonstrate that avatars can possess traits which diverge from their creator, often towards a more idealized form.

Thus, in line with prior findings regarding self-esteem and real/ideal discrepancies (Barnett & Womack, 2015; Bosson et al., 2010; Crocker & Knight, 2005; Harter, 1990), the discrepancy between the real and avatar selves has similarly shown a negative correlation with self-esteem; further, this effect has remained consistent whether the discrepancy was operationalized in terms of personality (Bessière et al., 2007) or in terms of both personality and attractiveness (Pringle, 2015; Wang et al., 2014). These correlational findings leave open the question of whether there is a causal relationship at work: does the usage of a heavily idealized avatar lead to lower self-esteem, due to unflattering comparisons between the avatar and actual self, or does low self-esteem compel individuals to create more idealized avatars to compensate for perceived shortcomings? This study sought to determine if individuals whose self-esteem is threatened create avatars which are more idealized, compared to non-threatened individuals, and if creating avatars serves to lessen the negative impact that a social threat has on one's self-esteem.

Self-Esteem

Self-esteem has been a subject of interest for psychology for over 100 years (James, 1890). Broadly, it has come to be defined as an "overall assessment of the value of one's self or self-worth" (Zeigler-Hill & Shackelford, 2020). Believing that one has some inherent value may easily be viewed as a requirement for psychological health and subjective well-being, with self-esteem shown to affect important life outcomes such as relationship satisfaction and job satisfaction (Orth et al., 2012). It has been posited that low self-esteem may put an individual at

risk for outcomes associated with poor mental health (Metalsky et al., 1993) and subsequent research has demonstrated that possessing low self-esteem is linked with anxiety (Sowislo & Orth, 2013) and depressive symptoms (Masselink et al., 2018). Mindfulness, which enables an individual to focus their attention and surpass negative thoughts, has demonstrated a positive association with self-esteem (Pepping et al., 2013; Randal et al., 2015; Thompson and Waltz, 2008).

Reaching beyond the subjective experience, low self-esteem has also been associated with aspects of physical health, namely associations with poor physical health and compromised recovery from illness (Stinson et al., 2008). While it is possible that impaired health may lead to reduced self-esteem, a lack of self-esteem may potentially impair health through a variety of vehicles. Prior work has found that individuals with low self-esteem experience stress with greater frequency, with these frequent periods of stress increasing the amount of cortisol, the stress hormone, to which the system is exposed (Pruessner et al., 1999). In addition to the physiological response, individuals with low self-esteem may be less likely to undergo behaviors which may be protective of one's health, such as breast self-exams (Smits & Kee, 1992). Low self-esteem has also been linked to a variety of negative behaviors, such as compulsive use of social media applications and Internet addiction, more generally (Andreassen et al., 2017). Moreover, it has been shown that adolescents with lower self-esteem (gathered through self-reports, as well as responses from parents and teachers) engage in more delinquent behaviors (Donnellan et al., 2005); these results remained consistent with those measured again after two years. Furthermore, those with low self-esteem as adolescents were more likely to engage in criminal behavior as adults (Trzesniewski et al. 2006). The longitudinal nature of these studies

suggests that low self-esteem serves as a causal factor for, rather than an effect of, criminal or delinquent conduct.

While self-esteem is related to a number of outcomes, it has been suggested that the function of self-esteem is that it exists specifically as a way for individuals to monitor their inclusionary status (Gerber & Wheeler, 2006; Leary et al. 1995; Leary & Baumeister, 2000). Therefore, instances where an individual feels isolated or rejected would be especially threatening. Social rejection may take a variety of forms: betrayal, discrimination, ostracism, stigmatization, etc., yet the underlying characteristic shared amongst them is low relational value (Richman & Leary, 2009). Self-esteem demonstrates a strong positive correlation with a person's belief that they are accepted and valued by others (Leary et al., 2001). Social rejection has been linked with negative outcomes both physical and psychological (Blackhart et al., 2007; Dickerson & Kemeny, 2004; Zadro et al., 2004). Rejection elicits feelings of shame (Gruenewald et al., 2004), beliefs that life is meaningless (Twenge et al., 2003), and depression (Hagerty & Williams, 1999). These feelings are aversive and encourage people to behave in ways that would restore belonging, with the hope of alleviating these negative sensations (Leary et al., 1995). Additionally, social rejection may increase behaviors considered risky to one's health in addition to decreasing health protective behaviors (Baumeister et al., 2005; Pascoe & Smart Richman, 2009). Social rejection can effectively diminish one's self-esteem and for those who already possess a low self-esteem, the psychological distress and physiological stress is experienced for a longer duration (Brown, 2010) and with greater sense of rejection (Nezlek et al., 1997).

Self-Affirmation and Self-Enhancement

One route by which the avatar creation process could reduce the strength of a threat to one's self-esteem stems from self-affirmation theory, whereby an individual can affirm their own

self-worth to ward off the effects of messages that are threatening to the self-concept (Steele, 1988). Individuals are motivated to maintain a sense of self-worth as they go about their everyday life, despite occurrences that could diminish the self, such as negative evaluations by others or interpersonal conflict. The affirmation need not occur within the same domain as the threatening message (Allport, 1961); individuals may affirm their ability as a family member when faced with negative evaluations of their ability as a coworker. In doing so, individuals are able to recognize that their self-worth need not depend on the threat in question and thus the threat becomes less potent (Sherman & Cohen, 2006). Avatar creation may be one potential avenue via which affirmation may arise as the user is often referencing themselves in the creation of their avatar, requiring that the user hold a mirror to themselves (Kim & Sundar, 2012). However, people are biased when exploring their own attributes and are often biased towards *self-enhancement* (Higgins, 1987) to focus predominantly on one's strengths over one's weaknesses. Paulhus & John (1998) divide the concept into two types: an *egotistic bias* (exaggeration of positive aspects) and a *moralistic bias* (minimization of negative aspects). In fact, a majority of individuals hold overly positive self-views and, over time, easily forget any feedback which may be perceived as threatening to the self (Sedikides et al., 2016). In the face of social rejection or a threat to belonging, a person may compensate by generating a representation of themselves (in the case of the current study, an avatar) that does not suffer any of their actual or perceived shortcomings. Higgins (1989) describes this tendency as an approach motive, wherein a person is driven to reduce the discrepancy between their actual self (current state) and bring it in line with their ideal self (desired end-state). It is possible that in the absence of any outlet by which the person may change their actual behaviors or idiosyncrasies, an avatar may serve as the form of self by which the individual may craft a more likeable rendition, as the

ability to self-enhance via the simple selection of a few customizations may lead one to believe that they are much closer to a better version of themselves, thereby affirming their self-worth. Relatively little prior research has examined this possibility.

Prior Experimental Work

Two studies have explored the effects that avatar creation may have on the user. Kang and Kim (2020) split participants into groups in which some individuals were tasked with creating an avatar that reflected themselves. In contrast, participants in a control condition were provided with a printed screenshot of a randomly generated avatar (using the same software) and were tasked with creating a *character* (any reference to self or avatar in this condition was omitted) that closely resembled the received image. Results indicated that those who engaged in the avatar creation task, relative to control, demonstrated significantly more positive affect about themselves on a subsequent single-item self-report measure. In another study investigating the effects of avatar creation, Lee-Won and colleagues (2017) exposed male participants to feedback that was either threatening to their masculinity or non-threatening to their masculinity before having them engage in an avatar creation task. Males in the threatened condition subsequently created avatars that were significantly more muscular than those created by non-threatened individuals. Additionally, males underwent a handgrip task as a measure of endurance after the creation of the avatar. Results indicate a significant mediation effect of masculinity threat on handgrip endurance through avatar muscle definition. This mediation contributes to prior understanding on how customized avatars may impact subsequent behavior, the Proteus Effect (Yee & Bailenson, 2007).

However, while these studies serve to underscore the importance of exploring avatar creation, there are limitations in the conclusions that can be drawn based on this research. While

Lee-Won and colleagues (2017) examined the effect of a threat on avatar creation and the subsequent effect the avatar creation has on performance, this study was restricted to male participants and masculinity threats; therefore, the extent to which these results may be generalized to non-male participants and pertain to threats to the self not within the domain of masculinity remain open questions. Additionally, the research did not measure the subjective experience of the participants, so it remains unknown if the act of creating the avatar served to alleviate any psychological distress experienced from threatened masculinity. Furthermore, while Kang and Kim (2020) note the positive effect of creating an avatar on attitude toward one's self, this was not in response to any threat, social or otherwise, and as previously noted, the affective measure consisted of only one item. In order to more clearly test the theory that a threat to self-esteem will lead to more idealized avatars, and that the act of creating these avatars will serve to buffer against losses in self-esteem, an experiment would need to manipulate the presence of a more global threat to self-esteem, in addition to manipulating the opportunity to build an avatar immediately following such a threat. Thus, rather than the narrow category of masculinity, the current experiment focuses specifically on social rejection and belongingness threats.

Social Rejection and Belongingness

Traditionally, social connectedness and inclusionary needs were met by family (Serovich et al., 2001), romantic relationships (Chen & Freeley, 2014; Eshbaugh, 2010), or friendships (Lee & Goldstein, 2016; Utz et al., 2013). Notably, however, it has been theorized that even activities that may appear to be solitary in their execution (e.g., watching TV or reading a novel) may also be motivated by social connectedness needs. Gabriel and colleagues (2017) theorized that "social surrogates" may take a variety of forms that may also serve to fulfill an individual's emotional needs for belonging (see also Hartmann, 2016). Some activities that have been

examined through this lens include looking at pictures of others on social media (Nadkarnia & Hofmann, 2012), reading letters from others (Gardner et al., 2005) and eating comfort foods (Troisi & Gabriel, 2011); songs which generate nostalgia also promote social connectedness (Cheung et al., 2013). Social surrogacy can also take the form of engagement with fiction, wherein individuals may form a "parasocial relationship" through repeated encounters with a specific character and the development of enduring, one-sided intimacy on the part of the viewer (Horton & Wohl, 1956). Notably, while avatars are digital representations of the self, the extent to which someone interacts with their avatar can vary from serving as an externalization of the self (Webb, 2001) to simply tools (Cui et al., 2009) or parasocial others (Lewis et al., 2008). The work of Banks and colleagues (2019) conceptualized the various forms of relationships between a player and avatar on a continuum ranging from "Avatar as Object" to "Avatar as Other," integrating dimensions of sociality, differentiation, and agency that a player may ascribe to their avatar.

Derrick and colleagues (2009) investigated the usage of social surrogates in response to a social threat, with the prediction that use of a social surrogate would mitigate negative effects on self-esteem. Social threat was manipulated through a writing task in which participants described an experience in which they fought with a close other, compared to a control condition in which individuals listed items within their bedroom. After the self-esteem threat or control condition, participants were randomly assigned to write about either a time they watched a favorite television show or a time they watched whatever was on television. After controlling for global self-esteem taken prior to manipulations, individuals who experienced a social threat and wrote about a favored television program self-reported greater state self-esteem compared to those who were similarly threatened but wrote about a show which was not their favorite.

Thus, prior research suggests both that social threats that make us feel rejected or like we do not belong can have potent effects on self-esteem and well-being (Blackhart et al., 2007; Brown, 2010; Dickerson & Kemeny, 2004; Gruenewald et al., 2004; Hagerty & Williams, 1999; Leary et al., 1995, 2001; Nezlek et al., 1997; Richman & Leary, 2009; Twenge et al., 2003; Zadro et al., 2004) and that these threats may be mitigated by seemingly non-social activities (Derrick et al, 2009). Using a similar method, the current study asks how these results might differ when one is no longer writing about a favored television show but generating a representation of themselves in the form of an avatar, a task that has been noted as being potentially self-affirming (Kang & Kim, 2020).

The Current Study

The purpose of the current study was two-fold: to determine if individuals whose self-esteem is threatened, via social rejection, create avatars which are more idealized, compared to non-threatened individuals, and to explore whether creating avatars serves to lessen the impact that a social rejection threat has on one's self-esteem. As a task, the avatar creation process turns the gaze inward as the user examines themselves in order to determine how they wish to be represented. In the face of a threat to self-esteem, this process could lead to self-affirmation through individuals focusing more heavily on their positive traits over negative. Thus, it was predicted that:

H1: For individuals who created an avatar, receiving a social threat will result in the creation of a more idealized avatar relative to those who did not receive a social threat.

This study sought to operationalize avatar idealization in multiple ways. To get a direct measure of idealization, participants across the threat and no-threat conditions were asked to indicate how much overlap there was between their avatar and their ideal self; it was predicted

that individuals would report greater overlap between their avatar and ideal selves after the social rejection prime compared to the control (Hypothesis 1A). As a second measure of idealization, participants completed a personality measure for their avatar, and this measure was compared to pre-manipulation reports of their actual personality and the personality they would ideally like to possess with difference being operationalized as the Euclidean distance between personality profiles at the item-level; it was hypothesized that individuals would report less difference between their avatar and idealized selves after the social rejection prime compared to the control (Hypothesis 1B). As a final measure of idealization, each avatar was rated for attractiveness; it was predicted that after a social rejection prime, individuals would generate avatars that were rated as more attractive than those created by individuals in the control group (Hypothesis 1C).

Further, although prior research demonstrates a negative correlation between avatar idealization and self-esteem (Bessière et al., 2007; Pringle, 2015; Wang et al., 2014), it was theorized that this stems from low self-esteem leading one to the create avatars that are more idealized, rather than arising from a negative effect of an unflattering self-comparison between an idealized avatar and the actual self. When individuals are exposed to a threat to the self, they may be motivated to engage in self-affirmation (Steele, 1988; Sherman & Cohen, 2006) and create a self-enhanced representation of themselves which compensates for perceived shortcomings. Because the avatar creation process could serve as a self-affirming process (Kang & Kim, 2020) requiring that the user think critically of their strengths and weaknesses, with leanings toward perceiving themselves in a positive light (Higgins, 1987, 1989), it was predicted that building an avatar would buffer against losses in self-esteem, yielding similar results to prior research on the use of social surrogates (Derrick et al, 2009). Thus, it was hypothesized that:

H2: Creating an avatar will mitigate the effect of social rejection such that individuals who were subject to social rejection before creating an avatar will report greater state self-esteem after avatar creation compared to those who were subject to social rejection and did not create an avatar.

Additionally, it was theorized that the mechanism behind the effect of avatar creation on self-esteem could stem from the idealization of the created avatar. The creation of an avatar may only effectively mitigate social threat when there is a sufficient level of idealization ascribed to it. Thus, it was hypothesized that:

H3: The effect of avatar creation on state self-esteem, in response to a social rejection threat, was mediated by the level of idealization that is displayed by the avatar.

Method

Participants

Participants (N = 500) were recruited from the psychology department subject pool. A sample size was determined based on the effect size found in Derrick and colleagues (2009), on which the current study's initial design was based. Demographic information gathered about participants included age and gender.

Pre-screening

A minimum of two weeks before beginning the experiment, participants took part in a large, online departmental pre-screening survey in which they completed the Rosenberg Self-Esteem Scale to be used as a covariate within this study.

Instrumentation

Rosenberg Self-Esteem Scale (RSES). Participants completed the 10-item Rosenberg Self Esteem Scale (1965) prior to participation in the study. Participants responded to items related to self-evaluations on a 4-point Likert scale from 1 (Strongly Disagree) to 4 (Strongly

Agree) with higher scores indicating higher trait self-esteem. Scores were averaged. Global, or trait-level, self-esteem was included as a covariate when it correlated significantly with any dependent variables.

Experimental Procedure

This portion of the study took place at least two weeks after prescreening data had been collected. Participants who signed up for the study were provided with a survey link which could be opened at the time and location of their choosing. Participants were randomly assigned to one of the four conditions contained within this 2 (Threat/No Threat) x 2 (Avatar/No Avatar) design. Pseudorandom counterbalancing was performed in an effort to evenly distribute participants among the four conditions. Participants were asked to take 5 minutes on each of two consecutive writing tasks, the details of which are described below, using Qualtrics. Both writing tasks either contained a threat to self-esteem, comprising the Threat condition, or they did not, composing the No Threat condition. Once participants completed the writing tasks, they were tasked with building an avatar that reflected their own identity, the Avatar condition, or they were tasked with copying a pre-generated image as closely as possible, No Avatar condition. All participants completed the building/copying task by using the website: https://readyplayer.me/avatar. Screenshots were provided along with instructions to guide participants in this process. Participants were unable to advance past this point in the study unless they provided a specific link to their generated creation.

Participants then completed several outcome measures and demographics, after which they were granted 1.0 research credits.

Baseline Personality Assessment

Due to an error on behalf of the researcher conducting the pre-screening portion of the study, participants did not complete a measure of their actual or ideal personalities prior to the experimental procedure. In response to this error, at least two weeks after the last participant took part in the experimental procedure, these same participants were invited to take part in an online survey on their personality, ostensibly unrelated to the experimental procedure. The personality items collected are described below.

Instrumentation

IPIP-NEO-60 (Actual). The personality of the participant's current self was assessed using the International Personality Item Pool. A 60-item form (IPIP-NEO-60; Maples-Keller et al., 2019) was used to assess the personality of the actual self. The directions were, "The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. **Describe yourself as you generally are now, not as you wish to be in the future.** Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age". Items were rated on a 5-point Likert scale from 1 (Very Inaccurate) to 5 (Very Accurate). An average score was calculated for each trait (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness). Subscale scores were used as a covariate if they were associated with any dependent variables. Each subscale can further be broken down into six facets (two items per facet).

IPIP-NEO-60 (Ideal). The personality of the participant's ideal self was assessed using the International Personality Item Pool. A 60-item form (IPIP-NEO-60; Maples-Keller et al., 2019) was used to assess the personality of the ideal self. The directions were, "The following pages contain phrases describing people's behaviors. Please use the rating scale next to each

phrase to describe how accurately each statement describes how you would like to be. **Describe yourself as you wish to be in the future.** Describe yourself as you honestly wish to be, in relation to other people you know of the same sex as you are, and roughly your same age". Items were rated on a 5-point Likert scale from 1 (Very Inaccurate) to 5 (Very Accurate).

Self-Similarity (Actual/Ideal). For the purposes of this study, an item was created named Self-Similarity. This item was an adaptation of the Aron, Aron, & Smollan (1992) Inclusion of the Other in the Self (IOS) Scale. The measure contains seven answer choices, each containing two circles in a Venn diagram format. These answer choices range from the circles barely touching each other (indicating low similarity between the actual and ideal self) to almost completely overlapping (indicating high similarity between the actual and ideal self). The directions provided were, "Please select the picture below which best describes how related these concepts are for you." (See Appendix for visualization of this measure).

Manipulations

Self-Esteem Threat

Participants in the self-esteem threat condition were tasked with writing, within a Qualtrics survey, two 5-minute essays, one in which they wrote about a time they felt rejected, "Please write about a time that you felt rejected. Please spend around 5 minutes on this task" and one in which they wrote about a time they fought with a close other, "Please write about a time that you fought with a close other. This person could be a family member, friend, or romantic partner. Please spend around 5 minutes on this task". These essay prompts were counterbalanced. Participants were required to spend a minimum of 20 seconds on each of these essay pages before they were able to advance.

Self-Esteem Control

Participants in the self-esteem control condition were tasked with writing, within a Qualtrics survey, two 5-minute essays, one in which they wrote about a route they travel often, "Please write about the shops and buildings that you pass on a route that you travel regularly. Please describe everything you can recall from these shops and buildings. Please spend around 5 minutes on this task" and one in which they wrote as many items they could remember from their living space, "Please write out a list of as many items in your living space as you can remember. Please spend around 5 minutes on this task". These essay prompts were counterbalanced. Participants were required to spend a minimum of 20 seconds on each of these essay pages before they were able to advance.

Avatar Creation

Participants in the avatar creation condition then arrived at a new screen and were prompted with the directions, "Please create an avatar that reflects your identity, personal interests, and values." Participants were provided with directions and screenshots on how to create the avatar and were to use the website: https://readyplayer.me/avatar in order to do so. After successfully creating the avatar on this platform, participants were able to generate a unique link to their creation which was required for them to advance the study within Qualtrics.

Character Creation

Participants in the no avatar condition then arrived at a new screen and were prompted with the directions, "Your task is to recreate the character shown as closely as possible." Participants were randomly shown one of four possible pre-generated character images: colorfully-dressed male, colorfully-dressed female, plainly-dressed male, or plainly-dressed female. This variety of images was used in order to prompt participant engagement with the customization options within the character creation website. The image could continually be

referenced during the recreation process. Participants were provided with directions and screenshots on how to create the character and were to use the website: https://readyplayer.me/avatar in order to do so. When the participants decided they had copied the image closely enough, participants were able to generate a unique link to their creation which was required for them to advance the study within Qualtrics.

Outcome Measures

Instrumentation

State Self-Esteem. Participants completed the 20-item Heatherton & Polivy (1991) measure of state self-esteem in which participants rated their agreement with statements regarding their current state on a 5-point Likert scale from 1 (not at all) to 5 (extremely). Scores were averaged.

IPIP-NEO-60 (Avatar). The personality attributed to the participant's avatar was assessed using the International Personality Item Pool. A 60-item form (IPIP-NEO-60; Maples-Keller et al., 2019) was used to assess the personality attributed to the avatar. The directions were, "The following pages contain phrases describing people's behaviors. **Please use the rating scale next to each phrase to describe how accurately each statement describes the avatar you just created.**". Items were rated on a 5-point Likert scale from 1 (Very Inaccurate) to 5 (Very Accurate). An average score was calculated for each trait (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness).

Self-Similarity (Avatar/Ideal). The Self-Similarity measure previously described to determine the similarity between actual and ideal self was modified to compare the avatar with the ideal self. The measure contained seven answer choices, each containing two circles in a Venn diagram format. These answer choices ranged from the circles barely touching each other

(indicating low similarity between the avatar and ideal self) to almost completely overlapping (indicating high similarity between the avatar and ideal self). The directions provided were, "Please select the picture below which best describes how related these concepts are for you".

Analyses

Data analysis was conducted using IBM SPSS Version 25.

Data Cleaning

Transformation

Variables not normally distributed were transformed, if possible, to normality prior to analyses.

Inference criteria

An alpha level was set at $p < .05$ for all a priori hypotheses.

Preliminary Analyses

State self-esteem was used as both a dependent measure and as a manipulation check to determine if the rejection based essays did, in fact, threaten participant's self-esteem. There was no significant effect of condition on state self-esteem, $F(3,400) = .480$, $p = .696$, $\eta^2 = .004$, which suggests that the manipulation failed, despite controlling for trait self-esteem, age, gender, and personality.

Each of the previously stated hypotheses presupposes that participants feels socially threatened; therefore, the results of this study are unable to answer these exact hypotheses and any further analyses are exploratory.

Primary Analyses

Hypothesis 1: For individuals who created an avatar, receiving a social threat will result in the creation of a more idealized avatar relative to those who did not receive a social threat

1a. (Self-Similarity). The Self-Similarity participants reported between their Avatar with their Ideal Self correlated with: general self-esteem $r(208) = .245$, $p < .001$, self-similarity between participant's Actual and Ideal Self $r(208) = .347$, $p < .001$, participant's conscientiousness $r(208) = .165$, $p = .017$, and participant's neuroticism $r(208) = -.182$, $p = .008$. Conducting a one-way ANCOVA with these covariates revealed no effect of Condition on Self-Similarity between participants avatar and their ideal self, $F(1,202) = .503$, $p = .479$, $\eta^2 = .002$.

1b. (Personality). As for the use of personality as a form of idealization, participant's Euclidean distance between their Avatar and their Ideal Self was correlated with: general self-esteem $r(207) = -.211$, $p = .002$, Euclidean distance between participants Actual and Ideal Self $r(207) = .740$, $p < .001$, participant's conscientiousness $r(207) = -.270$, $p < .001$, and participant's neuroticism $r(207) = .356$, $p < .001$. Conducting a one-way ANCOVA revealed no effect of Condition on the Euclidean distance between their Avatar and Ideal Self when comparing participants in the threatened and non-threatened conditions, $F(1,201) = .113$, $p = .738$, $\eta^2 = .001$.

1c. (Attractiveness). A 2-Way Mixed effects model with Absolute Agreement was used to calculate the intraclass correlation coefficient amongst four raters. A poor degree of reliability was demonstrated for the attractiveness ratings of the created avatars. The average measure ICC (2,k) was .549 with a 95% confidence interval [.443 - .639]. Conducting a one-way ANCOVA revealed no effect of condition on avatar attractiveness between participants in the threatened and non-threatened conditions, $F(1,196) = 2.425$, $p = .121$, $\eta^2 = .012$.

Hypothesis 2: Creating an avatar will mitigate the effect of social rejection such that individuals who were subject to social rejection before creating an avatar will report greater

state self-esteem after avatar creation compared to those who were subject to social rejection and did not create an avatar

Since the threat manipulation failed to work, it was possible to collapse the threat and non-threat conditions in order to compare any effect of creating an avatar on state self-esteem. However, there was no significant effect of condition on state self-esteem, $F(1,402) = 1.276$, $p = .259$, $\eta^2 = .003$, despite controlling for trait self-esteem, age, gender, and personality. Looking at the respective subscales of state self-esteem provides similar results for: Performance Self-Esteem, $F(1,402) = 1.269$, $p = .261$, $\eta^2 = .003$, Social Self-Esteem, $F(1,402) = .258$, $p = .612$, $\eta^2 = .001$, and Appearance Self-Esteem, $F(1,402) = .924$, $p = .337$, $\eta^2 = .002$.

Despite being unable to answer the hypotheses, some insight can still be derived through comparing the extent to which individual's actual personalities compare to both their ideal personalities and the personality ascribed to their avatar, as shown in Table 1. Aside from Agreeableness, participants actual personality demonstrated significantly higher correlations with the personality attributed to the avatar compared to participant's ideal personality.

Discussion

The current experiment was intended to explore the impact of threatened self-esteem on the creation of avatars and the usage of avatars as a means to lessen the impact of self-esteem threats. Individuals wrote instances where they faced social rejection and were then either tasked with creating an avatar that reflected themselves or with recreating a previously generated image. The idealization of avatars was operationalized based on a self-report item, through the differences existing between one's actual personality with their ideal personality relative to the differences between one's actual personality with their avatar's personality, and in attractiveness ratings.

However, based on the manipulation check/dependent measure of state self-esteem, it appears that participants did not experience the intended reduction in self-esteem that was to be generated writing essays describing a social threat. Regardless of condition, participants state self-esteem did not significantly differ. The manipulations used in this study were identical to those found in Derrick et al., 2009. Similarly, the act of creating an avatar had demonstrated an improvement in feelings towards oneself as demonstrated in Kang & Kim (2020). However, even when collapsing across threat conditions, creating an avatar did not result in a significant improvement in state self-esteem.

There are a variety of reasons that the manipulations used in this study did not work as expected. Due to the COVID-19 pandemic, several changes were made to the original design of this study in an effort to reduce exposure and spread amongst research staff and participants. Initially, participants were to physically come into a research lab in order to write their two essays with a required time of five minutes each; this would have mirrored the cubicle setting and six minute essay as performed in Derrick et al., 2009. Participants in this current study were instructed to spend five minutes on each writing task but were able to advance past the essay portion after 20 seconds of time had elapsed. The average time spent on each essay was: Rejection essay *M* = 3.7 minutes, SD = 3.4 minutes, Fight essay M = 3.6 minutes, SD = 2.9 minutes. While it can safely be assumed that those who did not spend much time on the task were devoting less attention to the task, it does not necessarily follow that those who spent longer necessarily engaged anymore so, as participants were able to take this study at their leisure and may have clicked away from the study or been performing other activities along with the study. However, even when using word counts as a measure of attention the word counts for the essays were M = 85 words, SD = 47 words and M = 89 words, SD = 55 words, respectively.

While the word counts in Derrick et al., 2009 were not reported, it is possible that when participants were given six full minutes with nothing else to do except write and reflect on their past experiences, the average word count was larger than was found in this present study. Furthermore, since participants were able to take this study at their leisure on whichever device they wished, though laptops/desktops were encouraged, some participants may have taken this study when there were other people in the room, potentially even friends or family. A threat to self-esteem in the form of remembering a time one was rejected or fought with a close other may not be as effective if a participant is surrounded by people, with whom they may or may not have contact.

Another change from the initial procedure was the medium and software used in order to generate the avatars or characters. The original procedure was for participants to use a popular mobile app, Bitmoji, on a tablet device in order to mirror the avatar/character creation task used in Kang & Kim (2020). Instead, participants were required to follow a link to: https://readyplayer.me/avatar which is far less popular and offers far fewer customization options than found on Bitmoji but enabled users to easily upload a link within the study. This circumvented the requirement for participants to upload an image file, for which there would have been no method to verify the content of the image file prior to the completion of data collection. While the average time spent creating the avatar was M = 6.6 minutes, SD = 13.1 minutes, it is again impossible to tease apart how much time reflects engagement with the task, unfamiliarity using the interface, or time spent on other tasks/distractions from the avatar task. Additionally, one particularly desirable feature of the Bitmoji app was the ability to take a selfie and continually reference this image of the self, thereby reinforcing the concept that the avatar should be representation of the participant. However, based on the correlations amongst the

personality traits for those who created avatars, the personality traits attributed towards one's avatar was significantly more correlated with one's actual personality than with their ideal personality, which suggests that participants did not have trouble with thinking of their avatar as a representation of the self. Nevertheless, these results occurred in the absence of threatened self-esteem and do not serve to answer the hypotheses this study was intended to test.

While the manipulations were unable to elicit the necessary threat to self-esteem required in order to address the outlined hypotheses, it remains an open question as to whether self-esteem does in fact influence the creation of avatars and the usage of avatars as a means to lessen the impact of self-esteem threats. A more fruitful attempt at answering these questions could be to meet participants where they are at, letting participants report on when their self-esteem has been threatened and to prompt an avatar creation task at that time. One potential way to capture this would be an extended study in which participants self-report on their affect, as well as brief statements on the events immediately prior, at random times throughout the day for a period of several weeks. A baseline average affect score would need to be collected leading up to the study, but once the study began, any self-report that fell below a standard deviation, or two, of this average affect could prompt the participant to create an avatar and upload this image to a repository, as well as completing a post-manipulation measure of affect. Such a study would likely need to mirror the 2 x 2 design found in this present study to determine the effect of creating an avatar on self-esteem, compared to relevant control tasks.

While the popularity of the "metaverse" has grown in public perception due to the actions of Facebook (now Meta), the concept has existed in prior works such as a Neal Stephenson's Snow Crash and the 2011 film, *Ready Player One*. While a far cry from the fictional spaces depicted within these works, individuals are increasingly interested in how they present

themselves online and wish to do so in a personalized, or unique, way. Many of the top-selling non-fungible tokens (NFTs), such as the Bored Ape Yacht Club or Pudgy Penguins, could be considered avatars. Therefore, the hypotheses of these studies are still very much relevant to society as it unfolds into the metaverse.

Table 1

Correlations between Participant's Personality, Ideal Personality, & Avatar Personality

Actual Personality Trait	Correlation with Ideal	Correlation with Avatar	Z
Neuroticism	0.145	0.589	5.84
Extraversion	0.47	0.688	4.17
Openness	0.576	0.747	3.86
Conscientiousness	0.396	0.687	4.73
Agreeableness	0.663	0.694	0.74

Note. N = 208

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Appendix A

Rosenberg Self-Esteem Scale

Please record the appropriate answer for each item, depending on whether you: Strongly agree, agree, disagree, or strongly disagree with it.

1 = Strongly Disagree

2 = Disagree

3 = Agree

4 = Strongly Agree

_____ 1. On the whole, I am satisfied with myself.

_____ 2. At times I think I am no good at all.

_____ 3. I feel that I have a number of good qualities.

_____ 4. I am able to do things as well as most other people.

_____ 5. I feel 1do not have much to be proud of.

_____ 6. I certainly feel useless at times.

_____ 7. I feel that I'm a person of worth.

_____ 8. I wish I could have more respect for myself.

_____ 9. All in all, I am inclined to think that I am a failure.

_____ 10. I take a positive attitude toward myself.

Appendix B

State Self-Esteem

Items	Primary factor
1. I feel confident about my abilities.	Performance
2. I am worried about whether I am regarded as a success or failure. (R)	Social
3. I feel satisfied with the way my body looks right now.	Appearance
4. I feel frustrated or rattled about my performance. (R)	Performance
5. I feel that I am having trouble understanding things that I read. (R)	Performance
6. I feel that others respect and admire me.	Appearance
7. I am dissatisfied with my weight. (R)	Appearance
8. I feel self-conscious. (R)	Social
9. I feel as smart as others.	Performance
10. I feel displeased with myself. (R)	Social
11. I feel good about myself.	Appearance
12. I am pleased with my appearance right now.	Appearance
13. I am worried about what other people think of me. (R)	Social
14. I feel confident that I understand things.	Performance
15. I feel inferior to others at this moment. (R)	Social
16. I feel unattractive. (R)	Appearance
17. I feel concerned about the impression I am making. (R)	Social
18. I feel that I have less scholastic ability right now than others. (R)	Performance
19. I feel like I'm not doing well. (R)	Performance
20. I am worried about looking foolish. (R)	Social

Appendix C

IPIP-NEO-60

Actual Self Directions: The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. **Describe yourself as you generally are now, not as you wish to be in the future.** Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

Ideal Self Directions: The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes how you would like to be. **Describe yourself as you wish to be in the future.** Describe yourself as you honestly wish to be, in relation to other people you know of the same sex as you are, and roughly your same age.

Avatar Self Directions: The following pages contain phrases describing people's behaviors. **Please use the rating scale next to each phrase to describe how accurately each statement describes the avatar you just created.**

1 = Very Inaccurate; 2 = Moderately Inaccurate; 3 = Neither Accurate nor Inaccurate; 4 = Moderately Accurate; 5 = Very Accurate

Appendix D

Appendix IRT-based IPIP–NEO–60 items

The number in parentheses following the item indicates the corresponding item number in the 300-item IPIP–NEO. An R after the item number indicates that the item should be reverse scored.

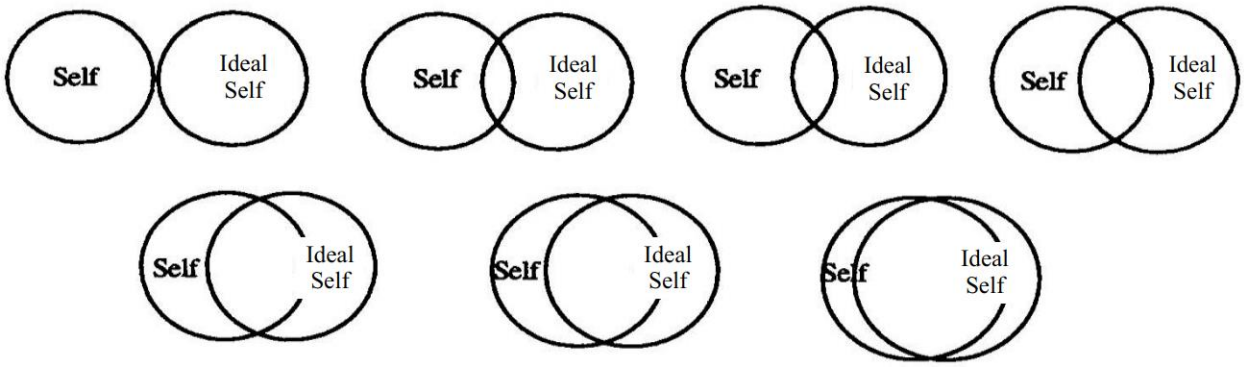
Neuroticism (N)	
N1: Anxiety	
Worry about things.	−1
Get stressed out easily.	−91
N2: Anger	
Get angry easily.	−6
Lose my temper.	−126
N3: Depression	
Often feel blue.	−11
Dislike myself.	−41
N4: Self-consciousness	
Find it difficult to approach others.	−76
Am easily intimidated.	−16
N5: Immoderation	
Rarely overindulge.	(171R)
Am able to control my cravings.	(231R)
N6: Vulnerability	
Remain calm under pressure.	(176R)
Am calm even in tense situations.	(296R)
Extraversion (E)	
E1: Friendliness	
Make friends easily.	−2
Act comfortably with others.	−92
E2: Gregariousness	
Love large parties.	−7
Avoid crowds.	(247R)
E3: Assertiveness	
Take charge.	−12
Try to lead others.	−42
E4: Activity level	
Am always busy.	−17
Am always on the go.	−47
E5: Excitement seeking	
Love excitement.	−22
Seek adventure.	−52
E6: Cheerfulness	
Have a lot of fun.	−57
Love life.	−147
Openness (O)	
O1: Imagination	
Have a vivid imagination.	−3
Love to daydream.	−63
O2: Artistic interests	
Believe in the importance of art.	−8
Do not like art.	(158R)
O3: Emotionality	
Experience my emotions intensely.	−13
Am not easily affected by my emotions.	(193R)
O4: Adventurousness	
Prefer to stick with things that I know.	(138R)
Don't like the idea of change.	(198R)
O5: Intellect	
Avoid philosophical discussions.	(203R)
Am not interested in theoretical discussions.	(263R)
O6: Liberalism	
Tend to vote for liberal political candidates.	−28
Believe in one true religion.	(118R)
Agreeableness (A)	
A1: Trust	
Trust others.	−4
Believe that others have good intentions.	−34
A2: Morality	
Cheat to get ahead.	(159R)
Take advantage of others.	(249R)
A3: Altruism	
Love to help others.	−74
Am concerned about others.	−104
A4: Cooperation	
Insult people.	(229R)
Get back at others.	(259R)
A5: Modesty	
Believe that I am better than others.	(144R)
Think highly of myself.	(174R)
A6: Sympathy	
Sympathize with the homeless.	−29
Feel sympathy for those who are worse off than myself.	−59
Conscientiousness (C)	
C1: Self-efficacy	
Handle tasks smoothly.	−65
Know how to get things done.	−155
C2: Orderliness	
Like to tidy up.	−40
Leave a mess in my room.	(190R)
C3: Dutifulness	
Tell the truth.	−105
Break my promises.	(195R)
C4: Achievement striving	
Work hard.	−50
Set high standards for myself and others.	−170
C5: Self-discipline	
Carry out my plans.	−145
Have difficulty starting tasks.	(265R)
C6: Cautiousness	
Make rash decisions.	(150R)
Act without thinking.	(270R)

(*Continued on next column*)

Appendix E

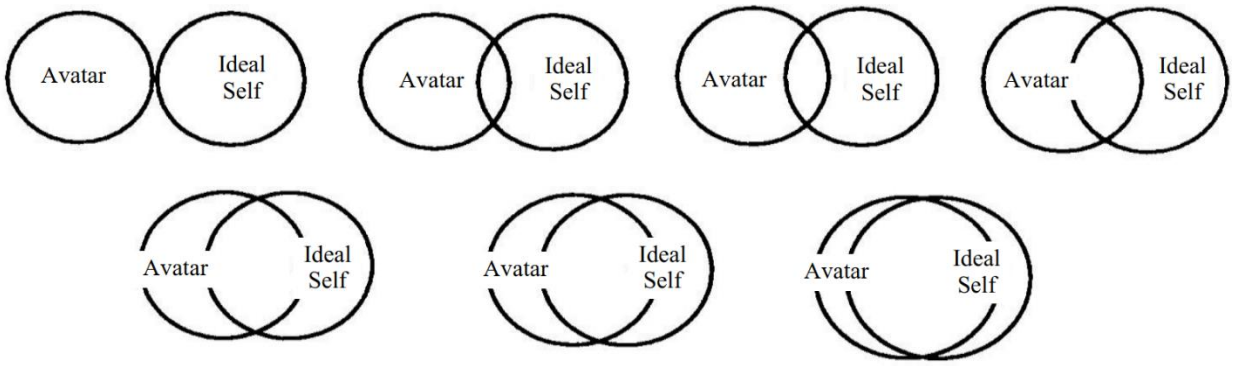
Self-Similarity (Actual/Ideal)

Please select the picture below which best describes how related these concepts are for you.



Self-Similarity (Avatar/Ideal)

Please select the picture below which best describes how related these concepts are for you.



Appendix F

Attractiveness Rating

How attractive is the following avatar?

1 = Very Unattractive

2 = Unattractive

3 = Somewhat Unattractive

4 = Neither Attractive nor Unattractive

5 = Somewhat Attractive

6 = Attractive

7 = Very Attractive

Appendix G

Self Esteem Threat Essay Prompt 1

Please write about a time that you fought with a close other. This person could be a family member, friend, or romantic partner. Please spend around 5 minutes on this task.

Self-Esteem Threat Essay Prompt 2

Please write about a time that you felt rejected. Please spend around 5 minutes on this task.

Self-Esteem Control Essay Prompt 1

Please write out a list of as many items in your living space as you can remember. Please spend around 5 minutes on this task.

Self-Esteem Control Essay Prompt 2

Please write about the shops and buildings that you pass on a route that you travel regularly. Please spend around 5 minutes on this task.

Appendix H

Avatar customization prompt

Please create an avatar that reflects your identity, personal interests, and values. This task should take around 5 minutes. When you are satisfied with your avatar, please hand the device to the research assistant for verification and to continue the rest of the study.

Character creation prompt

Please create a character that is as close a match as possible to the provided image. This task should take around 5 minutes. When you are satisfied that the characters match, please hand the device to the research assistant for verification and to continue the rest of the study.