Abstract

Introduction

How do video games and performance within them affect self-perception of an individual and mate choice.

Materials

This study is composed of three separate experiments, each of which involved the same general progression of Kasumovic et al (2015). The survey given to participants had three separate sections that consisted of demographic information about themselves and the games they play, the experimental treatment where participants were randomly assigned a game, and the collection of the dependent variables through the mating-related survey questions. We describe each section in more detail below.

Violent Video Game Play. Following prior research, to estimate violent video game exposure, participants were asked to list the titles of up to five games that they currently play, rate how often they play each game, and the extent of the violent content within each game (rated on 7-point scales to estimate). This allowed us to calculate a total violent video game exposure value by adding the exposure levels of each game which was calculated by the level of violence in each game (1-7) multiplied by how often they played the game (1-7), then averaged over 5 games (e.g., Anderson & Dill, 2000; Bartholow, Bushman, & Sestir, 2006; Uhlmann & Swanson, 2004, Kasumovic et al 2015). This resulted in individuals falling within a scale of 1-49, with a greater value signifying the choice to spend a greater proportion of their weekly game playing time playing violent games.

Demographics. We next asked details about the individual which included sex, age, and country of residence. We also included a 7-point Likert scale of their sexuality (1 = attracted to men only; 7 = attracted to women only) and asked about their current relationship status (Single, In an open relationship/casually dating, In a long-term monogamous relationship eg. married, partnered, Recently single/divorced/separated).

Played a video game. Participants were then randomly assigned to play a violent or non-violent game for 5 minutes. There were three possible violent and non-violent games that participants could receive (Table S1), making six possible games in total. With 30 seconds left to play, participants were reminded to remember their score as after 5 minutes we asked them to enter their score to reinforce how they performed. Participants were then asked to self-report how well they thought they played on a 7 point Likert scale; this self-perceived score was used in further analyses.

Mating-related Variables. We asked participants to complete four separate surveys that were presented in randomized order. We included the 4-item Mate Value Scale to measure participants' self-perceived desirability as a mate (Edlund & Sagarin, 2014) and the Sex-Goal Activation (SGA) to measure current motivation for sex (REF). The revised Sociosexuality Inventory (SOI) assessed attitudes toward sexuality, with higher scores indicating a greater tendency to engage in sexual relationships without emotional commitment (Penke & Asendorpf, 2008). We also included 5 items from the Conflict Tactics Scale (CTS) to assess levels of intimate partner violence directed at a current or most recent romantic partner (Straus, Hamby, Boney-McCoy, & Sugarman, 1996).

In experiment 1 (Game Manipulation), participants received the survey exactly as outlined above. This served to explore the role of demographic variables and their interaction with game type and self-perceived performance on the mating related variables. In experiment 2, (Rank Manipulation), After we asked players to enter their score, we provided them with a ranking of their performance ostensibly telling participants that their performance was ranked relative to the last 9 individuals that played this game. In actuality, their position in the 10 person rank was randomized and the scores of the other fake participants was increased or decreased in an appropriate fashion to match the rank they were given relative to the score they entered. This provided a second manipulation. In experiment 3 (Face Preferences), we provided the exact same survey as in Experiment 1, except that prior to the collecting information on the mating-related variables, we asked participants to complete a face-preference task by asking them to select which face they preferred in a pair where the faces were masculinized or feminized versions of the same face. This face preference task consisted of two sections where in the first, participants were asked to rate which face they preferred for a short-term relationship and the second involved participants stating which face they preferred for a long-term relationship. In each section, participants were given four pairs of faces where the order of faces was randomized with no repetition.

Statistics

To explore whether men and women varied in their perceived performance in the random game they were assigned, we used a multiple regression model with the game type (violent or non-violent game) as a factor and sex, age, and exposure to violence as covariates. We also added interactions between game type and age and game type and sex.

To explore how our measures of mate value, sex goal activation, and sociosexual orientation inventory, were affected by the video game treatment, we used a MANOVA with sex and age as fixed factors and their self-rated performance in the game and exposure to violence as a covariates. We also added interactions between game type and age, game type and sex, and game type and performance. We then performed univariate analyses to explore the specific effects of the video game treatment on each measure.

For Experiment 2, we also added rank as a covariate in the necessary models. For Experiment 3, we performed two additional linear models exploring short and long-term face preferences with the game type as a factor and sex, age, self-perceived performance and the mating related variables as covariates. We used R (version XXXXX) to perform all analyses. The code, data, and output for all analyses can be found at (WEBSITE ADDRESS HERE).

Ethics Statement

All research was approved by the ethics committee at UNSW Australia and was conducted in accordance with the Declaration of Helsinki. All data and the complete surveys for both studies are provided in the supplementary materials. Only respondents who reported playing video games in the past 30 days were allowed to participate. All raw data are available at (WEB ADDRESS HERE).

Results

Overall demography for the three studies

We had a total of 1775 participants across the three studies which was posted on Amazon's Mechanical Turk. Individuals were paid USD$1.00. All individuals were from the USA except for a single individual from Puerto Rico. We first removed all the individuals who failed one of the two attention checks (n=144), selected 'other' when asked for their sex (n=2), or selected 'other' in their relationship status (n=13). This left a total of 1616 individuals across all experiments. The sample size and demography for all three studies are in Table 1.

Study	Sample size	Mean age	Age range	Sex	Relationship status

Game Manipulation	517	31.84±9.76	18-68	Female: 248 Male: 269	Long term: 293 Single: 182 Casual/Open: 26 Recently single: 16
Rank Manipulation	678	35.28±10.41	18-74	Female: 310 Male: 368	Long term: 369 Single: 263 Casual/Open: 21 Recently single: 25
Face Preferences	421	33.78±10.41	18-71	Female: 176 Male: 245	Long term: 258 Single: 127 Casual/Open: 23 Recently single: 13

Experiment 1: Gaming Manipulation

There was a significant effect of sex ($F_{1,510}$=22.49, P<0.0001) with men (4.07±0.09) rating their performance higher relative to women (3.40±0.09). Participants playing the non-violent games (4.079±0.005) rated their performance significantly higher relative to those playing the violent games (3.434±0.006; $F_{1,510}$=34.14, P<0.0001). There was a significant negative correlation between how participants perceived their performance and their age ($F_{1,510}$=22.39, P<0.0001; Figure 1a) and a positive correlation between how participants perceived their performance and their exposure to violence ($F_{1,510}$=6.25, P=0.01; Figure 1b). There were no interactions between age and game type ($F_{1,510}$=1.64, P=0.20) or sex and game type ($F_{1,510}$=0.58, P=0.44).

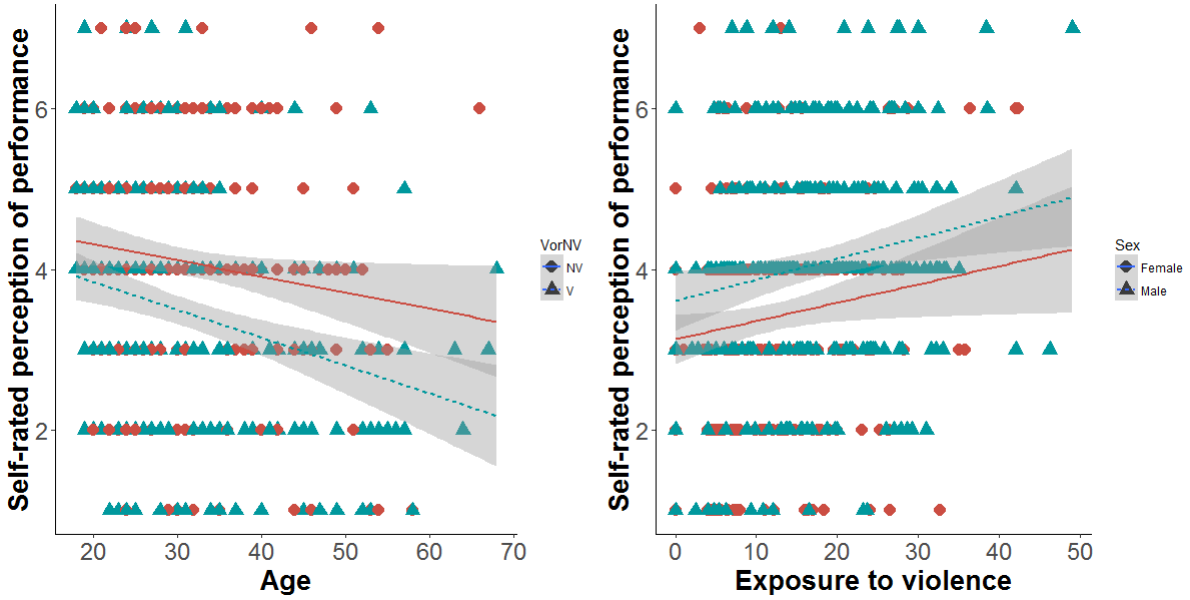


Figure 1: The relationship between self-rated performance and (a) age separated by game type and (b) the exposure to violence separated by sex.

Our MANOVA showed an overall effect of age, sex, and self-rated performance on all our mating related variables (Table 1). There were no significant interactions.

Table 1: MANOVA exploring the role of the type of game, sex, age and self-rated performance on our measures of mate value, sex goal activation, and sociosexual orientation inventory

	Pillai	df	F	P
Game type	0.0001	3, 506	0.02	0.995
Age	0.045	3, 506	7.88	**<0.0001**

Sex	0.105	3, 506	19.78	**<0.0001**
Self-rated Performance	0.032	3, 506	5.58	**0.0009**
Exposure to Violence	0.007	3, 506	1.14	0.33
Game × Performance	0.007	3, 506	1.27	0.28
Game × Sex	0.002	3, 506	0.28	0.84
Age × Sex	0.008	3, 506	1.32	0.27

An individual's mate value was significantly positively correlated by an individual's self-rated performance ($F_{1,508}$=16.73, p<0.0001; Figure 2). There was also a trend towards an effect of sex ($F_{1,508}$=3.04, p=0.08; Figure 1) with men that performed more poorly having a relatively lower mate value score. No other factors were significant in the model.

Sex goal activation was negatively correlated with age ($F_{1,508}$=20.37, p<0.0001; Figure 2). No other factors were significant in the model.

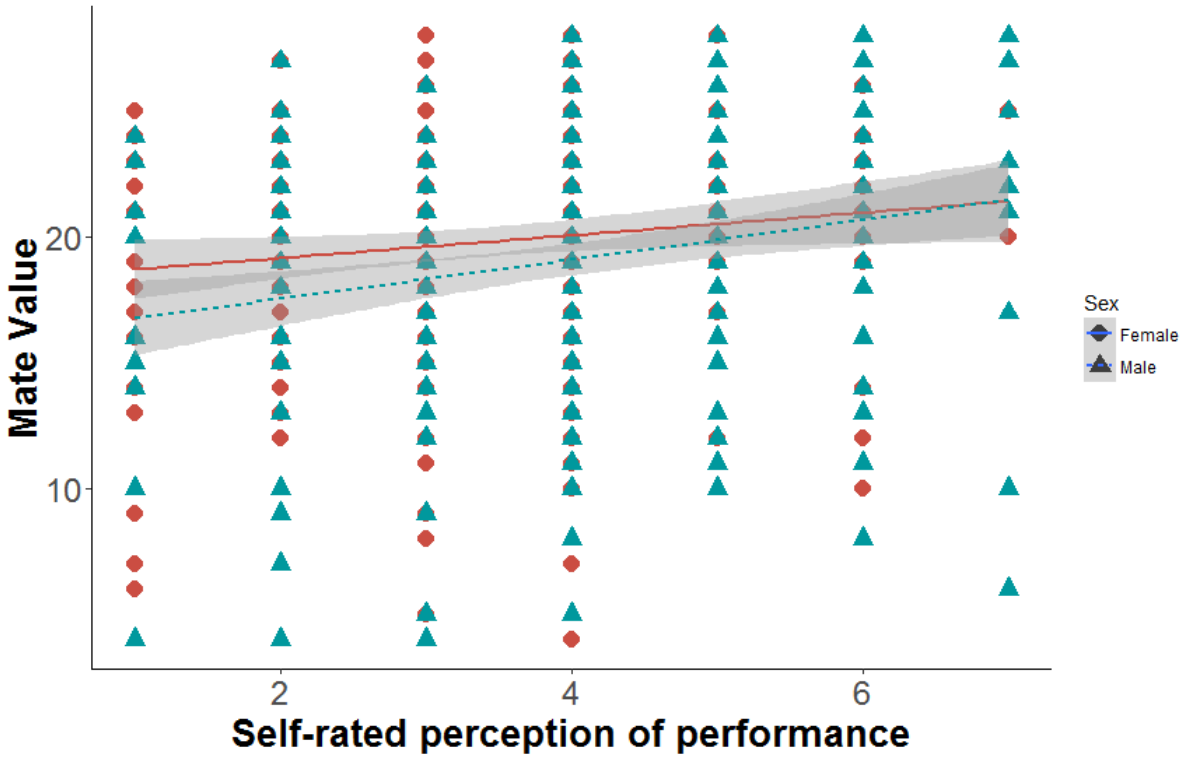


Figure 2: A positive correlation between an individual's self-rated performance and their mate value with men that perceived themselves as performing more poorly having a lower mate value relative to women.

There was a significant interaction between age and sex ($F_{1,508}$=3.97, p=0.047) such that SOI increased in men and decreased in women as they aged (Figure 3a). There was a near-significant effect of game type and self-rated performance ($F_{1,508}$=3.26, p=0.07) such that SOI was positively correlated with self-rated performance with those individuals playing a non-violent game having greater slope (Figure 3b). There was also near-significant effect of exposure to violence ($F_{1,508}$=2.81, p=0.09) with individuals that were exposed to more violent video games having a higher SOI.

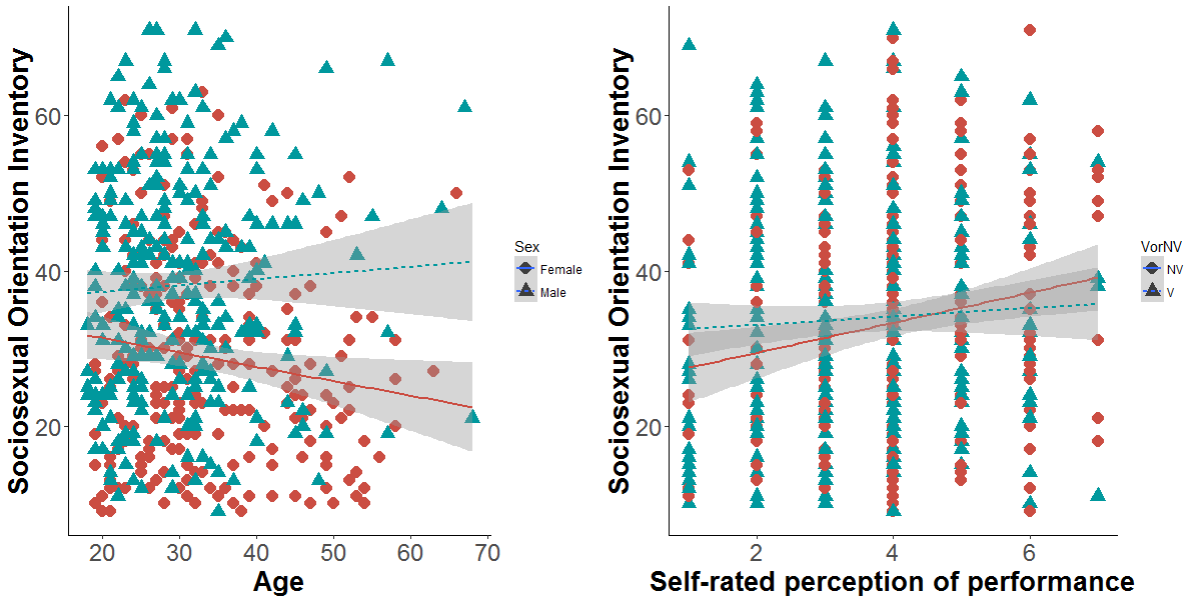


Figure 3: The relationship between sociosexual inventory and (a) age separated by sex and (b) participants' self-rated perception of their performance.

Experiment 2: Rank Manipulation

There was a significant effect of sex ($F_{1,670}$=56.17, P<0.0001) with men (3.85±0.07) rating their performance higher relative to women (3.08±0.08). There was a significant negative correlation between how participants perceived their performance and their age ($F_{1,670}$=69.34, P<0.0001; Figure S1a) and a positive correlation between how participants perceived their performance and their exposure to violence ($F_{1,670}$=32.43, P<0.0001; FigureS1b). There was a near-significant effect of our rank manipulation ($F_{1,670}$=2.85, P=0.09) with participants receiving lower ranks scoring their performance more poorly. There was no effect of game type ($F_{1,670}$=0.63, P=0.42) and there were no significant interactions between rank and game type ($F_{1,670}$=1.85, P=0.17) or sex and game type ($F_{1,670}$=1.57, P=0.21).

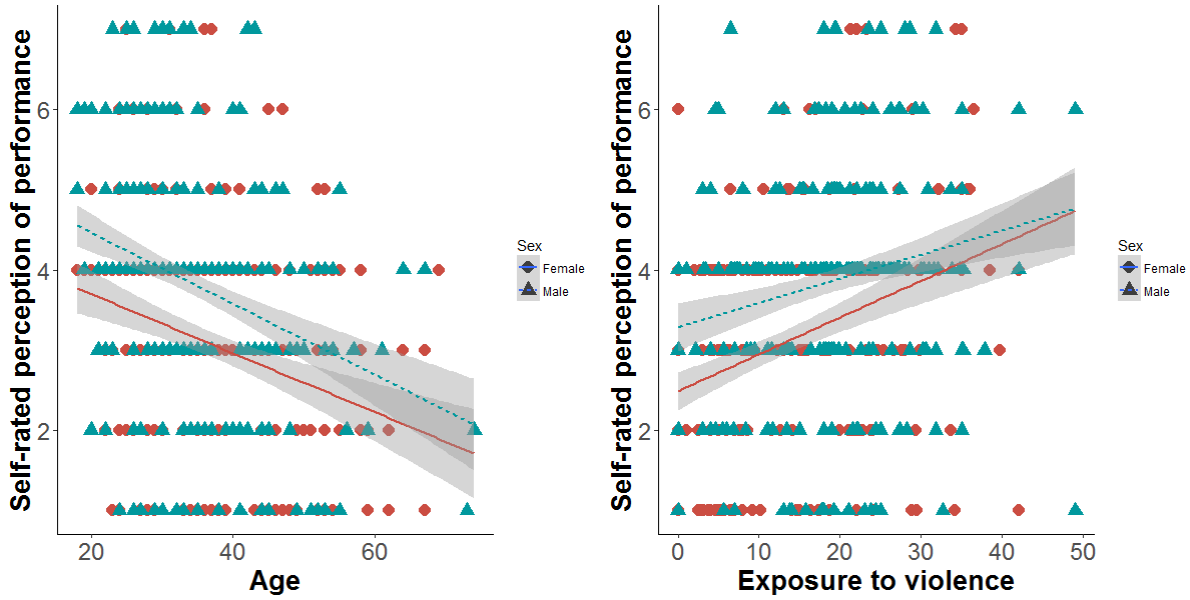


Figure S1: The relationship between self-rated performance and (a) age separated by sex and (b) the exposure to violence separated by sex.

Our MANOVA showed an overall effect of age, sex, and self-rated performance on all our mating related variables (Table 2). There were no significant interactions.

Table 2: MANOVA exploring the role of the type of game, sex, age and self-rated performance on our measures of mate value, sex goal activation, and sociosexual orientation inventory

	Pillai	df	F	P
Rank	0.007	3, 665	1.66	0.17
Game type	0.002	3, 665	0.37	0.77
Age	0.022	3, 665	4.98	**0.002**
Sex	0.111	3, 665	27.69	**<0.0001**
Self-rated performance	0.036	3, 665	8.25	**<0.0001**
Exposure to violence	0.006	3, 665	1.36	0.25
Game × Performance	0.003	3, 665	0.61	0.61
Game × Rank	0.005	3, 665	1.17	0.32
Game × Sex	0.004	3, 665	0.98	0.40
Age × Sex	0.007	3, 665	1.47	0.22

An individual's mate value was significantly positively correlated by an individual's self-rated performance ($F_{1,667}$=18.67, p<0.0001; Figure S2). There was also a near-significant effect of rank ($F_{1,667}$=3.42, p=0.065) with individuals with a lower rank tending to have a higher mate value.

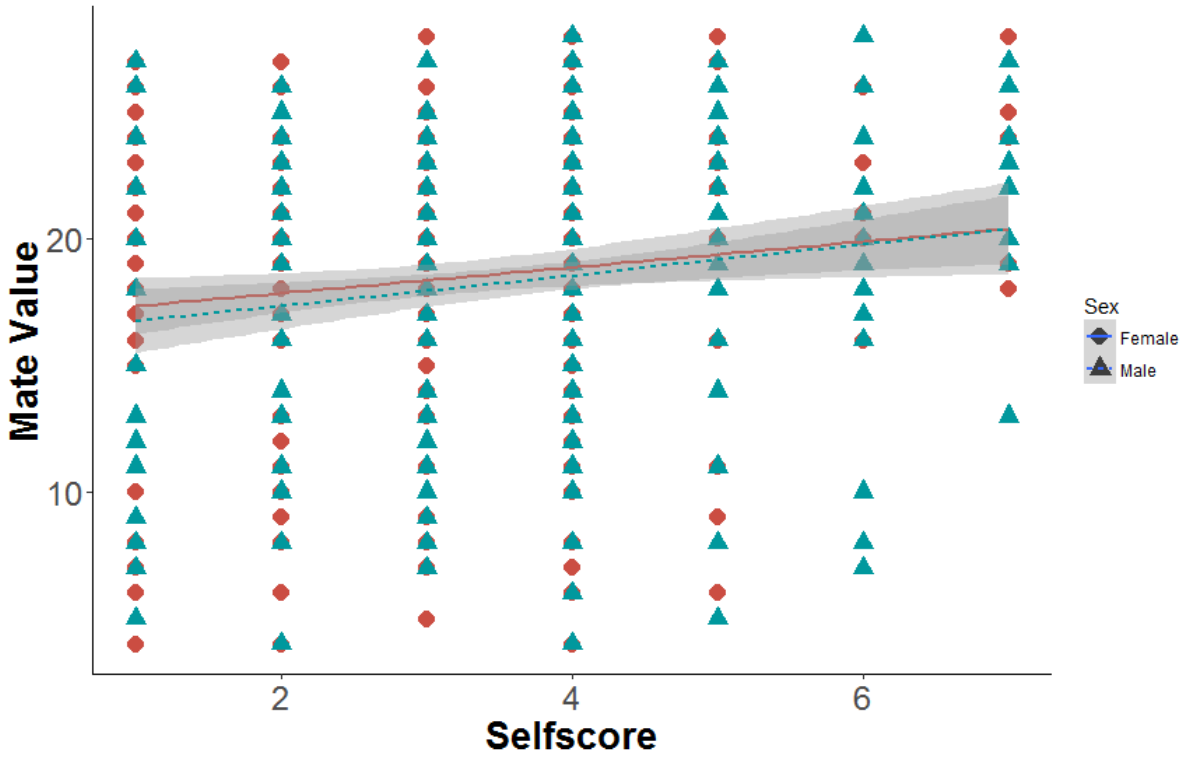


Figure S2: A positive correlation between an individual's self-rated performance and their mate value with men that perceived themselves as performing more poorly having a lower mate value relative to women.

SGA was negatively correlated with age ($F_{1,667}$=9.64, p=0.002) and positively correlated with self-rated performance ($F_{1,667}$=6.16, p=0.01; Figure 5a).There was a near- significant effect of sex ($F_{1,667}$=3.11, p=0.08) with men (3.69±0.08) having a higher SGA compared to women (3.42±0.10). There was also a near-significant effect of the exposure to violence ($F_{1,667}$=2.79, p=0.10) with participants that were exposed to more violent video games having a higher SGA.

SOI was significantly negatively correlated with age ($F_{1,667}$=5.41, p=0.02). There was also a significant effect of sex ($F_{1,667}$=83.16, p<0.0001) with men (41.53±0.86) having a higher SOI relative to women (30.37±0.80). There was a near-significant age by sex interaction ($F_{1,667}$=3.15, p=0.08) with SOI increasing in older men and decreasing in older women. There was also a near-significant effect of rank and game type on SOI ($F_{1,667}$=3.01, p=0.08) where participants ranked lower had a higher SOI when they played the non-violent games and a lower SOI when they played non-violent games; the opposite was true at a higher ranking.

Experiment 3: Face Preferences

There was a significant effect of sex ($F_{1,414}$=7.40, P=0.007) with men (3.85±0.07) rating their performance higher relative to women (3.07±0.08). Participants playing the non-violent games (3.57±0.08) rated their performance significantly higher relative to those playing the violent games (3.41±0.08; $F_{1,414}$=36.85, P<0.0001). There was a significant negative correlation between how participants perceived their performance and their age ($F_{1,414}$=33.31, P<0.0001; Figure S3). There was no correlation between how participants perceived their performance and their exposure to violence ($F_{1,414}$=1.19, P=0.27). There were also no interactions between age and game type ($F_{1,414}$=0.10, P=0.75) or sex and game type ($F_{1,510}$=0.42, P=0.52).

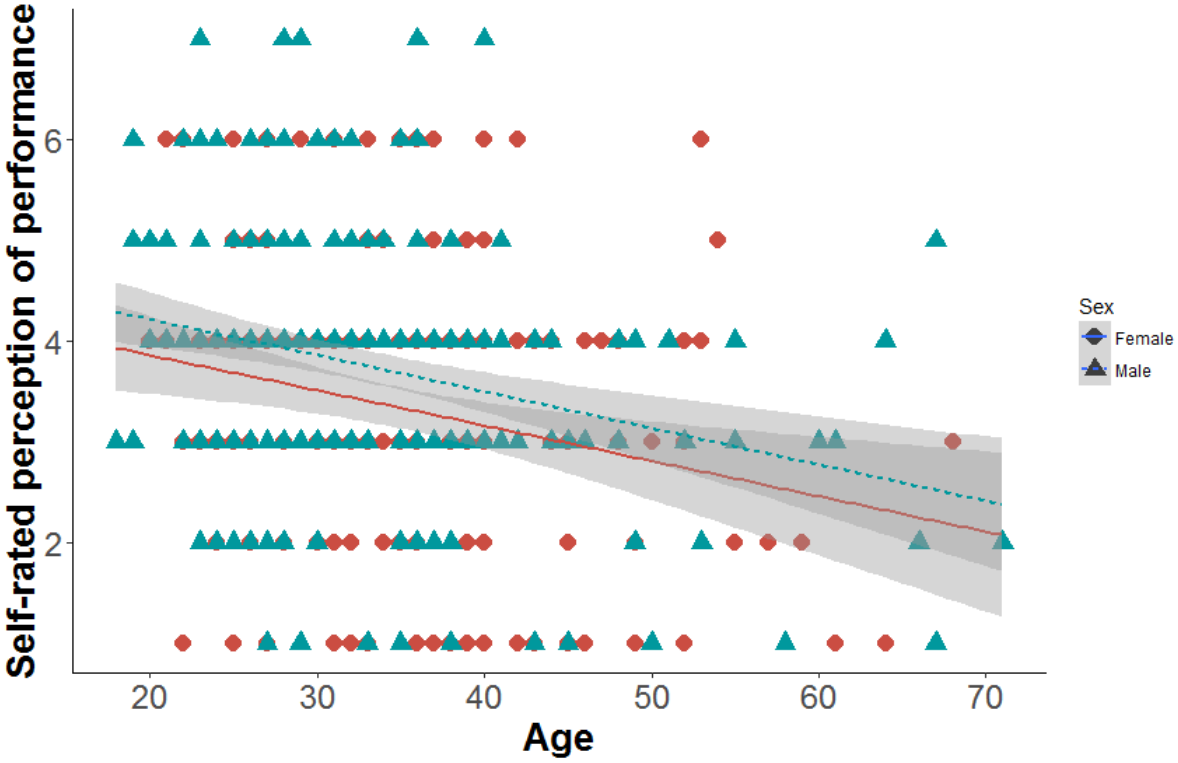


Figure S3: The relationship between self-rated performance and age separated by sex.

Our MANOVA showed an overall effect of age, and an interaction between game type and age on all our mating related variables (Table 3).

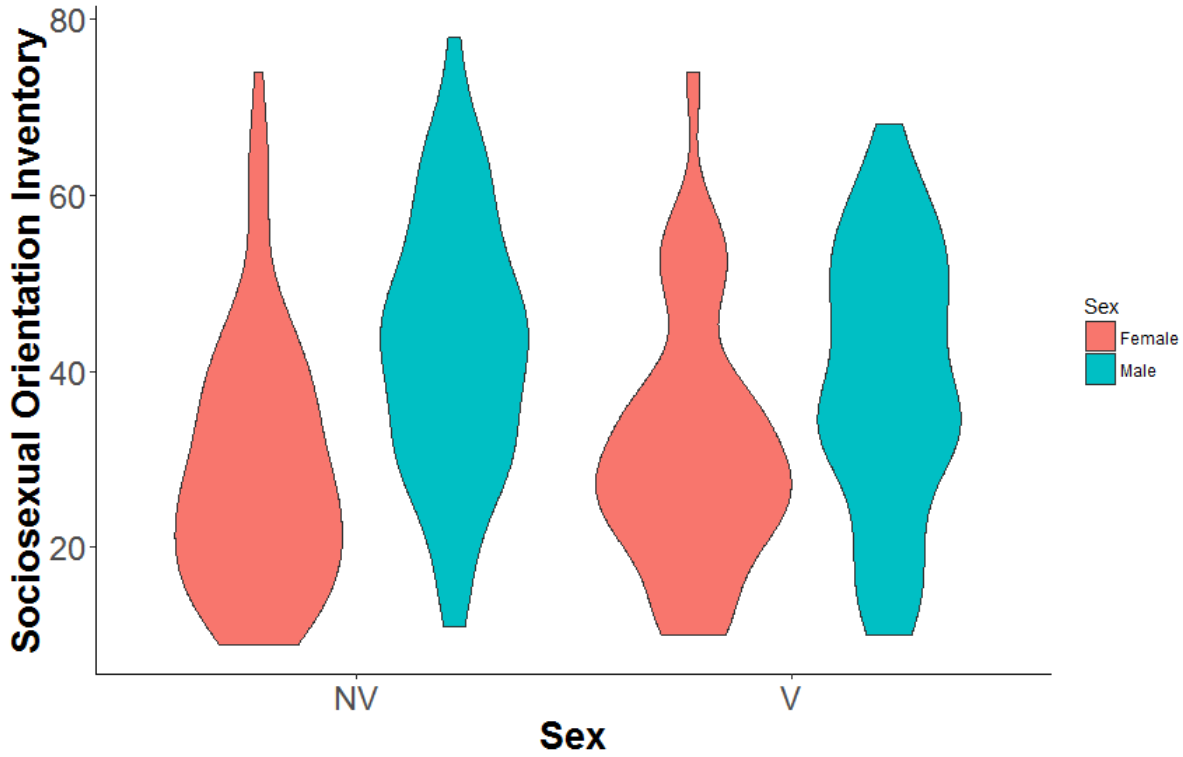
Table 3: MANOVA exploring the role of the type of game, sex, age and self-rated performance on our measures of mate value, sex goal activation, and sociosexual orientation inventory

	Pillai	df	F	P
Game type	0.003	3, 410	0.37	0.77
Age	0.014	3, 410	1.90	0.13
Sex	0.118	3, 410	18.34	**<0.0001**
Self-rated Performance	0.014	3, 410	1.92	0.13
Exposure to Violence	0.015	3, 410	2.12	0.10
Game × Performance	0.007	3, 410	1.00	0.39
Game × Sex	0.021	3, 410	2.97	**0.03**
Age × Sex	0.004	3, 410	0.53	0.66

An individual's mate value was significantly positively correlated by an individual's self-rated performance ($F_{1,412}$=5.40, p=0.02). There was also a trend towards an effect of sex ($F_{1,412}$=3.44, p=0.06) with men having a relatively higher mate value score. No other factors were significant in the model.

There was a near-significant correlation between SGA and a participant's exposure to violence ($F_{1,412}$=3.46, p=0.06) with individuals exposed to greater violence having a higher SGA. No other factors were significant in the model.

Sociosexual inventory was significantly negatively correlated with age ($F_{1,412}$=5.09, p=0.02). There was also a significant effect of sex ($F_{1,412}$=50.40, p<0.0001; Figure 9) with men (41.53±0.86) having a higher SOI than women (30.37±0.80). There was also a significant Game Type by Sex interaction ($F_{1,412}$=6.76, p=0.01; Figure 4). There were no other factors that were significant.



There was a significant effect of sex ($F_{1,412}$=13.74, p=0.0002) and a significant interaction between Sex and Self-rated performance ($F_{1,412}$=5.93, p=0.015; Figure 11) such that women preferred more feminized faces the higher their performance and men preferred more masculinized faces the higher their performance.

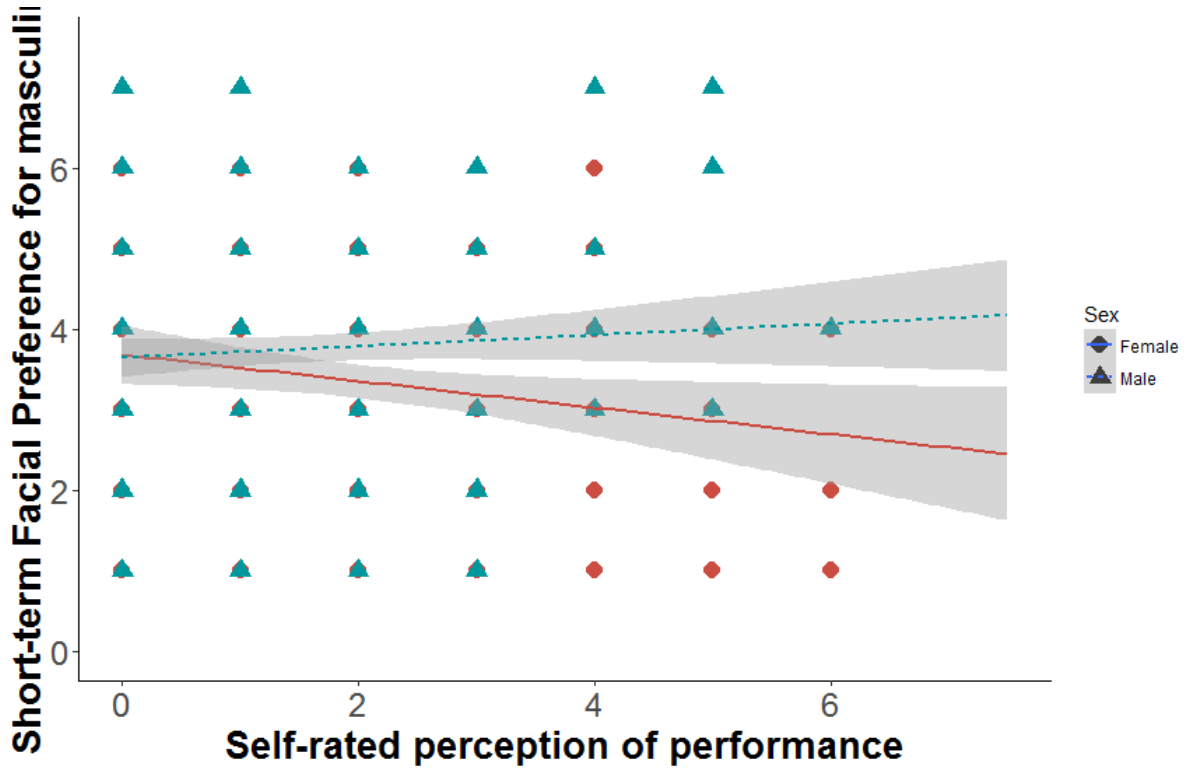


Figure 5

We used the same model to explore long-term face preferences. There was a significant effect of age ($F_{1,412}$=9.67, p=0.002) with preference for masculinity increasing with age, and Sex ($F_{1,412}$=7.01, p=0.008) with women showing a greater preference for facial masculinity (Figure 6). There was also a significant effect of SOI ($F_{1,412}$=6.77, p=0.01; Figure 7) with facial preference for masculinity decreasing with an increase in SOI.

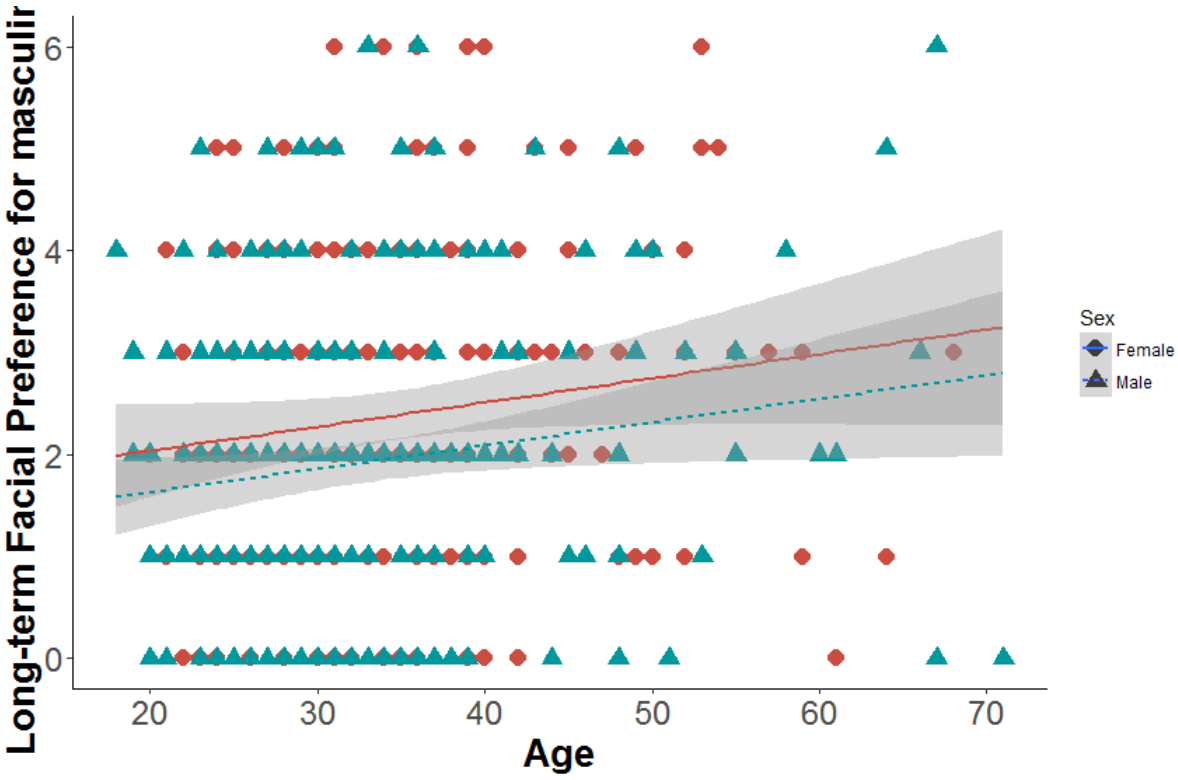


Figure 6

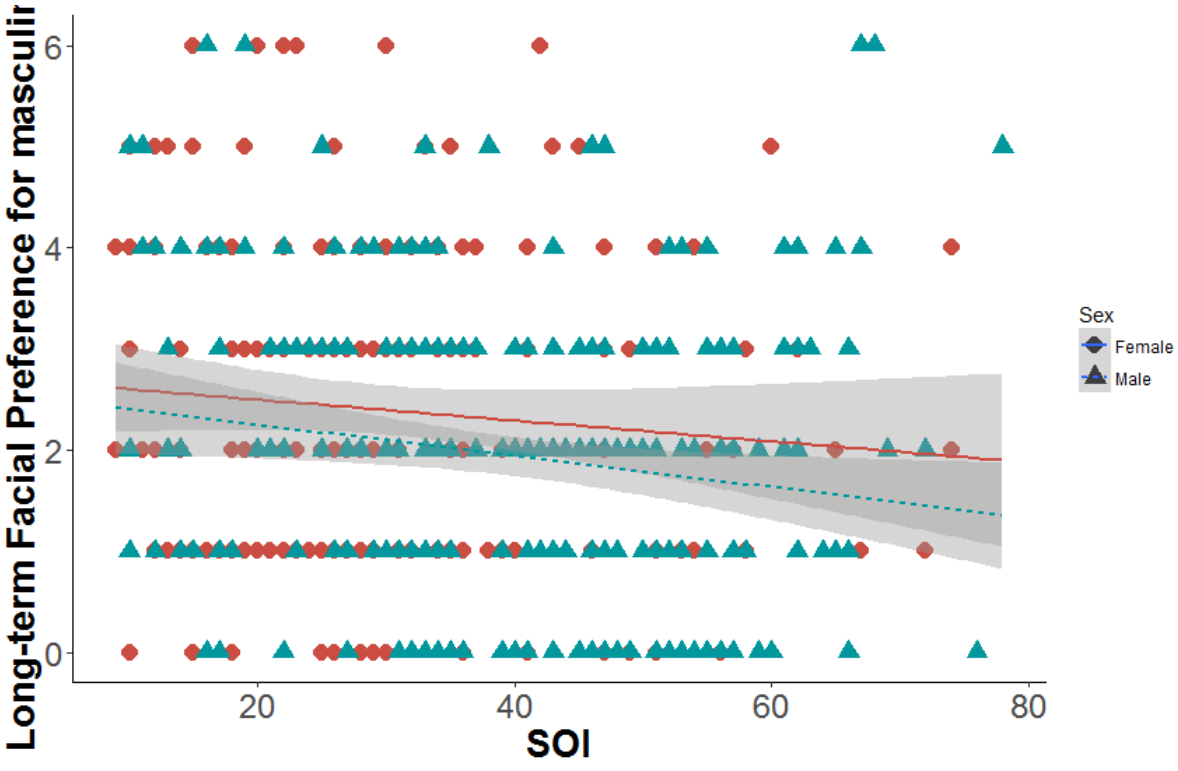


Figure 7

Discussion

Table S1

Type of game	Game name	Link
Violent	More Mindless Violence	http://www.kongregate.com/games/legitgames/more-mindless-violence
	Deanimator	http://www.newgrounds.com/portal/view/237765
	Gunblood	https://www.crazygames.com/game/gunblood
Non-violent	Bubble Shooter	https://www.bubbleshooter.net/
	Pongnop	http://www.notdoppler.com/pongnop.php
	Perfect Balance	http://www.kongregate.com/games/ttursas/perfect-balance