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Sexist Games = Sexist Gamers?
A Longitudinal Study on the Relationship Between Video Game Use and Sexist Attitudes

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Abstract

From the oversexualized characters in fighting games, such as Dead or Alive or Ninja Gaiden, to the overuse of the damsel in distress trope in popular titles, such as the Super Mario series, the under- and misrepresentation of females in video games has been well documented in several content analyses. Cultivation theory suggests that long-term exposure to media content can affect perceptions of social realities in a way that they become more similar to the representations in the media and, in turn, impact one's beliefs and attitudes. Previous studies on video games and cultivation have often been cross-sectional or experimental, and the limited longitudinal work in this area has only considered time intervals of up to 1 month. Additionally, previous work in this area has focused on the effects of violent content and relied on self-selected or convenience samples composed mostly of adolescents or college students. Enlisting a 3 year longitudinal design, the present study assessed the relationship between video game use and sexist attitudes, using data from a representative sample of German players aged 14 and older (N = 824). Controlling for age and education, it was found that sexist attitudes – measured with a brief scale assessing beliefs about gender roles in society – were not related to the amount of daily video game use or preference for specific genres for both female and male players. Implications for research on sexism in video games and cultivation effects of video games in general are discussed.

Introduction

While the representation of women in the population of video game players has changed substantially over the last decades – a recent publication by the Entertainment Software Association (ESA), for example, reports that around 48% of players in the United States are female[1] – their representation in the games is still contorted. A large number of content analyses have found that female characters in video games are both largely underrepresented[2-8] and more likely to be portrayed in an oversexualized manner than male characters.[3-5,7,9-13] Despite differences in the samples of games that were studied, several of these analyses consistently found a proportion of female characters < 20%, with the share of games featuring a female protagonist being even lower.[2,8,9] The report by the advocacy group Children Now,[9] for example, indicates that out of the 16% of female characters they found, 50% appear only as props or bystanders in the game.

The under- and misrepresentation of females in video games is not only potentially off-putting for female players, but may also have an impact on the players' beliefs and attitudes. The APA Task Force on the Sexualization of Girls suggested that media, such as television or video games, can shape and affect beliefs about and attitudes toward gender roles in society.[14] Cultivation theory posits that long-term exposure to media content can affect the perception of social realities and the attitudes toward those.[15,16] More specifically, it assumes that the perceptions of social realities become more similar to the way these are portrayed in the media, the more heavily the medium is used. These so-called first-order cultivation effects that relate to an individual's perception of reality are assumed to be complemented by second-order effects relating to personal beliefs and attitudes.[17] Cultivation theory has been widely used in research on the effects of mass media. A recent literature review found more than 500 published studies that used cultivation theory.[18] Despite the criticism that the theory has faced over the years – including the debate over whether it can actually be called a theory – it still ranks among the most popular theories in communication and media research.[19-21]

While originally developed to assess the effects of television viewing, cultivation theory has also been applied to video games. In line with the origins of cultivation theory, the majority of this work has focused on the effects of violence in games. Overall, the evidence for cultivation effects of video game violence is rather limited. Anderson and Dill[22] found no correlation between amount of video game play and estimations of crime likelihood and feelings of safety after they controlled for gender. Another cross-sectional study by van Mierlo and van den Bulck[23] only yielded some evidence for first-order cultivation effects of violent video games relating to estimates of serious crime and the proportion of policemen in the workforce, but none for any second-order effects. An analysis using data from the same project as the current study found no relationship between the use of video games in general or preference for

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first-person shooter games and militaristic attitudes.[24] A long-term experimental study by Chong et al.[25] also found no second-order cultivation effects and only partial support for first-order effects. Similarly, the longitudinal field study by Williams[26] only found first-order cultivation effects for real-world dangers relating to situations that are also present in the world of the particular game that was used.

With regard to sexist video game content, there are even fewer studies that have investigated its potential cultivation effects. A cross-sectional survey by Stermer and Burkley[27] showed that men who play video games featuring sexist content show higher levels of benevolent sexism. An experimental study by Dill et al.[28] found that men exposed to stereotypical representations of women in video games were more tolerant of sexual harassment after playing the game. Another experimental study by Fox et al.,[29] looking at the so-called Proteus effect, revealed that participants who saw their own faces on a sexualized avatar in a VR environment expressed more rape myth acceptance than those confronted with a nonsexualized avatar. In sum, unlike the studies on violence, the limited evidence for cultivation effects of sexist video game content point more toward second-order effects. However, these studies have exclusively enlisted crosssectional designs or assessed only the short-term effects of video game exposure. At the same time, the longitudinal studies on violence have been limited to periods of no more than 1 month, and all of the studies in that area have relied on self-selected or convenience samples composed mostly of adolescents or college students.

The aim of the present study was to investigate the impact of video game use on real-world attitudes relating to gender roles. As the evidence for cultivation effects of video games can be called mixed at best, a research question was formulated instead of a directed hypothesis:

RQ1: Does increased video game exposure cultivate sexist attitudes?

However, it might also be possible that the previously established cross-sectional links are indicative of selection, rather than cultivation, effects. As a longitudinal design was used, this complementing question was also posed:

RQ2: Are sexist attitudes conducive to an increased engagement with video games?

Methods

Participants and procedure

The data for the present paper comes from a three-wave longitudinal panel study on the uses and effects of gaming in Germany. The recruitment procedure for this study consisted of two phases. In the first phase, a representative sample of 50,012 individuals aged 14 years and older were asked about their use of video games in an omnibus telephone survey. Approximately 25% (N = 12,587) of the respondents in the omnibus survey could be identified as active video game players. Out of these 12,587 game players, a random sample of 4,500 players was recruited for the first wave of the main study.

Participant recruitment and the computer-assisted telephone interviews (CATI) were conducted by a professional German market research institute. The first wave of the study was conducted in 2011, the second in 2012, and the third in 2013. Due to financial constraints and in anticipation of panel mortality, a random subset of about 50% of the respondents from each previous wave was recruited for waves 2 and 3. Hence, out of the 4,500 active game players interviewed in wave 1, 2,199 were interviewed in the second wave, and 902 were also interviewed in the third wave. As the items on attitudes toward gender roles were only included in waves 1 and 3, the current analyses are limited to data from these two waves.

Measures

As the survey included many different topics and to minimize respondent burden in a telephone interview, abbreviated scales were employed for most of the constructs that were measured, including sexist attitudes. As the list of measures would otherwise be too long, only those that were used in the analyses for the present paper are reported here.

Sociodemographics. Respondent sex (male = 0; female = 1), age, and highest educational degree were assessed. The options for the answer to the education item reflected the German educational system and were coded into an ordinal variable ranging from 0 = ‘‘no school leaving certificate'' to 5 = ‘‘university degree''.

Video game use. Participants were asked how often they play computer or video games: every day, several times a week, several times a month, or less often. Depending on their answer to this questions, they were asked how many hours per day, week, month, or year they play on average. From this, the average number of hours per day was

computed. In addition, respondents were asked to indicate their preference for different video game genres, including first-person shooter, role-playing, and action games, on a scale from 1 = ‘‘I do not like it at all" to 5 = ‘‘I like it very much," with the additional option to note ‘‘I do not know the genre at all".

Sexist attitudes. Sexist attitudes were measured with three items from the German translation[30] of the sex-role orientation scale by Brogan and Kutner,[31] using a scale ranging from 1 = ‘‘strongly disagree" to 5 = ‘‘agree completely". The items were slightly rephrased to make them more easily comprehensible in a telephone interview and to adapt them to modern realities of gender roles. Higher agreement with the items indicated stronger sexist attitudes.

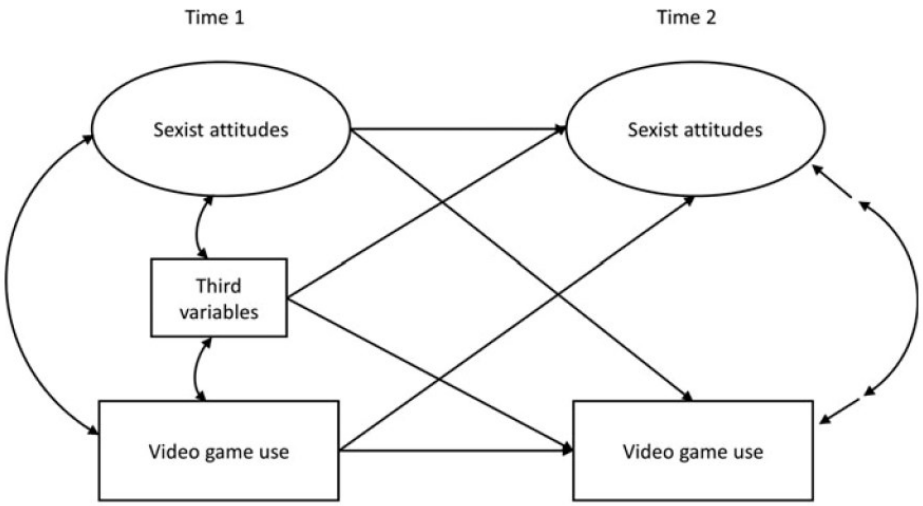

FIG. 1. Cross-lagged structural equation model with third variable control.

The scale showed high internal consistency in both wave 1 (α = 0.80) and 3 (α = 0.79).
The items of the sexist attitudes scale as well as the descriptives for all variables used in the analyses can be found in Appendix A.

Data analysis

A cross-lagged structural equation model with sexist attitudes as a latent factor and video game use in hours per day as a manifest variable was estimated using the lavaan package for R.[32] Age and education were entered as covariates (see Fig. 1 for a schematic illustration of the cross-lagged model with third variable control). While education was an ordinal variable, according to Finney and DiS-tefano,[33] the use of ML estimation methods yields valid results, if the ordinal variable has at least five levels, which was the case for education. It was decided to enlist a multigroup model, instead of simply using respondent sex as a covariate, to assess potential differences between female and male players in the relationship of video game use and sexist attitudes. The data used in this analysis came from waves 1 (time 1) and 3 (time 2). Missing data were excluded listwise, resulting in a sample of 825 (360 female). Using Mahalanobis distance, an extreme outlier was identified who reported 23 hours of play per day at time 1. It was decided to remove this outlier, so the final model included 824 (360 female) cases. Since even after removal of the outlier the video game use variables deviated from the criteria for univariate normal distribution according to West et al.,[34] the MLM estimator with Satorra-Bentler scaling correction that is robust to nonnormality was used. Invariance tests revealed that the item loadings for the sexism factor were fully invariant for the two groups, but only partially invariant over time. Accordingly, the factor loadings were set to full metric invariance across groups and partial metric invariance over time. The final model showed a very good fit according to the cutoff criteria by Hu and Bentler[35]: chi square (Satorra-Bentler scale correction, df= 49)= 99.5, p< 0.001, comparative fit index=0.97, standardized root mean square residual = 0.03, root mean square error of approximation = 0.05.

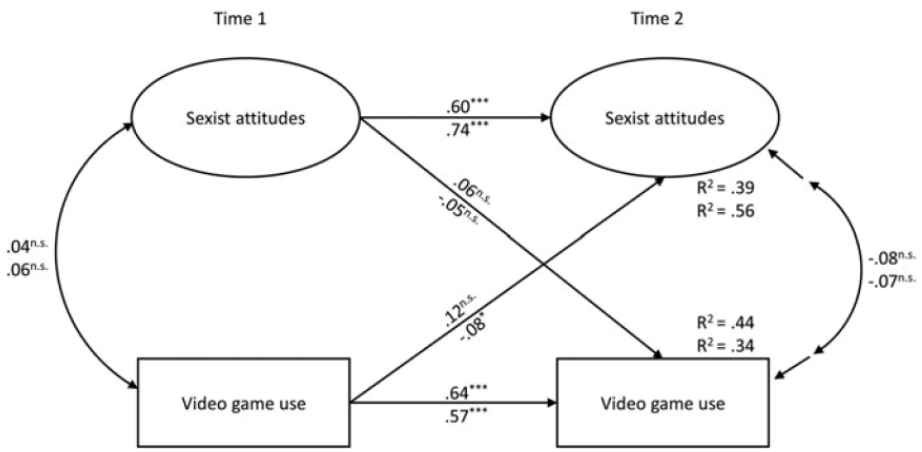

FIG. 2. Cross-lagged structural equation model: relationships between sexist attitudes and video game use. Upper row: standardized coefficients for the female respondents; lower row: standardized coefficients for the male respondents. *p≤0.05; **p≤0.01; ***p≤.001. MLM estimation, χ^2 (Satorra-Bentler scale correction, df=49, N_{female}=360, N_{men}=464)=99.5, p<0.001, comparative fit index=0.97, root mean square error of approximation=0.05, standardized root mean square residual=0.03. For the sake of readability, the third variables that were controlled for in this model (age and education) and their coefficients are not shown in this figure.

Results

For both male (r=-0.20, p<0.001) and female (r=-0.30, p=0.001) players, education showed a significant negative correlation with sexist attitudes. Age was also negatively correlated with sexist attitudes. However, this was only significant for male players (r=-0.17, p=0.001), indicating that younger male players were more likely to hold sexist beliefs and attitudes. Education and age also displayed negative correlations with video game use, with less educated female players (r=-0.19, p<0.001) and older male players (r=-0.17, p<0.001) being found to engage less frequently. No longitudinal associations between age and education at time 1 (year 1) were found with video game use or sexist attitudes at time 2 (year 3).

The results of the longitudinal analyses are shown in Figure 2. To ease the interpretation of the model, the included control variables age and education at time 1 are not displayed. The autoregression coefficients indicated that sexist attitudes were stable over time for both males (β=0.74,p<0.001)and females(β=0.60,p<0.001). The stability for video game use was slightly lower for the male (β=0.57, p<0.001) than female (β=0.64, p<0.001) game players. More interestingly, however, there was no cross-sectional association between sexist attitudes and overall video game use for both men and women. On the longitudinal level, the only statistically significant finding was a negative association between video game use at time 1 and sexist attitudes at time 2 for males (p=0.027). However, the size of this effect (β=-0.08) can be considered negligible. All other longitudinal associations were both small and nonsignificant (β<0.13). As previous research on television[36] and video games[23,26] has suggested that cultivation effects might be more specific and limited to particular contents, additional models were also estimated in which hours of play per day were replaced by preference ratings for genres deemed especially prone to the underrepresentation of females or sexist content according to the results of previous content analyses: role-playing, action, and first-person shooter games. However, no cross-sectional (T1: r< 0.1) or longitudinal links (β<0.11) were found between genre preferences and sexist attitudes.

Discussion

Concern over the cultivation of beliefs and attitudes through media exposure has been an actively debated topic for decades. The popularity of video games has reignited interest in this topic. While the issue of sexist content in video games has been well documented in numerous content analyses,[2-13] the cultivation of sexist beliefs and attitudes over time has yet to be examined. The current study addressed this issue by examining the influence of video game exposure on sexist beliefs and attitudes over a 3 year period. However, no evidence for a cultivation effect on sexist attitudes was found. At the same time, the study also showed no signs of a selection effect. These findings conflict

with the results of previous cross-sectional and experimental work that found some evidence for links between sexist video game content and benevolent sexism[27] and tolerance for sexual harassment.[28] However, these studies were either cross-sectional[27] or looked at short-term effects.[28,29] They also focused on very specific games and types of sexism, whereas the present study was longitudinal and looked at general beliefs about gender roles in society and overall use of video games. Both the design of the current study and its main findings are more in line with previous cultivation studies on violence in video games that found no[22,24] or only very limited[23,25,26] evidence for cultivation effects. The weak – and mostly nonsignificant – effects that were found in the current study also do not deviate too much from average cultivation effect found for television exposure according to a meta-analysis of 97 studies that reports an average correlation of 0.1 and an average partial correlation of 0.09.[37] Although the findings from the present study are certainly not conclusive, the absence of any longitudinal links between video game use and sexist attitudes at least suggests two things. First, similar to what has been suggested for aggression,[38] it is likely that there are factors, such as personal experience and family and peer influences, that affect the development, proliferation, prevention, or reduction of sexist attitudes more strongly than (fictional) media content. Second, general and broad cultivation effects of video games are somewhat unlikely, as players differ in the games they play, and the interactivity of the medium also causes the experience of the same game to differ between players.

While the current research was the first to evaluate cultivation effects of video game use on sexist attitudes employing a longitudinal design using data from a large-scale representative sample, there are several limitations to consider when interpreting the findings. First, the current study was conducted within Germany. As such, the results cannot be generalized to other countries and cultures. Furthermore, the youngest participants within the study were 14 years old when they were first interviewed. Therefore, it cannot be concluded from the results of this study alone if cultivation effects may be prevalent for younger players who might be more impressionable by media content in general. Additionally, as already noted by other researchers,[23,25,26] given the broad range of gaming systems, genres, and games, and the differences in the users' personal preferences, it cannot be assumed that there is a typical media diet for video games. Accordingly, there is also no universal ‘‘video game reality'' that could uniformly affect perceptions of real-world social realities. As no relationship was found between sexist attitudes and the preference for specific genres, future cultivation research on video games might be best advised to focus on specific subgenres or even an individual game (series), as Williams[26] and Chong et al.[25] have done in their studies on violent content. Lastly, in line with previous studies on the effect of sexist contents in video games that have found some evidence for second-order cultivation effects,[27-29] this study exclusively focused on second-order effects on attitudes toward gender roles. However, it may be that there are first-order effects on the perception of gender roles in society or second-order effects on attitudes that do not relate to gender roles, but, for example, body image, sexual harassment,[28] benevolent sexism,[27] or rape myth acceptance.[29]

Even though the current study failed to find evidence to support the cultivation of sexist beliefs or attitudes due to video game exposure, there might still be merit in applying a cultivation perspective to the effects of video games on sexism, especially if the focus is more on particular subgenres or individual games (series) and, ideally, multiple dimensions of sexism pertaining to gender roles, body image, and sexual harassment are assessed on both first-order and second-order effects levels. Corroborating previous findings on video games and cultivation, this study clearly shows that overall exposure to video games or preference for specific genres are not predictive of player attitudes toward real-world issues. Still, as indicated by the limitations of the present study and the tentative evidence from previous work, it may well be that, similar to television, ‘‘some genres/games have some [cultivation] effects on some players.''[36]

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Appendix A

Table A1. Variables and Descriptives at Time 1

Item	*Scale*	*Min*	*Max*	M	SD	*Skew*	*Kurtosis*
Sexist attitudes							
The man should be responsible for all major decisions made in a family.	1-5	1	5	1.86	0.98	0.90	0.09
In a group of male and female members, a man should take on the leadership.	1-5	1	5	1.75	0.96	1.23	1.07
Even if both partners work, the woman should be responsible for taking care of the household.	1-5	1	5	1.84	0.99	1	0.32
Video game use							
Overall video game use	h/day	0.003	10	0.84	1.37	2.75	11.73
How much do you like to play the following gaming genres?							
Role-playing games	1-5	1	5	2.51	1.52	0.43	-1.32
First-person shooter games	1-5	1	5	1.98	1.4	1.09	-0.35
Other action games	1-5	1	5	2.16	1.23	0.59	-0.92
Sociodemographics							
Respondent sex	Female = 1; male = 0	0	1	0.44	0.5	0.26	-1.94
Age	Years	14	85	38.17	14.75	0.4	-0.25
Education	0-5	0	5	3.17	1.37	-0.1	-1.44

Table A2. Variables and Descriptives at Time 2

Item	*Scale*	*Min*	*Max*	M	SD	*Skew*	*Kurtosis*
Sexist attitudes							
The man should be responsible for all major decisions made in a family.	1-5	1	5	1.55	0.98	1.58	2.09
In a group of male and female members, a man should take on the leadership.	1-5	1	5	1.67	0.92	1.34	1.36
Even if both partners work, the woman should be responsible for taking care of the household.	1-5	1	5	1.75	0.93	1.15	0.86
Video game use							
Overall video game use	h/day	0.003	8	0.81	1	2.59	10.1
How much do you like to play the following gaming genres?							
Role-playing games	1-5	1	5	2.34	1.46	0.63	-1.03
First-person shooter games	1-5	1	5	1.93	1.37	1.013	-0.23
Other action games	1-5	1	5	2.13	1.21	0.63	-0.82