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Dual-process model and competitiveness as predictors of in-game toxicity¹

Keywords: social dominance orientation, right-wing authoritarianism, ambivalent sexism, computer games, competitiveness, toxicity

Słowa kluczowe: orientacja na dominację społeczną, prawicowy autorytaryzm, seksizm ambiwalentny, gry komputerowe, kompetytywność, toksyczność

1. Computer game environment

Several dozen years have passed since the first computer games appeared on the market in the early 1960s and since they gained popularity in the late 1970s and early 1980s. Many revolutions regarding computer games, both in their popularity and reception among the public, have taken place during that time. Soon, the first concerns were voiced that playing computer games may lead to aggressive behaviour (Cooper and Mackie, 1986). Many studies were conducted in subsequent years which supported this view, which was summarised in a meta-analysis (Anderson et al., 2010). Despite the stir among the public caused by the research and attempts to blame computer games even for such events as school shootings in the USA (Markey and Ferguson, 2017, p. 35), it turned out that a link between playing computer games and aggression was slight, if any at all (Ferguson, 2015; Hilgard et al., 2017). Therefore, concerns related to the games (Markey and Ferguson, 2017) proved unjustified. Instead, other issues emerged which affect the gaming community. The aim of this paper is to explain the phenomenon of toxicity in computer games and achieve a better understanding of video game sexism.

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1.1. Toxicity in computer games

Some forms of toxicity in computer games generally include toxic behaviour (Khandaker, 2019; Monge and O'Brien, 2021), negative stereotypes (Kowert et al., 2014), cyberbullying (Kwak et al., 2015), sexual harassment (Fox and Tang, 2014, 2016; Tang et al., 2020) and many other negative behaviours (Martens et al., 2015; Lapolla, 2020). Gamers themselves can behave in a toxic manner when trying to cope with various forms of toxicity. Therefore, it is necessary to understand exactly why such behaviours occur.

Toxicity can be caused by a number of factors. Hypotheses tested so far include social dominance orientation (Tang and Fox, 2016), sexism (Tang et al., 2020), right-wing authoritarianism (Jagayat and Choma, 2021), perceived threat (Jagayat and Choma, 2021), favouring one's own group (Kwak et al., 2015), dark triad (Tang et al., 2020), identifying oneself with the gaming community (Tang et al., 2020) or dependence on where toxicity occurs (Neto et al., 2017). Moreover, there are proven differences in the level of aggression depending on sex (Björkqvist, 2018), which can be attributed both to genetic and environmental factors (Tuvblad and Baker, 2011). An interesting study exploring possible causes of toxicity was conducted by Adachi and Willoughby (2011). The study demonstrated that it was the rivalry between the players in the game rather than violence in a game that affected the players' behaviour.

1.2. Gaming community

The gaming community is much more diverse in reality than according to many stereotypes (Shaw, 2011; Chess et al., 2016). Apart from stereotyping gamers as a community (Kowert et al., 2014), women are also stereotyped in these circles (Harrison et al., 2016). Braithwaite (2013) describes a situation from the well-known game *World of Warcraft*, in which different lines can be heard from an NPC (non-player character – a character controlled by the computer) depending on the character's sex. If the player's sex was defined as male, he was greeted with words praising his strength. When the sex of the player's character was defined as female, she could hear that she looked lovely.

Lynch et al. (2016) analysed the images of male and female characters in more than 500 games issued between 1983 and 2014. It turned out that the level of the sexualisation of female characters differed depending on the decade when the game was published. Moreover, character sexualisation depended on the PEGI ranking (Pan European Game Information; ranking used to assess the content of a computer game, more on: www.pegi.info) of the game. Games intended for teenagers and adults had sexualised female characters significantly more frequently. This can lead one to the conclusion that those games were created with the male user in mind, which can deepen the feeling of female alienation in the world of computer games.

1.3. Sexism

Two dominating typologies of sexism in the literature include classifications into traditional and modern sexism (Swim et al., 1995) and hostile and benevolent (Glick and Fiske, 1996). According to the theory of ambivalent sexism (Glick and Fiske, 1996), negative attitudes towards women can be presented directly (hostile sexism) or indirectly as unjustified kindness (benevolent sexism). Therefore, hostile sexism is defined according to Allport's definition of prejudice (Glick and Fiske, 1996, p. 491). In his opinion, prejudice is a hostile attitude or emotions – basically unfounded – towards someone (Allport, 1979, p. 6). Benevolent sexism is understood as perceiving women in an apparently positive manner, which is a consequence of perceiving them stereotypically (Glick and Fiske, 1996, p. 491).

In the interviews, Khandaker (2019) heard many times from the female participants that women were often perceived stereotypically in computer games, e.g. they were expected to play supportive rather than leading roles or that they could have their place in a game, but only at the lower rungs in the rankings, which is a consequence of the fact that they are simply worse. It can be inferred that certain toxic behaviours may be motivated by prejudice. Therefore, the following hypotheses were put forward:

- H1: A high score on the hostile sexism scale will be positively predictive of the level of general harassment, sexual harassment and video game sexism.
- H2: A high score on the benevolent sexism scale will be negatively predictive of the level of general harassment, sexual harassment and video game sexism.

1.4. The double process model

Toxicity in games can also be explained by two dimensions of conservatism, i.e. social dominance orientation and right-wing authoritarianism. Social dominance orientation (SDO) is a construct developed by Pratto et al. (1994), and it involves the individual's preference for maintaining inequality between groups. According to the theory, inequalities within society and the hierarchical nature of groups are justified, and there is no reason to try to eliminate them. SDO has been used many times to verify negative attitudes, e.g. towards women (Christopher and Wojda, 2008; Feather and McKee, 2012; Pratto et al., 2000).

Altemeyer's (1998) right-wing authoritarianism (RWA) is a construct which measures authoritarian and conservative values. Individuals with high scores on the RWA scale submit to authorities. They have faith in traditional values and condemn those who do not submit to those values.

A certain paradoxical effect of these dimensions of conservatism was observed in a study conducted by Bilewicz et al. (2014). They found that young people with a high RWA level demanded that hate speech should be banned. Unlike them, people with a high SDO level demonstrated a very high level of acceptance

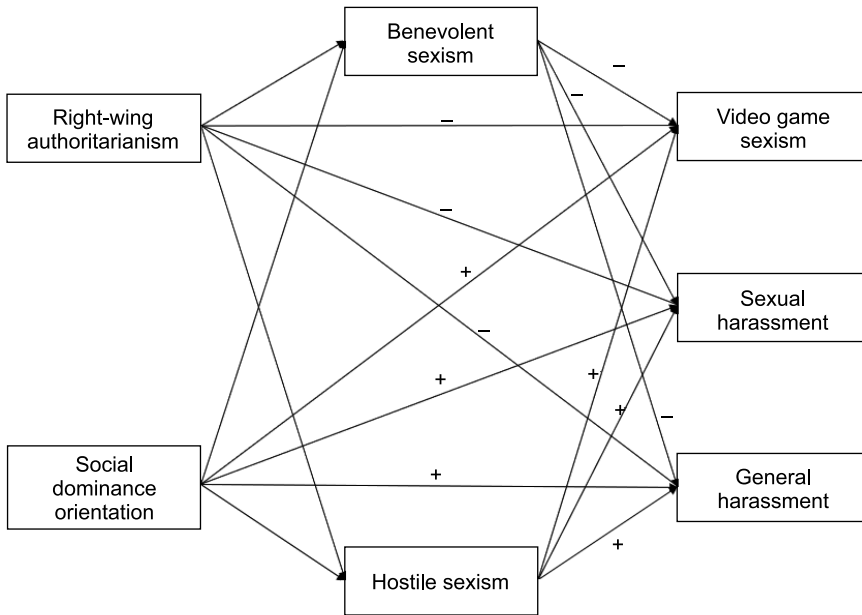


Fig. 1. Proposition of model for explaining general harassment, sexual harassment and video game sexism
Source: prepared by the author.

of such speech. This difference may arise from the fact that people with a high RWA level prefer stability and observe rules, and they see hate speech as an attempt at influencing the existing social order.

RWA and SDO are integrated into a theoretical approach called the double process model, developed by Duckitt (2001). According to this theory, SDO and RWA are two very important predictors of prejudice, but it also stresses that their sources and consequences are different. This model can be used to explain, for example, ambivalent sexism: benevolent sexism is linked to RWA, and hostile sexism to SDO (Christopher and Mull, 2006). This is a consequence of the fact that hostile sexism, like SDO, is characterised by open hostility, whereas RWA consolidates the patriarchal attitude to the society, including women, which makes it associated with benevolent sexism. Moreover, if hate speech was accepted (Bilewicz et al., 2014), SDO was correlated with it positively, while RWA was negatively correlated. Therefore, the following hypotheses were put forward:

- H3: A high score on the social orientation scale will be positively predictive of the level of general harassment, sexual harassment and video game sexism.
- H4: A high score on the right-wing authoritarianism scale will be negatively predictive of the level of general harassment, sexual harassment and video game sexism.

H5: Hostile sexism will be a mediator between social dominance orientation on the one hand and general harassment and sexual harassment on the other.

H6: Benevolent sexism will be a negative mediator between right-wing authoritarianism on the one hand and general harassment and sexual harassment on the other.

Based on this study, it was decided to develop a pathway model, which was tested by sex and without this classification, to check if there were statistical differences in its fitting.

2. Study methodology

2.1. Characteristics of the study group

The study included 1,821 people, and 950 (52.2%) completed it. This number does not include minors ($n = 108$; 5.9%) and those whose answers to open-ended questions were unrelated to the study ($n = 6$). Moreover, two people were removed from the database, which took more than several dozen standard deviations than the other respondents to complete the questionnaire. Of the other participants ($N = 834$), 40% declared female sex, 58.6% – male, and 1.3% – other. The study participants were aged 18 to 40 years ($M = 21.64$; $SD = 3.75$). They usually indicated a village as their place of residence (25.2%), a city of over 500 thousand residents (24.7%) or a city of 20,001 to 100 thousand residents (20.5%). An average respondent had secondary or higher education (85.9%), with 45.9% respondents enrolled in a course of studies or having completed one.

Of the study participants, 762 declared that they played single-player games, and 790 played multi-player games. Seven hundred and eighteen people admitted that they played both single- and multi-player games. Of those playing multi-player games, 39.4% usually play them with friends, 37.6% more or less equally often alone or with friends, and 17.6% – usually alone.

Additionally, each participant in the study was requested to identify one to three games that they have been playing the most frequently and dedicating the most time to recently. The aim of the analysis of the responses to this question was to establish whether at least one multi-player game was indicated and whether at least one is competitive. A large majority of the study participants pointed to at least one multi-player game (95.4%), of whom 82.7% mentioned at least one competitive game.

2.2. Research procedure

The study was conducted with the use of the Qualtrics platform. The study was distributed on Facebook between 19 and 30 March 2021. The link to the study was published on computer-related discussion forums (e.g. League

of Legends Polska or Forum Komputerowe [Computer Forum]). The study had a form of a one-part questionnaire, which took 10–12 minutes to complete.

The questionnaire consisted of three parts (see Appendix). The first of them was a tag on demographic data and information on using gaming platforms. In this part, the participants were asked whether they played multi-player or single-player games. If a person declared that he/she played multi-player games, the next part became available with questions about multi-player games. The third part of the questionnaire contained scales of attitude measurements. Half of the study subjects were shown the scales in a random order, and in those presented to the other half, the toxicity scale was at the end. This classification resulted from concerns that the declared level of toxicity could be lower in a group with the toxicity scale at the end, as other scales can provoke negative associations with toxic behaviours. Comparisons with the *t*-test showed that no toxicity level differed significantly depending on which group the study participants were in (Table 1).

Table 1

The mean values of the Student *t*-test on toxicity scales depending on the group

Item	Random order		Toxicity at the end		Scales		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>	95% <i>CI</i>
Sexual harassment	1.50	0.585	1.46	0.63	0.93	0.06	[-0.07; 0.20]
General harassment	2.78	1.01	2.76	1.03	0.35	0.02	[-0.11; 0.16]

Note: all *p*'s > .05

Source: own preparation.

2.3. Scales

Social dominance orientation. This construct was measured with five-point and seven-degree scales (1 – I definitely disagree; 7 – I definitely agree), which were used earlier in Poland (Bilewicz et al., 2014). Example items on this scale are “It is probably good that certain groups are on top and others at the bottom” and “Better groups should dominate over worse ones” (*M* = 2.92; *SD* = 0.37; α = 0.85).

Right-wing authoritarianism. RWA was measured with an abbreviated, six-item version of a seven-degree scale, like in the study by Bilewicz et al. (2015). Example items: “Turning your back on the tradition will have fatal consequences one day”, “Discipline and obedience is the right key to a good life” (*M* = 3.26; *SD* = 0.35; α = 0.78).

Ambivalent sexism. A participant had to take a stance on each of the ten statements (5 items in each subscale) on a seven-point scale. An abbreviated version of the scale has already been used in this form (Pietrzak and Mikołajczak, 2015).

Hostile sexism. Example items: “Women exaggerate their problems at work”, “When women lose in a fair competition with men, they usually complain that they are discriminated against” ($M = 3.31$; $SD = 0.55$; $\alpha = 0.85$).

Benevolent sexism. Example items: “Each man should have a partner to adore”, “Women should be worshipped and protected by men” ($M = 2.97$; $SD = 0.40$; $\alpha = 0.79$).

Toxicity in computer games. Toxicity in games was measured by the scale developed by Tang and Fox (2016). The scale was divided into two subscales. One of them concerned sexual harassment, the other – general harassment. Each of the subscales consisted of five items with five possible answers (1 – Never, 5 – Always). The scale was translated into Polish by the authors of this article, with certain elements kept in English. This modification resulted from the fact that many players do not play with Poles, which is why the study participants may have forgotten that, for example, although they do not swear in Polish, they do it in English (Gawinkowska et al., 2013).

Sexual harassment. Sexual harassment concerns direct toxicity, which manifests itself in games and can be called sexual harassment. Example items: “I told someone that I loved him/her (or asked if he/she wanted to be with me)”, “I suggested that someone played for sex-related reasons (e.g. he/she wants his/her partner to like him/her, seeks attention)” ($M = 1.48$; $SD = 0.15$; $\alpha = 0.67$).

General harassment. General harassment is understood as a direct form of toxicity. However, it concerns toxic behaviours unoriented to sex or the appearance of the recipient of negative messages. Example items: “I used swear words (e.g. »fuck«, »bitch«, »shit«)”, “I commented on someone’s intelligence (e.g. »moron«, »idiot«, »retard«, »down«)” ($M = 2.77$; $SD = 0.49$; $\alpha = 0.89$).

Video game sexism. This scale is based on a questionnaire and consultations with players and researchers who deal with the subject (Fox and Tang, 2014). They resulted in a 16-item scale (in the author’s translation, verified by a person fluent in English). A participant was supposed to decide to what extent he/she agrees with the items on a seven-point scale (1 – I definitely do not agree; 7 – I definitely agree). Example items: “Women play on a computer to be perceived as better by men”, “Women prefer spending time on picking clothes for their character in a game than on playing” ($M = 2.68$; $SD = 0.71$; $\alpha = 0.91$).

3. Results

Table 1 shows the scores achieved by men and women and the results of Student *t*-tests. Table 2 shows correlations between various scales. Since there are statistically significant differences between men and women regarding the scores in each scale (Table 2), it was decided to show the correlations broken down by sex to get as much information as possible (Table 3).

t-Tests were used to check the differences between the individuals who play at least one competitive game and those who do not. The individuals who

mentioned at least one competitive game had higher scores on the general harassment scale $t(320) = 9.69; p < .001; d = 0.82; 95\% CI = [0.65; 0.99]$, sexual harassment $t(331) = 5.28; p < .001; d = 0.44; 95\% CI = [0.28; 0.62]$ and video game sexism $t(313) = 5.88; p < .001; d = 0.49; 95\% CI = [0.33; 0.67]$.

Table 2

Mean and Student t-test values depending on sex

Item	Women		Men		Scales		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>	95% <i>CI</i>
Social dominance orientation	2.31	1.22	3.34	1.47	10.99***	0.78	[0.64; 0.92]
Right-wing authoritarianism	3.10	1.29	3.39	1.33	3.11**	0.22	[0.08; 0.36]
Benevolent sexism	2.52	1.31	3.29	1.48	7.89***	0.56	[0.42; 0.70]
Hostile sexism	2.53	1.37	3.86	1.47	13.12***	0.93	[0.79; 1.08]
Video game sexism	2.19	1.04	3.02	1.13	10.87***	0.77	[0.63; 0.92]
Sexual harassment	1.34	0.55	1.57	0.62	5.37***	0.38	[0.24; 0.52]
General harassment	2.39	0.93	3.03	0.99	9.36***	0.66	[0.52; 0.80]

** $p < 0.01$; *** $p < 0.001$
 Source: own preparation.

Table 3

Correlation between scales by sex

Item	1.	2.	3.	4.	5.	6.	7.
1. Social dominance orientation	–	.264***	.156**	.399***	.424***	.265***	.244***
2. Right-wing authoritarianism	.244***	–	.465***	.464***	.321***	.150**	.063
3. Benevolent sexism	.220***	.471***	–	.348***	.242***	.089*	.036
4. Hostile sexism	.405***	.410***	.414***	–	.680***	.335***	.276***
5. Video game sexism	.334***	.287***	.293***	.744***	–	.358***	.360***
6. Sexual harassment	.224***	.144**	.120*	.317***	.424***	–	.540***
7. General harassment	.116*	.148**	.166**	.224***	.288***	.540***	–

Note: The left part of the table shows results for women, and the right – for men.
 * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$
 Source: own preparation.

Figure 2 shows a pathway model, which was tested both for all the respondents and broken down by sex. For some paths, there was a statistically significant difference in the model fitting, depending on whether it was assumed that the values for a path vary from one sex to the other or not. Where two results are seen, the first concerns women, and the other concerns men. The total effects are shown in brackets. Correlations between variables and their remainders were also checked. All the variables and their remainders were significantly correlated: the correlation between right-wing authoritarianism and social dominance orientation: $r = .276, p < .001$; the correlation between the remainders

of benevolent and hostile sexism: $r = .249, p < .001$; the correlation between the remainders of video game sexism and sexual harassment: $r = .205, p < .001$; the correlation between remainders of video game sexism and general harassment: $r = .210, p < .001$; the correlation between remainders of sexual harassment and general harassment: $r = .486, p < .001$.

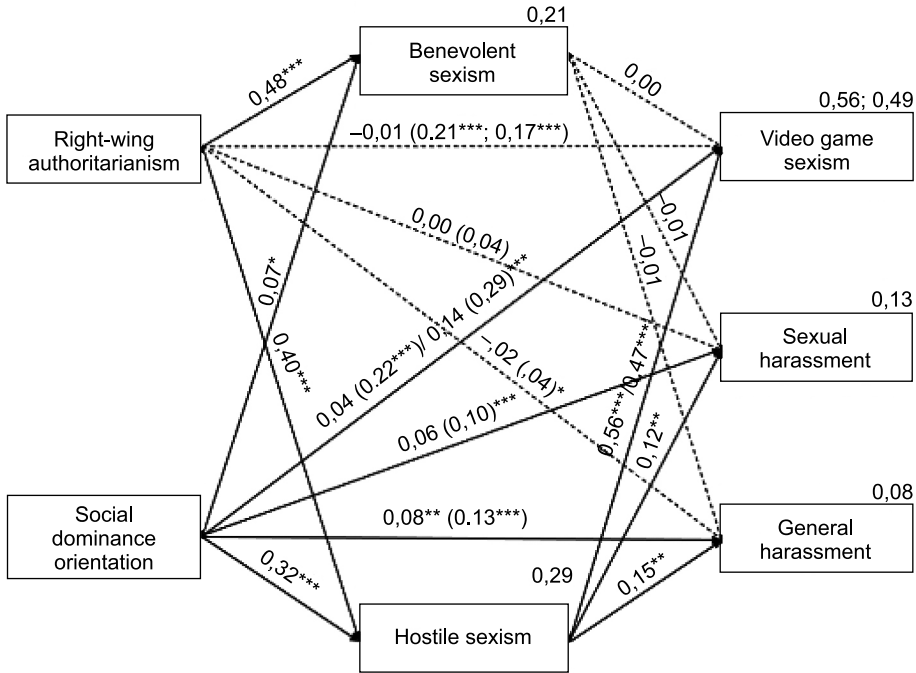


Fig. 2. Model for explaining general harassment, sexual harassment and video game sexism
Source: prepared by the author.

Hypotheses H1–H6 were used to test the pathway model shown in Fig. 1. Figure 2 shows all the statistical values obtained in the model testing process. The final model for the two groups is well-fitted to data $\chi^2(14) = 14.709; p = .398$; CFI = 1.000; RMSEA = 0.08; SRMR = 0.016. The first hypothesis (H1) about the effect of hostile sexism on the general harassment level ($\beta = 0.30$; 95% CI = [0.21; 0.38]), sexual harassment ($\beta = 0.31$; 95% CI = [0.22; 0.40]) and video game sexism (for women $\beta = 0.74$; 95% CI = [0.65; 0.80], for men $\beta = 0.61$; 95% CI = [0.54; 0.67]) was confirmed.

The second hypothesis (H2) on the negative effect of benevolent sexism on general harassment ($B = -0.01$; $p = .864$), sexual harassment ($B = -0.01$; $p = .409$) and video game sexism ($B = 0.00$; $p = .994$) was not confirmed.

The third hypothesis (H3) on the direct effect of SDO on general harassment ($\beta = 0.15$; 95% CI = [0.08; 0.23]), sexual harassment ($\beta = 0.15$; 95% CI = [0.08; 0.23])

and video game sexism (although a significant effect was observed only for men) (for women $B = 0.04$; $p = .211$, for men $\beta = 0.18$; 95% $CI = [0.10; 0.25]$) was confirmed.

The effect of RWA on general harassment ($B = -0.02$; $p = .453$), sexual harassment ($B = 0.00$; $p = .992$) and video game sexism ($B = -0.01$; $p = .59$) was not significant in any case, which is why hypothesis four (H4) was rejected.

An indirect effect (Soper, 2021) of SDO and RWA on dependent variables was checked to verify hypotheses H5 and H6. The hostile sexism-mediated indirect effect of SDO was not statistically significant in any case. Hostile sexism did not mediate SDO relations either with general harassment ($B = 0.05$; 95% $CI = [-0.15; 0.24]$) or with sexual harassment ($B = 0.04$; 95% $CI = [-0.12; 0.19]$), or with video game sexism (for women $B = 0.18$; 95% $CI = [-0.10; 0.46]$, for men $B = 0.15$; 95% $CI = [-0.11; 0.41]$). In consequence, hypothesis five (H5) was rejected. Hypothesis six (H6) was totally rejected because the direct effect of benevolent sexism on dependent variables was not statistically significant in any case, which means that mediation of benevolent sexism did not take place.

A model of the same structure, divided into groups, with respect to whether a study participant mentioned at least one competitive game as one that he/she has been playing the most frequently recently, was also checked. None of the pathways differed statistically significantly.

4. Discussion

A double process model was tested in this study to find predictors for general harassment, sexual harassment and video game sexism. SDO proved to be a significant predictor for all dependent variables. In turn, RWA was not a statistically significant predictor for any of the variables. No effect of RWA on general or sexual harassment can be attributed to the fact that different subscales act in a mutually negating way. According to the findings of the study by Bilewicz et al. (2014), individuals with high SDO were more willing to accept hate speech than individuals with high RWA. This may have been a result of conventionalism, as hurling abuse at people, including strangers, is – according to tradition – unacceptable. Further, authoritarian aggression – a different subscale of RWA – could be a positive predictor for toxic behaviours. This explanation seems to be confirmed by data, as authoritarian aggression correlated with general and sexual harassment significantly more than conventionalism (for general harassment $Z(834) = 1.34$; $p = 0.09$; for sexual harassment $Z(834) = 1.77$; $p = 0.038$). One should note that an abbreviated scale was used, and each subscale contained only two items.

It was an unexpected finding that benevolent sexism was not in any way predictive of video game sexism. Based on the studies so far, it would seem that a person showing a high level of benevolent sexism can deny women a right to participate with equal rights in the “masculine world”, i.e. of computer

games. Although the scale of video game sexism seems to present women in a stereotypical manner, there was no statistically significant effect.

The advantage of this study is that knowledge was obtained on the double process model (Duckitt, 2001) in the gaming community. Figure 2 shows that two psychological constructs – SDO and RWA – have different consequences for attitudes towards a foreign group in the case of men and towards their own group in the case of women. According to earlier studies (Tang et al., 2020), SDO was predictive of various forms of toxicity, while RWA was not. This may be a consequence of the fact that toxicity in this study was regarded as a form of hate speech, and SDO was associated with acceptance of its use in the previous study (Bilewicz et al., 2014).

According to another interesting finding, individuals who mentioned a competitive game had higher scores on the scales of general harassment, sexual harassment and video game sexism. However, the pathway analysis performed here showed that there were no significant differences depending on whether a respondent mentioned any competitive game or not. The results show that competitiveness is positively correlated with toxicity. However, it does not matter in the case of the model tested here.

Further studies of the relationship between competitive games and toxicity should look into how respondents perceive a game which the author regards as competitive. For example, *League of Legends* (51% of the respondents have spent the largest amount of time playing this game recently) features many different playing modes. There are normal games in which the player does not gain or lose anything, regardless of whether he/she wins or loses. There are ranked games in which a player gains or loses league points, which translate into a rank visible to all players, and there are regularly organised tournaments in which one can win cosmetic items, for which one usually has to pay. Therefore, one can conclude that players in a game can vary depending on the playing mode that they choose the most frequently. This should be noted in another attempt at studying the gaming community.

The respondents were asked to estimate how large – in their opinion – the portion of women was in the gaming community. The author is aware that the actual percentage of women in the gaming community varies depending on the specific game and its type. However, the result confirms that the position of women in games is definitely underrated. The male respondents gave a significantly lower portion that – in their opinion – women accounted for in the gaming community. Men reported that 27.5% of gamers were women, whereas female players believed the number to be 33.4%. However, statistical reports from sources such as Newzoo (Bosman, 2019) suggest that the actual figure could be as high as 46% of all players. It's possible that women are perceived to represent a smaller portion of the gaming community, leading to stereotypes of both the gaming community as a whole (Chmiel, 2018) and female players themselves. These findings from the study may reflect this phenomenon. The strength of the effect for the *t*-test, which was used to compare the mean score on the scale of video game sexism depending on the sex, was $d = 0.77$,

i.e. the effect is great. This produces an image based on which one can regard women as being perceived more stereotypically than men – the latter think that fewer women play computer games, while at the same time stereotyping those women who actually play.

When looking closely at the findings of this study, one should pay attention to the choice of scale for measuring toxicity in games. An answer on the general harassment and sexual harassment scale could be between 1 and 5 (1 = Never, 5 = Always). The medium values were also named in order to make the scale as similar as possible to the original one. However, this scale seems to be much less objective than the one which requires responses ranging from “I definitely disagree” to “I definitely agree”. This second scale probably represents the spectrum of responses much more precisely, which can, to a certain extent, result from “folk wisdom”, which suggests, e.g. “never say never”. Moreover, this may arise from the fact that it is difficult for someone to say that he/she “always” does something because, to some people, it may mean that if they fail to do it once, then this is not “always”, and others may regard the word as approximate. Moreover, another modification was introduced in this scale – some words remained untranslated because many players do not have contact with the Polish language in online games. This may have affected the results, especially since the scale of sexual harassment had much fewer words left untranslated, which may have caused the respondents to not recall their behaviours in a different language.

A high average result on the general harassment scale ($M = 2.76$; $SD = 1.02$) is thought-provoking. To a certain extent, it arises from using this scale for the measurement of general harassment. In one item, a respondent was supposed to determine how often they happened to use swear words in a game. This item had a definitely highest mean ($M = 3.53$; $SD = 1.24$) compared with those with which the respondents determined how often they insulted others ($M = 2.65$; $SD = 1.21$) or commented on their intelligence ($M = 2.76$; $SD = 1.25$). Therefore, it is easy to notice that the item that definitely raised the average, depending on the situation, did not have to be toxic towards other players. Obviously, one could ponder how much using swear words in games is desirable or undesirable, but this does not have to be associated with toxicity.

Conclusion

Despite a low variance of general harassment and sexual harassment explained by the model proposed in this study, one should emphasise that some hypotheses have been confirmed, which results in adding more knowledge and finding further aspects of the ambivalent sexism theory and the double process model. Moreover, more than 50% of the variance of video game sexism scale was explained, i.e. the findings of the study conducted by Fox and Tang (2014) were replicated. Moreover, the model proposed in this study emphasises the significance of SDO in analyses of attitudes towards co-players.

This study also included an attempt to expand the knowledge of competitiveness in computer games. The analyses conducted with the *t*-test showed that those individuals who mentioned at least one competitive game are characterised by a higher level of general harassment ($d = 0.82$), sexual harassment ($d = 0.44$) and video game sexism ($d = 0.49$). Therefore, these are moderate and high effects, but the differences were not statistically significant in the pathway model. This may be attributed to the fact that the differences between groups are explained by many predictors, which is why no specific pathway differed significantly depending on which group a respondent belonged to. A further study should analyse the relationship between competitive games and toxic behaviours because the model proposed in this study failed to explain competitiveness.

In another direction of future study, the targeted player group could be characterised better. The analyses conducted in this study focused on players of approx. 30 games, which could also be a significant factor affecting the toxicity level. In further studies, it would be worthwhile to ask more precisely why the players play specific games – depending on the motivation, tendencies to be toxic may change, and toxicity may prove to be totally independent of the game one plays.

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S u m m a r y

The objective of this research was to gain a better understanding of in-game toxicity by measuring general harassment in computer games, sexual harassment in computer games, and video game sexism. A proposed dual-process model was used with social dominance orientation and right-wing authoritarianism as the main predictors and benevolent sexism and hostile sexism as additional independent variables. A total of 834 participants, of which 40% were female, completed an online survey. The data was analysed using t-tests and a structural equation model. Social dominance orientation was found to be a better predictor than right-wing authoritarianism, consistent with previous research. The variance of video game sexism was explained by 50%, while the variance of general harassment in computer games and sexual harassment in computer games was explained by 8% and 13%, respectively. Competitive game players had statistically higher scores on all three dependent variable scales.

Model podwójnego procesu i kompetytywność jako predyktory toksyczności w grach komputerowych

Streszczenie

Badanie miało na celu znalezienie predyktorów toksyczności ogólnej, toksyczności związanej z płcią i seksizmu w grach. Przetestowany został model podwójnego procesu, w którym predyktorami były orientacja na dominację społeczną i prawicowy autorytaryzm, a zmiennymi zależnymi toksyczność ogólna, toksyczność związana z płcią oraz seksizm w grach. Analizie poddano wyniki internetowych badań ankietowych przeprowadzonych wśród 834 osób, z których 40% stanowiły kobiety. Do analizy użyto testów *t*-studenta i analizy modelu ścieżkowego. Orientacja na dominację społeczną była lepszym predyktorem obydwu toksyczności niż prawicowy autorytaryzm, co jest zgodne z wynikami poprzednich badań. Za pomocą przedstawionego modelu udało się wyjaśnić około 50% wariancji seksizmu w grach. Głównymi predyktorami seksizmu w grach były seksizm życzliwy i seksizm wrogi. Wariancja toksyczności ogólnej i toksyczności związanej z płcią została wyjaśniona w około 10%. Przeanalizowana została także zależność między graniem w grę kompetytywną a wynikami na skalach seksizmu w grach, toksyczności ogólnej oraz toksyczności związanej z płcią. Osoby grające w grę kompetytywną uzyskiwały wyższe wyniki na każdej ze skal w sposób istotny statystycznie.

Survey questionnaire

Basic information

First, please provide some basic information about yourself.

1. Sex
 - a. Female
 - b. Male
 - c. Other
2. Age:
3. Place of residence
 - a. Village
 - b. Town of up to 20,000 residents
 - c. Town of 20,001 to 100,000 residents
 - d. Town of 100,001 to 500,000 residents
 - e. Town of over 500,000 residents
4. Education
 - a. None
 - b. Elementary
 - c. Secondary
 - d. Vocational
 - e. Student
 - f. University

The next questions will concern trends associated with computer games.

1. How long have you been playing computer games?
 - a. for 1 year
 - b. for 1 to 3 years
 - c. for 3 to 5 years
 - d. for 5 to 10 years
 - e. for 10 to 15 years
 - f. for more than 15 years
2. What kind of games do you play?
 - a. Single player yes/no
 - b. Multi-player yes/no
3. List one to three games which you have spent the largest amount of time playing recently.
4. What playing platforms do you use the most frequently (max 3)
 - a. PC
 - b. Telephone
 - c. Nintendo Switch
 - d. PlayStation
 - e. Xbox
 - f. Other, what:
5. How many hours do you spend playing games weekly?
 - a. Up to 1 hour
 - b. 1 to 5 hours
 - c. 5 to 10 hours
 - d. 10 to 15 hours
 - e. 15 to 20 hours
 - f. 20 to 30 hours
 - g. 30 to 40 hours
 - h. 40 to 50 hours
 - i. More than 50 hours

Questions about multi-player games – if you gave the answer “multi-player-yes” to the question “What kind of games do you play?”

The following questions concern only multi-player games.

1. When playing multi-player games, you usually play:
 - a. Alone
 - b. With friends
 - c. More or less equally often alone and with friends
2. How long have you been playing multi-player games?
 - a. for 1 year
 - b. for 1 to 3 years
 - c. for 3 to 5 years
 - d. for 5 to 10 years
 - e. for 10 to 15 years
 - f. for more than 15 years
3. How many hours do you spend playing multi-player games weekly?
 - a. Up to 1 hour
 - b. 1 to 5 hours
 - c. 5 to 10 hours
 - d. 10 to 15 hours
 - e. 15 to 20 hours
 - f. 20 to 30 hours
 - g. 30 to 40 hours
 - h. 40 to 50 hours
 - i. More than 50 hours

Social dominance orientation

Source: Pratto, Felicia, Sidanius, Jim, Stallworth, Lisa M. and Malle, Bertram F. (1994), <https://doi.org/10.1037/0022-3514.67.4.741>

1. It's probably a good thing that certain groups are at the top and other groups are at the bottom.
 - a. 1 – strongly disagree
 - b. 2
 - c. 3
 - d. 4
 - e. 5
 - f. 6
 - g. 7 – strongly agree
2. Inferior groups should stay in their place.
3. We should do what we can to equalize conditions for different groups. (R)
4. We should push for group equality (R)
5. Sometimes other groups must be kept in their place.

Right-wing authoritarianism

Source: Bilewicz, Michał, Soral, Wiktor, Marchlewska, Marta and Winiewski, Mikołaj (2015), <https://doi.org/10.1111/pops.12313>

1. What our country really needs, instead of expanding the range of citizens' rights and liberties, is a solid dose of true law and order.
 - a. 1 – Strongly disagree
 - b. 2
 - c. 3
 - d. 4
 - e. 5
 - f. 6
 - g. 7 – Strongly agree
2. The withdrawal from tradition will turn out to be a fatal fault one day.
3. Obedience and respect for authority are the most important values children should learn.

4. What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path
5. Decency and observing the law are better for us in the long perspective than undermining the rules on which our community is founded.
6. What our country needs most is disciplined citizens, following national leaders in unity.

Video game sexism

Source: Fox, Jesse and Tang, Wai Yen (2014), <https://doi.org/10.1016/j.chb.2013.07.014>

1. Most women who play video games just do so with their boyfriends.
 - a. 1 – Strongly disagree
 - b. 2
 - c. 3
 - d. 4
 - e. 5
 - f. 6
 - g. 7 – Strongly agree
2. Most women who play video games are not very good at them.
3. Women who play video games are actually seeking special favors from men.
4. Women who play video games just do it to get attention from men.
5. Women are too easily offended by what goes on in video games.
6. Women get too offended by sexual comments in games.
7. Women are too sensitive about sex jokes and nude pictures of women that circulate in games.
8. Women who call themselves gamer girls think they deserve special treatment.
9. Having a woman play brings down the quality of the game.
10. If a woman plays with a team or guild, she is almost always the weakest link.
11. Women can't handle trash talking in games like men can.
12. Having women around makes the game less fun.
13. Video games are a man's world, and women don't belong.
14. Women are more worried about socializing than anything else in a game.
15. Women prefer spending time dressing up their character rather than playing.
16. Women don't play games to kill or achieve.

Ambivalent sexism (ASI)

Source: Glick, Peter and Fiske, Susan T. (1996), <https://doi.org/10.1037/0022-3514.70.3.491>

1. People are often happy without heterosexual romance. (R)
 - a. 1 – Strongly disagree
 - b. 2
 - c. 3
 - d. 4
 - e. 5
 - f. 6
 - f. 7 – Strongly agree
2. Once a man commits, she puts him on a tight leash.
3. Despite accomplishment, men are incomplete without women.
4. When women lose fairly, they claim discrimination.
5. Women exaggerate problems at work.
6. Women are too easily offended.
7. Women seek power by gaining control over men.
8. Every man ought to have a woman he adores.
9. Women have a more refined sense of culture, taste.
10. Women should be cherished and protected by men.

Toxic behaviours

Source: Tang, Wai Yen and Fox, Jesse (2016), <https://doi.org/10.1002/ab.21646>

Recall a game that you play regularly or that you played regularly in which you trash-talked or experienced trash-talk. Tick how often you happened to exhibit the following behaviours. Try to determine their frequency as precisely as possible.

1. doubted their motivations for playing video games because of their gender (e.g., said that they were getting special treatment or free stuff because they were a girl, said that they were playing along with their boyfriend, said that they were playing for attention, said that they performed sexual favors to gain special treatment).
 - a. None of the time
 - b. Rarely
 - c. Some of the time
 - d. Most of the time
 - e. Always
2. said that you loved them (e.g., asked them to be your girlfriend)
3. made sexist comments or insults (e.g., told sex jokes, get back in kitchen, “you were on your period”, make a sandwich, called bitch, cunt, whore, slut, etc.)
4. made comments about appearance or weight (e.g., fat, ugly, dressed like a whore, have bedroom or sexy eyes)
5. made a rape joke or threatened to rape
6. said curse words (e.g., fuck, son of a bitch, shit, asshole)
7. said general insults (e.g., called names, were rude, called a troll, loser, jerk, douchebag, told you or others to shut up)
8. made comments about intelligence (e.g., called retard, idiot, moron, stupid, downs syndrome)
9. made comments about others’ abilities to play (e.g., called noob, camper, scrub, criticized poor performance, suck at the game, blame others for losing the game, said they were inferior, laughing at their mistakes)
10. asked others to leave the game (e.g., asked them to uninstall the game, quit the game, or never to play the game again)

Percentage of women gamers

What do you think: What percentage of gamers do women account for?

- Slider 0–100 with the starting position at “50”