

The longitudinal relationship between everyday sadism and the amount of violent video game play

Tobias Greitemeyer*, Christina Sagioglou

University of Innsbruck, Austria



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ABSTRACT

Previous research found correlational evidence that the trait of everyday sadism is associated with the amount of violent video game play. Due to the correlational design, the direction of the association remained unclear. According to the selection hypothesis, everyday sadists should be attracted to violent video games, whereas the socialization hypothesis would propose that repeated exposure to violent video games makes the player more sadistic. However, these hypotheses are by no means mutually exclusive and the relation between everyday sadism and violent video game exposure could be bidirectional. To examine the causal mechanisms more closely, we carried out a longitudinal study ($N = 743$) for which we collected data at two points in time, six months apart. Results showed that (a) everyday sadists are more likely than others to play violent video games and (b) repeated exposure to violent video games predicts everyday sadism over time. Overall, this bidirectional influence reflects a downward spiral of everyday sadistic tendencies and violent video gaming reinforcing each other.

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1. Introduction

Paulhus and Williams (2002) proposed that there are three distinct dimensions that characterize the dark side of human personality (labelled the Dark Triad): narcissism, Machiavellianism, and psychopathy. Narcissists seek admiration and attention and have a grandiose sense of self-importance and superiority. Machiavellians manipulate and exploit others. Psychopathy can be characterized as the tendencies of callousness, thrill seeking, and unemotionality. According to recent research (e.g., Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009; Paulhus, 2014), every sadism could be added as a fourth dimension. Generally, everyday sadists find pleasure in causing harm. They crave for cruelty and their aim is to humiliate others for personal enjoyment (Buckels, Jones, & Paulhus, 2013). These four dimensions (labelled the Dark Tetrad) are significantly correlated, but each trait also has its distinct profile (Chabrol, Melioli, Van Leeuwen, Rodgers, & Goutaudier, 2015). Importantly, these measures have been developed to target subclinical levels of these traits. That is, they are not intended to assess clinically relevant variations, but instead capture nuances of manifestations anywhere below the level of clinical disorders.

Violent video game play is characterized by causing serious harm to other game characters. Perhaps not surprisingly, there is a positive relationship between the Dark Tetrad and the amount of violent video game play (Greitemeyer, 2015). In particular, of the Dark Tetrad, everyday

sadism has the most robust association with amount of violent video game play (Greitemeyer, 2015). Yet, due to the correlational design, the nature of the association between violent video game exposure and everyday sadism could not be addressed. That is, everyday sadists may be attracted to violent video games, repeated exposure to violent video games may increase the player's sadistic tendencies, or both directions of influence may be at work. In the present research, we aimed for disentangling these alternative explanations by testing the interplay between everyday sadism and amount of violent video game play over time.

1.1. The association between violent video game play and dark personalities

A great number of studies have addressed the effects of exposure to violent video games on aggression and aggression-related variables. Although some studies fail to find that violent video games cause aggression (e.g., Adachi & Willoughby, 2011), it appears that individuals who frequently play violent video games do become more aggressive. Two recent meta-analyses (Anderson et al., 2010; Greitemeyer & Mügge, 2014) showed that playing violent video games significantly increases the accessibility of aggressive thoughts, hostile affect, and aggressive behavior. It thus appears that playing violent video games does have an impact on the player's aggression outside the virtual world.

Correlational studies suggest that there is also a relation between amount of violent video game exposure and malevolent personality dispositions. For example, habitual violent video game play is associated with higher trait aggression (e.g., Anderson et al., 2004) and trait hostility (Gentile, Lynch, Linder, & Walsh, 2004). Moreover, violent video

* Corresponding author at: Institut für Psychologie, Universität Innsbruck, Innrain 52, 6020 Innsbruck, Austria.

E-mail address: tobias.greitemeyer@uibk.ac.at (T. Greitemeyer).

game exposure was shown to be associated with increased narcissism and decreased agreeableness (Anderson et al., 2004). A recent study (Greitemeyer, 2015) found that everyday sadism, Machiavellianism, and psychopathy (in addition to trait aggression and agreeableness) were associated with amount of violent video game play. Importantly, of the Dark Tetrad, trait aggression, and agreeableness, everyday sadism was the best predictor of amount of violent video game play.

An important question is how precisely everyday sadism and exposure to video game violence are related. Behavioral research suggests that everyday sadists actively seek opportunities to indulge their appetite for cruelty (Buckels et al., 2013), so it appears a plausible explanation that particularly everyday sadists are attracted to violent video games, possibly due to the opportunity to cause virtual injury and death. This reasoning is in line with the selection hypothesis proposing that highly aggressive individuals are more likely to seek out violent media contents than do individuals who are less aggressive (Huesmann, Moise-Titus, Podolski, & Eron, 2003). The socialization hypothesis, on the other hand, proposes that exposure to violent content causes the user to become more aggressive over time (Anderson, Gentile, & Buckley, 2007). Therefore, the positive association between everyday sadism and amount of violent video game play could also be due to violent video game exposure increasing the player's sadistic tendencies.

Importantly, the two directions are by no means mutually exclusive and it may well be that sadistic individuals are inclined to play violent video games in the first place, and that repeatedly playing violent video games then further increases their sadistic tendencies. Such a mutual reinforcement of personality variables and amount of violent media consumption was described by Slater and colleagues who termed it "downward spiral model" (Slater, Henry, Swaim, & Anderson, 2003). In the present research, we test the possible downward spiral model of everyday sadistic tendencies and exposure to video game violence in a longitudinal research design.

1.2. The present study

The present research examines the longitudinal association between everyday sadism and amount of violent video game exposure. Overall, it was predicted that everyday sadism would be positively associated with amount of violent video game exposure. Because trait aggression, the Big 5 (in particular, agreeableness), and the Dark Triad (narcissism, Machiavellianism, and psychopathy) are typically associated with both everyday sadism and violent video game exposure (Anderson et al., 2004; Greitemeyer, 2015), we further examined whether the relation between everyday sadism and amount of violent video game exposure would remain significant when controlling for the impact of these constructs. Finally, making use of the longitudinal design, we examined the direction of the association between everyday sadism and amount of violent video game exposure.

2. Method

2.1. Participants

Participants were citizens of the U.S. who took part on Amazon Mechanical Turk (MTurk) in exchange for a modest payment. Data were collected 6 months apart. At Time 1, there were 1602 participants. Attentive participation was verified with an item attention check (cf. Oppenheimer, Meyvis, & Davidenko, 2009), which was placed among the dependent measures: "Please leave this item blank (don't select an answer), so we know you are reading the questionnaire properly". Forty-five individuals failed this check. At Time 2, all participants who passed the check were invited to fill out the second questionnaire. There were 743 individuals (410 females, 333 males; mean age = 35.7 years, $SD = 12.0$, age range: 18–79) who completed both questionnaires.

2.2. Measures

To measure amount of violent video game play, participants were asked to name their three favorite video games, to indicate how often they play each video game (on a scale from 1 = *sometimes* to 7 = *very often*), and to rate how violent the content of each video game was (on a scale from 1 = *not at all* to 7 = *very*). As in previous research (e.g., Anderson & Dill, 2000; Greitemeyer, 2014), for each video game, the frequency of game play was multiplied by violent content. These three violent video game exposure scores were then summed to provide a measure of the amount of violent video game play.

The expanded version of the Comprehensive Assessment of Sadistic Tendencies (Buckels & Paulhus, 2014) was used to assess everyday sadism, which contains 18 items. A sample item is: "I was purposely mean to some people in high school." To measure narcissism, Machiavellianism, and psychopathy, we used the Dirty Dozen, with four items per subscale (Jonason & Webster, 2010). Sample items are: "I tend to want others to pay attention to me" (narcissism), "I have used deceit or lied to get my way" (Machiavellianism), and "I tend to be cynical" (psychopathy). Both sadistic tendencies and the Dark Triad items were assessed on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). To measure trait aggression, participants responded to the short version of the Buss and Perry aggression questionnaire (Bryant & Smith, 2001), which contains 12 items (e.g., "I have threatened people I know.") These items were assessed on a scale from 1 (*very unlike me*) to 5 (*very like me*). To measure the Big 5, a brief version was employed (Gosling, Rentfrow, & Swann, 2003). There are two items per scale. Some scale reliabilities were relatively poor, which is a typical psychometric cost of using short measures (cf. Gosling et al., 2003). The Big 5 items were assessed on a scale from 1 (*disagree strongly*) to 7 (*agree strongly*). For all scales, items were pooled, using the average.

3. Results

Descriptive statistics, intercorrelations, and scale reliabilities of all measures are shown in Table 1. In support of our central hypothesis, violent video game play was positively associated with everyday sadism at both times of measurement. In addition, amount of violent video game play was consistently positively associated with trait aggression and the Dark Triad and was negatively associated with agreeableness. This pattern of results is highly consistent with past findings (e.g., Greitemeyer, 2015).

Next, we examined whether everyday sadism is associated with amount of violent video game play when controlling for the impact of trait aggression, the Big 5, and the Dark Triad. We performed two multiple regressions (separately for Time 1 and Time 2). Everyday sadism, trait aggression, the Big 5, and the Dark Triad were used as predictors for amount of violent video game play. The overall regressions were significant, $F(10, 732) = 11.88$, $R^2 = 0.14$, $p < 0.001$; $F(10, 732) = 15.71$, $R^2 = 0.18$, $p < 0.001$. At both Time 1 and Time 2, everyday sadism was still significantly associated with amount of violent video game play, $\beta = 0.40$, $p < 0.001$, $\beta = 0.43$, $p < 0.001$, respectively. At Time 1, extraversion, $\beta = -0.08$, $p = 0.036$, and openness, $\beta = 0.10$, $p = 0.008$, also significantly predicted amount of violent video game play. At Time 2, openness, $\beta = 0.10$, $p = 0.005$, significantly predicted amount of violent video game play. All other predictors were not significant.

To address the interplay between everyday sadism and amount of violent video game play over time, a cross-lagged panel design (i.e., two regression analyses and structural equation modeling) was used. In the first regression, everyday sadism and amount of violent video game play at Time 1 were used as predictors for everyday sadism at Time 2. The overall regression was significant, $F(2, 740) = 803.62$, $R^2 = 0.69$, $p < 0.001$. Most importantly, amount of violent video game play at Time 1 significantly predicted everyday sadism at Time 2, $\beta = 0.08$, $p < 0.001$. As expected, everyday sadism showed high stability, $\beta = 0.80$, $p < 0.001$. In the second regression, amount of violent video game play and everyday sadism at

Table 1

Means, standard deviations, and bivariate correlations.

Variable	M	SD	α	1	2	3	4	5	6	7	8	9	10
1. VVE T1	6.00	8.56	–										
2. Sadism T1	1.87	0.54	0.87	0.35***									
3. Trait aggression T1	2.00	0.73	0.88	0.17***	0.57***								
4. Extraversion T1	3.50	1.72	0.78	–0.02	0.05	–0.09*							
5. Agreeableness T1	5.36	1.27	0.57	–0.11**	–0.44***	–0.55***	0.04						
6. Conscientiousness T1	5.52	1.25	0.65	–0.07	–0.24***	–0.34***	0.20***	0.28***					
7. Neuroticism T1	3.17	1.55	0.79	–0.03	0.10*	0.47***	–0.21***	–0.35***	–0.38***				
8. Openness T1	5.12	1.26	0.56	0.08*	–0.01	–0.04	0.31***	0.17***	0.11**	–0.20***			
9. Narcissism T1	3.61	1.94	0.88	0.09*	0.35***	0.37***	0.15***	–0.24***	–0.17***	0.18***	0.00		
10. Machiavellianism T1	2.94	1.73	0.85	0.15***	0.56***	0.51***	0.04	–0.42***	–0.28***	0.21***	–0.02	0.54***	
11. Psychopathy T1	2.49	1.64	0.82	0.18***	0.57***	0.56***	–0.07	–0.62***	–0.29***	0.22***	–0.06	0.35***	0.65***
12. VVE T2	5.49	8.00	–	0.74***	0.38***	0.19***	–0.02	–0.15***	–0.09*	0.03	0.08*	0.07	0.18***
13. Sadism T2	1.86	0.53	0.87	0.36***	0.82***	0.47***	0.03	–0.42***	–0.18***	0.07	–0.01	0.30***	0.50***
14. Trait aggression T2	2.03	0.72	0.89	0.20***	0.54***	0.83***	–0.07	–0.53***	–0.29***	0.44***	–0.04	0.34***	0.46***
15. Extraversion T2	3.46	1.74	0.78	–0.06	0.01	–0.11**	0.89***	0.07	0.22***	–0.23***	0.27***	0.15***	0.02
16. Agreeableness T2	5.35	1.28	0.53	–0.10*	–0.39***	–0.51***	0.07	0.80***	0.26***	–0.29***	0.13**	–0.25***	–0.41***
17. Conscientiousness T2	5.47	1.26	0.58	–0.07	–0.21***	–0.32***	0.14***	0.30***	0.77***	–0.36***	0.08*	–0.16***	–0.23***
18. Neuroticism T2	3.20	1.54	0.78	–0.02	0.10*	0.42***	–0.18***	–0.29***	–0.34***	0.84***	–0.17***	0.15***	–0.20***
19. Openness T2	5.05	1.29	0.55	0.08*	–0.02	–0.05	0.29***	0.14***	0.06	–0.18***	0.78***	0.02	0.00
20. Narcissism T2	3.68	1.96	0.89	0.06	0.33***	0.32***	0.12**	–0.25***	–0.14***	0.13**	0.01	0.74***	0.46***
21. Machiavellianism T2	3.05	1.78	0.85	0.14***	0.51***	0.41***	0.02	–0.37***	–0.23***	0.17***	–0.03	0.41***	0.74***
22. Psychopathy T2	2.60	1.68	0.83	0.18***	0.50***	0.47***	–0.12**	–0.59***	–0.25***	0.20***	–0.10*	0.27***	0.54***

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

Time 1 were used as predictors for amount of violent video game play at Time 2. The overall regression was significant, $F(2, 740) = 475.96$, $R^2 = 0.56$, $p < 0.001$. Both amount of violent video game play at Time 1, $\beta = 0.69$, $p < 0.001$, and everyday sadism at Time 1, $\beta = 0.14$, $p < 0.001$, significantly predicted amount of violent video game play at Time 2. The bidirectional relation between sadistic personality and amount of violent video game play is illustrated in Fig. 1.

Finally, we used structural equation modeling to control for the impact of trait aggression, the Big 5, and the Dark Triad. Accordingly, amount of violent video game play at Time 2 was predicted by amount of violent video game play, everyday sadism, the Big 5, and the Dark Triad (all at Time 1). Moreover, amount of violent video game play at Time 1 was employed to predict everyday sadism, the Big 5, and the Dark Triad (all at Time 2). We also included stability coefficients for all constructs. The model provided an acceptable fit to the data, $\chi^2(145, N = 743) = 1046.10$, $p < 0.001$, CFI = 0.93, RMSEA = 0.09. The path coefficients are shown in Table 2. As can be seen, amount of violent video game play at Time 1 significantly predicted everyday sadism at Time 2. It thus appears that playing violent video games increases pleasure in harming other people (i.e., everyday sadism). Notably, there was also a significant path from everyday sadism at Time 1 to amount of violent

video game play at Time 2, suggesting—in concert with the regression analyses—that the relationship between playing violent video games and everyday sadism is bidirectional. The model also showed that the amount of violent video game play significantly predicted trait

Table 2

Path coefficients in the longitudinal structural model estimating stability and cross-lagged paths from T1 to T2.

Stability coefficients between T1 and T2	
VVE	0.69***
Sadism	0.80***
Trait aggression	0.82***
Extraversion	0.88***
Agreeableness	0.80***
Conscientiousness	0.77***
Neuroticism	0.84***
Openness	0.78***
Narcissism	0.74***
Machiavellianism	0.74***
Psychopathy	0.78***
Cross-lagged paths from T1 to T2	
VVE → sadism	0.08***
VVE → trait aggression	0.06**
VVE → extraversion	–0.04*
VVE → agreeableness	–0.01
VVE → conscientiousness	–0.02
VVE → neuroticism	0.01
VVE → openness	0.02
VVE → narcissism	–0.01
VVE → Machiavellianism	0.03
VVE → psychopathy	0.03
Sadism → VVE	0.17***
Trait aggression → VVE	–0.05
Extraversion → VVE	–0.01
Agreeableness → VVE	–0.02
Conscientiousness → VVE	–0.00
Neuroticism → VVE	0.07*
Openness → VVE	0.04
Narcissism → VVE	–0.05
Machiavellianism → VVE	0.02
Psychopathy → VVE	–0.03

Note. Coefficients shown are standardized coefficients.

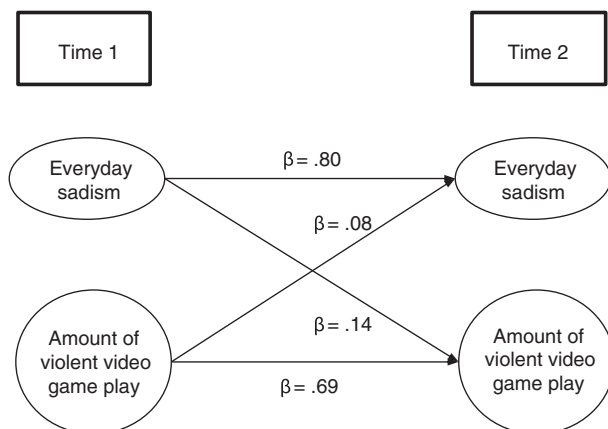
* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

Fig. 1. The longitudinal relation between everyday sadism and exposure to violent video game play. All paths are significant.

11	12	13	14	15	16	17	18	19	20	21
0.20***										
0.51***	0.40***									
0.51***	0.21***	0.55***								
−0.09*	−0.04	0.01	−0.10*							
−0.56***	−0.13**	−0.41***	−0.56***	0.07						
−0.25***	−0.10*	−0.19***	−0.31***	0.17***	0.31***					
0.18***	0.03	0.08*	0.44***	−0.20***	−0.33***	−0.40***				
−0.03	0.07	−0.03	−0.05	0.29***	0.13**	0.09*	−0.17***			
0.28***	0.08*	0.36***	0.36***	0.12**	−0.27***	−0.16***	0.14***	0.02		
0.55***	0.19***	0.56***	0.47***	−0.01	−0.40***	−0.24***	0.21***	−0.01	0.50***	
0.79***	0.22***	0.57***	0.54***	−0.14***	−0.59***	−0.29***	0.22***	−0.10*	0.35***	0.63***

aggression over time, indicating that violent video game play contributes to an increase in trait aggression over time.

4. Discussion

The present research strongly suggests that there is a bidirectional association between everyday sadism and exposure to violent video games. First, the correlation between everyday sadism and exposure to violent video games was significant at both time points and the effect size was medium to large. This relation held when controlling for the impact of trait aggression, the Big 5, and the Dark Triad. In fact, although trait aggression, the Big 5 (in particular, agreeableness), and the Dark Triad were associated with amount of violent video game exposure, everyday sadism was by far the best predictor of amount of violent video game play. Most importantly, the present study is the first that addressed the interplay between everyday sadism and exposure to violent video games over time. Cross-lagged models showed that the relationship between everyday sadism and violent video game play is bidirectional. On the one hand, everyday sadists are more than others attracted to violent video games. On the other hand, violent video game play increases the player's sadistic tendencies. Overall, it appears that a downward spiral (cf. Slater et al., 2003) is at work in that everyday sadists prefer to play violent video games in the first place, and their desire to cause harm is then further strengthened by previous violent video game play.

Taken together, of the Dark Tetrad and trait aggression, everyday sadism had the most robust association with amount of violent video game play, suggesting that the observation that avid players of violent video games score higher than others on everyday sadism is *not* a byproduct of them having other forms of socially-averse personalities. Causing virtual harm during video game play appears to be particularly attractive to individuals who have urges for cruelty that are above the population average (i.e., everyday sadists). In this vein, it is important to acknowledge that the overall mean level of everyday sadism was considerably below the midpoint of the scale. That is, individuals who prefer to play violent video games do not score high on everyday sadism; they just score higher than individuals who do not play violent video games.

Overall, our findings fit well with previous research suggesting that everyday sadism predicts enjoyment of others' suffering beyond the

Dark Triad traits. For example, everyday sadists spend time and energy for the opportunity to aggress an innocent victim (Buckels et al., 2013). They are more likely to punish cooperative individuals (i.e., antisocial punishment; Pfattheicher & Schindler, 2015) and use the Internet to upset other users (trolling; Buckels, Trapnell, & Paulhus, 2014). Finally, everyday sadism is positively correlated with male sexual aggression and coercion (Russell & King, 2016).

Interestingly, in the present study, trait aggression and the Dark Triad similarly predicted the amount of violent video game play, but when controlling for everyday sadism, any predictive power of these constructs was eliminated. It should be noted, however, that the reversed direction of influence remained significant in that the amount of violent video game play significantly predicted trait aggression over time. Hence, as documented in previous longitudinal investigations (e.g., Anderson et al., 2007; Krahé & Möller, 2010), exposure to violent video games does have notable long-term effects on the player's level of aggression.

It is important to acknowledge that our study suggests that there is a bidirectional relationship between everyday sadism and amount of violent video game play, but because of the correlational design no causal conclusions are warranted. Future research may employ experimental designs to examine whether the relations between everyday sadism and amount of violent video game play are causal. For example, participants could be randomly assigned to play either a violent or a neutral video game. Afterward, their willingness to work for the opportunity to hurt others could be assessed (e.g., Buckels et al., 2013). A further limitation of our work involves the reliance on self-reports. Self-report measures have their merits, but there are also some serious weaknesses. In particular, given that the dark side of human personality is a sensitive topic, some participants might not be truthful in their reporting. Future research that employs peer-reports would be very welcome.

To conclude, the present research shows that repeated exposure to violent video games does have long-term consequences and that there is a reciprocal link between violent video game play and socially-averse personalities. In particular, everyday sadists appear to be attracted to violent video games. Proponents of catharsis theory would argue that performing virtual harm could constitute an effective way to reduce the desire for further cruelty. Unfortunately, empirical evidence does not speak in favor of but rather against the idea of catharsis (e.g., Geen & Quanty, 1977). As aggression sets the stage for further

aggression, violent video game play does not satisfy but rather foster the urge for cruelty.

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