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Abstract

Different personality traits are correlated with problematic internet use and online gaming. However, associations between dark personality traits and problematic online gaming (POG) have received less attention. The present study investigated direct and indirect associations of the Dark Tetrad traits (i.e., Machiavellianism, psychopathy, narcissism, sadism) with POG via online gaming motives (controlling for hours spent gaming) among 421 online gamers. Mediation analyses showed narcissism was indirectly associated with POG via online gaming motives of escape and fantasy among role-playing game players and total sample. Sadism was directly associated with POG among first-person shooter game players and indirectly with POG via online gaming motives of escape and fantasy among role-playing game players and total sample. The findings suggest that dark traits should also be taken into account when considering theoretical models involving problematic gaming use, online gaming motives, and preference of different games.

Keywords: problematic online gaming; online gaming motives; narcissism; sadism; psychopathy; Machiavellianism

Introduction

Problematic online gaming (POG) can have serious negative effects on people's psychology and physical health including fatigue, sleep problems, depression, and anxiety (Männikkö, Billieux, & Kääriäinen, 2015). Uses and gratifications theory (henceforth, U&G) has been used to understand problematic gaming. According to U&G, personality differences, gratifications, and motivations for using particular media may facilitate problematic use of those media (Balakrishnan & Griffiths, 2017; Kircaburun, Alhabash, Tosuntaş, & Griffiths, 2018; Ryan, Chester, Reece, & Xenos, 2014). Using U&G, we examine the role of antisocial personality traits (i.e., psychopathy, narcissism, Machiavellianism, and sadism) as distal predictors, gaming motives as proximal predictors, and game-type as moderators, to understand POG.

Dark Tetrad and Problematic Online Gaming

Despite literature on personality predictors of POG (Gervasi et al., 2017), relationships between Dark Tetrad personality dimensions (i.e. Machiavellianism, psychopathy, narcissism, and sadism) and POG have not been fully investigated, although one study suggested a positive association between narcissistic traits and POG (Kim, Namkoong, Ku, & Kim, 2008). Given the poor self-control, impulsive, and aggressive nature of individuals scoring higher on Dark Tetrad traits (Jonason & Tost, 2010; Malesza & Ostaszewski, 2016), individuals with higher levels of dark personality traits may be more vulnerable to developing dependent online behaviors because they might self-select environments conducive to their social/sexual goals (Jonason & Zeigler-Hill 2018).

The Dark Triad personality comprises three overlapping undesirable and antisocial personality dimensions and has drawn increasing attention among researchers (Furnham, Richards & Paulhus, 2013). Machiavellians are ambitious and self-centered individuals, and are

prone to deceive, manipulate, and exploit others to achieve their personal goals (Christie & Geis, 1970). Psychopaths are high in manipulation, impulsivity, recklessness, and thrill-seeking traits and low in empathy, guilt, remorse, and anxiety (Glenn, Kurzban, & Raine, 2011). Finally, narcissism refers to the traits such as grandiosity, superiority, dominance, and entitlement (Corry, Merritt, Mrug, & Pamp, 2008). While few studies have emphasized the need of sufficiency tests on the subject (Jonason, Zeigler-Hill, & Okan, 2017), it has been suggested that the Dark Triad should be expanded to the Dark Tetrad by adding sadism (Buckels, Trapnell, & Paulhus, 2014; van Geel, Goemans, Toprak, & Vedder, 2017). Sadism refers to humiliating, demonstrating cruel and deviant behaviors, and/or inflicting intentional pain on others to feel powerful or pleasure (O'Meara, Davies, & Hammond, 2011).

Dark Tetrad traits correlate with offline socially undesirable outcomes including interpersonal aggression (Jones & Olderbak, 2014), and hedonistic values (Kajonius, Persson, & Jonason, 2015), which may translate into online behavior given personality traits are consistent across situations (Gervasi et al., 2017). Indeed, because Dark Tetrad traits are associated with problematic social media use (Kircaburun, Demetrovics, & Tosuntaş, 2018) and antisocial online behaviors including cyberbullying, cybertrolling, and cyberstalking (Buckels et al., 2014; van Geel et al., 2017), it may be those high on these traits also demonstrate other problematic online behaviors. For example, 'grief play' (i.e., trolling in online games) has been associated with all dimensions of Dark Tetrad traits (Ladanyi & Doyle-Portillo, 2017). Narcissistic gamers are more addicted to videogames because of urges to be recognized and respected by others in-game (Kim et al., 2008). For example, gamers with higher narcissistic trait scores value wealth and in-game power as they do in the real world (Kim et al., 2008), which may drive excessive gaming. Physical sadism is associated with the amount of violent videogame play (Greitemeyer, 2015),

which signals a potential risk for compulsive gaming because of increasing time spent on particular media leading to problematic use (Kuss & Griffiths, 2012).

In addition to impulsivity and aggression, pleasure and competitive feelings may follow gaming dependence because dark personality traits are associated with higher levels of pleasure and satisfaction at others' misfortune (James, Kavanagh, Jonason, Chonody, & Scrutton, 2014), which may be facilitated via gaming. Therefore, we explored the relationship between Dark Tetrad traits and POG.

The Mediating Role of Online Gaming Motives

Online gaming motives have been categorized under seven dimensions including social, escape, fantasy, coping, skill development, competition and recreation (Demetrovics et al., 2011). According to U&G (Ryan et al., 2014), personality traits may predict individuals' motivations for using specific media. Empirical studies demonstrate personality traits may relate to online gaming motives. While extraverts play videogames for social, achievement, and leadership motivations (Graham & Gosling, 2013), narcissism and narcissistic rivalry are related to playing videogames for amusement, distraction, imagination stimulation, social relationships in virtual world, improving avatar abilities, and with gaming frequency and spending more money gaming, which may be related to competitive motives (Stopfer, Braun, Müller, & Egloff, 2015). However, individuals with higher sadistic impulses can potentially fulfill their cruelty needs via the playing violent videogames (Greitemeyer, 2015).

It is well established that gamers' motivations to play online games may lead POG. For instance, gamers who play to (i) escape from real life, (ii) compete with others, and (iii) cope with problems, have more POG than those gaming for other motives (Laconi, Pirès, & Chabrol, 2017). The Compensatory Internet Use Model (henceforth, CUIM) asserts that individuals become problematic online users by compensating their unmet offline needs in online contexts

(Kardefelt-Winther, 2014). This provides an additional explanation for possible mediating effects of gaming motives. Gamers scoring high on Dark Tetrad traits may compensate their antisocial urges (that they cannot fulfill in the real world) in virtual environments (e.g., gaming platforms). Empirically, online gaming motives mediate between psychiatric symptoms and POG, especially escape, competition, and fantasy motives (Ballabio et al., 2017). Therefore, we expect similar mediating effects from escape, fantasy, and competition motives, between Dark Tetrad traits and POG.

The Moderating Role of Game-Types

Among multiplayer online games, the most predominant are (i) massively multiplayer role playing games (MMORPGs), (ii) massively multiplayer first-person shooter (MMOFPS) games, and (iii) massively multiplayer real-time strategy (MMORTS) games (Ghuman & Griffiths, 2012). In MMORPGs, players choose a character with different roles/features and compete or co-operate with other players in a fantasy world to level-up and gain more power. These games are generally social and violent and involve players teaming-up with others and killing the enemies using weaponry (e.g., knives, axes, swords). MMOFPS gamers see the world from the characters' viewpoint and involves killing others via various shotguns to survive and level-up. Finally, MMORTS gamers compete against other people by building cities, states, and armies. They use different strategies to defeat others' armies (Ilkilic, 2017). These different types of games are separated from each other by distinct features, characteristics, and gamers' habits. For example, MMORPG players spend more time gaming, followed by MMOFPS gamers and MMORTS gamers (Nagygyörgy et al., 2013). While impulsivity has been associated with MMOFPS game addiction (Metcalf & Pammer, 2014), lower self-regulation, dysfunctional impulsivity, and agreeableness have been related to POG among MMORPG players (Collins, Freeman, &

Chamarro-Premuzic, 2012), speculating that different games fulfill inherent psychological needs (Nagygyörgy et al., 2013).

Similarly, drawing upon CIUM (Kardefelt-Winther, 2014), individuals with different personality traits may try to fulfill different needs, affecting their preference of game-types and level of game dependency. The present study examined the question of whether game-types have a moderating role between Dark Tetrad traits, online gaming motives, and POG. We also adjusted for hours spent gaming in the model because previous studies mostly report on the relationship between dark traits and time spent on gaming.

Methods and Materials

Participants and procedure

Participants were Turkish online gamers who completed an online survey. To recruit gamers, the survey was promoted on a variety of Turkish multiplayer online gaming social media groups (e.g., *World of Warcraft, Dota, Dota 2, Hearthstone, Playerunknown's Battlegrounds*). All participants were informed about the aims of the study and were told that participation was voluntary and that all data were confidential and anonymous. To be included in the data analysis, participants had to complete all survey items. The final sample comprised 421 gamers (M_{age}=20.82 years, *SD*=4.70; 100% male). Sample power and required sample size were checked using G*Power program with *a priori* analysis and sample sizes for each game-type were sufficient for valid results with power >.80, α=.05, effect size f^2=.06 (Faul, Erdfelder, Buchner, & Lang, 2009). Participants had to choose their most played game type by clicking on one of the following options: (i) massively multiplayer role playing games (MMORPGs), (ii) massively multiplayer first-person shooter (MMOFPS) games, or (iii) massively multiplayer real-time strategy (MMORTS).

Measures

Problematic Online Gaming Questionnaire (POGQ): The POGQ comprises 18 items on a 5-point Likert scale from "never" to "always", three items for each problematic use dimension (i.e., preoccupation, immersion, withdrawal, overuse, interpersonal conflict, social isolation) that assess POG symptoms, e.g., "*How often do you daydream about gaming?*"). The scale developed by Demetrovics et al. (2012) was adapted into Turkish by the first author using standardized back translation processes (Beaton, Bombardier, Guillemin, & Ferraz, 2000). Second order CFA with the Turkish form had adequate fit to the data (χ^2/df=2.62, RMSEA=.06 [CI 90% (.05, .07)], CFI=.93, GFI =.92) and had good internal consistency (Cronbach's α=.89), indicating that the scale can be used as a one-factor model.

Motives for Online Gaming Questionnaire (MOGQ): The MOGQ comprises 27 items on a 5-point Likert scale from "never" to "always", four items for each motivation (i.e., social, escape, competition, coping, skill development, fantasy, recreation) that assess motives of online gaming. The scale developed by Demetrovics et al. (2011) was adapted to Turkish by the first author using standardized back translation processes (Beaton et al., 2000). The translated scale indicated mostly inadequate fit to the data. Therefore, exploratory factor analyses (EFAs) and confirmatory factor analyses (CFAs) were conducted using two items of each dimension that had the highest item-total correlations (e.g., *I play online games*: "*...because I can meet many different people*", "*...because it makes me forget real life*", "*...because I like to win*", "*...because it helps me get rid of stress*", "*...because it improves my coordination skills*", "*...to feel as if I was somebody else*" and "*...because I enjoy gaming*"). The seven dimension 14-item MOGQ indicated a good fit to the data (χ^2/df=1.94, RMSEA=.05 [CI 90% (.03, .06)], CFI.98, GFI=.97) and the seven dimensions had good internal consistencies (αs =.74 to .88).

Dark Triad Dirty Dozen Scale (DTDD): The DTDD comprises 12 items on a 9-point Likert scale from "strongly disagree" to "strongly agree", four items for each personality

dimension (i.e., sub-clinical Machiavellianism, psychopathy, and narcissism) that assess the dark personality features of individuals. The scale developed by Jonason and Webster (2010) was adapted into Turkish by Özsoy, Rauthmann, Jonason, and Ardıç (2017). The scale had an adequate fit to the data (χ^2/df=3.57, RMSEA=.08 [CI 90% (.07, .09)], CFI=.94, GFI =.94) and adequate-to-good internal consistency (αs =.67 to .87).

Short Sadistic Impulse Scale (SSIS): The unidimensional SSIS comprises 10 items (e.g., *"Hurting people would be exciting", "I have fantasies which involve hurting people"*) on a 2-point Likert scale ("like me" and "unlike me"). The scale developed by O'Meara, Davies, and Hammond (2001) was adapted into Turkish by the first author using standardized back translation processes (Beaton et al., 2000). Previous studies reported high validity and reliability of the scale (O'Meara et al., 2001). The Turkish form of the scale indicated acceptable fit (which may be a function of the dichotomous nature of the scoring procedure) to the data (χ^2/df=4.08, RMSEA=.08 [CI 90% (.07, .10)], CFI=.93, GFI=.94) and had good internal consistency (α=.79).

Data Analysis

Mediation analyses (carried out using bootstrapping method with 95% bias-corrected confidence intervals and 5,000 bootstrapped samples), were carried out with Dark Tetrad personality traits as independent variables, online gaming motives as mediator variables, game-type as the moderator variable, amount of online gaming as the control variable, and POG as the outcome variable. Multi-group moderation analyses were conducted for MMORPG, MMOFPS, and MMORTS gamers (these are not depicted as figures) and the total sample (Figure 1) separately using two different estimands (Gaskin, 2016a, 2016b). Moderation estimand calculates the significance level of a path across different groups. Each direct and indirect pathway was tested one-by-one using these methods via using AMOS 23.0 software. Moreover, initial results

were tested and confirmed via using SmartPLS 3.0 software. Moderation analyses with SmartPLS 3.0 software were conducted via using Gaskin's Stats Tools Package (Gaskin, 2016c).

Results

Participants' most preferred online videogame-types ($\chi^2(3)=17.73$, $p<.001$) were role-playing (MMORPGs) games (44%), first person-shooter (MOFPS) games (28%) and real-time strategy (MMORTS) games (28%). The game-types were used as a moderating variable in the model using multi-group analysis. The amount of hours spent gaming was provided by participants and included in the model as a control variable. Table 1 contains descriptive statistics, skewness-kurtosis values, and correlations for the study variables.

There were no moderating effects of game-type between Machiavellianism and online gaming motives and POG. Machiavellianism was indirectly associated with POG via escape, competition, and fantasy motives in the total sample. However, total effect on POG was non-significant (Table 2). There were no moderating effects of game-type between psychopathy and online gaming motives and POG. Psychopathy was indirectly associated with POG via competition and skill development among the total sample.

Game-type did not moderate the mediating effect of online gaming motives or the direct link between narcissism and POG. However, narcissism was indirectly associated with POG among total sample and MMORPG gamers ($\beta=.14$, $p<.01$; 95% CI [.04, .24]) via escape and fantasy. Online gaming motives fully mediated the relationship between narcissism and POG in the total sample and MMORPG gamers. Among MMOFPS and MMORTS gamers, only the total effect of narcissism on POG was significant. The model in which narcissism was a predictor variable explained 34% of the variance of POG among the total sample, 41% among MMORPG gamers, 38% among MMOFPS gamers, and 26% among MMORTS gamers.

Game-type moderated the direct relationship of sadism with POG (B=2.08, p<.01). Sadism was indirectly associated with POG among total sample via escape, competition, and fantasy, and among MMORPG gamers (β=.22, p<.001; 95% CI [.16, .26]) via escape and fantasy. Moreover, sadism was directly associated with POG only among MMOFPS gamers (β=.21, p<.01; 95% CI [.09, .33]). The model in which sadism was a predictor variable explained 34% of the variance of POG among the total sample, 41% among MMORPG gamers, 40% among MMOFPS gamers, and 26% among MMORTS gamers. Sadism explained an additional 2-4% of the variance among first-person shooter game players when compared to other personality dimensions.

Discussion

The present study examined the direct and indirect relationships of Dark Tetrad personality variables with POG via online gaming motives. To investigate the relationship of dark personality traits with different game-types, role-playing, first person-shooter, real-time strategy gamers, and the total sample were examined separately. Considering the theoretical underpinnings of the U&G model, the findings of the present study showed that different personality traits and online gaming motives were associated with different levels of problematic online game use. Narcissism was indirectly associated with POG via escape motive among role-playing gamers and total sample. Sadism was directly associated with POG among first-person shooter gamers and indirectly associated with POG via escape, competition and fantasy motives among total sample. However, it should be noted that these relationships were small in size, meaning there is more to problematic gaming than dark personality traits and the motives reported here.

Partially consistent with Kim et al.'s study (2008), narcissism was indirectly associated with POG via the online gaming motive of escape. Gamers scoring high on narcissistic traits used

the playing of games as an escape from their real life. Narcissists are in a constant need for admiration and ego-reinforcement and they are less agreeable individuals (Campbell, Bosson, Goheen, Lakey, & Kernis, 2007; Jonason, Li, & Teicher, 2010). Therefore, they may be expected to have problematic social relationships, and they may not be able to get the admiration they need from their offline life. This may lead them to look for different mediums where they can compensate their ego-reinforcement needs. Online games provide a competitive environment that can facilitate narcissists to be successful and admired by others. This result is also consistent with Stopfer et al. (2015) who reported that narcissism was positively associated with spending more money on gaming. Narcissists would be expected not to hold themselves back from spending money on a platform where they can satisfy their ego needs to feel special and important.

Sadism was indirectly associated with POG via escape, competition, and fantasy motives among the total sample, and it was directly associated with POG among first-person shooter gamers. Given that most of the gamers in the study were playing violent games (within role-playing games and first-person shooter games), this finding is expected because previous studies indicate both cross-sectionally and longitudinally that everyday sadism is associated with the amount of violent videogame play when other personality traits are controlled for (Gonzalez & Greitemeyer, 2018; Greitemeyer, 2015; Greitemeyer & Sagioglou, 2017). Sadists enjoy humiliating others, cruelty, and deviant behaviors (O'Meara et al., 2011). Arguably, it would be expected that those with sadistic tendencies might play videogames to escape into a world where they can hurt others and exercise their fantasies of hurting and killing; something which they may find difficult to do without serious consequences in the real world. They may become dependent on gaming because of their need to have what they perceive as pleasant feelings. Such gamers would also want to compete and beat others to humiliate them to make themselves feel superior.

Despite their differences, all the Dark Tetrad personality dimensions were significantly associated with the competition motive. Individuals with dark personality traits use various tactics to reach their interpersonal and social goals (Jonason & Webster, 2012). They may enjoy competing with others just to show their superiority, and this motivation may also be leading them to online gaming. However, this motivation did not lead to POG. On the other hand, because individuals with darker personality features enjoy grief play significantly more than others (Ladanyi & Doyle-Portillo, 2017), grief play may play a mediating role between dark personality dimensions and POG. Irritating others in-game may cause a positive mood changes that may lead to excessive use for these individuals.

Limitations and Conclusions

The present study is not without limitations. First, the participants were exclusively male, although in most studies, the majority of online multiplayer games are played by men (Griffiths, Kuss, & King, 2012) and the sample size was modest albeit sufficiently powered for statistical purposes. Future studies may try to encourage female participants to test for gender-specific effects and/or use a larger, nationally representative sample. Second, the cross-sectional nature of the study prevents the drawing of stronger causal conclusions. To overcome this, future studies may need to adopt longitudinal designs. Third, all the data were self-report and, therefore, subject to well-known biases including memory recall and social desirability. Lastly, the present study used quantitative surveys for data collection. Future studies may wish to use mixed-methods or qualitative data methods to collect 'richer' insights.

Despite these limitations, the present study shows for the first time that relationship between narcissism and POG can be explained by online gaming motives. Also, the relationship between sadism and POG was demonstrated for the first time in an empirical study. Sadism was indirectly associated with POG among the total sample and role-playing games sample via online

gaming motives. Moreover, it was a sole direct predictor of problem gaming among first-person shooter games sample.

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TABLES

Table 1. *Descriptive statistics and correlations of the study variables.*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Problematic online gaming	-												
2. Social	.16**	-											
3. Escape	.50**	.26**	-										
4. Competition	.27**	.19**	.22**	-									
5. Coping	.29**	.22**	.59**	.24**	-								
6. Skill development	.30**	.32**	.31**	.35**	.34**	-							
7. Fantasy	.40**	.36**	.55**	.18**	.34**	.35**	-						
8. Recreation	.12*	.12*	.09	.17**	.26**	.15**	.06	-					
9. Machiavellianism	.07	.05	.11*	.28**	.05	.10*	.13**	-14**	-				
10. Psychopathy	.05	-.06	.06	.17**	.02	.10*	.07	-.06	.52**	-			
11. Narcissism	.21**	.06	.20**	.35**	.14**	.09	.23**	-.01	.44**	.23**	-		
12. Sadism	.15**	-.03	.19**	.14**	.08	.13**	.19**	-.07	.41**	.47**	.27**	-	
13. Amount of Gaming	.31**	.16**	.23**	.19**	.11*	.17**	.16**	.10*	-.06	.08	-.03	.02	-
M	45.50	5.75	5.89	6.72	6.70	6.38	4.71	9.06	13.63	13.74	17.90	12.07	2.98
SD	12.79	2.56	2.66	2.51	2.45	2.64	2.75	1.34	7.80	7.29	9.32	2.21	1.28
Skewness	.35	.11	.08	-.32	-.27	-.25	.64	-1.50	.80	.72	.09	1.62	.11
Kurtosis	-.39	-1.10	-1.21	-.98	-.92	-1.08	-.95	1.91	-.10	-.07	-1.00	2.49	-1.04

* $p < .05$, ** $p < .01$.

Table 2. Total, direct and indirect effects of Dark Tetrad on problematic online gaming for overall sample and massively multiplayer online role-playing gamers (MMORPG), multiplayer online first-person shooter (MOFPS) gamers, and massively multiplayer online real-time strategy (MORTS) gamers.

Variables	MMORPG	MOFPS	MORTS	Total Sample
Machiavellianism→ POG (total effect)	.11	.09	.05	.08
→ POG (direct effect)	.02	.04	-.05	-.01
→ POG (total indirect effect)	.09	.05	.10	.09**
→ Escape →POG	.06	.03	.02	.04**
→ Competition →POG	.03	.01	.04	.03**
→ Fantasy →POG	.01	.03	.03	.02**
Psychopathy → POG (total effect)	.05	.13	-.06	.04
→ POG (direct effect)	-.04	.08	-.09	-.02
→ POG (total indirect effect)	.09	.05	.03	.06*
→ Competition →POG	.02	.01	.02	.02*
→ Skill Development →POG	.01	.00	.01	.01*
Narcissism → POG (total effect)	.20*	.23**	.23**	.22**
→ POG (direct effect)	.06	.17	.10	.09
→ POG (total indirect effect)	.14**	.06	.13	.13**
→ Escape → POG	.09**	.03	.05	.07**
→ Fantasy →POG	.03*	.03	.02	.03**
Sadism → POG (total effect)	.20**	.26**	.01	.15**
→ POG (direct effect)	-.02	.21**	-.02	.04
→ POG (total indirect effect)	.22**	.05	.03	.11**
→ Escape → POG	.14**	.03	.00	.06**
→ Competition →POG	.02	.00	.01	.01*
→ Fantasy →POG	.05*	.02	.01	.03**

Note. POG=problematic online gaming. Only the significant indirect effects are shown in table; full report is available upon request.

*p<.05, **p<.01

FIGURES

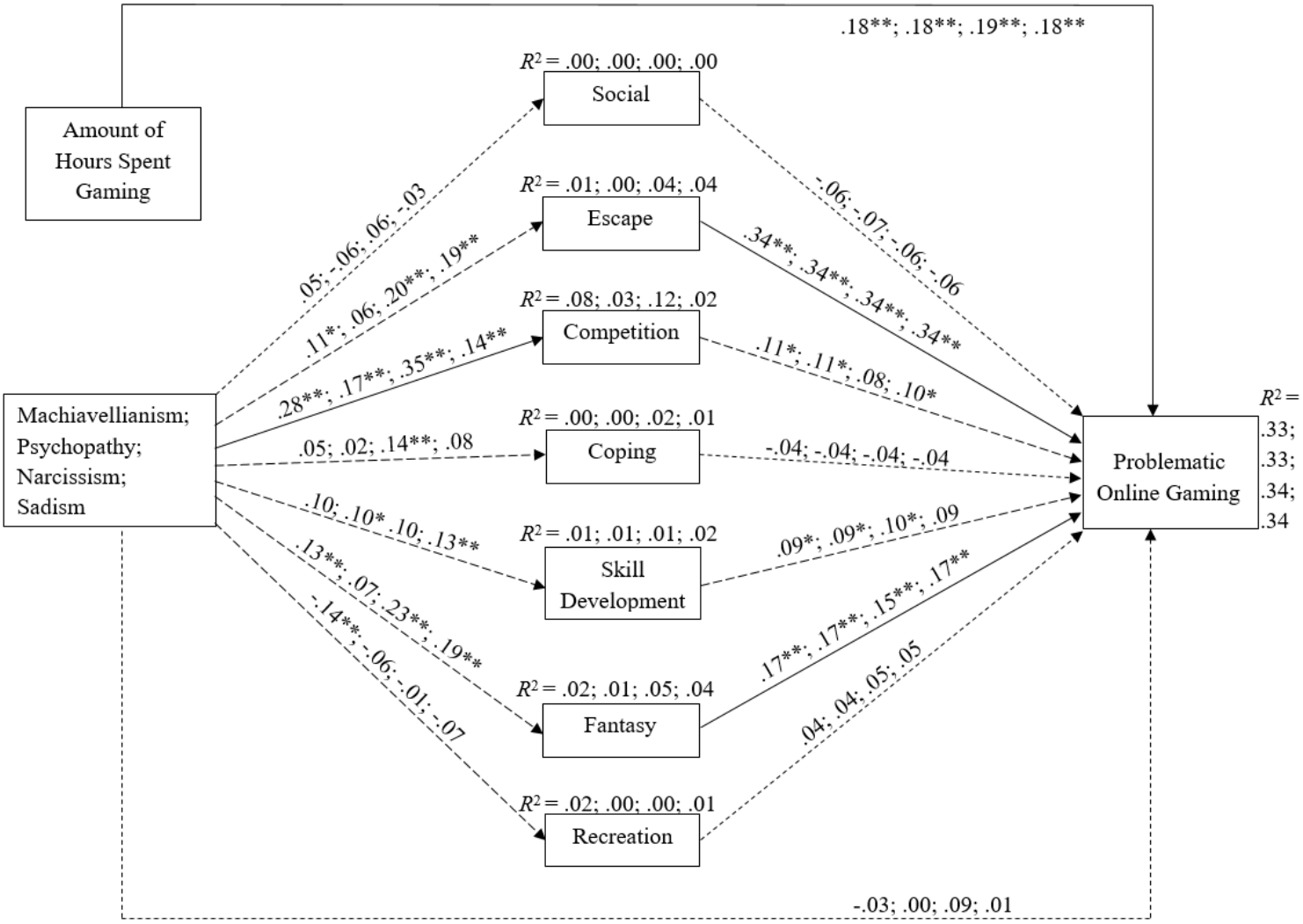

Figure 1. Final four models (for each personality dimension) of the path coefficients between variables among total sample. All variables in model are observed variables. The first value (left) in brackets describe the model path coefficient in which Machiavellianism is independent variable, whereas second, third and fourth values represent path coefficients of models in which psychopathy, narcissism and sadism are independent variables respectively. Amount of online gaming was included as control variable. For clarity, covariances between errors of mediator variables have not been depicted in figure. All path coefficients on simple arrows are significant;

all path coefficients on dotted arrows are non-significant; some of the path coefficients on dashed arrows are significant while some of them are not. *p<.05, **p<.01.