Abstract

The Dark Tetrad traits (i.e., Machiavellianism, psychopathy, narcissism, sadism) are associated with antisocial online behaviors. However, the mediating role of these behaviors between the Dark Tetrad and problematic social media use (PSMU) is unclear. Among a sample of 761 participants, we investigated direct and indirect associations of the Dark Tetrad traits with PSMU via cyberbullying, cyberstalking, and cybertrolling. Multiple mediation analyses demonstrated cyberbullying and cyberstalking fully mediated the relationship between Machiavellianism and PSMU in the total sample and among men. Narcissism was indirectly associated with PSMU via cyberstalking in the total sample and among women. The relationship between sadism and PSMU was fully explained by cyberbullying and cyberstalking in the total sample. Cybertrolling was associated with sadism, psychopathy, and Machiavellianism, although it was not related to PSMU. We suggest that antisocial online behaviors may provide explanation for the relationship between dark personality traits and PSMU with different behaviors mediating different traits among men and women.

Keywords: problematic social media use, cyberbullying, cyberstalking, cybertrolling, sadism, psychopathy, narcissism, Machiavellianism

Introduction

Problematic social media use (PSMU) refers to being preoccupied with social media, having a strong motivation to use social media, and spending excessive time on social media leading to impairments in social, personal and/or professional life, as well as psychological health and wellbeing (Andreassen & Pallesen, 2014). Even though Problem Behavior Theory (PBT) was initially proposed to explain offline risky/deviant behaviors (Boyd, Young, Grey, & McCabe, 2009; Jessor, 1987, 1991), several recent studies have used it to understand problematic (i.e., addictive and/or deviant) online behaviors (De Leo & Wulfert, 2013; Gámez-Guadix, Borrajo, & Almendros, 2016; Kircaburun et al., 2018b, 2018d). According to PBT, in addition to interrelated factors such as personality, environmental factors, and behavioral systems in the development of problem behaviors, engaging in one problem behavior increases the likelihood of engaging in another problem behavior. A recent study demonstrated that there was a direct relationship between the Dark Triad traits and PSMU (Kircaburun, Demetrovics, & Tosuntaş, 2018c), and given the association between these traits and antisocial online behaviors, these behaviors may play a mediating role in this relationship. Narcissism has been associated with antisocial motives in social media use (e.g., trolling) (Ferenczi, Marshall, & Bejanyan, 2017), and psychopathy and sadism have been associated with online misconduct behaviors and a tendency towards engaging in antisocial online behaviors (Sest & March, 2017; Williams, McAndrew, Learn, Harms, & Paulhus, 2001). It has also been demonstrated that those high in Machiavellianism engage in greater cyberbullying (Wang, Lei, Liu, & Hu, 2016). Drawing upon PBT, we examined direct and indirect associations of dark personality traits (i.e., Machiavellianism, psychopathy, narcissism, sadism) with PSMU via antisocial (i.e. deviant) online behaviors (i.e. cyberbullying, cyberstalking, cybertrolling).

Dark tetrad and problematic social media use

Despite a large body of literature on the relationship between personality and PSMU (Kuss & Griffiths, 2011), the potential role of dark personality traits (except narcissism) have been neglected, although findings from a preliminary study suggested that they should also be taken into account (Kircaburun et al., 2018c). In addition to narcissism, Machiavellianism positively predicted PSMU, while despite significant correlation with PSMU, psychopathy was negligible in the model among other traits (Kircaburun et al., 2018c).

Dark personality traits have unique features that may lead to problematic online use. Narcissism refers to a grandiose sense of self-importance, superiority, and entitlement (Corry, Merritt, Mrug, & Pamp, 2008), which may direct individuals to PSMU via preoccupation with self-promotion in social media via selfies and other tools (Kuss & Griffiths, 2011). Beside their deceptive, manipulative, and exploitative nature (Christie & Geis, 1970), Machiavellians have a fear of social rejection (Rauthmann, 2011) which may canalize them to prefer online communication, where they can manipulate others more easily. Psychopaths may engage in cybersex using social media to fulfill their need for sensation and extra stimulation (Shim, Lee, & Paul, 2007). On the other hand, self-promotion, social, and entertainment gratifications obtained from social media are PSMU risk factors (Kircaburun, Alhabash, Tosuntaş, & Griffiths, 2018a). Although, there is a need for further empirical research (Tran et al., 2018), increasing evidence suggests the Dark Triad should be expanded to the Dark Tetrad with the addition of sadism especially when investigating deviant online behaviors because sadism has predicted additional variance in these behaviors (Buckels, Trapnell, & Paulhus, 2014; van Geel, Goemans, Toprak, & Vedder, 2017).

In addition to their unique correlates, given the common correlates between dark traits and problematic online use such as lower agreeableness, lower conscientiousness, higher dissociation, higher borderline personality facets, and higher aggression (Douglas, Bore, &

Munro, 2012; Kayiş et al., 2016; Kircaburun et al., 2018d; Lu et al., 2017; Richardson & Boag, 2016), the Dark Tetrad personality, which comprises four overlapping undesirable and antisocial personality constructs (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009), can relate to increased PSMU. Therefore, we tested the direct associations of these traits with PSMU.

The mediating role of cyberbullying, cybertrolling, and cyberstalking

Some of the antisocial and deviant online behaviors defined in the literature are cyberbullying, cybertrolling, and cyberstalking. Evidence suggests that dark personality traits may be important determinants of these behaviors. Cyberbullying, which refers to repetitive, intentional, and harmful online behaviors demonstrated against weaker ones (Patchin & Hinduja, 2015), was particularly related to psychopathy (Goodboy & Martin, 2015) and sadism (van Geel et al., 2017). Given that psychopaths tend to be more impulsive and have limited empathy for others (Douglas et al., 2012), not realizing that they are harming others may prevent them quitting this behavior. Moreover, sadists may engage in cyberbullying simply because they enjoy seeing their victims suffer (van Geel et al., 2017).

Cybertrolling (characterized by aggresive, destructive, deceptive, and disruptive online behaviors without a clear reason or motivation), can be distinguished from cyberbullying with pointlessness and disruptiveness of the act and higher perpetrator anonymity (Buckels et al., 2014). Individuals engage in cybertrolling to cope with boredom, attention seeking, revenge, and urges to damage others (Shachaf & Hara, 2010), in which these motives echo with different facets of dark personality traits. Empirical evidence suggests clear patterns between cybertrolling and Dark Tetrad traits, especially sadism and psychopathy (Buckels et al., 2014; Cracker & March, 2016; March, Grieve, Marrington, & Jonason, 2017).

Cyberstalking can be defined as willful, repeated, and malicious following or harassment of another person in online contexts (Coleman, 1997). Cyberstalking may include

behaviors like maintaining remote surveillance on, persistent contacts with, and/or direct threats toward the victim (Smoker & March, 2017). Even though empirical studies are scarce, preliminary findings suggest that all Dark Tetrad traits are significant predictors of cyberstalking (Smoker & March, 2017).

Given the obsessive and mood changing nature of these antisocial online behaviors (Patton, Nobles, & Fox, 2010), such behaviors may associate with higher PSMU because mood modification and preoccupation are two addiction-like symptoms that may lead to problematic use (Andreassen, Torsheim, Brunborg, & Pallasen, 2012). Such mood modifying effects can either be excitatory (e.g., providing a 'high' or a 'buzz') or inhibitory (e.g., providing a sense of escape or numbing) but are experienced as being positively reinforcing for individuals (Griffiths, 2005). Given that Dark Triad traits associate with values such as power, hedonism, and manipulation (Jones & Figueredo, 2013; Kajonius, Persson, & Jonason, 2015), individuals high on aforementioned traits may engage in cyberbullying, cybertrolling, and/or cyberstalking to feel powerful, entertained, or relieved as a coping strategy against everyday real-life problems. These reinforcing mood changes may follow preoccupation and salience and transform into problematic (and sometimes addictive) use. Problem Behavior Theory (PBT) provides additional support for the assumption that engaging in one problem behavior increases the likelihood of engaging in another problem behavior. Moreover, cross-sectional and longitudinal studies also confirm these theoretical assumptions via positive relationships between problematic Internet and social media use with cyberbullying (Gámez-Guadix et al., 2016; Kircaburun et al., 2018d). Therefore, we expect to find indirect pathways between the Dark Tetrad traits (especially sadism and psychopathy) and PSMU via cyberbullying, cybertrolling, and cyberstalking.

The role of sex

Empirical literature suggests an equivocal pattern for sex differences in cyberbullying, cyberstalking, cybertrolling, and PSMU. Studies report that men are better characterized by Dark Tetrad traits than women (Craker & March, 2016; Muris, Merckelbach, Otgaar, & Meijer, 2017). A majority of studies have found higher cyberbullying and cybertrolling among men (Craker & March, 2016; Kircaburun & Tosuntaş, 2018) while some found no difference or higher scores for women (March et al., 2017; Xiao & Wong, 2013), and others found higher cyberstalking and PSMU scores for women (Kircaburun et al., 2018c; Smoker & March, 2017). It may be that men have higher antisocial personality facets that lead to higher involvement in antisocial online behaviors, while women are more prone to become addicted to activities that involve higher social interactions because of their lower levels of antisocial personality features. Because of these differences between men and women, relationships between these variables may vary across gender. While cyberbullying and cybertrolling may lead to higher PSMU among men, women may become higher problematic users via engaging in excessive cyberstalking.

Consequently, based on the previously explained rationale, we composed and tested our hypotheses that the Dark Tetrad traits would be directly and indirectly associated with PSMU via cyberbullying, cybertrolling, and cyberstalking. We hope to replicate the results of previous studies by demonstrating direct and indirect associations from Machiavellianism and narcissism to PSMU via cyberstalking. We also expect cyberbullying and cybertrolling to mediate the relationships of psychopathy and sadism with PSMU. Also, we further investigated the question of whether there are differences in the aforementioned associations between men and women.

Methods
Participants and procedure

Participants ($N = 761$) were 274 male and 487 female undergraduates ($M_{age} = 20.70$ years, $SD_{age} = 2.28$; Range = 18 to 28 years), who were recruited from a Turkish university.

All participants were informed about the aims of the study before they completed paper-pencil

questionnaires and were told that participation was voluntary and that all data were

confidential and anonymous. Sample sizes for each sex were above the recommended

thresholds (*n* = 250) for obtaining stable correlation estimates (Schönbrodt & Perugini, 2013).

Measures

The Turkish translation (masked for blinded review) of the six-item Bergen Social

Media Addiction Scale (Andreassen et al., 2012) was used to assess problematic social media

use (e.g., "*How often during the last year have you tried to cut down on the use of social

media without success?*"). Participants were asked their agreement to the above (1 = *never;* 5

= *always).* Items were averaged together to create a single index of problematic social media

use (Cronbach's α = .88).

The Turkish form (Özsoy, Rauthmann, Jonason, & Ardıç, 2017) of the 12-item Dark

Triad Dirty Dozen Scale (Jonason & Webster, 2010) was used to assess Machiavellianism

(e.g., "*I tend to manipulate others to get my way.*"), psychopathy (e.g., "*I tend to be

cynical.*"), and narcissism (e.g., "*I tend to want others to admire me.*"). Participants were

asked their agreement to the above (1=*strongly disagree*; 9=*strongly agree*). Items for each

scale were averaged together to create indexes of Machiavellianism (Cronbach's α = .82),

psychopathy (α=.66), and narcissism (α = .88).

We measured sadistic impulses using the Short Sadistic Impulse Scale (O'Meara,

Davies, & Hammond, 2001). The scale is composed of 10 dichotomous items (e.g., "*Hurting

people would be exciting.*"), ranging between "*like me*" and "*unlike me*". The Turkish version

has good psychometric properties (masked for blinded review). It had adequate internal

consistency in the present study (α = .74).

The Turkish translation (Kircaburun et al., 2018d) of the nine-item Cyberbullying

Offending Scale (Patchin & Hinduja, 2015) was used to capture individual differences in

cyberbullying (e.g., "*I spread rumors about someone online.*"). To label aggressive online behaviors as cyberbullying perpetration, the behavior should be demonstrated repetitively (Hinduja & Patchin, 2008; Kircaburun et al., 2018b; Zsila et al., 2017). Therefore, the scale was dichotomized and showed high internal consistency (α = .79).

We developed a scale to assess individual differences in cyberstalking via examining the existing literature (e.g., Smoker & March, 2017). Ten items were tested via using exploratory (EFA) and confirmatory (CFA) factor analyses. Consequently, the scale comprised three sub-factors, which are "current intimate partner stalking" (e.g., "*I tried to check up on my intimate partner's social media messages without noticing him/her*"), "former/ future intimate partner stalking" (e.g., "*I tried to see my ex-lovers' private social media accounts*"), and "harrasing despised-ones online" (e.g., "*I tried to harrass someone I do not like online*"), and eight items on a 5-point Likert scale from "*never*" to "*many times*". Second-order CFA confirmed the scale structure obtained from EFA (KMO = .77, p < .001, explaining 68% of the variance) and further showed that the scale can be used unidimensionally (χ^2/df = 2.45, RMSEA = .04 [CI 90% (.03, .06)], CFI = .99, GFI = .99). The scale was used dichotomously in the present study because of the repetition of behavior principle (Coleman, 1997), following the same procedure from the Cyberbullying Offending Scale. The sub-factors and total scale had adequate-to-good internal consistencies (α = .72 - .81).

Similarly, we developed a scale to assess individual differences in cybertrolling. EFA (KMO = .82, p < .001, explaining 54% of the variance) and CFA indicated adequate-to-good validity for the scale (χ^2/df = 3.34, RMSEA = .06 [CI 90% (.03, .08)], CFI = .99, GFI = .99). A unidimensional scale emerged with six items on a 5-point Likert scale from "*never*" to "*many times*" assessing cybertrolling behaviors (e.g., "*I post disturbing and contradictive content in social media just to amuse myself.*"). The scale had good internal consistency (α = .83). Finally, we measured participants' daily social media use by asking them to choose among four options:

"less than two hours", "between two and four hours", "between four and six hours", and "more than six hours".

Results

Table 1 contains descriptive statistics and correlations amongst Dark Tetrad traits, cyberbullying, cyberstalking, cybertrolling, and problematic social media use (PSMU). To examine the mediating role of cyberbullying, cybertrolling, and cyberstalking on the relationship between dark personality traits and PSMU, we tested a saturated multiple mediation model with total sample (Figure 1), while adjusting for daily social media use, participants' sex, and age. Mediation analyses were carried out using bootstrapping method with 95% bias-corrected confidence intervals and 5,000 bootstrapped samples. To find the specific mediators each indirect pathway was checked one-by-one using an estimand (Gaskin, 2016).

In the total sample, sadism was directly associated with cyberbullying, cybertrolling, and cyberstalking, and indirectly with PSMU via cyberbullying and cyberstalking. Narcissism was indirectly associated with PSMU via cyberstalking. Machiavellianism was directly associated with cyberbullying, cybertrolling, and cyberstalking, and indirectly with problematic social media use via cyberbullying and cyberstalking. However, their effect sizes were small. Psychopathy was directly associated with cyberbullying and cybertrolling. However, this did not lead to PSMU. Sadism has a residual predictor role in problematic antisocial online behaviors when included into model with the Dark Triad traits, which may indicate that, despite its overlap with other traits, sadism should be added to the Dark Triad to form the Dark Tetrad. In order to examine the additional contribution of sadism to the Dark Triad, we conducted hierarchical multiple reggression analyses predicting PSMU, cyberbullying, cyberstalking, and cybertrolling while controlling for Machiavellianism,

psychopathy, and narcissism. Sadism accounted for additional 1% of PSMU, 5% of cyberbullying, 2% of cyberstalking, and 2% of cybertrolling.

Finally, because sex differences in some of the study variables are well established, we looked for differences in study variables across sex and tested the model among men and women separately adjusting for daily social media use and age (Table 2). As a result of t-tests (not shown as a table), men had significantly higher scores on Machiavellianism (t[759]=-6.15, *p*=.001), psychopathy (t[759]=-5.61, *p*=.001), narcissism (t[759]=-4.03, *p*=.001), sadism (t[759]=-7.97, *p*=.001), cyberbullying (t[759]=-7.35, *p*=.001), and cybertrolling (t[759]=-5.47, *p*=.001), and women had higher PSMU (t[759]=2.33, *p*=.02). Cyberstalking did not differ significantly across sex (t[759]=-1.45, *p*=.15). Moreover, the relationship between narcissism and PSMU was fully mediated by cyberstalking among women, cyberbullying and cyberstalking fully explained the association between Machiavellianism and PSMU. Sadism and psychopathy were not associated with PSMU.

Discussion

The purpose of the present study was to test direct and indirect associations of the Dark Tetrad traits of Machiavellianism, psychopathy, narcissism, and sadism with problematic social media use (PSMU) via cyberbullying, cyberstalking, and cybertrolling. As hypothesized, sadism was associated with cyberbullying, cyberstalking, and cybertrolling, and in turn, cyberbullying and cyberstalking led to higher PSMU in the total sample. Despite the small effect size, it may be that a small minority of participants could not fulfill their need for cruelty (van Geel et al., 2017) and become obsessed with individuals they were stalking online, fantasizing to make them suffer, may have become problematic users of social media.

We replicated and brought further explanation to the findings of a previous study, which reported a direct association between Machiavellianism and PSMU (Kircaburun et al., 2018c), and demonstrating that Machiavellianism was indirectly associated with PSMU via

cyberbullying and cyberstalking. However, this association was only significant in the total sample and among men. Even though we did not expect to see significant association of Machiavellianism with cyberbullying and cybertrolling while sadism and psychopathy were in the equation, Machiavellianism appears to be an important trait that can lead to higher moral disengagement (Egan, Hughes, & Palmer, 2015), another important predictor of antisocial online behaviors (Bussey, Fitzpatrick, & Raman, 2015). This finding shows that in addition to sadistic and psychopathic motivations (e.g., harming others, seeing them suffer), Machiavellianistic predispositions such as giving up moral values easily and/or lacking remorse can be unique predictors of antisocial online behaviors especially among men.

As expected, narcissism was not associated with cyberbullying or cybertrolling among other traits. It may be that when psychopathy is adjusted for, the role of narcissism on interpersonal violence becomes insignificant (Jonason, 2015). Narcissism was related to higher cyberstalking among total sample and women. Whether to pursue previous or present intimate partners or to harrass someone they do not like, women higher in narcissism appear to be more obsessed with online stalking. Given the nature of this behavior, it may be that those who engage in higher cyberstalking may be driven from the fear of missing out of what stalked individuals might have shared/posted, or the stalker may be trying to give a message to victims that she is watching their every online movement. Moreover, women higher in narcissism may try to have the upper hand in the relationship via following online interactions of their intimate partners by engaging in this behavior (Smoker & March, 2017).

Partially parallel to our hypothesis, cyberbullying and cyberstalking, but not cybertrolling, were associated with higher PSMU. Individuals engaged in higher cyberbullying and cyberstalking scored higher on PSMU. Even though previous cross-sectional evidence indicated that cyberbullying and PSMU should be associated (Kircaburun et al., 2018d), the role of cyberstalking on PSMU was empirically demonstrated for the first

time. Cyberbullying via motivations such as social acceptance, endorsement of power, and romantic revenge (Schenk, Fremouw, & Keelan, 2013; Xiao & Wong, 2013) may lead to different gratifications such as feeling powerful and superior which may metamorphose into positive mood modifications. Social media users that have difficulties in pursuing real-life social and professional success may try to overcome this shortcoming via cyberbullying others to feel powerful, and in turn, may become problematic users to have this feeling as much as possible in order to feel good. Additionally, cyberstalking may lead to higher PSMU via fear of missing out (Wegmann, Oberst, Stodt, & Brand, 2017). Cyberstalking demands an excessive time for investigation of shared posts from different social media accounts and victim profiles (Kircaburun et al., 2018c). Given that preoccupation is another symptom of problematic use, excessive social media use for an obsessive drive such as stalking others may easily turn into problematic use (Andreassen et al., 2012).

Limitations and conclusions

Several limitations should be noted for the present study. First, the Dark Triad Dirty Dozen scale has been criticized its brevity and lack of essential content (Jones & Paulhus, 2014). Therefore, future studies should replicate the findings here using different measures to assess dark personality traits. However, given we found what we expected, in spite of these limitations, we contend the Dirty Dozen is an adequate measure via its utility (Koehn, Okan, & Jonason, 2018). Second, the cross-sectional nature of the study prevents making causal associations between variables. Longitudinal studies may be used in the future to examine the directions of relationships. Third, the majority of the participants were female undergraduates, which lead to restrictions concerning generalizability of the results. Future studies should test the associations using different, more representative samples.

Despite its limitations, there are several important contributions offered by the present study. We replicated some of the findings of a minority of empirical studies that Dark Tetrad

traits are associated with antisocial online behaviors (i.e., cyberbullying, cyberstalking, and cybertrolling). Furthermore, we demonstrated that the relationship between the Dark Tetrad traits and problematic social media use may fully be mediated by cyberbullying and cyberstalking. We suggest that antisocial urges and gratifications may lead to higher engagement in problematic online use such as social media, and further studies should investigate these relationships in more detail via using different scales that have been designed to be used together for assessing the Dark Triad and sadism (e.g., SD3 Dark Triad scale [Jones & Paulhus, 2014], Assessment of Sadistic Personality [Plouffe, Sakolfske, & Smith, 2017]).

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TABLES

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

	1	2	3	4	5	6	7	8	9
1. Problematic Social Media Use	-								
2. Cyberbullying	.31**	-							
3. Cyberstalking	.42**	.51**	-						
4. Cybertrolling	.22**	.57**	.42**	-					
5. Machiavellianism	.23**	.46**	.37**	.42**	-				
6. Psychopathy	.15**	.41**	.25**	.38**	.53*	-			
7. Narcissism	.22**	.30**	.37**	.28**	.50*	.28*	-		
8. Sadism	.22**	.47**	.34**	.39**	.50*	.50*	.34*	-	
9. Daily Social Media Use	.48**	.15**	.23**	.12*	.06	.03	.07	.11*	-
M	16.35	1.14	2.05	.86	9.43	9.82	16.26	11.23	2.25
SD	6.08	1.76	1.90	1.39	6.16	5.71	9.04	1.71	1.00

*p < .01, **p < .001

Table 2. *Standardized estimates of total, direct, and indirect effects on problematic social media use for overall sample and men and* women.

	Effect (S.E.)		
	All Sample	Men	Women
Machiavellianism → PSMU (total effect)	.11** (.04)	.17* (.07)	.09 (.05)
→ PSMU (direct effect)	.05 (.04)	.10 (.07)	.04 (.05)
→ PSMU (total indirect effect)	.06*** (.02)	.07*** (.03)	.05** (.02)
→ Cyberbullying → PSMU	.03** (.01)	.04** (.02)	.02 (.02)
→ Cyberstalking → PSMU	.04*** (.01)	.03* (.01)	.04*** (.01)
Narcissism → PSMU (total effect)	.11** (.04)	.07 (.06)	.14** (.05)
→ PSMU (direct effect)	.06 (.03)	.02 (.05)	.08 (.04)
→ PSMU (total indirect effect)	.05*** (.01)	.05** (.02)	.06** (.02)
→ Cyberstalking → PSMU	.05*** (.01)	.03* (.01)	.06*** (.01)
Sadism → PSMU (total effect)	.08* (.04)	.12 (.07)	.05 (.04)
→ PSMU (direct effect)	.02 (.04)	.04 (.07)	.00 (.04)
→ PSMU (total indirect effect)	.06*** (.02)	.08*** (.03)	.05** (.02)
→ Cyberbullying → PSMU	.03** (.04)	.06** (.07)	.01 (.02)

→ Cyberstalking → PSMU	.04*** (.04)	.02* (.04)	.04** (.07)

Note. PSMU = problematic social media use. Only the significant indirect effects are shown in the table; full report is available upon request.

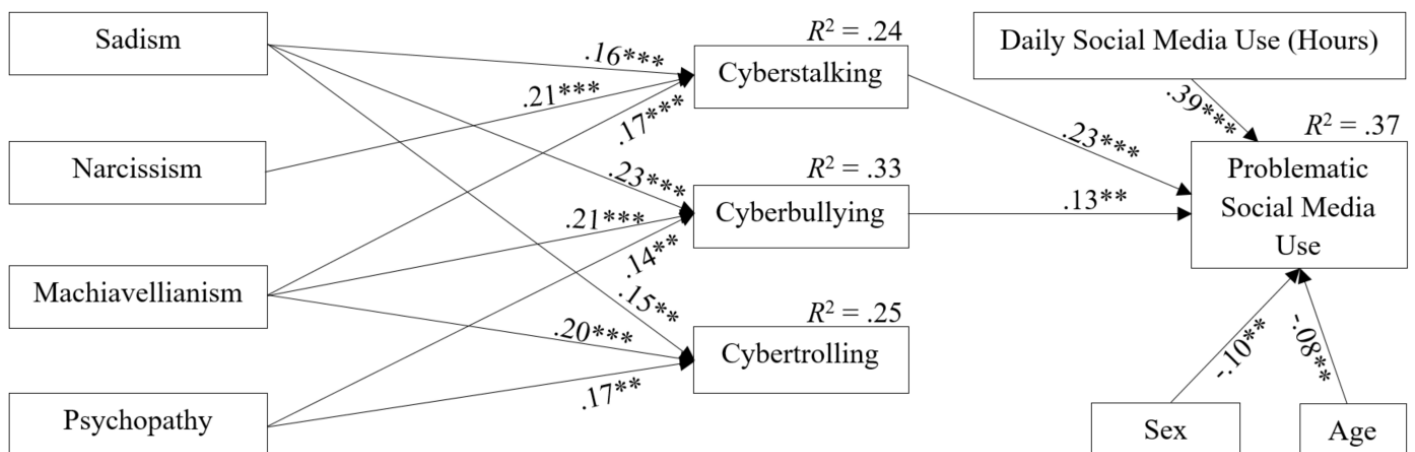*p < .05, **p < .01, ***p < .001.

FIGURES

Figure 1. *Final model of the significant path coefficients. All variables in model are observed variables. Daily social media use, sex (women = 1; men = 2) and age were adjusted for cyberstalking, cyberbullying, cybertrolling, and problematic social media use, however, some of the pathways were not shown in the figure for clarity. For clarity, non-significant pathways,*

covariances between errors of control, independent, and mediator variables have not been

depicted in figure.