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Development and Validation of the Online Antisocial Personality Scale (OAPS) Using the DSM-5 Criteria for Antisocial Personality Disorder (APD)

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Abstract
Recent studies have consistently demonstrated that antisocial behaviors occur in online environments. Although online antisocial behavior has a long history, it appears to have become more widespread in recent years due to the widespread use of online social networks. Although there are established criteria and instruments assessing antisocial behavior there are few examining such behavior online. Therefore, the present study aimed to develop the Online Antisocial Personality Scale (OAPS). The OAPS was developed using the diagnostic criteria for antisocial personality disorder in DSM-5. The OAPS assesses antisocial behavior in online environments. The present study comprised 447 adolescents (219 girls and 228 boys) from four different samples. The measures used included the Online Antisocial Personality Scale (OAPS), E-Bullyıng Scale (E-BS), and Personality Belief Questionnaire-Short Form (PBQ-STF). The structural validity of OAPS was investigated with exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and criterion validity. When validity and reliability analysis of the OAPS are considered as a whole, it is concluded that the OAPS is a valid and reliable scale that assesses online antisocial personality among adolescents.

Keywords: Antisocial personality, antisocial personality disorder, online antisocial behavior, online antisocial personality

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Introduction

Antisocial personality disorder (APD) is defined as a pervasive pattern of disregard for (and violation of) the rights of others among individuals over the age 15 years but is known to begin in childhood or early adolescence and continues into adulthood. This pattern has also been referred to as psychopathy, sociopathy, and dissocial personality disorder (American Psychiatric Association [APA], 2013). Antisocial individuals are known to have a handicap in empathy. This causes antisocial individuals to be indifferent to the feelings, rights, and suffering of others. APD is widespread. The one-year prevalence of the disorder is between 0.2% and 3.3% (APA, 2013). Alcohol use disorder, substance addiction, low socioeconomic status, and sociocultural factors (migration, etc.) increase the prevalence of the disorder (APA, 2013). The APA (2013) diagnoses APD according to seven diagnostic criteria. These are legal irresponsibility (*"failure to conform to social norms with respect to lawful behaviors, as indicated by repeatedly performing acts that are grounds for arrest"*: p. 659); deceitfulness: (*"as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure"*: pp., 659); impulsivity (*"failure to plan ahead"*: p. 659); irritability-aggressiveness (*"as indicated by repeated physical fights or assaults"*: p. 659); security irresponsibility (*"reckless disregard for safety of self or others"*: p. 659); economic irresponsibility (*"as indicated by repeated failure to sustain consistent work behavior or honor financial obligations"*: p. 659); and impenitence (*"lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another"*: p. 659).

More recently, studies have been conducted examining whether antisocial behaviors are possible in online environments. For instance, research has been carried out (amongst others) into (i) antisocial behaviors in online discussion environments (Cheng et al., 2015), (ii) identifying individuals with antisocial behaviors in online environments (Kumar et al., 2017), (iii) identifying antisocial behavior on *Twitter* (Almuhanna, 2017), (iv) using social media in an antisocial way (Den Hamer et al., 2014), (v) online antisocial and prosocial behaviors (Erreygers et al., 2017), (vi) cyber-trolling behaviors in terms of psychopathy, sadism, and empathy (Sest & March, 2017), (vii) hostility among *Instagram* users (Liu et al., 2018), and (viii) exposure to online antisocial behavior (Davis, 2002). These studies emphasize that antisocial behavior is possible in online environments.

Although online antisocial behavior has a long history, it appears to have become more widespread in recent years due to the widespread use of online social networks such as *Twitter*, *Facebook* and *YouTube* (Almuhanna, 2017). Research has shown that individuals exposed to online antisocial behavior have similar psychosocial reactions to individuals exposed to offline antisocial behaviors (Kowalski et al., 2014; Nicol, 2012; Sest & March, 2017). Furthermore, exposure to online antisocial behaviors may leave more permanent psychological distress on the victim (Park et al., 2014). Adolescents who are exposed to antisocial behavior in online environments tend to show antisocial behaviors in online environments and offline social environments (Den Hamer et al., 2014; Fanti et al., 2012). In other words, victims can come to engage in the same antisocial behavior over time if they have experienced it themselves (Kowalski et al., 2014). In addition, online antisocial behaviors can penetrate large audiences quickly and show longer-lasting effects for the victims. Indeed, the online environment can arguably facilitate antisocial behavior, such as sending hate mail or serious threats, spreading rumors, and/or carrying out sexual and racial harassment (Dehue, 2013). Consequently, online antisocial behaviors are arguably at least as dangerous and destructive as offline antisocial behaviors.

The APA's (2013) definition of APD can also be applied to online antisocial behavior. Such online antisocial behaviors can include (but are not limited to) cyber-flaming, cyber-hate, online provocation, online antagonism (Almuhanna, 2017), cyber-trolling (Cheng et al., 2017), cyber-stalking (Reyns, 2012), cyber-aggression (Álvarez-García et al., 2018), cyber-violence (Owen, 2016; Peterson & Densley, 2017), cyber-hostility (Liu et al., 2018), griefing (Cheng et al., 2015) computer crime (Seigfried-Spellar et al., 2017), hacking (Barber, 2001), and cyberbullying (Cao & Lin 2015; Den Hamer et al., 2014). In this context, online antisocial behavior can be defined as disregard for and violation of the rights of others in online environments.

In empirical studies, the concepts of cyber-hostility, cyber-trolling, and cyberbullying are prominent. Cyber-hostility is defined as harassing, threatening, or offensive language directed toward a specific individual or group online (Liu et al., 2018). Cyber-trolling is defined as deliberate provocation of others using deception and harmful behavior in online environments (Hardaker, 2010). Cyberbullying is defined as an aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself (Smith et al., 2008). Cyberbullying is considered to constitute a specific form of antisocial behavior, characterized by an intentionality to repetitively hurt an individual alongside an imbalance of power (Erreygers et al., 2017). Cyberbullying is one of the most researched topics among online antisocial behaviors (Kowalski et al., 2014).

Kowalski et al. (2014) conducted a multidimensional meta-analysis study on 131 cyberbullying studies. The results demonstrated that cyberbullies were found to be more disadvantaged in terms of satisfaction, drug and alcohol use, self-esteem, academic achievement, and loneliness. Risk factors for cyberbullying perpetration included cyber-victimization, traditional bullying, traditional victimization, age, frequency of internet use, moral disengagement, normative beliefs about aggression, anger, risky online behavior and narcissism. Protective factors for cyberbullying perpetration included having empathy for others, parental monitoring, interpersonal skills, perceived support by peer and family, positive school climate, and the physical, social and psychological safety of the school. Possible consequences of being cyberbullied include depression, self-esteem, anxiety, academic achievement, loneliness, life satisfaction and drug and alcohol use. According to the meta-analysis, individuals who reported high levels of cyberbullying victimization also tended to report high levels of stress, suicidal ideation, depression, anxiety, loneliness, somatic symptoms, conduct and emotional problems, and drug and alcohol use. In addition, individuals who reported high levels of cyberbullying victimization also tended to report low levels of life satisfaction, self-esteem, and prosocial behaviors. Arguably the most interesting finding of this study was the evolution of cyber-victims into cyberbullies. In this context, it can be said that cyberbullying is a contagious and/or learned behavior (Kowalski et al., 2014).

Adolescents are exposed to higher levels of cyberbullying than other age groups. According to one study, the age at which teenagers are the most susceptible to cyberbullying victimization is 12-14 years (Tokunaga, 2010). At the same time, cyberbullying behaviors are relatively common among adolescents (Kowalski et al., 2014). Therefore, it can be said that the adolescence period is risky for both cyberbullying and cyberbullying victimization. Numerous studies have reported in the prevalence studies of cyberbullying among adolescents. In some studies, the prevalence of cyberbullying among adolescents has been found to range between 1% (Allen, 2012) and 79% (König et al., 2010). The large disparity in prevalence rates is likely due to the variety of measurement tools, the lack of consensus on the definition of cyberbullying and cyberbullying victimization concepts, the differences in sampling, and the intercultural differences. Moreover, as technology has become more diversified, the prevalence of cyberbullying is increasing (O'Neill & Dinh, 2015).

Individuals with online antisocial behaviors cause fear, embarrassment and sadness in the victims, and anti-social individuals have low levels of empathy and high level of pride, and experience relaxation after antisocial behavior (Xu et al., 2012). In addition, there are many risk factors for those engaged in carrying out online antisocial behaviors including Dark Tetrad personality traits (i.e., narcissism, Machiavellianism, psychopathy, and sadism) (Ang et al., 2011; Craker & March, 2016; Goodboy & Martin, 2015; Sest & March, 2017; van Geel et al., 2017), traditional bullying (Erdur-Baker, 2010; Gradinger et al., 2009; Ortega et al., 2009), cyberbullying victimization (Den Hamer et al., 2014; Kowalski et al., 2014), hours per day spent online (Mishna et al., 2012), lack of empathy towards others (Brewer & Kerslake, 2015; Kowalski et al., 2014; Sest & March, 2017), peer rejection (Calvete et al., 2010; Wright & Li, 2013), loneliness (Brewer & Kerslake, 2015), insecure attachment (Wright, 2015), and being male (Sourander et al., 2010). Another study by Sourander et al. (2010) reported other risk factors for online antisocial behavior including family structure (families without two biological parents at home), general health problems, and somatic illness, psychosocial problems (hyperactivity problems, emotional problems, conduct problems, peer problems, prosocial problems), alcohol use, being drunk, smoking, not feeling safe in school, not feeling cared for by teachers, and physiological problems (distracting headaches, recurring abdominal pain, and problems with falling asleep).

Antisocial behavior is often observed in online public debates on websites or social media. Methods used to combat antisocial behavior include (i) comment ranking, (ii) moderation, (iii) and early troll identification (Cheng et al., 2017). If comment ranking is performed on social media accounts, the most 'liked' or answered comments appear first on the page by default. Therefore, it is possible to get detailed information about social media users' profile and social media shares via this technique, and online antisocial profiles can be identified by this method. Moderation includes listening and responding to the content of social media accounts or news sites. Here, moderation refers to content and community management where individuals with online antisocial tendencies accessing social media accounts and news sites can be identified and prevented. Troll identification is based on analyzing user shares on websites and identifying trolls. Some sites have even resorted to completely disabling comments (Cheng et al., 2017). Nonetheless, on the majority of popular discussion websites, antisocial behavior continues to be prevalent (Cheng et al., 2017). Increased levels of use and more time spent online accessed through a variety of devices has increased children's exposure to a range of online risks, including cyberbullying (O'Neill & Dinh, 2015). Indeed, dozens of online antisocial behaviors have been conceptualized in the past two decades (Almuhanna, 2017; Álvarez-García et al., 2018; Barber, 2001; Cao & Lin 2015; Cheng et al., 2015; Cheng et al.,

2017; Den Hamer et al., 2014; Liu et al., 2018; Owen, 2016; Peterson & Densley, 2017; Reyns, 2012; Seigfried-Spellar et al., 2017).

There are now numerous psychometric instruments in the literature that assess a variety of online antisocial behaviors including cyber-harassment (Beran, & Li, 2005; Beran et al., 2012; Ybarra & Mitchell, 2007), cyberbullying (Arıcak et al., 2012; Hinduja & Patchin, 2008; Li, 2010; Smith et al., 2008), cyber-aggression (Modecki et al., 2013; Pornari & Wood, 2010; Runions et al., 2013), cyber- trolling (Buckels et al., 2014; Craker & March, 2016), cyber-stalking (Ménard & Pincus, 2012; Paullet, 2010), cyber-hostility (Nicol & Fleming, 2010), griefing (Coyne et al., 2009; Ladanyi & Doyle-Portillo, 2017), cyber-hate (Burnap & Williams, 2016), and cyber-flaming (Hwang et al., 2016). Although some instruments assess similar characteristics, they are named differently. Consequently, a more inclusive concept is needed. The concept of 'online antisocial behavior' more generally offers researchers a holistic perspective. The concept of online antisocial behavior provides a general framework for all these aforementioned behaviors (Almuhanna, 2017; Álvarez-García et al., 2018; Barber, 2001; Cao & Lin 2015; Cheng et al., 2015; Cheng et al., 2017; Den Hamer et al., 2014; Liu et al., 2018; Owen, 2016; Peterson & Densley, 2017; Reyns, 2012; Seigfried-Spellar et al., 2017).

Some online antisocial behaviors have previously been examined via the evaluation of banned internet users (Cheng et al., 2015) and the analysis of content in online environments (Cheng et al., 2017; Kumar et al., 2017). More recently, Likert-type scales have been used in survey research (e.g., Erreygers et al., 2017, 2018). In these latter two studies, a modified scale was used (i.e., the European Cyberbullying Intervention Project Questionnaire; Brighi et al., 2012; Del Rey et al., 2015; Schultze-Krumbholz et al., 2015) to assess online antisocial behavior. Therefore, there is a need for a scale that specifically evaluates online antisocial behavior more generally.

Antisocial behaviors are typically characterized by antisocial personality (APA, 2013). Similarly, online antisocial behaviors can also be characterized by online antisocial personality (Buckels et al., 2014; Craker & March, 2016). Consequently, online antisocial behaviors cannot be considered independent of online antisocial personality, and such behaviors stem from personality patterns. The aim of the present study was to develop and validate the Online Antisocial Personality Scale (OAPS).

Methods

Participants

The present study comprised 447 adolescents (219 girls and 228 boys) from four different samples. The pilot study sample comprised 24 adolescents (10 girls and 14 boys). The scale validity studies were performed on 423 adolescents (209 girls and 214 boys) across three different samples. The scale validity was analyzed using exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and criterion validity. The EFA sample comprised 116 adolescents (58 girls and 58 boys). The CFA sample comprised 111 adolescents (57 girls and 54 boys). The criterion validity sample comprised 196 adolescents (94 girls and 102 boys). In all samples, adolescents were aged between 14-18 years. In the present study, convenience sampling was used to collect the data.

Materials

Online Antisocial Personality Scale (OAPS): In the present study, the OAPS was developed by using the diagnostic criteria for APD in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013). The OAPS assesses antisocial behavior in online environments. The OAPS comprises eight items and one dimension (i.e., online APD), and is rated on a 5-point Likert-type scale (1=not suitable at all, 5=completely suitable). Findings on the validity and reliability of OAPS are presented in a later section of the present paper.

E-Bullyıng Scale (E-BS): The E-BS was developed by Lam and Li (2013) and adapted into Turkish by Gençdoğan and Çikrıkci (2015). It is a one-dimensional scale comprising six items and rated on a 7-point Likert type scale [0=0 times to 6=6 times or more]). The structural validity of E-BS was examined with CFA and criterion validity. As a result of CFA, the E-BS was found to have perfect fit (χ^2=9.34, χ^2/df=1.55, p=.15, RMSEA=.05, CFI=.99, IFI=.99, GFI=.98, AGFI=.93, NF1=.97, SRMR=.03, RFI=.93). The criterion validity of the E-BS was evaluated by using the Cyber Bullying Scale (CBS) (Arıcak et al., 2012). The reliability of E-BS was assessed by Cronbach's alpha coefficient, test-retest reliability, and split-half reliability. As a result of the reliability analysis, the E-BS was found to be a reliable scale. High scores on the scale indicate high levels of cyberbullying (Gençdoğan & Çikrıkci, 2015). The six-item and one-dimensional structure of the E-BS was tested in the present study. High scores on the scale indicate a high level of cyberbullying. As a result of CFA, E-BS was found to have acceptable fit values (except from RMSEA) [(χ^2=30.441, df=9, χ^2/df=3.382, p<.001, RMSEA=.111, GFI=.95, AGFI=.88, CFI=.97, IFI=.97 and TLI (NNFI)=.96]. In the present study, the Cronbach alpha coefficient of the E-BS was .74.

Personality Belief Questionnaire-Short Form (PBQ-STF): In the present study, the sub-dimension of the PBQ-STF Antisocial Personality Belief was used. The PBQ-STF was developed by Beck and Beck (1991) and adapted into Turkish by Taymur et al. (2011). The construct validity of PBQ-STF was examined by EFA and criterion validity. The PBQ-STF comprises 65 items and nine sub-dimensions. The criterion validity of the PBQ-STF was assessed using the Dysfunctional Attitude Scale (DAS-A) (Şahin & Şahin, 1992) and the Temperament and Character Inventory (TCI) (Köse et al., 2004). The reliability of PBQ-STF was assessed by Cronbach's alpha coefficient and test-retest. As a result of the reliability analysis, the PBQ-STF was found to be a reliable scale. High scores on the scale indicate a high level of related subscales (Taymur et al., 2011). The seven-item and one-dimensional structure of the Antisocial Personality Belief subscale was tested in the present study. The CFA results showed that the subscale of Antisocial Personality Belief had acceptable compliance values [(χ^2=40.752, df=14, χ^2/df=2.911, p< .001, RMSEA=.099, GFI=.94, AGFI=.89, CFI=.93, IFI=.93 and TLI (NNFI)=.90]. In the present study, the Cronbach alpha coefficient of the Antisocial Personality Belief subscale was .91.

Procedure and ethics

In the present study, the OAPS was developed using the seven diagnostic criteria for APD in DSM-5 (APA, 2013). The diagnostic criteria of APD were adapted to the online environment with eight items relating to the seven diagnostic criteria. APD's second criterion (i.e., deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure) was adapted for online environments and led to the creation of two different types of anti-social deceptive behavior (i.e., deceiving others opening fake accounts, and deceiving others for pleasure). The eight-item draft of the OAPS was examined by five researchers in the field of cyberpsychology. Changes were made to OAPS by taking into consideration the suggestions of the researchers. After the proposed changes were made, the OAPS was presented to the same group again. At this stage, eight-item OAPS was agreed. The OAPS was then examined in terms of clarity via a pilot study. The pilot study was carried out with 24 adolescents. The final version of OAPS was produced following the feedback from the adolescents. The final version of the OAPS and the items' relationship with each DSM-5 criterion for APD are presented in Table 1. Finally, data were collected for the validity and reliability of OAPS.

Ethics committee approval and application permission were obtained before the data were collected. Ethics committee approval was obtained from Fırat University (Turkey). Application permission was given by Elazig Provincial Directorate of National Education. After obtaining ethics committee approval, five high school directorates in Elazığ city center were contacted by telephone to see if they would be prepared to participate in the research and all five schools agreed to help. The schools chosen were those most easily accessible to the research team and therefore the participants comprise a convenience sample. The approval of the administration of the survey was carried out by the third author under the supervision of the teacher in the classroom. In all schools, the surveys were administered in those in grades 1 to 4 (i.e., a total of 20 classes). The aim of the study was explained to the participants, and written informed consent was provided by all participants. The data were collected voluntarily in the classes where the students were educated. Participants' use of online environments was defined as the key selection criterion. Adolescents who did not use the online environments or did not want to participate in the study were excluded. A total of 51 students did not want to participate in the study (89.8% response rate). The data collection process lasted approximately 20-25 minutes.

Data analysis

The structural validity of OAPS was examined using both EFA and CFA. Before starting the EFA, the suitability of the data for factor analysis was examined by the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test. As a result of these analyses, it was found that the data were suitable for factor analysis. Principal component analysis was used in EFA. The structure obtained as a result of EFA was tested with CFA. Prior to CFA, the data were examined for sample size, multiple linearity, multicollinearity, and multiple normality. Given that the data set met the assumptions of CFA, the model was tested with the covariance matrix using the maximum likelihood method. The model fit was examined with χ^2/df, RMSEA, GFI, CFI, IFI and TLI (NNFI) fit indices. Commonly accepted fit indices and acceptable limits for model fit are presented in Table 2 along with a description of each acronym. The criterion validity of the OAPS was evaluated using the E-BS and PBQ-STF (Antisocial Personality Belief subscale). The reliability of OAPS was evaluated with Cronbach α internal consistency reliability coefficient and corrected item total correlation coefficients. The Cronbach α internal consistency coefficient and corrected item total correlation coefficients were calculated in the EFA, CFA, and criterion validity samples. SPSS and AMOS programs were used to analyze the data.

Table 1. *OAPS final form and relationship with Antisocial Personality Disorder*

DSM-5 English*	DSM-5 Turkish**	OAPS-Turkish	OAPS-English
1. Failure to conform to social norms with respect to lawful behaviors, as indicated by repeatedly performing acts that are grounds for arrest.	1. Tutuklanmasına yol açan yineleyici eylemlerde bulunmakla belirli olmak üzere, yasal yükümlüklere uymama.	1. Online ortamlarda yasal sorumluluklara uymam.	1. I do not obey the law in online environments.
2. Deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure.	2. Sık yalan söyleme, takma adlar kullanma ya da kişisel çıkarı ya da zevki için başkalarını dolandırma ile belirli düzmecilik (sahtekârlık).	2. Online ortamlarda sahte hesaplar açarak yalan paylaşımlarda bulunurum. 3. Online ortamlarda keyif için başkalarını dolandırırım.	2. I open fake accounts in online environments and share lies. 3. I deceive others for pleasure in online environments.
3. Impulsivity or failure to plan ahead.	3. Dürtüsellik ya da geleceğini tasarlamama.	4. Online ortamlarda kendimi kontrol edemem.	4. I can't control myself in online environments.
4. Irritability and aggressiveness, as indicated by repeated physical fights or assaults.	4. Sık sık kavga dövüşlere katılma ya da başkalarının hakkına el uzatma ile belirli olmak üzere sinirlilik ve saldırganlık.	5. Online ortamlarda başkalarına zarar verecek düzeyde sinirli ve saldırgan davranırım.	5. I act irritably and aggressively enough to damage others in online environments.
5. Reckless disregard for safety of self or others.	5. Kendinin ve başkalarının güvenliğini umursamama.	6. Online ortamlarda kendimin ve başkalarının güvenliğini umursamam.	6. I don't care about the safety of myself and others in online environments.
6. Consistent irresponsibility, as indicated by repeated failure to sustain consistent work behavior or honor financial obligations.	6. Sürekli bir işinin olmaması ya da parasal yükümlülüklerini yerine getirmeme ile belirli sürekli bir sorumsuzluk.	7. Online ortamlarda ekonomik sorumluluklarımı hiçe sayacak düzeyde sorumsuz davranırım.	7. I am so irresponsible in online environments that I disregard my economic responsibilities.
7. Lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another.	7. Başkasını incitmesi, başkasına kötü davranması ya da başkasından çalması durumunda aldırmazlık gösterme ya da yaptıklarına kendince bir kılıf uydurma ile belirli olmak üzere vicdan azabı çekmeme (pişmanlık duymama).	8. Online ortamlarda zarar verdiğim insanlara (incitme, kötü davranma, bilgi çalma gibi) karşı vicdan azabı çekmem.	8. I do not feel remorse for the people I hurt (such as hurting, mistreating, stealing information) in online environments.

* DSM-5-English (APA, 2013)
**DSM-5-Turkish (Köroğlu, 2014)

Table 2. *Goodness of fit indices and acceptable limits*

Indices	Acceptable limits
χ^2/df	≤5 acceptable fit, ≤3 perfect fit
RMSEA	≤0.10 weak fit, ≤0.08 good fit, ≤0.05 perfect fit
GFI	.85-.89 acceptable fit, ≥ .90 good fit
AGFI	.85-.89 acceptable fit, ≥ .90 good fit
CFI	≥ .90 acceptable fit, ≥ .95 good fit, ≥ .97 perfect fit
IFI	≥ .90 acceptable fit, ≥ .95 good fit, ≥ .97 perfect fit
TLI (NNFI)	≥ .90 acceptable fit, ≥ .95 good fit

(Brown, 2006; Cokluk, Sekercioglu & Buyukozturk, 2012; Hu & Bentler, 1999; Kelloway, 2015; Kline, 2011; Raykov & Marcoulides, 2008; Meydan & Şeşen, 2011; Schumacker & Lomax, 2004; Schermelleh-Engel et al., 2003, Sümer, 2000; Şimşek, 2007; Tabachnick & Fidell, 2013; Thompson, 2004) (as cited in, Savci & Aysan, 2019) [(χ^2=Chi-Square, df=degrees of freedom, RMSEA=The Root Mean Square Error of Approximation, GFI=Goodness of Fit Index, AGFI=Adjusted Goodness of fit Index, CFI=Confirmatory Fit Index, IFI=Incremental Fit Index, TLI (NNFI)=Tucker Lewis Index (NNFI=Non-Normed Fit Index)]

Results

Pilot study

As noted above, a pilot study was conducted to evaluate the items, instructions, and response options of the OAPS by adolescents. The pilot study was performed with 24 adolescents (10 girls and 14 boys). Feedback from adolescents was obtained from OAPS during the study period. As a result of the study, it was observed that adolescents did not give negative feedback about items, instructions, and response options of the OAPS.

Scale validity

Exploratory Factor Analysis (EFA): The structural validity of OAPS was investigated using EFA. EFA was carried out with 116 adolescents (58 girls and 58 boys). The suitability of the data with EFA was evaluated with the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test. As a result of the analysis, it was found that the dataset was suitable for EFA. The Kaiser-Meyer-Olkin (KMO) coefficient=.84 and Bartlett's Sphericity Test χ^2=371.516, p <. 001). In the next stage, EFA was performed on eight items using principal component analysis. As a result of EFA, a single-factor structure with an eigenvalue of 4.095 was obtained. This single-factor structure accounted for 51.2% of the total variance. The eigenvalue of the remaining seven factors was below 1. Therefore, these factors were not evaluated as structures. In addition, a scree plot was analyzed. When the line graph shown in Figure 1 is examined, it can be seen that the graph continues in a horizontal plane after the first break. Indeed, it is seen that after the first factor, breakage occurs. Finally, the factor loadings of OAPS were examined. Accordingly, the factor load values of OAPS varied between .63 and .78. The scree plot of the OAPS is presented in Figure 1, and the EFA results are shown in Table 3.

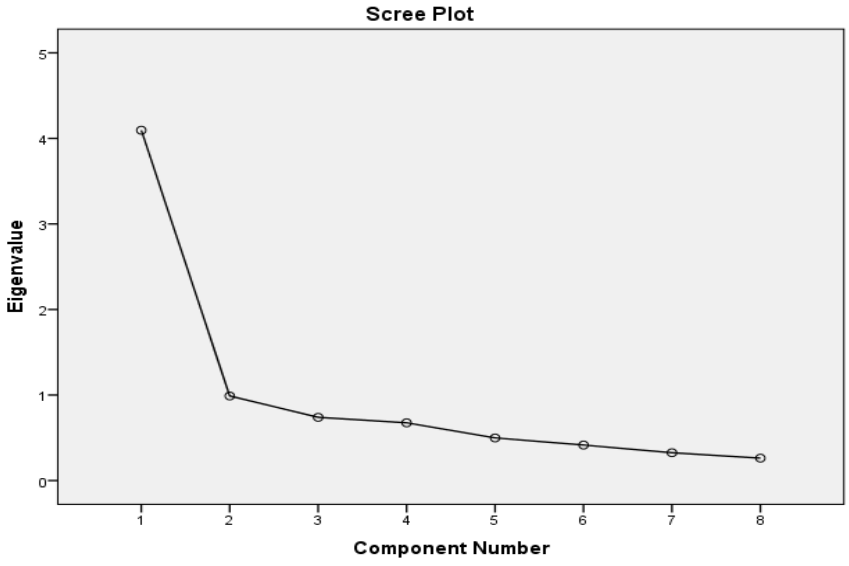

Figure 1. The scree plot of the Online Antisocial Personality Scale

Table 3. *The EFA results of Online Antisocial Personality Scale*

	Items	Factor Loading	% of Variance	Eigenvalue
OAPS	1	.64	4.095	51.2
	2	.63		
	3	.67		
	4	.77		
	5	.71		
	6	.76		
	7	.78		
	8	.75		

Confirmatory Factor Analysis (CFA): The one-dimensional OAPS structure determined by EFA was then tested with CFA. CFA was performed on the data collected from 111 adolescents (57 girls and 54 boys). The OAPS' eight-item and one-dimensional structure were tested with the first-level CFA. As a result of CFA, the OAPS model had perfect fit index values [($\chi^{2=}$32.302, df=20, χ^2/df=1.615, *p*=.04, RMSEA=.075, GFI=.93, AGFI=.87, CFI=.98, IFI=. 98 and TLI (NNF1)=.98]. The factor loadings of the OAPS for CFA ranged between .63 and .91. The model of the OAPS is presented in Figure 2 and Figure 3. The CFA results are shown in Table 4.

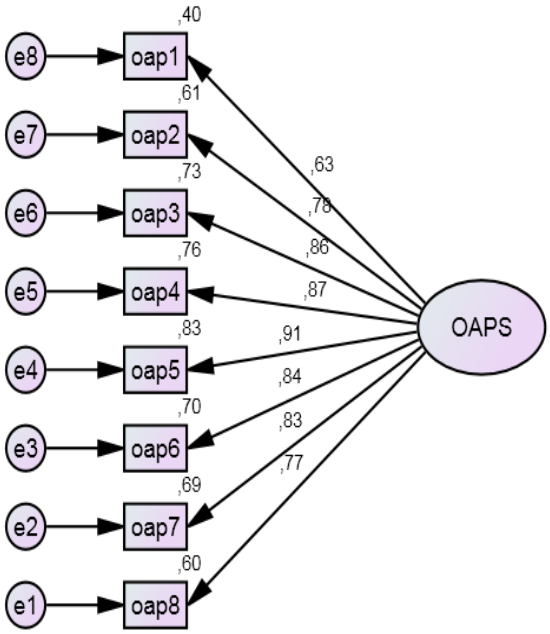

Figure 2. Model of the OAPS in the CFA sample

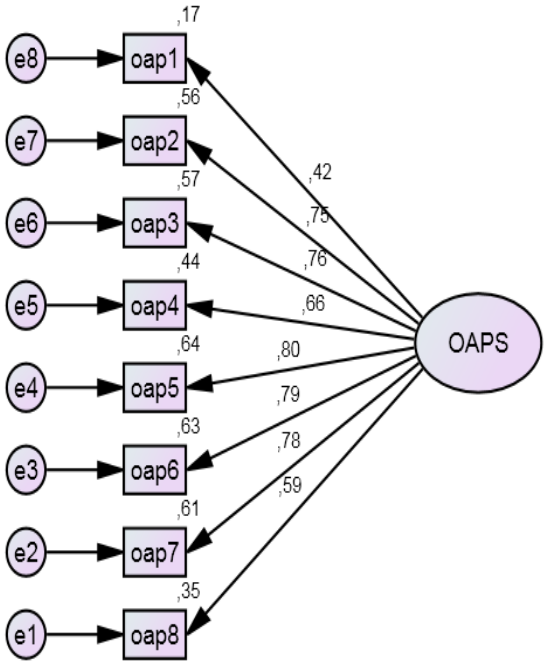

Figure 3. Model of OAPS in the criteria validation sample

Table 4. *The CFA results of Online Antisocial Personality Scale*

	CFA Sample			**Criterion Validity Sample**		
	λ	R^2	*T*	λ	R^2	*t*
OAPS → oap1	.63	.40	6.908***	.42	.17	5,149***
OAPS → oap2	.78	.61	8.889***	.75	.56	8,130***
OAPS → oap3	.86	.73	9.952***	.76	.57	8,175***
OAPS → oap4	.87	.76	10.189***	.66	.44	7,465***
OAPS → oap5	.91	.83	10.755***	.80	.64	8,473***
OAPS → oap6	.84	.70	9.681***	.79	.63	8,424***
OAPS → oap7	.83	.69	9.575***	.78	.61	8,330***
OAPS → oap8	.77	.60		.59	.35	

****p*< .001

Criteria Validation: The criterion validity of the OAPS was evaluated by comparing scores with the E-BS, and PBQ-STF. The criterion validity of OAPS was performed on 196 adolescents (94 girls and 102 boys). Pearson's product-moment correlation analysis showed that the OAPS was significantly associated with cyberbullying (r=.64, *p* <.01) and antisocial personality beliefs (r=.36, *p* <.01).

Measurement Invariance of the OAPS across Three Samples: Measurement invariance of the OAPS was also tested over EFA (n=116), CFA (n=111), and criterion validity (n=196) samples by multi-group analysis. As a result of the analysis, it was found that the OAPS was not significantly different in EFA, CFA, and criterion validity samples (in terms of structural invariance and scalar invariance although not in terms of metric invariance). Structural invariance was tested over the baseline model in which any parameter value was not equalized. As a result of the analysis, the fit indices had acceptable values [(χ^2=158.673, df=60, χ^2/df=2.645, *p*<.001, RMSEA=.063, GFI=.92, CFI=.94, IFI=.95 and TLI (NNFI)=.92]. Therefore, the OAPS was structurally equal in terms of three samples.

In order to test the metric invariance, the factor loadings of the OAPS items were equalized between the groups, and the results of the multi-group CFA were compared with the structural model. Models were compared considering χ^2 and CFI values. For metric invariance, the χ^2 value was expected to be statistically non-significant and the CFI value to be less than .01. As a result of the analysis, metric invariance was not supported (χ^2=59.854,

p< .000 and CFI=.025). The factor loadings of the OAPS items were not equivalent in terms of samples. Finally, the scalar invariance of the OAPS was examined. As a result of the analysis, scalar invariance was supported (χ^2=1.927, *p*=.382 and CFI=.000). Therefore, the OAPS has scalar invariance. Overall, the OAPS had relatively acceptable measurement invariance across three samples. Results relating to measurement invariance of OAPS across three samples are presented in Table 5.

Table 5. *Results of measurement invariance of the OAPS across samples*

	χ^2	df	*p*	CFI	RMSEA	GFI	IFI	TLI (NNFI)
Structural Invariance	158.673	60	.000	.94	. 063	.92	.95	.92
Metric Invariance	59.854	16	.000	.025				
Scalar Invariance	1.927	2	.382	.000				

Scale Reliability

The reliability of OAPS was calculated in three different samples (EFA, CFA, and criterion validity) with Cronbach α internal consistency reliability coefficient and corrected item total correlation coefficient. The Cronbach α internal consistency coefficients of OAPS were .86 in the EFA sample, .94 in the CFA sample, and .87 in the criterion validity sample. The reliability of the OAPS was assessed with item-total correlation coefficients in three different samples (EFA, CFA and criterion validity). Corrected item total correlation coefficients of the OAPS ranged from .52 to .70 in the EFA sample, .62 to .87 in the CFA sample, and .39 to .75 in the criterion validity sample.

Discussion

As the use of technology has increased, online antisocial behaviors have also increased (O'Neill & Dinh, 2015). The aim of the present study was to develop a scale to assess online antisocial personality. In the literature, a wide range of behaviors are considered to be antisocial including cyber-flaming, cyber-hate, online provocation, online antagonism, cyber-trolling, cyber-stalking, cyber-aggression, cyber-violence, cyber-hostility, griefing, computer crime, hacking, and cyberbullying (Almuhanna, 2017; Álvarez-García et al., 2018; Barber, 2001; Cao & Lin 2015; Cheng et al., 2015; Cheng et al., 2017; Den Hamer et al., 2014; Liu et al., 2018; Owen, 2016; Peterson & Densley, 2017; Reyns, 2012; Seigfried-Spellar et al., 2017). It has been argued that the basic framework of such behaviors is online antisocial personality. Numerous studies have evaluated these behaviors from the perspective of online antisocial personality. Therefore, a new scale, the Online Antisocial Personality Scale (OAPS) was developed.

The validity of the OAPS was examined using EFA, CFA, and criterion validity. The criterion validity of the OAPS was evaluated with similar scales. The reliability of OAPS was evaluated with Cronbach α internal consistency reliability coefficient and corrected item total correlation coefficients. The EFA results showed that the OAPS has a one-dimensional structure. The OAPS explained more than half of the total variance (53.5%). In one-dimensional scales, this percentage is sufficient (Buyukozturk, 2010, Cokluk et al., 2012). In the literature, factor loading values are accepted as >.30 (Kline, 1994) or >.32 (Tabachnick & Fidell, 2013). Therefore, the factor loading values of the OAPS were within acceptable limits. The OAPS model was tested with CFA. As a result of CFA, the results showed that the single-factor OAPS model had good fit values. In addition, the measurement invariance of the OAPS was tested across three different samples (EFA, CFA, and criterion validity samples). Measurement invariance of the OAPS was conducted through structural invariance, metric invariance, and scalar invariance across different samples, demonstrating the OAPS had relatively acceptable measurement invariance across different samples (Kline, 1994; Tabachnick & Fidell, 2013).

The criterion validity of the OAPS was assessed by examining cyberbullying and antisocial personality belief. As a result of the analysis, the OAPS was found to be positively related to cyberbullying and antisocial personality belief. The reliability of the OAPS was evaluated using a Cronbach α internal consistency reliability coefficient. In order to evaluate a scale reliably, internal consistency reliability coefficient should be .70 and above (Cokluk et al., 2012). Therefore, it can be said that OAPS has acceptable internal consistency reliability coefficient because it was .86 in the EFA sample, .94 in the CFA sample, and .87 in the criterion validity sample. Finally, corrected item total correlation coefficients of OAPS had acceptable values. Corrected item total correlation coefficients of OAPS ranged from .52 to .70 in the EFA sample, .62 to .87 in the CFA sample, and .39 to .75 in the criterion validity sample. The findings of the present study indicate that the OAPS is a valid and reliable scale for assessing online antisocial personality among adolescents.

The OAPS was developed using the diagnostic criteria of the APD (APA, 2013). In this respect, the OAPS was developed by taking into consideration the accepted APD criteria. The diagnostic criteria of APD are known and accepted all over the world. Therefore, the OAPS can facilitate intercultural research. Furthermore, all the analyses regarding the validity and reliability of the OAPS increased its measurement power.

Strengths, limitations, and future research

Although the OAPS is a psychometrically robust scale, it has some limitations. The OAPS is a self-report scale and therefore has a number of well-known limitations and biases present in any self-report data (Dağ, 2005). The reliability and validity of OAPS was also carried out using non-representative, non-clinical convenience samples of Turkish adolescents. In future studies, the validity and reliability of OAPS needs to be examined using both clinical samples and samples that are more representative of adolescents both in and outside of Turkey. Finally, whether or not the OAPS provides consistent results over time has yet to be investigated. Therefore, OAPS consistency should be examined using the test-retest method. In future research, the OAPS should also be examined using different adolescent samples. Groups of adolescents, especially those that are cyber-provocateurs, cyber-trolls, cyber-stalkers, cyberbullies, cyber-criminals, and hackers, may be appropriate for future OAPS development. In future studies, specific users of the deep web could also be included because such use is associated with illegal activities and organizations. These groups may be more suitable samples for further testing the OAPS. Such online antisocial behaviors are expected to be higher among such samples.

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Authors Contribution Rate

Authors contributed equally.

Ethical Approval

Ethical permission (Day: January 23, 2018; No: 97132852/050.01.04/ -243612) was obtained from the Firat University Ethical Review Board for this research. The authors report that the study was conducted in accordance with the Helsinki Declaration.

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