Psychometric Properties of the Revised Trolling Questionnaire in Argentinean Adults

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Abstract

Trolling with new technologies is a disruptive, deceptive, and destructive behavior, with great psychosocial, legal, and economical relevance. However, there are no studies in the scientific literature that have examined the properties of questionnaires to assess them. Therefore, the purpose of the present study was to observe the psychometric properties of the *Revised Trolling Questionnaire* by Buckels et al.'s in a sample of Argentinean adults. An intentional sample of 837 participants from Argentina (mean age = 28.4 years; 61% female) was formed. They completed the Buckels et al.'s Revised Trolling Questionnaire, measures of dark personality, Internet addiction, cyberstalking, and socio-demographic questions. Exploratory and confirmatory factorial analyses indicated a one-factor structure with correct fit statistics. Internal consistency was adequate: Cronbach's α = .80 and Omega coefficient (*ω*) = .81. Concurrent validity of the trolling questionnaire was observed with dark personality (Machiavellianism, narcissism and psychopathy), problematic Internet use (symptomatology and disfunctionality), and cyberstalking. Machiavellianism and disfunctionality were the most significant variables associated with trolling. Therefore, the Argentinean Spanish version of this test showed evidence of adequate psychometric properties.
Keywords: questionnaire, Troll, aggression, property, technology.

Propiedades psicométricas del Cuestionario Revisado de Trolling en adultos argentinos

Resumen

El *trolling* mediante las nuevas tecnologías es un comportamiento disruptivo, molesto y destructivo, con una gran relevancia psicosocial, legal y jurídica. No existen estudios en la literatura científica que hayan examinado las propiedades de un instrumento para evaluarlo. El propósito del presente estudio fue observar las propiedades del *Cuestionario Revisado de Trolling* de Buckels et al. en una muestra de adultos argentinos. Se constituyó una muestra intencional de 837 participantes argentinos (edad promedio=28,4 años; 61% mujeres). Completaron el Cuestionario Revisado de Trolling de Buckels et al., un cuestionario de personalidad oscura (maquiavelismo, psicopatía y narcisismo), de adicción a internet, de *cyberstalking* y preguntas sociodemográficas. Un análisis factorial exploratorio como confirmatorio indicó una correcta estructura unifactorial.

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La consistencia interna fue adecuada: *α* de Cronbach = .80 y Omega coefficient (*ω*) = .81. La validez concurrente del cuestionario se observó con el *cyberstalking*, la personalidad oscura (maquiavelismo, narcisismo y psicopatía) y el uso problemático de Internet. El maquiavelismo y la disfuncionalidad eran las variables más asociadas al *trolling*. De este modo, la versión al español argentino de dicho test mostró evidencia de adecuadas propiedades psicométricas.
Palabras claves: cuestionario, Troll, agresión, propiedades, tecnología.

New technologies have grown exponentially in recent years, leading to a world of great interconnection and communication. On the other hand, they have also generated negative behaviors in their users, such as grooming, cyberstalking or trolling. Online trolling, however, has been little addressed by researchers compared to cyberbullying (Hardaker, 2010; Herring et al., 2002; Shachaf & Hara, 2010; Zezulka & Seigfried-Spellar, 2016).

The trolling phenomenon is defined in multiple ways, but always refers to disruptive, deceptive and destructive behavior in the context of the Internet, with no apparent instrumental purpose, except for disturbing others (Buckels et al., 2014; Herring et al., 2002; Navarro-Carrillo et al., 2021; Sanfilippo et al., 2018). Therefore, trolls have baited users to engage in conversations, enjoying the *flame* they initiate or generate, mainly in gaming contexts (Cook et al., 2018; Hilvert-Bruce & Neill, 2020), as in many other scenarios (Sanfilippo et al., 2017).

Although there is no consensus on how to define this behavior (Komaç & Çağıltay, 2019, Ortiz, 2020) and it is multidisciplinary (Akhtar & Morrison, 2019; Aydin et al., 2021; Hardaker, 2010; Sanfilippo et al., 2018), the most finished definition of trolling was offered by Fichman and Sanfilippo (2016) who conceptualized it as an intentionally disruptive behavior that occurs online, and between users having no existing relationship in real life. Thus, trolling is a deliberate provocation that often results in conflict and emotional reactions for the victims (Hardaker, 2010; Phillips, 2015). This is the definition used in this study to conceptualize trolling.

Trolls may act alone or in a group; indiscriminately or selectively toward specific individuals or corporate entities (Aydin et al., 2021). In some cases, trolling is reduced to a simple attempt to annoy others. On the other hand, some trolls demonstrate considerable skill, ability, creativity, and dedication (Dynel, 2016; Leone, 2017). Hence, trolling can be distinguished from other online aggression based on form, content, intent, and consequences (Fichman & Sanfilippo, 2016; Hardaker, 2010; Leone, 2017; Shachaf & Hara, 2010). Sest and March (2017) differentiate it from the concept of cyberbullying, which is much more direct, repeated, purposeful, and targeted at specific individuals. Unlike cyberbullying, trolling encompasses behaviors that may be one-off, unintentional, or untargeted (Slonje et al., 2013).In addition, the personality correlates of cyberbullying and trolling are quite different (Zezulka & Seigfried-Spellar, 2016).

Despite the efforts to prevent trolling, this behaviour is increasingly problematic given the growth of social networks and users (Case & King, 2018), especially in video game players, a space in which this behavior tends to be more justified (Hilvert-Bruce & Neill, 2020; Schaafsma, & Antheunis, 2018). For example, nearly 5.16 billion people were Internet users in 2020, encompassing 64.4% of the global population (Petrosyan, 2023). In terms of statistics on trolling, a survey conducted in the United States (Lenhart et al., 2016) found that people aged 15-29 were the most likely to report being trolled by sharing nude images (7% of cases).

With respect to trolling incidence, a survey of over 1,500 participants aged 13-18 in the United Kingdom showed that 24% of them had been bullied online because of their sexual orientation and gender, among others (Gani, 2016). The consequences of suffering online harassment are notorious for the victim: anxiety, depression, and, in some cases, suicide (Mehari et al., 2014). There are not many studies on the psychosocial consequences of trolling victims, but researchers suggested that this victimization can include committing suicide or insulting victims and their families after their death (Fichman & Sanfilippo, 2016). Due the impact and prevalence of this behavior, exploration of trolling is necessary (March, 2019).

An important behavior associated with the development of computers and mobile phones is an addiction to new technologies. It is a broad and evolving category (Soto et al., 2018), but it is defined as a constant preoccupation with new technologies and an inability to control their use (Young, 2011). One of the most common addictions in this regard is Internet addiction (Kurniasanti et al., 2019; Lam-Figueroa et al., 2011). There are almost no studies on the relationship between Internet addictions and trolling. Among

the few studies available, one of them found that Internet addiction was associated with increased trolling behaviors (Resett & González Caino, 2019). Another study detected relationships between the frequency of online comments, trolling enjoyment, and trolling behavior (Buckels et al, 2014). Because other studies (Buckels et al., 2014; González Caino & Resett, 2020; Resett & González Caino, 2019) identified a strong relationship between Internet addiction and trolling, mainly due to the disinhibition effect and problems controlling its use (Aydin et al., 2021; Nitschinsk et al., 2022), this study aimed to examine this association.

Another disruptive behavior through new technologies that has spread rapidly is cyberstalking (Wilson et al., 2022), which is defined as stalking, chasing, and manipulating others through information technologies (Sheridan & Grant, 2017; Shorey et al., 2015; Smoker & March, 2017) with negative psychosocial consequences for victims (March et al., 2020). Although cyberstalking and trolling are different constructs, both could be associated because they share aggressive attributes (Corcoran et al., 2015). On the other hand, both can be associated because of Internet addiction. For example, the relationship between cyberstalking and Internet addiction is well established in many studies (e. g., Navarro et al., 2015; Resett & González Caino, 2020), and between Internet addiction and trolling, as noted.

Many researchers have argued that relative anonymity on the Internet facilitates disinhibition, which leads to aggression and trolling (e.g., Nitschinsk et al., 2022). Thus, this disinhibition effect on aggression and other variables has been vastly studied in the psychological literature, including that individuals may feel more confident to attack if they believe they are protected by anonymity (e.g., Aydin et al., 2021; Nitschinsk et al., 2022; Smoker & March 2017; Widyanto & Griffiths, 2011). On the other hand, the personal knowledge afforded by an established relationship gives perpetrators of cyberbullying an advantage in the ability to manipulate their victim (Smoker & March 2017; Spitzberg & Cupach, 2007). In line with this, Smoker and March (2017) found that Machiavellianism was the most significant predictor. Hence, individuals with high scores on Machiavellianism may tend to engage in both trolling and cyberstalking behaviors.

Concerning the psychological and psychosocial variables predicting trolling, this was associated with normative beliefs in aggression (Hilvert-Bruce & Neill, 2020), self-esteem (March & Steele, 2020; Zezulka & Seigfried-Spellar, 2016),

sadism (Buckels et al., 2014; Buckels et al., 2018), and social reward (Craker & March, 2016). However, one of the most important aspects in this respect is dark personality, whose traits are strongly associated with aggressive behavior (Hidalgo-Fuentes, 2023). According to Vize et al. (2020), this construct is defined as negative, malicious or aversive personality traits (Machiavellianism, narcissism, and psychopathy), but which are frequent in normal populations (Furnham et al., 2013). Therefore, scientific studies on dark personality have been increasing, exploring these aversive personality traits, based on narcissism, Machiavellianism and psychopathy (Muris et al., 2017). Subclinical narcissism is divided into two: grandiose and vulnerable. Grandiose narcissism is characterized by exhibitionism, lack of humility and modesty, and interpersonal dominance; on the other hand, vulnerable narcissism is characterized by negative affect, distrust and the need for attention and recognition (Miller et al., 2012).

On the other hand, Machiavellianism is defined by a pattern of strategic thinking, manipulative ability, and callous pragmatism, where the desire for success shows control of impulsivity (Miller et., 2017). Finally, subclinical psychopathy is characterized by insensitivity, lack of empathy, impulsivity, disinhibition, and malice, being the most aversive construct within the dark triad due to its relationship to antisocial behavior and aggression (Paulhus & Williams, 2002; Resett et al., 2022). Buckels et al. (2014) found a significant correlation between dark personality and trolling behavior, which can be understood as an activity enjoyed by the perpetrator. This was also confirmed by Cracker and March (2016), Lopes and Yu (2017), and March et al. (2017). Sest and March (2017) -using R-GAIT- found psychopathy to be a more significant predictor compared to the remaining.

As a very frequent behavior on the Internet, the need for a scale to measure trolling is evident. The *Global Assessment of Internet Trolling* (GAIT, Buckels et al., 2014) is one of the few instruments available to measure it. Although this questionnaire is one of the few existing ones with adequate properties, a major disadvantage is that it consists of only four items. Field (2013) indicated that so few items may be insufficient to evaluate a construct. For this reason, Sest and March (2017) reviewed the GAIT and added four more questions to improve construct validity. The Revised version of the GAIT (R-GAIT) demonstrated reliability and construct validity (Sest & March, 2017). Although there are many data collection techniques (observations,

interviews, etc.), the advantages of self-reports are their ease of application and interpretation (Hartung et al., 2011). One the other hand, another advantage of this questionnaire is that it considers the conceptualization of trolling as an intentionally disruptive behavior that occurs on the Internet for no other purpose than to annoy others.

Despite public awareness of this behaviour and the growth of Internet users, there is little empirical research on trolling (Buckels et al., 2014). Therefore, the value of the present study is to be the first one in the scientific literature to assess the psychometric properties of the R-GAIT -a brief and self-administered questionnaire. Examining in detail the psychometric properties of an instrument to evaluate trolling is of remarkable importance. Not only for the theoretical value of this behavior, but also for the early detection and prevention of a problem with important psychosocial, clinical, legal, and economic implications.

Aims

To explore the factor structure and internal reliability of the revised Trolling Questionnaire (R-GAIT).

To examine the concurrent validity of this questionnaire with dark personality, Internet addiction, and cyberstalking.

Method

Type of study

The research was part of a larger study called Test Adaptation for the Measurement of Violence and Aggression. It was a psychometric study.

Participants

The sample was intentionally selected, comprised of adults ($N = 837$) from the Autonomous Cities of Buenos Aires and Paraná, Argentina. To recruit participants, the following criteria were considered: adults of both genders, aged between 18 and 50, who had completed secondary education and were familiar with the new technologies -such as mobile phones and computers-. Twenty-three participants were excluded because they were younger or older than 50, had not completed secondary school, or did not regularly use new technologies. Concerning age, the average was 28.4 years ($SD = 9.4$). Regarding gender, 39% were male and 61% female. In terms of education, 18% had completed

secondary studies, 41% had some university studies, 33% had completed university studies and the remaining group was completing or had completed postgraduate studies.

Measures

Sociodemographic questionnaire: gender, age, among others Revised Global Assessment for Internet Trolling (R-GAIT) (Sest & March, 2017)

It consists of eight questions that are answered on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items are: "I have sent people to unpleasant internet sites just for pleasure"; "I like to annoy, tease or insult people on the Internet (e.g. on forums or websites)"; "I like to annoy other players in-network or internet video games"; "The nicer a thing is, the more I feel like destroying it"; "I enjoy upsetting people I do not personally know on the Internet"; "Although some people think my posts/comments are offensive, I think they are funny"; "I say what I like, and if people can't handle it, it's just because they can't handle the truth" and "I prefer not to cause controversy or stir up trouble"(reversed). The first four questions are from the original GAIT (Buckels et al., 2014). The first three questions measured trolling performance and trolling enjoyment, while the last question is about identification with the trolling culture. Sest and March (2017) added the other four remaining questions for better measurement of the construct. Questions can be added or averaged to derive a global score.

The original version showed construct validity as adequate internal reliability (Buckels et al., 2014; Buckels et al., 2018). Similarly, the revised version indicated adequate Cronbach's $\alpha = .85$ and concurrent validity (Sest & March, 2017) with dark personality, sadism, and empathy. In this study, the Buckels et al. (2014) trolling questionnaire adapted to Argentina by Resett and González Caino (2019) was used. The remaining four questions were translated following recommendations of Muñiz et al. (2013). Those who translated from English to Spanish were researchers in psychology with knowledge of English, while the Spanish version was translated back into English by two different translators (native English speakers with knowledge of the Spanish language). Finally, the Spanish version was administered to 44 psychology students in a pilot sample. Cronbach's α was = .84 in this pilot sample.

Short Dark Triad (SD3; Jones & Paulhus, 2014)

The SD3 is a 27- item instrument divided into three subscales to measure each trait of the dark triad of personality: Machiavellianism, narcissism, and psychopathy. It presents a Likert-type response option with five choices ranging from *strongly disagree* (1) to *strongly agree* (5). Higher scores reflect higher levels of dark personality. Its psychometric properties - validity and reliability - are well determined in the United States and Northern European nations (Furnham et al., 2013; Jones & Paulhus, 2014) and Latin American countries, such as Argentina (Resett & González Caino, 2020) and Spain (Pineda et al., 2020). Cronbach's αs were .84, .72, and .83 in the present study, respectively.

Intimate partner cyberstalking Scale (Smoker & March 2017)

It consists of 21 items to measure online cyberstalking behaviors towards romantic partners, love ex-partners or positive attitudes toward cyberstalking. A sample question is: "I would help or have helped friends access their partner/ex-partner's online accounts". Responses are scored on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate a higher level of the construct being assessed. In first -world countries, this scale showed adequate internal reliability and construct validity. In Argentina, it also presented satisfactory internal consistency and construct validity (Resett & González Caino, 2020). Cronbach's α was .94 in this study**.**

Scale for Internet Addiction (Lam-Figueroa et al., 2011).

This scale measures Internet addiction and has two dimensions: behavioral symptoms with eight questions (being online for a long time, feeling bad when not online, among others) and dysfunctionality, with three questions (problems associated with addiction: missing work or school because of being online for a long time, among others). Each item is rated on a 4-point scale ranging from *Very seldom* (1) to *Always* (4). Its psychometric properties are well- established in South American countries (Lam-Figueroa et al., 2011; Resett & Gonzalez Caino, 2019). Cronbach's αs in the present study were .88 and .70, respectively.

Procedures

The purpose of the study was explained to the participants, and confidentiality, anonymity of responses, and voluntary participation were assured. Participants were recruited through social networks -Facebook and Instagram, among others- or at two universities in psychology courses. Questionnaires were sent by email or were answered at the university, with 61% of responses online and 39% face-to-face.

Ethical aspects

The study was approved by the Universidad Argentina de la Empresa following international and national ethical guidelines. It was determined that the research participants were not at any psychosocial risk.

Statistical analysis

Data were analyzed with the Statistical Program for Social Sciences SPSS version 23, MPLUS 6, and LISREL Student version. When examining the skewness and kurtosis values, it was observed that the trolling items deviated from normality. For skewness, the values ranged from .72 to 3.93. For kurtosis, they ranged from .41 to 9.83. Skewness values greater than 3 and kurtosis values of 8 to 20 -or more- are considered extreme (Kline, 2015; Tabacknick & Fidell, 2014). Other authors postulate similar criteria with values of 2 and 7, respectively (Boomsma & Hoogland, 2001; Chou & Bentler, 1995; Curran et al., 1996).

On the other hand, it was also detected that the relative multivariate kurtosis was not met by a $p < .001$. The sample was randomly divided into two groups: $n = 400$ participants for exploratory factor analysis EFA and the rest for the confirmatory factor analysis CFA ($n = 437$). The EFA was carried out using the weighted least squares (WLS) method, because this indicator is suitable for categorical data (Brown, 2006). Running the WLS is the recent recommendation instead of using principal component analysis (Flora et al., 2012; Lloret-Segura et al., 2014). Similarly, confirmatory factor analysis was performed using the weighted least squares robust method (WLSMV), as it is suggested for categorical data with a with less than five options and non-normal distribution (Byrne, 2012; Brown, 2006). To assess model fit, CFI and TLI were taken into account, which must have values above .90, and RMSEA and SRMR values below .10 to be acceptable (Bentler, 1992; Byrne, 2010). The more stringent criteria of CFI and TLI above.95 and RMSEA and RMR below.05 were also considered in this regard (Hu & Bentler, 1999).

Finally, the significance of the model's x^2 and the average variance extracted AVE were considered, which must be

greater than .50 (Hair et al., 2010). Non-significant x^2 values are a demanding criterion and depend on the sample size (Byrne, 2010). For this reason, it is suggested to divide x^2 by degrees of freedom. Although there is no universally agreed standard as to what is good in this respect, values of 3 or less are a common reference point (Cupani, 2012). For internal consistency, although Cronbach α index was reported, the composite reliability calculation was also used -the latter is a more current and more convenient index for ordinal data (Oliden & Zumbo, 2008). Due to the ordinal nature of the scale, the McDonalds Omega coefficient (ω) was also calculated using the Jamovi 2.2.5 program. To examine concurrent validity, Spearman correlations were performed between the trolling scores and the other variables, as the trolling scale could not be considered a continuous variable. SPSS software was used to calculate Cronbach's α and correlations; MPLUS for the EFA, and CFA; and LISREL for the calculation of relative multivariate kurtosis.

Results

To assess the factor structure of the R-GAIT, an EFA was first performed. The results showed that the one-factor model was the only acceptable solution and the only with eigenvalues > 1 (4.66). The goodness-of-fit values were correct CFI = .98 TLI = .97 RMSEA = .07 SRMR = .05 x^2(20) = 133.80; $p < .001$. This structure explained 58% of the variance. All item loadings were above .33, as shown in Table 1.

To further examine its factor structure, a CFA was conducted with the eight items of the R-GAIT to test the modelling that had emerged in EFA, such as presented in Figure 1. An inadequate modelling fit was found, as shown in Table 2 (Model 1). When looking at the under-specification indices, two covariances were found between the measurement errors of items 1 and 2, and 6 and 7, respectively. By specifying the covariance between the measurement error between items 1 and 2 and between items 6 and 7 (42.37 and 60.87, respectively), as shown in Figure 2, the model fit increased satisfactorily for all indicators, as presented in Table 2. This re-specification was carried out following Byrne (2010, 2012) who indicates that such covariances may be due to the fact that the items ask about similar topics or there is a bias in answering these questions. Although the x^2 of the model was significant ($p < .02$), when divided by the degree of freedom, a value of 1.79 was found. The factor loading of each item was significant ($p < .001$) and ranged from .31 to .77. The mean variance extracted was 1.51.

When exploring the internal consistency of the R-GAIT, Cronbach's α was .76, and when assessing the correlation of each item with the corrected total score about the impact of the item in question, very acceptable correlations were found. The correlation of each item with the corrected total score ranged from .40 to .60, with the sole exception of item eight, whose correlation was .21. When this item was removed, reliability amounted to .80 and all items loaded above .41. Compound reliability showed a satisfactory value at .98. With respect to the Omega coefficient, it was .81.

Table 1.

Factor loadings from the EFA of R-GAIT

Items	Factor loading
1. I have sent people to shock websites for the "lulz"	.80
2. The more beautiful and pure a thing is, the more satisfying it is to spoil	.71
3. I have shared or sent disturbing or controversial material on the Internet for the "lulz"	.84
4. I have disrupted people in comment sections of websites	.86
5. I enjoy upsetting people I do not personally know on the Internet	.87
6. Although some people think my posts/comments are offensive, I think they are funny	.77
7. I say what I like, and if people can't handle it it's just because they can't handle the truth	.55
8. I prefer not to cause controversy or stir up trouble (R)	.33

$N = 437$

Figure 1.
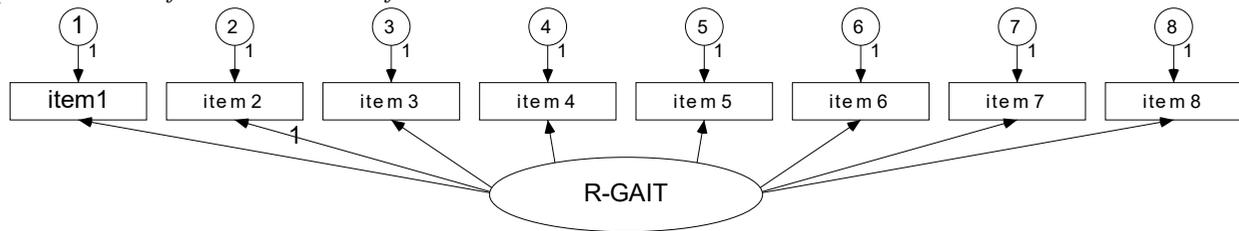*Hypothesized one-factor CFA model of R-GAIT*

Figure 2
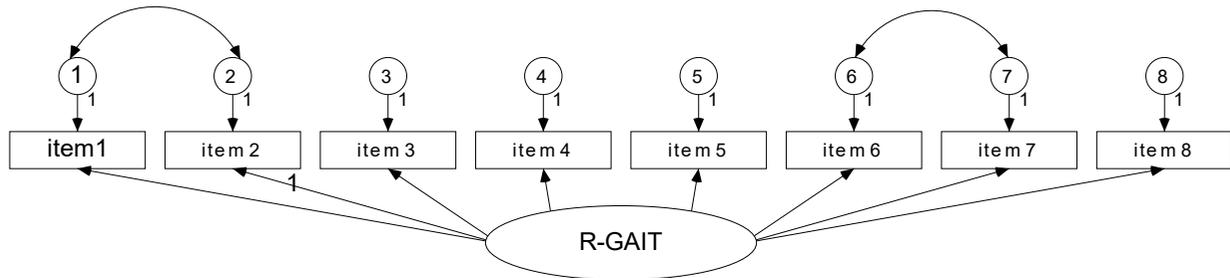*Hypothesized one-factor CFA model of R-GAIT with covariances among measurement errors*

Table 2.
Results from the CFA of R-GAIT

Model (M)	χ^2	*fd*	*p*	CFI	TLI	RMSEA	WRMR	$\Delta\chi^2$	Δdf	ΔCFI
M1. Model 1	133.798	20	.0001	.975	.965	.084	.054			
M2. Model 2	32.291	18	.021	.997	.995	.031	.027	101.507	2	.032

Note. fd = degrees of freedom. CFI = Comparative Fix Index. TLI = Tucker-Lewis Index. RMSEA = root mean square of residuals. WRMR = weight root mean square residual. $\Delta\chi^2$ = difference in χ^2 between models. Δdf = difference in degress of freedom between models. ΔCFI difference of CFI between.

To explore the concurrent validity of the R-GAIT, Spearman correlations were computed between scores of R-GAIT and the dark triad of personality, on one hand, and scores of R-GAIT and addiction to the Internet and cyberstalking. As shown in Table 3, trolling scores correlated positively and significantly with Machiavellianism, narcissism, and psychopathy. Also, trolling scores correlated positively and significantly with dysfunctionality, symptomatology, and cyberstalking, as is shown in Table 4.

Discussion

The purpose of this paper was to evaluate the psychometric properties of the Revised Global Trolling Questionnaire (R-GAIT) (Sest & March, 2017) in an Argentinean sample. This test is one of the most widely used to measure such behavior in the world, although there are no studies on its properties in international studies. To assess its concurrent validity, variables that showed a strong association with said behavior in international studies, such as dark personality, cyberstalking, and Internet addiction were examined.

In terms of factor structure, both the exploratory and confirmatory analyses found a one- factor model. In the EFA, this structure explained 58% of the variance and all factor loadings were above .33. The CFA yielded a very good fit: CFI and TLI above .95 and RMSEA and WRMR below .05. The results were even in line with recent criteria of CFI above .97 and RSMEA and WRMR below .07 (Hair et al, 2010). Although there are no other studies with

Table 3.

Spearman correlations between dark personality and trolling

	1	2	3	4
Trolling	1	-	-	-
Maquiavelism	.322***	1	-	-
Psychopathy	.233***	.525***	1	-
Narcissism	.123**	.518***	.414***	1

$N = 437$

** $p = .003$

*** $p < .001$

Table 4.

Spearman correlations between Internet addiction, cyberstalking and trolling

	1	2	3	4
Trolling	1	-	-	-
Symptomatology	.263***	1	-	-
Dysfunctionality	.351***	.554***	1	-
Cyberstalking	.216***	.212***	.179**	1

$N = 437$

** $p = .002$

*** $p < .001$

which to compare these results, this unidimensional factor structure is similar to that detected for the GAIT by Buckels et al. (Resett & González Caino, 2019).

Regarding its internal consistency, it was Cronbach's $\alpha =$ .76. An index between .70 and .80 is considered an adequate estimate of internal consistency (DeVellis, 2012; Kaplan & Saccuzzo, 2006; Loewenthal, 2001). By eliminating item eight "I preferred not to cause controversy or stir up trouble", due to its low correlation with the corrected total score, the consistency increased to .80. Item eight is the only reversed question. Many authors suggest that these questions may generate response bias (Solís-Salazar, 2015; Suárez et al., 2018; Van Sonderen et al., 2013). Another study with the R-GAIT also found satisfactory values of .84 (Sest & March, 2017). Composite reliability (.98) and the Omega index (.81) were also adequate (.98).

As for its concurrent validity, significant and positive associations of the R-GAIT with the three dimensions of dark personality were observed. Similar findings were detected by Lopes and Yu (2017). They also coincide -albeit partially- with Buckels et al. (2014), who found associations between Machiavellianism and psychopathy but did not detect correlations between narcissism and trolling. However, another study did find the latter association (Furian & March, 2023), while Craker and March (2016) and Volkmer et al. (2023) detected significant correlations between psychopathy and R-GAIT. The fact that in the present study, trolling was associated both with Machiavellianism and psychopathy is not surprising due to the aggressive and manipulative features of trolling (Hardaker, 2013). The relationship between narcissism and aggression is not surprising either. Research indicates that narcissitic individuals may react aggressively to feel superior or when their ego is threatened (Jones & Paulhus, 2010).

In line with other studies, trolling scores were positively associated with Internet addiction (Buckels et al., 2014; Resett & Gonzalez Caino, 2019). Regarding the relationship with cyberstalking, associations with trolling were also detected. The fact that some associations were small or moderate can be explained by the fact that constructs in psychology are multidetermined. It is possible that the relationships of trolling with Internet addiction and cyberstalking could be explained not only by the desinhibition and anonimity related to social networks, as suggested for trolling (Nitschinsk et al., 2022), but also by the technological motivations of trolls (desire for challenge, desire for innovation and exploration, among others) (Fichman & Sanfilippo, 2016).

Even though Argentina is a less developed country with a different cultural tradition from the first world, such as northern European countries, the United States or Canada, these findings suggest that this instrument would present evidence of psychometric properties in Spanish. In addition, it could be a useful tool to distinguish trolling from other online aggressions, such as cyberbullying or hacking. Also, as it is a brief questionnaire, but with solid psychometric properties, it can be a quick screening tool to promptly detect and prevent this problem in adolescents and young people, as well as other problems associated with new technologies, such as Internet addiction or cyberstalking. In this sense, it is a very useful instrument to measure the effectiveness of interventions carried out to reduce trolling and other aggressive online behaviors. It also contributes to

the prevention of possible factors associated with trolling that should be taken into account for its detection, such as dark personality and Internet addiction.

This study has several limitations that should be mentioned: Firstly, it was conducted with an intentional sample of adults from the Autonomous City of Buenos Aires and Paraná, Argentina. On the other hand, the data have been collected through self-report, which artificially inflates the relationships between variables due to the variance shared by the data collection method. Also, self-report has known limitations: response bias, lack of honesty in the answers, giving extreme responses or marking socially desirable alternatives, mainly in negative behaviors such as trolling and where many participants – because of their aversive behavior or their troll behavior - may have responded with much dishonesty, irony or withholding socially undesirable information. In addition, the fact that the study was been cross-sectional does not allow assessing its test / re-test reliability and does not allow inferring the directionality of the causality between variables.

Future studies should examine this problem in larger, randomly selected samples from several cities in Argentina - as well as examine the properties in samples from other countries - to generalize the results and determine whether they maintain their measurement invariance across different regions and nations. A relevant issue is that future research should be longitudinal, both to examine the test / retest consistency and to determine how temporarily stable trolling is - considering the rapid changes occurring in new technologies.

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