Psychometric properties of the Intimate Partner Cyberstalking Scale in Argentinean adults

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Abstract: Intimate partner cyberstalking is associated with significant psychosocial, economic, and legal costs for both victims and perpetrators. However, despite these significant negative outcomes, there is a paucity in instruments designed to measure this behavior. Further, many of the measures lack validation and psychometric exploration. Thus, the objective of this study was to evaluate the psychometric properties of the Intimate Partner Cyberstalking Scale (IPCS; Smoker & March, 2017). For this purpose, 595 adults of both genders (32% male; M_{age} = 30.08) were recruited in Argentina. Participants completed the IPCS-scale, a measure of internet trolling behavior, Dark Triad Personality scale, questions regarding use of new technologies, and demographic items. Both exploratory factor and confirmatory analyses yielded an adequate two-factor structure of the IPCS - scale (a dimension of indirect-direct cyberstalking and a dimension of indirect behaviors) with adequate internal consistency (Cronbach's alphas were .85 and 89, respectively). McDonald's consistency and composite reliability were satisfactory as well. Concurrent validity was established with measures of trolling and the use of new technologies. Also, it was detected that these variables, along with gender and dark personality, were predictors of cyberstalking. Overall, results of the current project indicate the IPCS-scale is a valid and reliable measure of assessing both direct and indirect intimate partner cyberstalking behavior in Argentina.

Keywords: Cyberstalking; scale; partner; properties; psychometrics; technology.

Propiedades psicométricas de la Escala de Ciberacoso de Pareja Íntima en adultos argentinos

Resumen*:* El acoso cibernético por parte de la pareja íntima está asociado con costos psicosociales, económicos y legales significativos tanto para las víctimas como para los perpetradores. Sin embargo, a pesar de estos importantes resultados negativos, hay escasez de instrumentos diseñados para medir este comportamiento. Además, muchas de las medidas carecen de validación y exploración psicométrica. Por lo tanto, el objetivo de este estudio fue evaluar las propiedades psicométricas de la *Intimate Partner Cyberstalking Scale* (IPCS; Smoker & March, 2017). Para ello, se reclutaron en Argentina 595 adultos de ambos sexos (32% varones; *Mage* = 30,08). Los participantes completaron la escala IPCS, una medida del comportamiento de troleo en Internet, la Escala de Personalidad de la Tríada Oscura, preguntas sobre el uso de nuevas tecnologías e ítems demográficos. Tanto el análisis factorial exploratorio como el confirmatorio arrojaron una estructura adecuada de dos factores de la escala IPCS (una dimensión de acoso cibernético directo-indirecto y una dimensión de comportamientos indirectos) con una consistencia interna adecuada (lo alfas de Cronbach fueron .85 y 89). respectivamente). La consistencia y confiabilidad compuestas de McDonald's también fueron satisfactorias. Se estableció una validez concurrente con las medidas de troleo y el uso de nuevas tecnologías. Asimismo, se detectó que estas variables, junto con el género y la personalidad oscura, eran predictoras del ciberacoso. En general, los resultados del proyecto actual indican que la escala IPCS es una medida válida y confiable para evaluar el comportamiento de ciberacoso directo e indirecto de la pareja íntima en Argentina.

Palabras clave: Cyberstalking; escala; pareja; propiedades; psicometría; tecnología.

Introduction

Cyberstalking: Definition and figures

The technological breakthroughs of recent decades have provided unprecedented advances in connections and communications. However, these new online platforms have provided opportunity for antisocial online behaviors, such as cyberstalking or cyberabuse (Baccarella et at., 2018). Cyberstalking is the adapted term for physical stalking, which is defined as a willful, repeated and malicious behavior, that is followed by harassment (Coleman, 1997; Wilson et al, 2021; Wilson et al., 2023). Stalking includes surveillance, persistent contact without permission, and/or threats to manipulate or control the victim (Purcel et al., 2001), and cyberstalking is stalking characterized by the use of technology, such as hidden webcams, cellphones, GPS devices, malware and spyware, to monitor´s the victim behavior (Marcum et al., 2017; Sheridan & Grant, 2007; Shorey et al., 2015).

Cyberstalking can take many forms, including sending direct [anonymous] threats via email, encouraging others to threaten or harass the victim, distributing intimate photographs online, impersonating the victim online, and seeking and compiling information on the victim (Short et al., 2014). In the United States, recent figures showed that 7-8% of adults who used Internet have had stalking´s behaviors (Duggan, 2017). Research exploring cyberstalking has great importance because of the significant negative impact and psychological outcomes (Morris et al., 2020) including depression, anxiety, stress (Kuehner et al., 2012), sleep problems (Worsley et al., 2017), and suicide ideation (Purcell et al., 2010, Short et al., 2014). In addition to these psychological outcomes, cyberstalking can have significant financial and social impact (Maple et al., 2011; Short et al., 2015).

There is evidence to suggest that intimate partner cyberstalking is the most common form of cyberstalking and is becoming more frequent (Chaulk & Jones, 2011; Sheridan & Grant, 2007), with this commonality attributed to fear of rejection from current, former, or potential romantic partners (Spitzberg & Cupach, 2007). The closeness, as well as the knowledge, that people have about a loving partner -past or current- give an advantage to the perpetrators of cyberstalking to manipulate and control the victims (Spitzberg & Cupach, 2007). Mainly, taking into account that the context of the loving couple is one of the most important developmental contexts for adults (Finchman & Cui, 2011).In this regard, 35% of the cyberstalkers were ex partners of the victim and 28.5% were former friends

(Dressing et al., 2014 A recent study with more than 1,300 university students found that almost 5% of them had carried out behaviors of this type (Reyns, 2018). Similarly, intimate partner cyberstalking could be a more extreme behavior to avoid the social, emotional and economic costs of potential relationship dissolution. For instance, jealousy and vulnerable narcissism are positive predictor of this behaviors (Branson & March, 2021) and belief in myths about love and sexist beliefs are related to intimate cyberstalking, as it is suggested in a systematic review in this respect (Caridadea et al., 2019). Furthermore, intimate cyberstalkers act more violently, being more intrusive in their behaviors than non-intimate cyberstalkers and spending a long time monitoring their behavior online without their knowledge (Fox et al., 2014; Marshall 2012; McEwan et al., 2009; Tokunaga & Gustafson 2014). On the other hand, information and communication technologies (ICT), and their absence of temporal and geographical limits, make it easier for cyberperpetrators to hide their identity and harm not only the victim but their environment (Fichman & Sanfilippo, 2016; Kiriakidis & Kavoura, 2010; Smith, 2012; Tokunaga, 2016; Zweig et al., 2014). In this sense, in intimate cyberstalking -compared to stalking- victims are expose to more public, sometimes it is difficult for a victim to escape, and cyberstalkers show more disinhibition in this context (Van Ouytsel et al., 2016). Likewise, the isolation that this type of abuse often generates causes it to increase (Morelli et al., 2017), mainly considering the variety of technological means with which it can be carried out (Wilson et al., 2021).

The Intimate Partner Cyberstalking Scale (IPCS)

Even though cyberstalking within the context of a couple is one of the most frequent forms -as well as its important psychosocial costs- there is little empirical research on intimate cyberstalking compared to other aggressive online behaviors, such as cyberbullying or trolling. Although research in this regard has increased in recent years, it is still in its infancy, as a recent review points out (Kaur et al., 2021).

The first step in this regard is the development and adaptation of tests to measure such behavior. Although there are some studies on the subject (Marcum et al., 2017; Zweig et al., 2013), there are few instruments with adequate psychometric properties to measure cyberstalking or cyberdating abuse (Smoker & March, 2017; Borrajo, Gamez-Guadix, Pereda, & Pereda, 2015; Soto & Ibabe, 2022). In this line, a recent meta-analysis indicates the need to develop and validate instruments for its measurement (Kaur et al., 2021). Among few tests

in this respect, it is The intimate partner cyberstalking scale (IPCS, Smoker & March, 2017). IPCS measure specific behaviors of cyberstalking within an intimate relationship. This is one of the most used in this regard, together with the Cyber Obsessional Pursuit scale (COP; Spitzberg & Hoobler, 2002), as indicated by a meta-analysis (Wilson et al., 2021). Construction of such a scale was considered warranted, based on the limited availability of cyberstalking scales (specifically examining partner behavior) and concerning content validity of other measures (e.g., the Obsessive Relational Intrusion measure includes only 5-items that assess cyberstalking behaviors). Existing partner and non-partner stalking measures used in previous research (i.e., McKeon et al., 2015; Tokunaga, 2011), along with the legal definition of stalking behaviors outlined in the Crimes Act of Victoria 1958 were adapted to construct the IPCS. However, there are almost no studies in the world scientific literature that have explored its psychometric properties, with the sole exception of one study, but in the Portuguese language, that showed adequate properties, such as a unifactorial structure and concurrent validity with dark personality (da Silva et al., 2021) and an English-speaking study that detected a three-factor structure (passive, invasive, and duplicitous), but using an exploratory factor analysis (March et al., 2022).

Sociodemographic and psychosocial predictor of IPC

Regarding intimate partner cyberstalking (IPC) and sociodemographic predictors, gender has been extensively studied some research found that being female was a positive predictor of IPCS (March et al., 2020). Other studies, however, showed that males were more perpetrators (Jaen-Cortés et al., 2017). Research does indicate that men and women may differ in the ways they carry out stalking; for example, men are more likely to employ overt physical staking behaviors such as following the victims, while women are to use more covert strategies such as making phone calls or via e-mail (Burke et al., 2011; Purcell et al., 2010). On the other hand, the inconsistency of the studies may be due the different samples and measures used (March et al., 2020).

Regarding psychosocial predictors, a recent review study indicated that in relation to the profile of perpetrators, research has focused mostly on their personality (Kaur et al., 2021). In this regard, March et al. (2020) found that controlling relationship behaviors, vulnerable narcissism, direct sadism, and secondary psychopathy were positive predictors for this behavior. Personality variables together with low impulse control

were found among the main correlates of perpetration (Wilson et al., 2023). A recent study detected that jealousy, vulnerable narcissism, and secondary psychopathy were related to this behavior (Branson & March, 2021). Therefore, personality has been extensively examined since the introduction of dark personality traits (Paulhus & Williams, 2002). Dark triad refers to aversive and subclinical personality traits, divided into psychopathy, narcissism and Machiavellianism. Subclinical psychopathy includes high impulsivity along with low anxiety and empathy, Machiavellianism traits show manipulation characteristics and narcissism is defined by grandiosity and superiority (Furnham et al., 2013; Paulhus & Williams, 2002). These dark personality traits had all been found to be positive, significant predictors of intimate partner cyberstalking (March et al., 2020; Smoker & March, 2017). Dark personality has been examined as an important predictor of cyberstalking (Chabrol et al., 2009; Menard & Pincus, 2012; Storey et al., 2009). In addition to intimate partner cyberstalking, these dark traits correlate with more general forms of cyberstalking (Kircaburun et al., 2018). March et al. (2020) found that all Dark Tetrad Traits -including sadism as a fourth trait- were positive predictors of intimate cyberstalking, but sadism and Machiavellianism being more significant predictor. Also, Pineda et al. (2022) using this model detected positive association of psychopathy and narcissism with cyberstalking, more precisely to cybercontrolling behaviors. Another study also found that psychopathy was one of the most aggressive dimensions of the dark personality in the case of partner retention (Baeza Ugarte & Fernández Tapia, 2022). In this sense, there is a theoretical explanation for why dark personality is related to this behavior (March et al., 2022), for example, dark personality traits, such as psychopathy, are associated with a greater impulsiveness and sensation seeking that lead to a higher level of cyberstalking (March et al, 2020). In this sense, dark personality can also be considered to assess the concurrent validity of said scale.

Mobile and internet use and trolling as construct validity of IPCS

As the psychometric properties of the Smoker and March cyberstalking scale have never been examined before in Spanish language, two behaviors were chosen theoretically and empirically associated with this behavior, such as the mobile and internet use and trolling. An important behavior associated with intimate cyberstalking could be use new technologies (computers, mobile phone, among others) excessively.

It is solidly proven that the characteristics of ICT, such as mobile phone and internet, like disinhibition and anonymity, can increase aggressive and hostile behaviors (Beran & Li, 2005; Fichman & Sanfilippo, 2016), such as cyberaggression (Smith, 2012). Thus, the constant concern about new technologies can lead to the impossibility of controlling their use. For example, social networking sites provide a novel way to collect information about an individual, and because such sites facilitate intrusion-like behaviors, they are being used as conduits for aggression and harassment online (Tang & Fox, 2016). According to Kraft and Wang (2010), social media has made aggression much easier, and visiting social media sites can increase the likelihood of being a victim of cyberaggression. However, there are not many studies that have examined the problematic use of new technologies and its relationships with this behavior, although one study detected an association between cyberstalking and internet addiction (Navarro et al., 2016), as well as with the fear of missing out and the involvement in the technologies of communication (Silva Santos et al., 2023).

Another disruptive behavior through new technologies is trolling, which is defined as an online communication with the intention of being provocative, offensive or menacing (Bishop, 2014). Despite intimate cyberstalking and trolling being different constructs, both could be associated because they share aggressive attribute (Corcoran et al., 2015). On the other hand, both can be associated due to Internet addiction. For example, the relationship between cyberstalking and Internet addiction is well established in many studies (e. g., Navarro et al., 2016), and between Internet addiction and trolling, as was pointed out. Many researchers have argued that relative anonymity in Internet facilitates disinhibition, resulting in assault and harassment. Thus, this disinhibition effect on aggression and other variables have been vastly studied in the psychological literature and, even, individuals may feel safer to attack if they believe they are protected by anonymity (e.g., Fichman & Sanfilippo, 2016; Widyanto & Griffiths, 2011).

The present study

Therefore, the value of the present study is to be the first in the scientific literature to evaluate the psychometric properties of the intimate partner cyberstalking scale in Spanish language: a short and self-administered questionnaire with good properties. On the other hand, unlike the two previous studies (da Silva et al., 2021; March et al., 2023), this research used larger samples and a greater number of variables to examine its concurrent validity. Finally, the fact that the few existing studies detected different factorial structures also contributes to the scientific literature. Examining in detail the psychometric properties of an instrument to assess intimate cyberstalking is of remarkable importance. Not only for the theoretical value of this behavior but also the early detection and prevention of a problem with important psychosocial, clinical, legal, and economic implications.

Therefore, the purpose of this study was: (1) to explore the factorial structure of the intimate partner cyberstalking scale in an Argentinian sample and its internal consistency, (2) to analyze its construct validity of the scale regarding trolling, use of new technologies (mobile and internet use) and dark personality, and (3) to predict intimate partner cyberstalking from dark personality traits, trolling, use new technologies, and gender. The hypotheses that were raised in the following study according to the international scientific literature were: (1) IPCS presents an adequate factorial structure and internal consistency, (2) IPCS shows concurrent validity with the scores of trolling, mobile and internet use and dark personality dimensions, and (3) higher scores of dark personality traits, trolling, use new technologies, and gender (being male) are significant predictors of cyberstalking.

Method

Participants

A sample of 595 adults of both genders (32% male and 68% female) was selected from Ciudad Autónoma de Buenos Aires (CABA) and Paraná, Argentina, with ages between 18 to 50 (*M* = 30.08 years old, *SD* = 9.14). A 52% lived with one of their parents. Regarding their romantic status, 14% of the participants didn´t like anyone, 17% liked someone but they didn´t have boyfriend/girlfriend status, 12% were going out with someone, but were not dating, 27% have a boyfriend/girlfriend, 13% were living with his/her partner and 17% were married. In the case of using the internet and cell phones, 10% indicated using the internet "nothing"; 35%, 2-3 hours; 31%, 4-8 hours; and 24%, more than 8 hours. Regarding cell phone, percentages were; 6%, 30%, 31%, and 33%, respectively.

Measures

Ad hoc Sociodemographic Questionnaire. Gender, age, city of residence, love couple situation y two questions were taken, one about daily cell phone use

and the other about daily internet use, which had the following alternatives: nothing, 2-3 hours, 4-8 hours and more than 8 from the internet, which were scored as 0, 1, 2 and 3. These items were used in other studies showing their reliability and validity (Resett et al., 2019). Both questions showed good consistency. Therefore, an index was derived in this regard (α = .72).

The Intimate Partner Cyberstalking Scale (IPCS; Smoker & March, 2017). This scale consists of 21 items to measure online cyberstalking behaviors towards a loving partner or loving ex-partner. An example of a question is: "I try to monitor my partner's behaviors through social media". Responses are scored on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate a higher level of the evaluated construct. In the countries of the first world, such as Australia, it showed adequate internal reliability (.92) and construct validity with the dark personality and sadism (March et al., 2022; Smoker & March, 2017), as in Brazil (da Silva et al., 2021) where it also demonstrated concurrent validity with dark personality and consistency above .70. Regarding its factorial structure, the study by March et al. (2022) yielded a three-dimensional structure, while that of da Silva et al. (2021) found a dimensional one. Questions were submitted to the reverse translation procedures by four experts in English and Spanish –two made the translation from English to Spanish and the rest the reverse translation-. Two psychology research specialists controlled the final translation and did not suggest changes. The translation was carried out following international recommendations (International Test Commission, 2017; Muñiz et al., 2013). Before applying it to the sample, a pilot sample of 60 university students from 18 to 16 years old (56% women) was set up to complete it and they were asked to ask any questions. No major doubts arose. Cronbach's alpha in that pilot sample was .91. The Spanish version presents only one difference with the original in English, because expert judges suggested changing the word phone to cellphone, since is the most common name for mobile phones, using the word phone just for landlines.

Global Assessment of Internet Trolling (GAIT; Buckels et al., 2014, revised by Sest & March, 2017). Questionnaire with four items that are a response by a likert scale (1= *strongly disagree*; 5 = *strongly agree*). Items are "I have sent people to shock websites for the lulz "; "I like to troll people in forums or the comments section of websites", "I enjoy griefing other players in multiplayer games", and "The more beautiful and pure a thing is, the more satisfying it is to corrupt". First three questions measure how trolling behavior is about carrying out trolling behavior and enjoy it, while the last

question is about the identification with trolling culture. Sest and March (2017) added the other four remaining questions for better measurement of the construct. This instrument had shown well psychometric properties, like Cronbach's alphas of .82, as construct validity, as suggested its association with sadism, psychopathy, and Machiavellianism (Buckels et al., 2014). Besides, the revised version showed predictive validity and good internal consistency (Sest & March, 2017). Its psychometric properties are adequate in Argentinean samples (Resett & Gonzalez Caino, 2023). In the present study, Cronbach's Alpha was of .80.

Dirty Dozen (DD; Jonason & Webster, 2010). The DD is a 12-item instrument divided into three subscales to each measure a feature of the dark triad: Machiavellianism, psychopathy, and narcissism. It is divided into 4 items per subscale and uses the 5-option Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*), which higher scores indicate more dark personality traits. Machiavellianism consists in the manipulation and exploitation of other people, maintaining the ability to manipulate plans in the long term to obtain satisfaction. Narcissism consists of grandiosity or excessive admiration towards oneself, wanting the admiration of the rest, feeling superior to other people and deserving special treatment because of this superiority. Psychopathy is characterized by low empathy, impulsiveness, antisocial behavior, insensitivity towards the feelings of others, and the absence or little remorse about the behaviors that harm others, which implies little or lack of morality in their actions. Examples of items include "I am manipulating others to get what I want"; "I have no guilt or remorse" and "I am to seek status, privileges, or try to excel". This instrument has good factorial structure, reliability, and convergent and discriminant validity according to the authors, both in the community and clinical population (Jonason & Webster, 2010). In Spanish-speaking samples, it also shows good properties (Copez Lonzoy et al., 2019; Nieto Ribes, 2015), as well as in Argentinean samples (Resett et al., 2022). Cronbach's alpha range was .75, .66, and .70, respectively.

Data recollection

Data recollection was carried out from March to September of the year 2017 and 2018 in the Autonomous City of Buenos Aires and Paraná, using a virtual (via Google Forms) and face-to-face modality. In the latter case, the duration of data collection was between 25-30 minutes. Participants were contacted by cell phones, social networks (for example, Facebook), or personally

in psychology courses at private universities. The Google formulary contained an explanation of the purpose of the investigation, questionnaires, and an acceptation of participation before the questionnaires. In the explanation of the form, the names and contact addresses of the authors of the investigation were also included. If the participants did not check the option to participate voluntarily, they could not answer the tests. Anonymity, confidentiality, and voluntary participation in the entire data collection process were ensured. The research was approved by a committee of the Universidad Argentina de la Empresa.

Data analysis

Data analysis was performed using SPSS v24 and MPLUS v6. Exploratory factor analysis was carried out with the maximum likelihood (ML) method, since principal component analysis is currently discouraged (Lloret-Segura et al., 2014). Although items were ordinal data, they rated on a five-point scale at least. Therefore, exploratory factor analysis can be used (Lloret-Segura et al., 2014). Oblimin rotation was used, asking for eigenvalues greater than 1. When examining the skewness and kurtosis values of the questions, it was observed that they slightly deviated from normality, since the skewness values ranged from .83 to .86 and the kurtosis ranged from .08 to 8.60. Asymmetry values greater than 3 and kurtosis 8 to 20 or more are considered extreme (Kline, 2015; Weston & Gore, 2006). As the values deviated from the normal distribution, although not in an extreme way (for example, Boomsma & Hoogland, 2001; Schmidt et al., 2008), the confirmatory factor analysis was performed with the robust maximum likelihood (MLM) method, as suggested in this respect (Byrne, 2012). Although the response format is ordinal, as in many other psychological measures, its distribution is not deviated excessively from normality and the questionnaire presented at least five response options to process data continuously (Schmidt et al., 2008). Thus, an exploratory factor analysis (a calibration study) was performed, followed by a confirmatory analysis (a replication study). We opted for this modified approach in the data or button above - first an exploratory and then a confirmatory one - because it is known that the factor structures of an instrument can vary from study to study or when you are in the process of adapting a test (Fehm & Hoyer, 2004; Wells & Davies, 1994). To evaluate the fit of the model, CFI and TLI indicators were taken into account, with values greater than 0.90 and RMSEA and SRMR with values less than 0.10 to be acceptable (Bentler, 1992; Byrne, 2010). We also consider the most demanding criteria of CFI and TLI above .95 and RMSEA and RMR below .05 in this regard (Hu & Bentler, 1999). Finally, statistical significance of the x^2 model and the average variance extracted from the AVE, which must be greater than .50 (Hair et al., 2010), were considered. Non-significant values of x^2 are an exacting criterion and are very sensitive to 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 on what is good in this regard, values of 3 or less are a common benchmark (Cupani, 2012). Cronbach's alpha was used to assess internal consistency, and Pearson's correlations were checked for concurrent validity. The AVE extracted mean variance and composite reliability were also calculated. The latter is a more current index and is not affected by the number of questions (Hair et al., 2010). It is suggested that the AVE and the composite reliability should be greater than .50 and .70, respectively. Finally, the consistency of McDonald's Omega was estimated using the Jamovi 2.2.5 program.

Results

IPCS factor structure

Regarding the first objective of evaluating the factor structure of the cyberstalking scale, exploratory factor analysis was carried out with the maximum likelihood method in the sample. The KMO = .94 and the x^2 = 6611.34, p <.001 indicated that it was appropriate to carry it out. Table 1 shows the results of this factor analysis. As seen in Table 1, two factors emerged which explained 52% of the variance. The first factor explained 45% of the variance and the second, 7%. All the items had a good factorial resolution, they loaded above 0.415 in their respective factors and there were no complex items. The first factor consisted of both indirect online stalking items (for instance, "I have checked my partner's messages –e.g. e-mail, Facebook, phone- without them knowing") and direct online stalking (for instance, "I have prevented my partner from contacting certain people"); while the second factor consisted of indirect stalking items (for instance, "I have used an alternative "fake" online account –e.g. Facebook, Instagram, e-mail- to check other's profiles without them knowing") and also carry out persecution or control behavior with new technologies (for instance, "I have used or considered using phone apps to track my partner's activities"). Correlation between both factors was r = .76, p <.001.

Then a two-factor model with related factors was tested, as emerged in the exploratory factor analysis.

Table 1. Components and factor loadings for intimate partner cyberstalking scale questions

Items	Factor I	Factor II
1 If my partner is going out, I will usually check their online accounts to see what they're up to	.721	
2 I would help, or have helped friends access their partner/ex-partner's online accounts	.500	
3 To a certain extent, my partner should expect that I would log into their online accounts	.627	
4 I have checked my partner's messages (e.g. e-mail, Facebook, phone) without them knowing	.933	
5 I have taken screenshots of information found on my partner's phone/computer without them knowing	.586	
6 If I suspected my partner was lying I would check their online accounts to help verify my suspicions	.870	
7 I have used an alternative ("fake") online account (e.g. Facebook, Instagram, e-mail) to check other's profiles without them knowing		.460
8 I have checked my partner's phone/computer history to see what they've been up to	.725	
9 I have used the location settings on my partner's phone/computer to see where they've been, without them knowing		.462
10 I have either asked my partner to remove or block certain people from their contacts (phone or social media), because I didn't like the person, or I have done so myself (removed/blocked the person).	.589	
11 I have prevented my partner from contacting certain people	.512	
12 I have posed as someone else over social media/email/phone in order to contact someone who wouldn't otherwise respond.		.520
13 If my partner adds a new contact on social media, I will attempt to find out more about the person and their connection without directly asking my partner	.415	
14 I have screenshots save do things my partner has done wrong to be used as evidence in the future, if the need arises.		.670
15 If my partner betrayed me, I wouldn't hesitate using social media to shame them		.708
16 The majority of my time spent on social networking sites is looking at my partner's pages		.851
17 I get a lot of information about my partner's activities and friendships from looking at his/her social media pages and phone		.606
18 I have changed my relationship status on social media to get a reaction from a partner/ex-partner		.752
19 I try to monitor my partner's behaviors through social media		.522
20 I have attempted to log in to my partner's online accounts or phone without them knowing	.746	
21 I have used or considered using phone apps to track my partner's activities		.527
Explained variance	45%	7%

A one-factor model was also tested. Table 2 shows the two-factor model fit, that was more satisfactory than the one-factor model, indicating more adequate CFI, TLI, RMSEA, SRMR, and x^2 values and ΔCFI $p > .01$ (Byrne, 2012). On the other hand, when dividing x^2 by degrees of freedom, value was 2.63 for the two-factor model, while was 3.43 for the one-factor model. With respect AVE, this was .43 for the indirect stalking subscale and .46

Table 2. Fit statistics of intimate partner cyberstalking scale models

	c2	df	p	CFI	TLI	RMSEA	SRMR	$\Delta X2$	Δdf	ΔCFI
Two-factor structure Model 1	495.99	188	.001	.914	.902	.053	.049	—	—	—
One-factor structure Model 2	647.48	189	.001	.873	.857	.064	.055	151.49	1	.041

Note. df = degrees of freedom. CFI = Comparative Fix Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation. SRMR = standard sized root mean squared residual. $\Delta\chi2$ = $\chi2$ difference between models. Δdf = degrees of freedom difference between models. ΔCFI = CFI difference between models.

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for the direct-indirect stalking subscale. Figure 1 shows the factor loadings and the correlation between the two factors. For the indirect-direct dimension factorial loads ranged from .497 to .760 and for the indirect dimension ranged from .530 to .752. The correlation between both factors was .852.

IPCS internal consistency

Regarding reliability, it was Cronbach's alpha .85 for the indirect stalking subscale and .89 for the direct-indirect stalking subscale. Regarding McDonald's consistency, these were .98 and .99, respectively, while the composite reliability was .99 and .99, respectively.

Concurrent validity of the IPCS from mobile and internet use, trolling, and dark personality

Concerning construct validity, Pearson's correlations were carried out with the scores of cyberstalking dimensions, mobile and internet use, and trolling. As shown in Table 3, significant and positive correlations
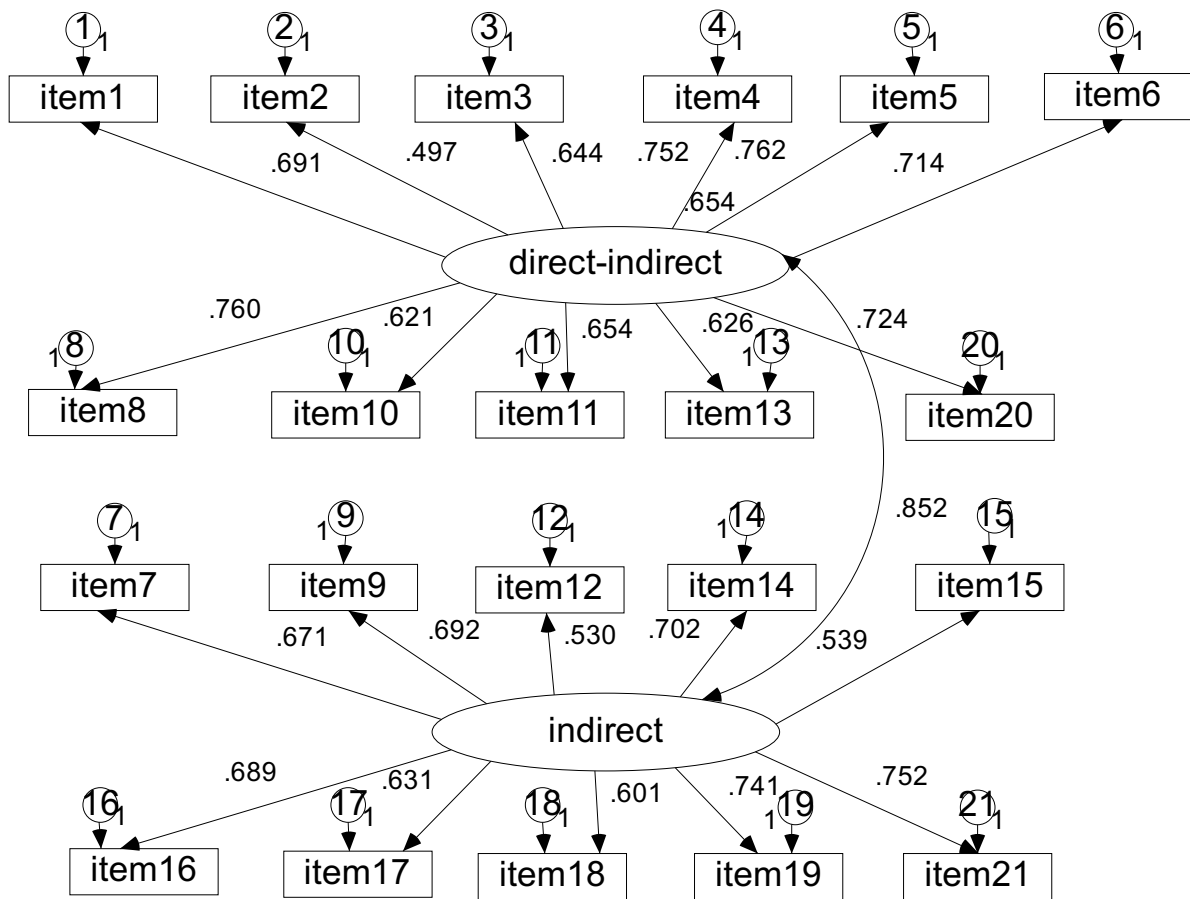

Figure 1. Intimate Partner Cyberstalking Scale two-factor structure.

were found between the cyberstalking scores of dimensions, mobile and internet use and trolling. At higher levels of cyberstalking, both direct-indirect and indirect, higher scores were observed for trolling, such as mobile and internet use, Machiavellianism, psychopathy, and narcissism. As seen in Table 3, the associations ranged from .145 to .283, with the exception of the dimensions of cyberstalking and Machiavellianism, which were above .40.

Prediction of cyberstalking scoring from gender, mobile and internet use, trolling and dark personality

Finally, concerning the objective of predicting cyberstalking scores, multiple linear regressions were carried out with the use of new technologies, the dimensions of dark personality, trolling, and gender (0 = male and 1 = female). Table 4 shows the results. As seen in the table, for direct-indirect cyberstalking, higher Machiavellianism scores, higher level of mobile and internet use, and being a woman were significant predictors. For indirect cyberstalking, higher scores on these variables were also significant predictors and being female along with higher levels of trolling. The percentage of the variance predicted was similar for both behaviors.

Discussion

The purpose of the present work was to evaluate the psychometric properties of the IPCS (Smoker & March, 2017) in Argentina. Cyberstalking is a negative problem with important psychosocial and economic consequences for both victims and perpetrators. Despite the importance of such behaviors, very few instruments have been developed in this regard. The IPCS is one of the few that exist to measure such behavior in the world, although there are no psychometric studies of its properties in Spanish-speaking samples, such as Argentina, while there are only two in this regard, but in Australia and Brazil, with discrepant results between them regarding their factorial structure. Therefore, the strength of this work was that it was the first in the world to systematically evaluate the psychometric properties of this scale in a sample of Argentinean adults.

Regarding the factorial structure, based on both in the exploratory and confirmatory analysis, a bifactorial measurement model was found, with a dimension made up of direct stalking behaviors, on the one hand, and another of both direct and indirect behaviors, on the other. In the exploratory factor analysis, this structure explained 52% of the variance and all the items were loaded in their respective factors and there were no cross-loading greater than .415. Concerning confirmatory

Table 3. Correlations between scores of intimate partner scale, trolling, mobile and internet use, and dark triad personality

	Trolling	Mobile and internet use	Psychopathy	Narcissism	Machiavellianism
Direct-Indirect Cyberstalking	.154**	.163**	.248**	.283**	.462**
Indirect Cyberstalking	.273**	.145**	.214**	.218**	.403**

Note: **$p < .01$

Table 4. Predictions of cyberstalking scores based on the mobile and internet use, dark personality (Machiavellianism, psychopathy and narcissism) trolling and gender

	Direct-indirect cyberstalking			Indirect cyberstalking		
	B	t	p	B	t	p
Mobile and internet use	.08	2.38	.018	.09	2.55	.011
Machiavellianism	.41	8.64	.001	.34	6.92	.001
Psychopathy	.01	.04	.962	-.02	-.58	.562
Narcissism	.06	1.38	.166	.02	.47	.637
Trolling	.05	1.49	.135	.19	4.78	.001
Gender	.15	4.13	.001	.09	2.31	.021
R^2	24%			20%		

factor analysis, this yielded a very adequate adjustment CFI = .914, TLI = .902, SRMSEA = .053, and SRMR = .049. CFI and TLI values above .90 and RMSEA and SRMR below.10, are suitable (Bentler, 1992; Byrne, 2010). Values were also close to more demanding criteria of CFI greater than .95 and RMSEA and SRMR less than .05 (Hu & Bentler, 1999). This model was more appropriate than a single-factor model. Unfortunately, there are not many studies with which to compare these results. Among the few studies in Australia, the author of the scale found a factorial structure of three factors called passive, invasive, and duplicitous (March et al., 2022). The two factors detected here would be similar to two of those reported in said study, since the passive of the study refers to indirect behaviors, while the duplicitous to direct and indirect behaviors, and both are made up of questions similar to the two factors found here. In contrast, the other study in the Brazilian population found greater evidence with confirmatory factor analyzes and the item response theory of a unifactorial structure (da Silva et al., 2021). More research is necessary in this regard, but the different structures found in the studies may be due to the fact that in all cases they are intentional samples as well as to cultural, social, technological and economic differences between nations. Many authors suggest that factorial structures may vary for these reasons (Tabachnick & Fidell, 2013). Therefore, the hypothesis that the IPCS would have adequate psychometric properties is fulfilled. However, in the present sample a different structure emerged from that of the existing studies.

Regarding the AVE index, it was below the .50 recommended for both subscales. In the case of its internal consistency, Cronbach's alpha showed .94 for all questions and .85 for the indirect stalking subscale and .89 for the direct-indirect stalking subscale. Therefore, they were very satisfactory, since an index between .70 and .80 is considered an adequate estimate of internal consistency (DeVellis, 2012; Kaplan & Saccuzzo, 2006; Lowenthal, 2001). An Australian sample study also detected a similar alpha with .92 (Smoker & March, 2017), while they are higher than those reported by da Silva et al. (2021). Composite reliability, an index that does not depend on the number of items, was also highly adequate with values above .98 for both factors. McDonald's consistency presented highly satisfactory levels, as well. Having used different internal consistency indicators is a great strength of this work. The hypothesis that the scale would present adequate internal consistency is verified.

Concerning its concurrent validity, significant and positive associations were detected between cyberstalking, on one hand, and trolling, mobile and internet use and dark personality, on the other. Associations were significant for both indirect-direct dimension and indirect dimension. These associations can be explained –perhaps- by the relative anonymity and disinhibition that ICT allow, mainly when the subjects are perceived to act under the anonymity that they allow (Griffiths, 2014; Suler, 2004; Widyanto & Griffiths 2011). Thus, individuals who are connected to social networks for a long time or using new technologies may engage in cyberstalking behaviors. Some studies have found that simply using the internet for several hours a day - not including compulsive use that affects the subject psychosocially - was associated with cyberstalking problems towards the couple (Resett et al., 2019), as well as the behavior of fear of missing out and use of new technologies (Silva Santos et al., 2023). Besides, the association between cyberstalking and trolling can be explained by this phenomenon of disinhibition and anonymity; it is also possible that subjects with a certain psychosocial profile - impulsivity, low pleasantness or high levels of dark personality - engage in aversive behaviors, such as trolling and cyberstalking. However, it is also possible that dark personality factors, such as impulsiveness and sensation seeking traits, cause these variables to covariate. In turn, the prolonged or excessive use of ICT would lead to an increase in such negative behaviors. More research is needed to determine the directionality of the variables in these respects. Future studies should examine whether it is the use of new technologies that is associated with said behavior or the motivations and expectations with which the subjects use the cell phone or the internet. Associations were also found between both dimensions of cyberstalking and the three dimensions of the dark personality, which coincides with numerous studies (da Silva et al., 2021; March et al., 2022). Although these associations were small in size, with the exception of Machiavellianism in which it was large, according to Cohen's (1988) guidelines. It is not surprising that this association is higher with machivalism due to the manipulative and exploitative nature of these subjects. The hypothesis that established that the IPCS would have concurrent validity with said variables is verified.

Concerning the prediction of cyberstalking behavior, a variance of 24% for indirect-direct cyberstalking, and a variance of 20% for indirect cyberstalking was predicted. Thus, similar levels of variance were predicted, but some predictors similar but others not for both types of cyberstalking. Significant predictors were machiavellianism score, being male, and the use of new technology for both dimensions. Trolling was a predictor

in the case of indirect cyberstalking. Smoker and March (2017) detected that the three dimensions of dark personality were associated with cyberstalking scores using the same measure, as well as other more recent studies in this regard (da Silva et al., 2021; March et al., 2022). In this research, Machiavellianism was also the dimensions that were most associated with cyberstalking behavior. Although there are no many studies that have examined this relationship, it has been established that individuals with high levels of Machiavellianism engage in relationships in which emotional manipulation abounds and employ strategies to benefit their interests (Abell et al., 2016; Jonason & Kavanagh, 2010), mainly taking into account the aspects of disinhibition and superficial contact that new technologies have, such as social networks, in which manipulative people can feel comfortable, such as the control and monitoring that they allow. The association between psychopathy and stalking was also found in other studies (Storey et al., 2009) and between such behavior and narcissism (Menard & Pincus, 2012), specifically narcissism characterized by introversion and fear of being rejected. Psychopathic traits are known to be associated with problems in interpersonal relationships due to their low pleasantness, insensitivity, and impulsivity (Jones & Neria, 2015; March et al., 2020; Muris et al., 2017; Paulhus et al., 2018). However, under certain circumstances people with machiavellian and narcissistic traits can be aggressive or hostile in interpersonal relationships; the former when their instrumental goals are threatened and the others when their ego is at risk (Jones & Paulhus, 2010). The use of new technologies and trolling were predictors of cyberstalking. However, trolling was a predictor only for indirect cyberstalking, probably the deceptive and manipulative nature of trolling could be explained this finding (Fichman & Sanfillippo, 2016). Other studies also detected that being male was associated with stalking (Dunlap et al., 2012; Duntley & Buss, 2012; McKeon et al., 2015; Marcum et al., 2017). However, other studies detected that men are to carry out more physical staking behaviors, while women are to use more covert strategies (Burke et al., 2011; Purcell et al., 2010). Yet in this study being female was a significant predictor for both dimensions of cyberstalking. However, in the present study there was no pure and exclusive dimension of direct cyberstalking, where perhaps men can carry out a higher level of such behavior, mainly due to their tendency towards more direct aggression. Future studies should examine if the cyberstalking varies according to the target of this behavior (romantic partners, ex-partners, known people, while, strangers, among others), as well as observing if the levels of said behavior vary in

this respect. The hypothesis that trolling, the use of new technologies, dark personality dimensions and gender would be significant predictors is partially verified, since psychopathy and narcissism were not.

All these results would indicate concurrent validity for the cyberstalking questionnaire in Argentina. That some associations were small or medium can be explained by the fact that the constructs in psychology are multi-determined. In addition to the dark personality, trolling and the use of the internet and cell phones, other factors may explain this behavior: for example, impulsiveness, temperament, coping styles, socioeconomic level, among others.

Despite Argentina being a less developed country and with a different cultural tradition than the first world, such as the countries of northern Europe, the United States or Canada, these findings would suggest that in the present sample of Argentina this instrument would present evidence of psychometric goodness to evaluate a relevant construct such as cyberstalking, as has been demonstrated in nations of Australia or Brazil.

This study has a series of limitations that must be mentioned: having been carried out with an intentional sample of adults from the Autonomous City of Buenos Aires and Paraná, Argentina. On the other hand, the data has been collected through the self-report, which artificially inflates the relationships between the variables by the variance shared by the data collection method. Likewise, the self-report has known limitations: bias in the responses, lack of honesty in them, giving extreme responses or marking socially desirable alternatives, mainly in negative behavior such as cyberstalking. On the other hand, the use of new technologies was measured simply with two questions. Also, the fact that the study was cross-sectional does not allow evaluating its test / re-test reliability and does not allow inferring the directionality of the causality between the variables.

Future studies should examine this problem in larger and randomly selected samples from various cities in Argentina - as well as examine the properties in samples from other countries -, to generalize the results and determine if it maintains its measurement invariance or not through different regions and nations. The latter is essential because in the few available studies different factorial structures emerge. A relevant issue is that future research must be longitudinal: both to examine its consistency test/re test and to determine how temporarily stable cyberstalking is -considering the rapid changes that occur in new technologies. Subsequent research should also include sadism as a fourth feature of the dark personality. Finally, it would be desirable for future research to examine this construct in adolescence, an

age at which both the use of new technologies increases remarkably compared to childhood, how to carry out actions to avoid and prevent such conduct.

Conflicts of interest

The authors have no conflicts of interest to disclose.

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