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Evaluating different patterns of problematic internet use using a unified self-report measure based on the ICD-11 framework: Psychometric properties of the Italian version of the ACSID-11

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ABSTRACT

The ACSID-11 was developed to assess five patterns of problematic Internet use—namely, gaming disorder, compulsive online shopping, problematic online pornography use, problematic social networks use, and online gambling disorder—using a unified set of items grounded in the ICD-11 framework. The present study examined the psychometric properties of the Italian version of the ACSID-11. A sample of 1263 participants (76.70 % females, $M_{age} = 40.89$, $SD = 13.72$, range = 18–83) completed the ACSID-11 and was included in the analysis of its factorial structure. A series of Confirmatory Factor Analyses (CFAs) confirmed the assumed four-factorial structure (i.e., Impaired Control, Increased Priority, Continuation/Escalation of Use, Functional Impairment in Daily Life/Marked Distress), which was superior to the unidimensional solution for all the patterns of problematic Internet use. Moreover, the second-order models demonstrated comparable fit to the four-factor solutions and supported the use of an overall composite score. A subsample of 999 participants (76.40 % females, M = 40.59, SD = 13.67, range = 18–83) also completed the Patient Health Questionnaire-9, the General Anxiety Disorder Scale-7, and the Satisfaction with Life Scale, whereas the number of participants who completed the measures used to assess convergent validity varied depending on whether they reported engaging in the corresponding behavior or not. Convergent and criterion validity were supported. These findings suggest that the Italian version of this unified item set is a valid and reliable tool for consistently assessing different patterns of problematic Internet use.

1. Introduction

Even if it was in the '90s that Marks (1990) introduced the concept of non-chemical addictions, the outburst of publications concerning new potential behavioral addictions arose in 2013 (Billieux, Schimmenti, Khazaal, Maurage, & Heernen, 2015), when the Diagnostic and Statistical Manual of Mental Disorders, in its fifth edition (DSM-5; American Psychiatric Association, APA, 2013), formally recognized Gambling Disorder as an addictive behavior and introduced Internet Gaming Disorder (IGD) as a condition deserving to be further analyzed. More recently, the last edition of the International Classification of Diseases (ICD-11; World Health Organization, WHO, 2018) introduced both Gambling Disorder and Gaming Disorder (GD) as official diagnoses in the subsection labeled "Disorders due to substance use or addictive behaviors." While it is critical to avoid the over-pathologization of everyday behaviors (e.g., social network use) and the tendency to aprioristically use the addiction framework when analyzing excessive behaviors (e.g., Billieux et al., 2015; Kardefelt-Winther, 2015; Loscalzo & Giannini, 2025), it is also important to pay attention to other potential behavioral addictions and to have proper instruments for their screening in the general population. That being said, since only GD and Gambling Disorder are currently recognized as a behavioral addictions, we prefer to avoid using the term "disorder" for the other conditions.

Among potential behavioral addictions that might be of primary public health concern, there are the Internet-use-based ones, such as Problematic Social Network Use (PSNU), but also other behaviors that –

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even if not yet formally recognized within the addiction framework – might be more easily spread thanks to the use of the Internet (e.g., shopping). The coverage of the Internet – now easily accessible to everyone at every moment – might indeed foster the rise of new problematic behaviors (Loscalzo, Rogier, & Velotti, 2025), for example concerning financial online trading, which some authors conceptualized as a form of gambling (e.g., Håkansson, Fernández-Aranda, & Jiménez-Murcia, 2021; Sonkurt, 2023). Therefore, having an instrument allowing for the screening for the various patterns of problematic Internet use (PIUs) seems critical. In this vein, the Assessment of Criteria for Specific Internet-use Disorders (ACSID-11) introduced by Müller et al. (2022) and based on the ICD-11 criteria for Gaming Disorder and other potential Internet-use disorders appears promising. Müller et al. (2022) designed the ACSID-11 to overcome the methodological limitations of previous self-report tools developed to evaluate PIUs (e.g., Fernandez & Griffiths, 2021; King et al., 2020). Their approach also responded to evidence suggesting that, when it comes to Internet use, certain problematic patterns—such as gaming and social network engagement—frequently co-occur (e.g., Müller et al., 2022), highlighting the need for a comprehensive and self-report scale applicable across different Internet-use behaviors, which would allow studies on commonalities and differences among the different PIUs. For this reason, Müller et al. (2022) developed a brief instrument designed to screen for five specific patterns of PIUs—namely gambling, gaming, pornography consumption, buying-shopping behaviors, and social network use—drawing on the ICD-11 criteria for Gambling and Gaming Disorders and the structure of the WHO's Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; WHO Assist Working Group, 2002). The ACSID-11 includes a preliminary screening sheet in which participants are asked to indicate which Internet-based activities they have engaged in over the past 12 months. Participants who report engagement in at least one of the five core Internet-based activities are presented with an additional set of 11 items specific to each endorsed category. Each item is assessed using two distinct response formats to detect risk relative to frequency and intensity for each behavior. These items assess four key dimensions of problematic use: (i) Impaired Control (IC) – three items; (ii) Increased Priority (IP) – three items; (iii) Continuation/Escalation of Use (CE) – three items; (iv) Functional Impairment in Daily Life and (FI) Marked Distress with one item each. Multiple Confirmatory Factor Analyses (CFAs), one for each specific PIU and separately for frequency and intensity ratings, supported the four-factor solution, which showed a superior fit compared to the unidimensional one. Convergent validity was very high, albeit assessed solely for GD, and criterion validity was supported via its association with a measure of symptoms of depression and anxiety. Reliability in terms of internal consistency was also good for the five PIUs. A subsequent study confirmed convergent validity of the ACSID-11 subscales for the other PIUs (Oelker, Rumpf, Brand, & Müller, 2024).

Beyond its excellent psychometric properties, the ACSID-11 presents several conceptual strengths that make it a valuable self-report measure. Most self-report instruments to assess GD—including those with robust psychometric properties—tend to conflate core diagnostic criteria (such as impaired behavioral control) with peripheral or less valid indicators (e.g., tolerance; see King et al., 2020, for a systematic review). A similar issue arises in the assessment of PSNU, which is commonly measured using the Bergen Social Media Addiction Scale (BSMAS), with each item reflecting one of the six components first identified by Brown (1993) and developed into a model by Griffiths (2005). Notably, the scale does not assess whether individuals persist in social network use despite experiencing negative consequences—a criterion widely regarded as fundamental in defining addictive behaviors (Castro-Calvo et al., 2021). Conversely, it emphasizes peripheral symptoms of PSNU, such as tolerance, which have shown limited association with mental distress and may not effectively distinguish problematic from engaged users (Fournier et al., 2023; Svicher, Fioravanti, & Casale, 2021). The same applies to the two most widely used measures for assessing problematic online pornography use (i.e., the Problematic Pornography Consumption Scale; Bőthe et al., 2018) and Compulsive Online Shopping (i.e., the Bergen Shopping Addiction Scale; Andreassen et al., 2015), both of which include peripheral symptoms. The ACSID-11 overcomes this limitation, as it is grounded in the ICD-11 diagnostic framework, which emphasizes core, clinically significant symptoms of addiction (Castro-Calvo et al., 2021). In fact, regarding GD, the ICD-11 criteria have been endorsed as superior to DSM-5 criteria in terms of diagnostic validity, clinical utility, and prognostic value, based on a prominent Delphi study involving 29 international experts on gaming disorder across 20 countries (Castro-Calvo et al., 2021). Having a self-report measure grounded in the conservative framework adopted by the WHO is especially valuable in the context of behaviors that are not inherently problematic—such as gaming, shopping, or social network use—as there is an increasing need to distinguish between merely excessive engagement and genuinely problematic involvement (i.e., uncontrolled and inflexible patterns that give rise to negative consequences). Moreover, the scientific landscape is burdened by a wide array of heterogeneous instruments used to assess behaviors that are nevertheless similar in terms of syndromic entities and neurobiological vulnerability (Blum, Cull, Braverman, & Comings, 1996; Brand, Young, Laier, Wölfling, & Potenza, 2016; Brand et al., 2019). For example, among the most widely employed tools for assessing GD is the Internet Gaming Disorder Scale-Short-Form (IGD-SF; Pontes & Griffiths, 2015), in which each item corresponds to one of the nine diagnostic criteria from the DSM-5 whereas the BSMAS is based on the six-component model (Griffiths (2005). Diagnostic manuals have increasingly embraced the perspective that addiction should be understood as a syndrome with multiple opportunistic expressions, and that the specific objects of addiction do not play a central role in its development (Shaffer et al., 2004). This does not mean that the distinct expressions of addiction lack unique features; rather, it suggests that assessment tools should be designed to capture the common core symptoms. Such an approach would not only facilitate scientific research into both the common and specific factors underlying various forms of addiction, but more importantly, help clarify whether certain presumed behavioral addictions truly warrant classification as genuine addictive disorders.

Given the ACSID-11′s strong psychometric properties as well as its conceptual strengths, we aimed to assess the properties of the Italian version. In detail, we analyzed the construct validity by comparing different factorial models through CFAs (a four-factor model, a unidimensional model, a second-order factor model, and a bifactor model), in line with the original work (Müller et al., 2022). Moreover, we further extended the psychometric evaluation by examining the validity of the ACSID-11 in greater detail. Concerning convergent validity, we examined the correlations with self-report instruments specifically targeting each of the five behavioral domains screened by the ACSID-11. We also evaluated criterion validity using measures of depressive symptoms, anxiety and satisfaction with life.

2. Method

2.1. Participants and procedure

All participants were recruited through advertisements on social networking sites (e.g., Instagram and Facebook), and data was collected via an online platform, from November 2023 to June 2024, using the online survey tool LimeSurvey® in line with the procedure of the original version of the ACSID-11 (Müller et al., 2022). The survey was designed in such a way that the questions and questionnaires related to specific online activities (i.e., Online Gaming, Online Shopping, Online Pornography Use, Social Network Use, Online Gambling) were displayed only if the participant had indicated in the pre-query that they had engaged in those activities in the last year. The only inclusion criterion for participation was being 18 years of age or older, in accordance with the age of legal majority in Italy. Participants were provided with

Table 1
Socio-demographic characteristics of the total (N = 1263) and sub-sample (n = 999).

Variable		Total	Sub-sample
Gender	Women	76.7 %	76.4 %
	Men	23.3 %	23.6 %
Age	Range	18–83	18–83
	M(SD)	40.89 (13.72)	40.59 (13.67)
Education qualification	Postgraduate Degree[a]	8.3 %	8.5 %
	Single-Cycle Degree	5.5 %	6.0 %
	Master's Degree	13.9 %	15.1 %
	Bachelor's Degree	18.1 %	19.1 %
	High School Diploma	46.6 %	44.4 %
	Middle School Diploma	7.4 %	6.8 %
	Primary School Diploma	0.2%	0.1%
Romantic Relationship	Married	40.9 %	39.8 %
	Engaged	29.6 %	30.1 %
	Single	19.0 %	19.5 %
	Divorced	2.9 %	2.9 %
	Separated	2.8 %	3.1 %
	Widowed	1.0 %	0.9%
	Other[b]	3.8 %	3.7 %
Working Status	Worker	63.3 %	62.9 %
	Working Student	7.4 %	8.3 %
	Student	12.0 %	12.5 %
	Homemaker	5.2 %	4.7 %
	Retired	5.0 %	4.7 %
	Unemployed	4.9 %	4.6 %
	Other[c]	2.2 %	2.3 %

Note. [a] = Ph.D., Master, Specialization; [b] = For example, cohabiting with a partner, remarried, dating; [c] = For example, Ph.D. student, occasional worker, volunteer, entrepreneur.

detailed information about the study's purpose and procedures, and were informed that participation was entirely voluntary, with the right to withdraw at any time without providing an explanation and without incurring any negative consequences. Informed consent was obtained prior to participation.

A total sample of 1263 participants (76.70 % females, M_{age} = 40.89, *SD* = 13.72, range = 18–83) completed the ACSID-11 and was included in the analysis of its factorial structure. Moreover, a subsample of 999 participants (76.40 % females, M_{age} = 40.59, *SD* = 13.67, range = 18–83) completed all the self-report measures used to assess criterion validity (Patient Health Questionnaire-9; General Anxiety Disorder Scale-7; Satisfaction with Life Scale). Instead, the number of participants who completed the self-report measures used to assess convergent validity varied depending on whether they reported engaging in the corresponding behavior or not. In detail, N = 424 participants reported engaging in online gaming and completed the IGDS9-SF; N = 900 reported engaging in online shopping and completed the Compulsive Online Shopping Scale; N = 296 reported engaging in online pornography and completed the Cyber Pornography Addiction Test; N = 985 reported using social networks and completed the Bergen Social Media Addiction Scale; and N = 66 reported engaging in online gambling and completed the Canadian Problem Gambling Index. The study was conducted in accordance with the Helsinki Declaration and part of a larger project approved by the Research Ethics Commission. Socio-demographic characteristics are presented in Table 1.

2.2. Measures

Assessment of Criteria for Specific Internet-use Disorders (ACSID-11; Müller et al., 2022). The ACSID-11 is composed of 11 items designed to assess the ICD-11 diagnostic criteria for disorders due to addictive behaviors (i.e., impaired control, increasing priority, continuation/escalation) associated with the use of the Internet (i.e., gaming, shopping, pornography, social networks, gambling). Like the ASSIST (WHO Assist Working Group, 2002), it has a two-part response format: i) participants indicate per each activity how often they have experienced it in the last year using a 4-point graded scale ranging between 0 (*Never*) and 3 (*Often*); ii) for each activity rated as experienced at least rarely (i.e., 1) they also answer how intensively they have experienced it through a 4-point Likert scale ranging between 0 (*Not at all intense*) and 3 (*Intense*). Thus, it evaluates both the frequency and intensity of the five problematic patterns of Internet use. Finally, the participants also answer the 11 items for each activity. Aiming to adapt it to the Italian language, we obtained permission from the authors (Müller et al., 2022). Then, we used the forward and back translation procedure (Beaton, Bombardier, Guillemin, & Ferraz, 2000) to translate the scale into Italian. First, a psychologist who is a native Italian speaker and fluent in German translated the original version of the ACSID-11 into Italian. Next, this Italian version was back-translated into German by a native German speaker who is also fluent in Italian and who was unaware of the research objectives and unfamiliar with the scale (Peters & Passchier, 2006). Both translators were independent of the research team. One of the authors, who has expertise in the topic, compared the original version with the back-translation to identify discrepancies resolved through consensus with the other authors. The final Italian version of the ACSID-11 is reported in Supplementary Table 1.

Internet Gaming Disorder Scale-Short-Form (IGDS9-SF; Pontes & Griffiths, 2015). This is a 9-item self-report scale with a 5-point graded response format, ranging from 1 (*Never*) to 5 (*Very Often*). We administered the Italian version by Monacis, de Palo, Griffiths, and Sinatra (2016).

Compulsive Online Shopping Scale (COSS; Manchiraju, Sadachar, & Ridgway, 2017). The COSS is a 28-item self-report scale that assesses online-based compulsive shopping behaviors, and it represents an adaptation of the Bergen Shopping Addiction Scale (Andreassen et al., 2015) to the online context. The response format is a 7-point graded scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). We administered the Italian version by Gori, Topino, and Casale (2022).

Cyber Pornography Addiction Test (CYPAT; Cacioppo et al., 2018). The CYPAT is an 11-item self-report scale developed by Cacioppo et al. (2018) to evaluate problematic online pornography use. The response format is a 5-point graded scale ranging from 0 (*Never*) to 4 (*Always*).

Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016). The BSMAS is a 6-item self-report scale that evaluates PSNU, referring to Griffiths (2005) six core addictions' symptoms, namely all the components evaluated by the COSS except for "problem." The response format is a 5-point graded scale ranging from 1 (*Very Rarely*) to 7 (*Very Often*). We administered the Italian version by Monacis, de Palo, Griffiths, and Sinatra (2017).

Canadian Problem Gambling Index (CPGI; Ferris & Wynne, 2001). The CPGI is a 9-item self-report scale that assesses problem gambling in the general population. The response format is a 4-point graded scale ranging from 0 (*Never*) to 3 (*Almost always*). We used the Italian version validated by Colasante et al. (2013).

Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The PHQ-9 is a short 9-item scale for evaluating the symptoms of Major Depression as defined by the DSM-IV (APA, 1994). More specifically, it is the depression module from the PHQ (Spitzer, Kroenke, & Williams, 1999). Participants rate each item, referring to their experience in the last two weeks, using a 4-point Likert scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*). We administered the Italian validation by Mazzotti et al. (2003).

General Anxiety Disorder Scale-7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). It is a 7-item self-report scale evaluating anxiety symptoms. The time frame is the last two weeks, and the response format is a 4-point graded scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*). We administered the Italian version by Bolgeo et al. (2023).

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). It is a brief self-report scale comprising five items that

Table 2
Descriptive statistics of the ACSID-11 items measuring PIUs (n = 1263).

		Gaming Disorder (n = 556)			Compulsive Online Shopping (n = 1137)			Problematic Online Pornography Use (n = 373)			Problematic Social Network Use (n = 1244)			Online Gambling (n = 90)		
	Min-max	*M(SD)*	Skew.	Kurt.	*M(SD)*	Skew.	Kurt.	*M(SD)*	Skew.	Kurt.	*M(SD)*	Skew.	Kurt.	*M(SD)*	Skew.	Kurt.
Frequency																
IC1	0–3	1.55 (1.05)	0.03	−1.22	1.55 (0.10)	−0.138	−1.03	1.45 (0.96)	0.09	−0.93	2.38 (0.97)	−1.38	0.62	1.52 (1.03)	0.07	−1.13
IC2	0–3	0.75 (0.93)	0.85	−0.54	0.68 (0.89)	1.00	−0.19	0.65 (0.89)	1.22	0.502	1.53 (1.09)	−0.14	−1.27	1.00 (1.12)	0.73	−0.89
IC3	0–3	0.39 (0.77)	1.96	2.89	0.40 (0.78)	1.88	2.46	0.48 (0.83)	1.71	1.97	0.92 (1.05)	0.67	−0.95	0.88 (1.12)	0.88	−0.72
IP1	0–3	0.57 (0.86)	1.29	0.53	0.34 (0.66)	1.87	2.67	0.28 (0.59)	2.22	4.70	0.84 (0.98)	0.77	−0.65	0.67 (0.97)	1.32	0.58
IP2	0–3	0.28 (0.63)	2.28	4.55	0.20 (0.54)	2.91	8.06	0.16 (0.46)	3.16	10.05	0.51 (0.84)	1.50	1.16	0.53 (0.96)	1.68	1.52
IP3	0–3	0.27 (0.62)	2.36	5.02	0.13 (0.42)	3.71	14.83	0.18 (0.52)	2.99	8.76	0.41 (0.77)	1.82	2.39	0.49 (0.94)	1.86	2.21
CE1	0–3	0.10 (0.41)	4.63	23.79	0.08 (0.33)	4.63	23.16	0.09 (0.38)	4.99	27.25	0.20 (0.55)	2.94	8.41	0.39 (0.87)	2.18	3.51
CE2	0–3	0.20 (0.54)	2.93	8.61	0.09 (0.35)	4.30	20.56	0.12 (0.41)	3.80	15.26	0.30 (0.66)	2.26	4.44	0.40 (0.83)	2.12	3.53
CE3	0–3	0.12 (0.41)	3.96	16.95	0.07 (0.31)	5.04	29.42	0.12 (0.42)	3.88	15.63	0.21 (0.56)	2.90	8.41	0.43 (0.89)	1.88	2.21
FI1	0–3	0.48 (0.79)	1.60	1.73	0.37 (0.67)	1.79	2.56	0.31 (0.61)	1.99	3.61	0.76 (0.88)	0.86	−0.29	0.68 (1.03)	1.33	0.42
MD1	0–3	0.13 (0.45)	3.82	15.16	0.13 (0.42)	3.66	14.01	0.19 (0.49)	2.73	7.37	0.43 (0.76)	1.68	1.91	0.59 (1.02)	1.50	0.78
Intensity																
IC1	0–3	0.97 (0.89)	0.50	−0.70	0.81 (0.78)	0.66	−0.19	0.83 (0.83)	0.75	−0.06	1.55 (0.94)	−0.15	−0.86	1.00 (1.08)	0.66	−0.92
IC2	0–3	0.54 (0.77)	1.25	0.66	0.48 (0.74)	1.42	1.22	0.52 (0.84)	1.59	1.67	1.12 (0.95)	0.35	−0.90	0.86 (1.02)	0.88	−0.49
IC3	0–3	0.29 (0.64)	2.37	5.48	0.28 (0.63)	2.36	5.120	0.39 (0.75)	1.94	3.04	0.66 (0.09)	1.09	0.24	0.76 (1.07)	1.18	−0.04
IP1	0–3	0.46 (0.77)	1.66	2.00	0.24 (0.57)	2.64	7.35	0.24 (0.61)	2.82	7.79	0.64 (0.83)	1.11	0.312	0.63 (0.98)	1.39	0.71
IP2	0–3	0.22 (0.55)	2.60	6.44	0.14 (0.44)	3.51	12.93	0.13 (0.40)	3.42	13.43	0.39 (0.72)	1.90	3.04	0.50 (0.94)	1.83	2.11
IP3	0–3	0.23 (0.56)	2.63	6.99	0.11 (0.42)	4.45	22.33	0.15 (0.47)	3.63	14.21	0.32 (0.66)	2.25	4.76	0.48 (0.95)	1.95	2.48
CE1	0–3	0.09 (0.38)	5.20	30.17	0.07 (0.32)	5.71	37.89	0.07 (0.35)	5.82	36.74	0.17 (0.51)	3.47	12.57	0.37 (0.84)	2.23	3.77
CE2	0–3	0.17 (0.60)	3.12	9.82	0.08 (0.34)	4.91	26.72	0.11 (0.39)	3.85	14.30	0.24 (0.60)	2.69	7.16	0.32 (0.78)	2.61	6.02
CE3	0–3	0.11 (0.42)	4.37	20.82	0.06 (0.31)	5.92	41.31	0.11 (0.44)	4.48	20.93	0.17 (0.50)	3.40	12.43	0.39 (0.86)	2.22	3.77
FI1	0–3	0.35 (0.68)	2.06	3.87	0.25 (0.54)	2.43	6.36	0.27 (0.55)	2.16	4.70	0.55 (0.76)	1.32	1.17	0.60 (0.99)	1.52	0.99
MD1	0–3	0.10 (0.38)	4.17	18.34	0.10 (0.38)	4.12	18.71	0.19 (0.51)	2.78	7.33	0.34 (0.66)	2.01	3.54	0.54 (1.00)	1.65	1.29

Note. IC = impaired control; IP = increased priority; CE = continuation/escalation; FI = functional impairment; MD = marked distress.

measure life satisfaction using a 7-point graded scale, ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). We administered the Italian version by Di Fabio and Gori (2016). Table 6 shows the internal consistency values for all the self-reported measures.

2.3. Statistical analyses

First, descriptive statistics (i.e., minimum and maximum scores, mean, standard deviation, skewness, and kurtosis) were calculated for all items of the ACSID-11. Subsequently, a series of CFAs was conducted to examine the dimensionality of the ACSID-11. In particular, four models were tested for each specific PIU assessed by the ACSID-11, considering both frequency and intensity scores: 1) A four-factor model, with (i) Impaired Control, (ii) Increased Priority, (iii) Continuation/Escalation, and (iv) Functional Impairment as factors; 2) a unidimensional model, assuming high intercorrelations among the factors and loading all items onto a single general factor; 3) a second-order factor model, in which a general (second-order) factor was hypothesized to account for the associations among the first-order factors; 4) a bifactor model, assuming that a general factor accounts for the shared variance among all items, while the specific factors capture unique variance beyond the general factor. The CFAs were conducted using the lavaan package (Rosseel, 2012) within the R statistical software (version 4.2.1), employing the Weighted Least Squares Means and Variance adjusted (WLSMV) estimation. The goodness of fit was evaluated using multiple indices, including the χ^2 (and its degrees of freedom and p-value), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI) and the Standardized Root Mean Square Residual (SRMR). The following cutoff values were considered indicative of model fit: $\chi^2/df < 3$, RMSEA < 0.08, CFI > 0.90, and SRMR < 0.10 (Hu & Bentler, 1999; Kline, 2011). In detail, RMSEA values between 0.06 and 0.08 were considered to indicate an adequate fit, while values below 0.06 indicated an excellent fit. For SRMR, values between 0.08 and 0.10 were regarded as adequate, and those below 0.08 as

Table 3
Fit indices of all the tested models for specific PIUs measured by ACSID-11 (N = 1263).

	Gaming Disorder											
	Frequency						Intensity					
Model	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
Four-factor	51.120 (38)	0.076	1.35	0.052 (0.039–0.065)	0.990	0.069	64.584 (38)	0.005	1.70	0.057 (0.044–0.070)	0.978	0.084
Unidimensional	95.835 (44)	<0.001	2.18	0.070 (0.059–0.082)	0.961	0.087	91.203 (44)	<0.001	2.07	0.059 (0.048–0.071)	0.960	0.100
Second-order factor	53.659 (40)	<0.001	1.34	0.052 (0.039–0.065)	0.990	0.072	66.903 (40)	0.005	1.67	0.055 (0.042–0.067)	0.977	0.088
Bifactor	42.489 (35)	0.180	1.21	0.050 (0.036–0.064)	0.994	0.065	–	–	–	–	–	–
	Compulsive Online Shopping											
	Frequency						Intensity					
Model	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
Four-factor	67.447 (38)	0.002	1.77	0.053 (0.044–0.061)	0.987	0.055	62.396 (38)	0.008	1.64	0.045 (0.037–0.054)	0.985	0.060
Unidimensional	178.324 (44)	<0.001	4.05	0.079 (0.072–0.087)	0.942	0.095	178.924 (44)	<0.001	4.07	0.066 (0.058–0.073)	0.920	0.118
Second-order factor	83.664 (40)	<0.001	2.09	0.057 (0.049–0.065)	0.981	0.063	88.237 (40)	<0.001	2.21	0.053 (0.045–0.061)	0.971	0.076
Bifactor	71.620 (35)	<0.001	2.05	0.057 (0.048–0.066)	0.984	0.058	73.113 (35)	<0.001	2.09	0.053 (0.044–0.062)	0.977	0.068
	Problematic Online Pornography Use											
	Frequency						Intensity					
Model	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
Four-factor	19.227 (38)	0.995	0.51	0.030 (0.001–0.050)	1	0.047	24.260 (48)	0.959	0.64	0.037 (0.015–0.056)	1	0.056
Unidimensional	46.691 (44)	0.362	1.06	0.059 (0.044–0.074)	0.997	0.077	37.535 (44)	0.743	0.85	0.045 (0.028–0.061)	1	0.079
Second-order factor	20.970 (40)	0.994	0.52	0.031 (0.001–0.051)	1	0.050	26.049 (40)	0.957	0.65	0.036 (0.013–0.054)	1	0.059
Bifactor	14.648 (35)	0.999	0.41	0.022 (0.001–0.045)	1	0.042	–	–	–	–	–	–
	Problematic Social Network Use											
	Frequency						Intensity					
Model	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
Four-factor	92.437 (38)	<0.001	2.43	0.067 (0.059–0.075)	0.991	0.044	87.579 (38)	<0.001	2.30	0.068 (0.060–0.076)	0.990	0.049
Unidimensional	256.809 (44)	<0.001	5.84	0.101 (0.094–0.108)	0.966	0.072	220.128 (44)	<0.001	5.00	0.095 (0.088–0.102)	0.966	0.080
Second-order factor	105.225 (40)	<0.001	2.63	0.069 (0.061–0.076)	0.990	0.048	106.707 (40)	<0.001	2.67	0.072 (0.064–0.080)	0.987	0.056
Bifactor	–	–	–	–	–	–	84.909 (35)	<0.001	2.43	0.071 (0.063–0.079)	0.990	0.051
	Online Gambling											
	Frequency						Intensity					
Model	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*	$\chi^2(df)$	*p*	χ^2/df	*RMSEA*	*CFI*	*SRMR*
Four-factor	3.739 (38)	1		0.052 (0.001–0.096)	1	0.034	4.901 (38)	1	\	0.071 (0.019–0.110)	1	0.044
Unidimensional	10.814 (44)	1	\	0.104 (0.071–0.136)	1	0.059	8.201 (44)	1		0.079 (0.038–0.114)	1	0.059
Second-order factor	4.542 (40)	1	\	0.056 (0.001–0.097)	1	0.039	5.661 (40)	1	\	0.070 (0.018–0.108)	1	0.048
Bifactor	3.650 (35)	1	\	0.056 (0.001–0.100)	1	0.035	4.747 (35)	1	\	0.068 (0.001–0.109)	1	0.044

Note. Bifactor model for Gaming Disorder Intensity, Problematic Online Pornography Use Intensity, and Problematic Social Network Use Frequency could not be identified.

excellent. For CFI, values between 0.90 and 0.94 were considered adequate, whereas values above 0.94 indicated an excellent fit. Finally, the fit of all tested models was compared both visually, by evaluating fit indices (e.g., RMSEA, CFI, SRMR), and statistically, through chi-square difference testing, to determine which model best fit the data (Brown, 2015).

To examine the internal consistency of the ACSID-11, we computed both Cronbach's alpha (α) and Omega McDonald (ω), considering

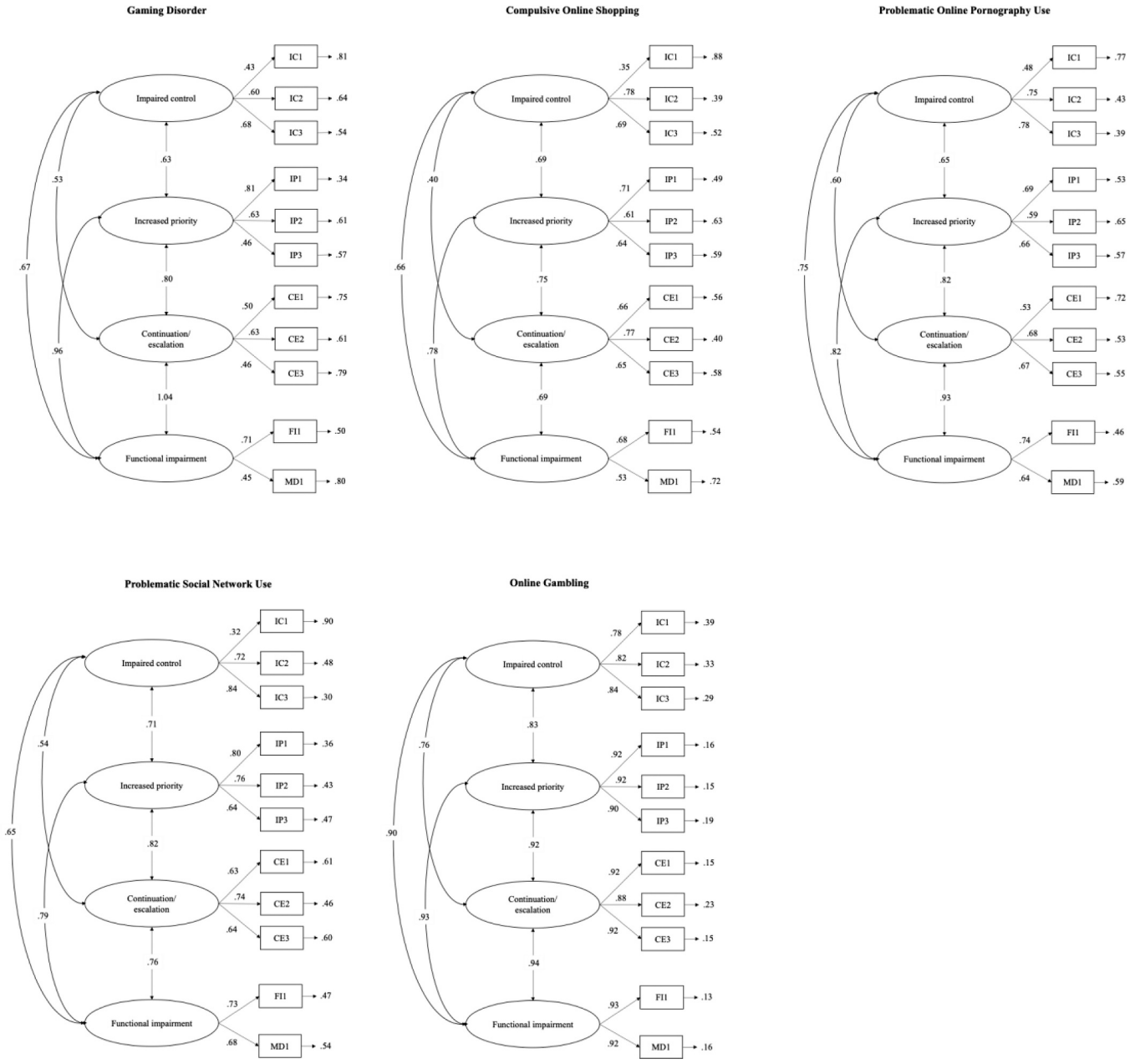

Fig. 1. Standardized solutions of the four-factor models tested for each specific PIUs measured by ACSID-11 (frequency subscale). Note. All estimates were significant at $p < 0.05$.

values ≥ 0.70 (Kline, 2011) as acceptable. The validity of the ACSID-11 was evaluated using validated measures that assess the same Internet-use behaviors and measures of related constructs, such as other types of Internet-use behaviors, depressive symptoms (PHQ-9), anxiety symptoms (GAD-7), and life satisfaction (SWLS). Correlation analyses were conducted, and in accordance with the cut-off values proposed by the European Federation of Psychological Assessment (EFPA; Evers et al., 2013), correlations below |.15| indicate inadequate validity; values between |.15| and |.35| indicate adequate validity; those between |.35| and |.50| reflect good validity; and correlations equal to or above |.50| indicate excellent validity.

3. Results

Since all survey fields were mandatory, there were no missing data. As a preliminary step, we examined the distribution of specific Internet-use behaviors in the total sample. Nearly all participants reported engaging in social network use ($n = 1244$, 98.50 %; $M_{age} = 40.79$, $SD = 13.69$, range: 18–83; 77.0 % females) and shopping ($n = 1137$, 90.00 %; $M_{age} = 40.10$, $SD = 13.41$, range: 18–78; 76.0 % females). Forty-four percent were involved in gaming ($n = 556$; $M_{age} = 38.61$, $SD = 13.57$, range: 18–74; 66.9 % females) and 29.50 % ($n = 373$; $M_{age} = 33.03$, $SD = 10.48$, range: 18–71; 44.5 % females) in pornography use. A minority (7.10 %, $n = 90$) reported engaging in gambling ($M_{age} = 34.43$, $SD = 11.47$, range: 18–64; 30.0 % females). Moreover, only a small subset of participants ($n = 88$; 6.97 %) reported engaging in a single activity—which in most cases was the use of social networks ($n = 79$; 89.77 %). The remaining participants were exclusively engaged in shopping ($n = 6$), pornography ($n = 2$), or gaming ($n = 1$); no participants reported gambling as their sole activity. Additionally, most participants reported involvement in both social network use and shopping ($n = 1125$, 90.4 %) or gaming ($n = 550$, 44.2 %). Finally, 50 participants (3.96 %) indicated

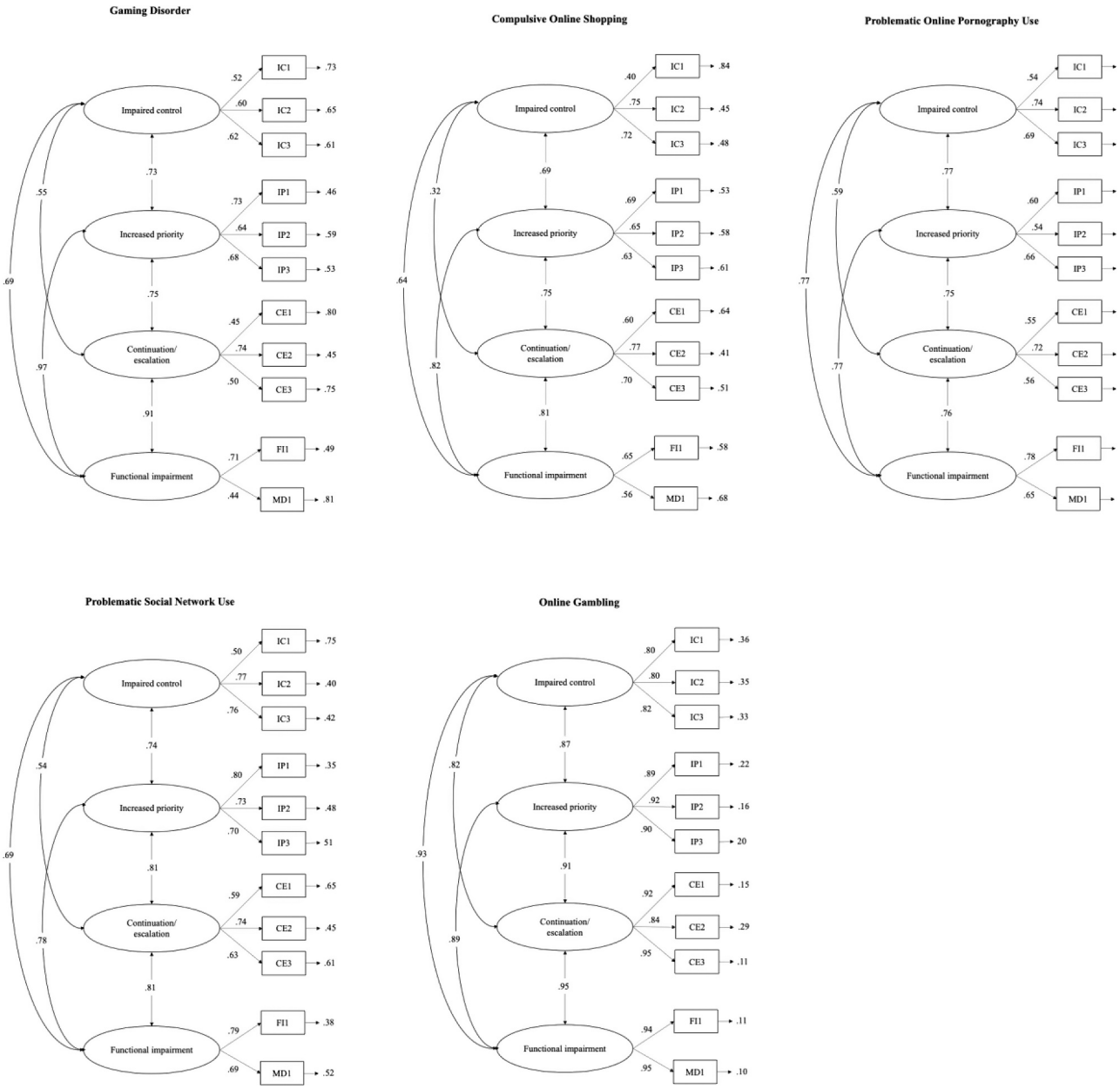

Fig. 2. Standardized solutions of the four-factor models tested for each specific PIUs measured by ACSID-11 (intensity subscale). Note. All estimates were significant at $p < 0.05$.

involvement in all the Internet-based activities.

The χ^2 tests revealed significant associations between gender and most types of online activities. Men were more likely than women to report engaging in online gaming (n = 184, 62.6 % of men vs. n = 372, 38.4 % of women; $\chi^2_{(1)} = 53.58$, $p < 0.001$, $\varphi = 0.21$), online pornography use (n = 207, 70.4 % of men vs. n = 166, 17.1 % of women; $\chi^2_{(1)} = 307.65$, $p < 0.001$, $\varphi = 0.49$), and online gambling (n = 63, 21.4 % of men vs. n = 27, 2.8 % of women; $\chi^2_{(1)} = 118.45$, $p < 0.001$, $\varphi = 0.31$). No associations between gender and either online shopping (n = 273, 92.9 % of men vs. n = 864, 89.2 % of women; $\chi^2_{(1)} = 3.43$, $p = 0.064$, $\varphi = 0.05$) and social network use (n = 286, 97.3 % of men vs. n = 958, 98.9 % of women; $\chi^2_{(1)} = 3.83$, $p = 0.050$, $\varphi = 0.06$) were detected.

3.1. Descriptive statistics of the ACSID-11 items

Table 2 presents the descriptive statistics for all ACSID-11 items, reported separately for each specific PIU and across both the frequency and intensity dimensions.

As reported, all ACSID-11 items resulted in being rated between 0 and 3, reflecting the full range of possible values. Moreover, consistent with expectations for a non-clinical sample, all items exhibited low average scores and right-skewed distributions. Finally, kurtosis was particularly high for most activities for the items of Continuation/ Escalation (CE) dimension and for the Marked Distress item (MD1).

3.2. CFAs

Table 3 shows the fit indices for all tested models for each specific PIU assessed by the ACSID-11, considering frequency and intensity separately.

Considering the four-factor models (Fig. 1 and Fig. 2), the fit indices indicated an excellent overall fit of the data for all PIU, with only a few indices falling within the adequate range (i.e., SRMR for GD Intensity and RMSEA for PSNU Frequency and Online Gambling Intensity).

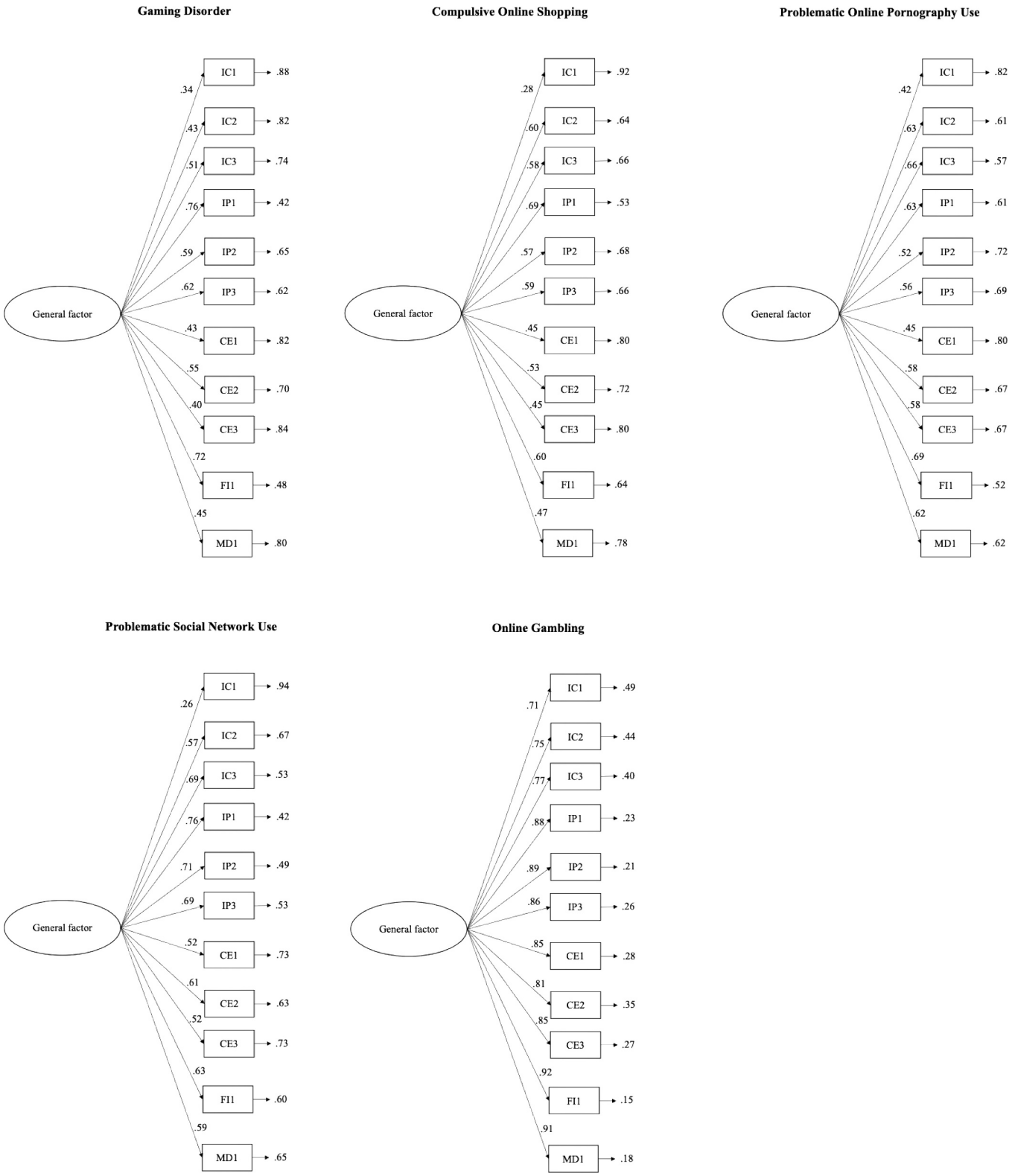

Fig. 3. Standardized solutions of the unidimensional models tested for each specific PIUs measured by ACSID-11 (frequency subscale). Note. All estimates were significant at $p < 0.05$.

However, as reported in Supplementary Table 2 and shown in Fig. 1, the model concerning the frequency of GD symptoms displayed an anomalous value, i.e. a correlation exceeding the value of 1. High intercorrelations were found among the factors.

The unidimensional models were tested and yielded at least an acceptable overall fit, although in some cases the χ^2/df ratio, RMSEA, and/or CFI exceeded recommended cutoffs. No anomalous values were detected (see Supplementary Table 2, Fig. 3, and Fig. 4). Furthermore, across all behavioral domains, visual inspection of model fit indicated that the four-factor models provided a superior fit compared to their

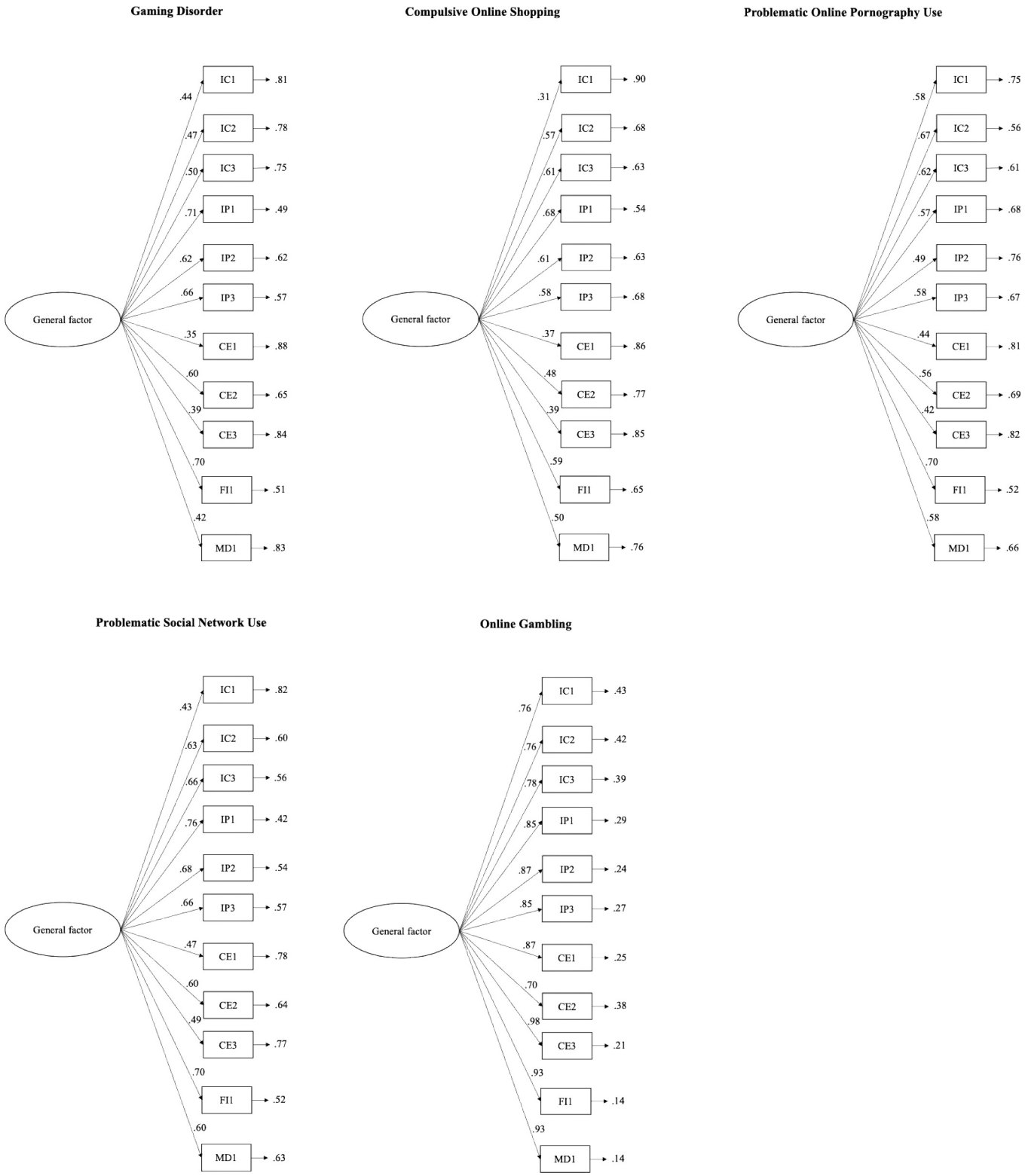

Fig. 4. Standardized solutions of the unidimensional models tested for each specific PIUs measured by ACSID-11 (intensity subscale). Note. All estimates were significant at $p < 0.05$.

respective unidimensional counterparts.

To account for the high intercorrelations among the factors, we tested both second-order factor models and bifactor models. Regarding the second-order factor models, the results showed a visually similar excellent fit compared to the four-factor models (see Table 3). Moreover, for all specific Internet-use behaviors considered, the four (first-order) factors loaded highly onto the (second-order) general factor, which supports the use of an overall score. However, like the four-factor models, some of the second-order models exhibited anomalous values (see Supplementary Table 2, Fig. 5, and Fig. 6).

The tested complementary bifactor models showed a visually comparable or superior fit. However, for some behaviors a model could not

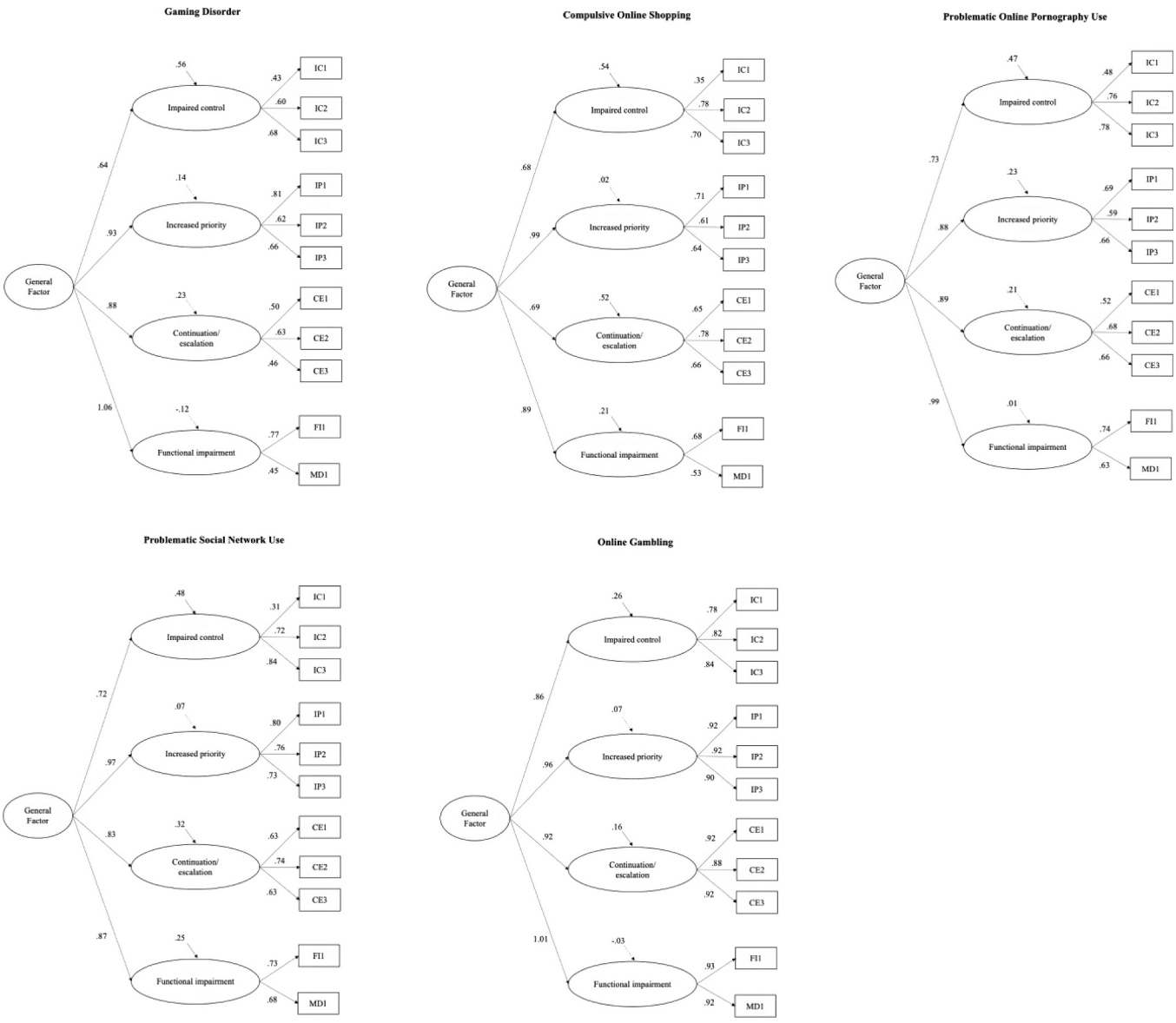

Fig. 5. Standardized solutions of the second-order factor models tested for each specific PIUs measured by ACSID-11 (frequency subscale). Note. All estimates were significant at $p < 0.05$, except for the dashed lines, which represent non-significant estimates.

be identified, and when a model was identified, it often exhibited anomalous values (see Supplementary Table 2, Figs. 7–8).

Taken together, the results suggest that the four-factor model as well as the bifactor/second-order models provided the best overall fit to the data (see the comparison results reported in Table 4). These findings support the appropriateness of using both the specific dimensional scores and a total score of ACSID-11.

Table 5 reports descriptive statistics for ACSID-11 total scores and each of the four factors, presented separately for all assessed Internet-use behaviors.

3.3. Validity and reliability

ACSID-11 scores were positively and statistically significantly correlated with the scores derived from validated instruments assessing PIUs, demonstrating adequate effect sizes when compared to measures targeting the same behavioral domain. Regarding the link with psychological distress, ACSID-11 scores showed significant correlations with PHQ-9 and GAD-7, with inadequate to adequate correlations depending on the specific behavior assessed. In contrast, correlations with life satisfaction (SWLS) revealed statistically significant negative associations exclusively for the frequency of PSNU and for both the frequency and intensity dimensions of Online Gambling, with inadequate and adequate effect sizes, respectively. Table 6 presents internal consistency coefficients (Cronbach's α and McDonald's ω) and Pearson's correlation values for the ACSID-11. Moreover, Supplementary Table 3 shows the corresponding sample sizes (n) for each correlation.

4. Discussion

This research aimed to explore some psychometric properties of the Italian translation of the Assessment of Criteria for Specific Internet-use Disorders (ACSID-11; Müller et al., 2022)—currently the only available instrument designed for the rapid screening of five problematic patterns of Internet use, including the two behavioral addictions recognized by the ICD-11 (WHO, 2018), namely gaming and gambling disorders. Accordingly, we replicated the analyses originally conducted by Müller et al. (2022), who developed the scale, and further extended the psychometric evaluation by examining the validity of the ACSID-11 in greater detail.

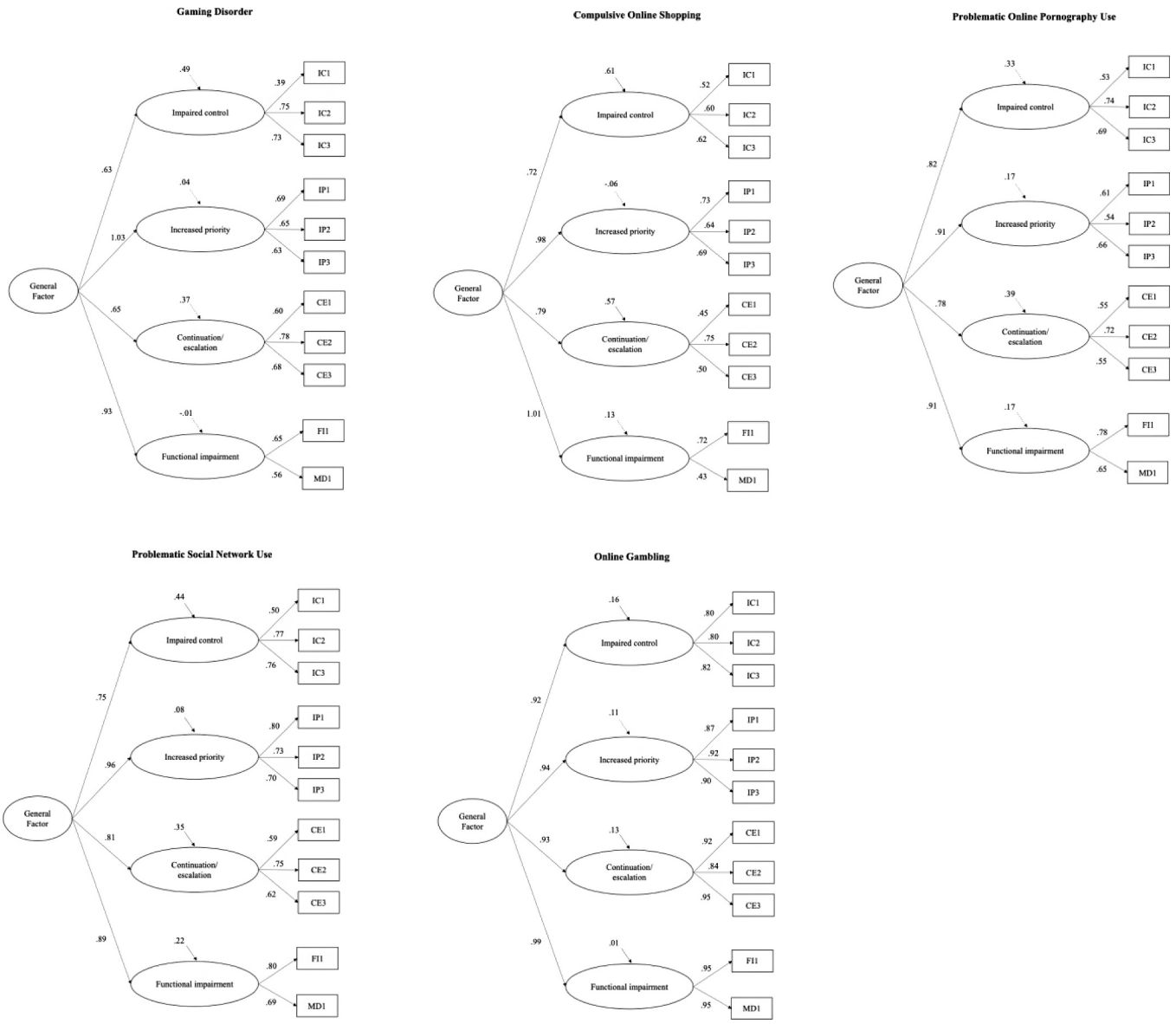

Fig. 6. Standardized solutions of the second-order factor models tested for each specific PIUs measured by ACSID-11 (intensity subscale). Note. All estimates were significant at $p < 0.05$, except for the dashed lines, which represent non-significant estimates.

Consistent with findings from the German sample reported by Müller et al. (2022), our results show that social network use and online shopping are highly prevalent, with nearly all participants endorsing these activities. In contrast, engagement in online gaming, pornography, and gambling was less frequent, with gambling being the least reported behavior—showing even lower prevalence than in the German sample (Müller et al., 2022). Additionally, participants typically engaged in multiple Internet-based activities, highlighting a substantial co-occurrence among these behaviors. However, given that our sample was drawn from the general population, mean scores for ACSID-11 items were generally low across all domains.

Regarding the factorial structure of the ACSID-11, we initially tested a four-factor model comprising Impaired Control, Increased Priority, Continuation/Escalation, and Functional Impairment. This model generally demonstrated an excellent fit. Given the high inter-factor correlations, we also tested a unidimensional model, in which all items loaded onto a general factor. This model yielded an acceptable overall fit, with the four-factor solution demonstrating superior performance over unidimensional alternatives—consistent with findings reported by Müller et al. (2022). As an additional approach to account for the high inter-factor correlations, we tested both second-order and bifactor models for each Internet-based behavior. These analyses indicated that the second-order models demonstrated comparable (or superior) fit to the four-factor solutions. Indeed, for some PIU domains, the bifactor models could not be identified or exhibited anomalous parameter estimates. These identifiability issues and anomalous findings are consistent with evidence from the bifactor modelling literature, which indicates that when indicator loadings are highly homogeneous or when the general factor is dominant, bifactor models may become unidentifiable or yield unstable parameter estimates (Eid, Krumm, Koch, & Schulze, 2018; Rodriguez, Reise, & Haviland, 2016). Therefore, these results further supported the use of an overall composite score. We also performed chi-square difference testing to identify which model best represented the data (Brown, 2015). These statistical comparisons further supported that the four-factor and bifactor/second-order models provided the best overall fit. Accordingly, our findings support the use of both the specific subdimension scores—Impaired Control, Increased Priority, Continuation/Escalation, and Functional Impairment—as well as the frequency and intensity total scores of the ACSID-11 when applied to the Italian general population. Moreover, analyses based on the

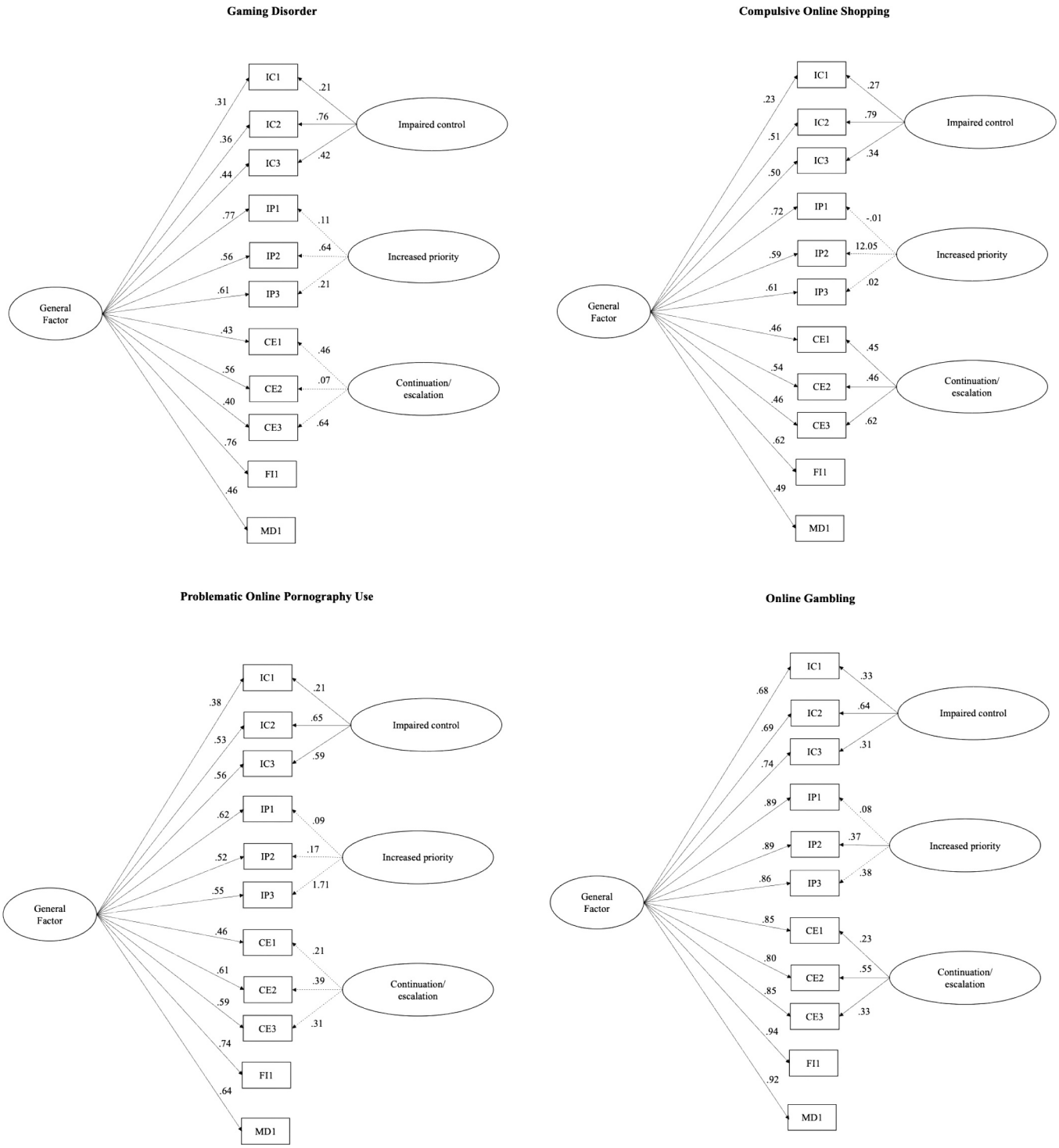

Fig. 7. Standardized solutions of the bifactor models tested for each specific PIUs measured by ACSID-11 (frequency subscale). Note. All estimates were significant at $p < 0.05$, except for the dashed lines, which represent non-significant estimates.

subsample of participants who completed all measures indicated good internal consistency for both the Frequency and Intensity total scores across the five Internet-use behaviors.

As expected, strong and statistically significant positive correlations were found between ACSID-11 total scores for Frequency and Intensity and validated instruments assessing the same specific problematic Internet use patterns (e.g., ACSID-11 scores for PSNU were highly correlated with scores from the BSMAS). Interestingly, the ACSID-11 scores related to online gambling did not show statistically significant correlations with other ACSID-11 domains. The lack of significant correlations between ACSID-11 scores related to online gambling and the other Internet-based behaviors may reflect a conceptual distinction: in gambling, the object of addiction is gambling activity itself, with the Internet primarily serving as an accessible delivery mechanism. In contrast, in behaviors such as PSNU and GD, the online environment is not merely a facilitator of addictive behavior but also a core component of the addictive experience—providing stimuli, feedback, and interaction opportunities that would otherwise not exist offline. This

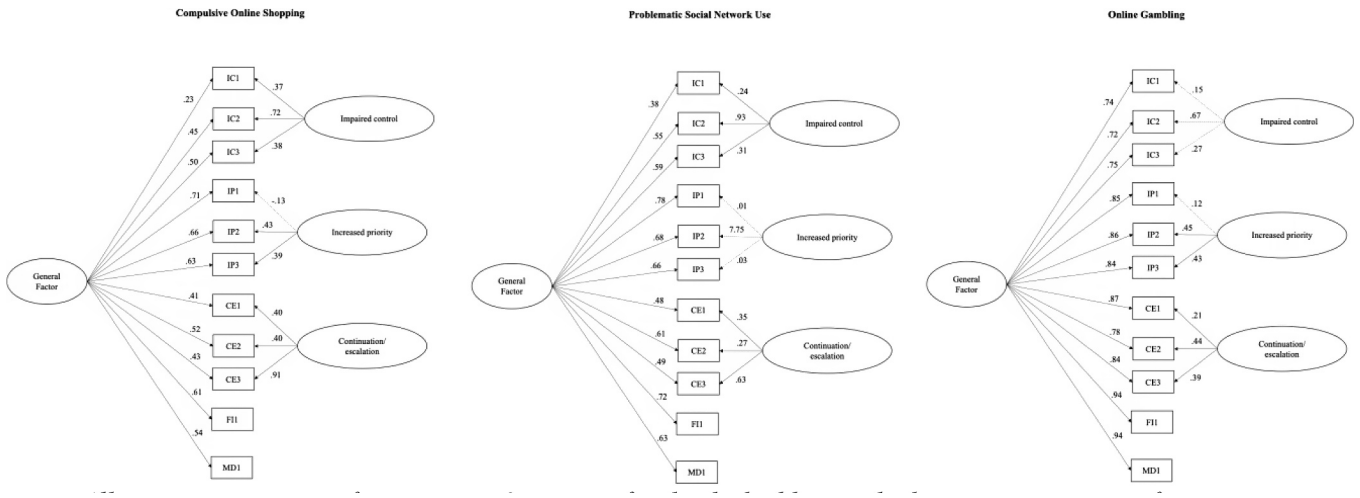

Fig. 8. Standardized solutions of the bifactor models tested for each specific PIUs measured by ACSID-11 (intensity subscale). Note. All estimates were significant at $p < 0.05$, except for the dashed lines, which represent non-significant estimates.

Table 4
Model comparison statistics for all tested models of specific PIUs measured by ACSID-11 (N = 1263).

Specific Internet-use disorder	Dimension	Model	*df*	χ^2	$\Delta\chi^2$	Δdf	*p*
Gaming Disorder	Frequency	Bifactor	35	42.489			
		Four-factor	38	51.120	9.903	3	0.019
		Second-order factor	40	53.659	5.008	2	0.082
		Unidimensional	44	95.835	66.144	4	<0.001
	Intensity	Bifactor	–	–			
		Four-factor	38	64.584			
		Second-order factor	40	66.903	3.365	2	0.186
		Unidimensional	44	91.203	34.863	4	<0.001
Compulsive Online Shopping	Frequency	Bifactor	35	71.620			
		Four-factor	38	67.447	−24.457	3	1
		Second-order factor	40	83.664	23.994	2	<0.001
		Unidimensional	44	178.324	143.174	4	<0.001
	Intensity	Bifactor	35	73.113			
		Four-factor	38	62.396	−15.309	3	1
		Second-order factor	40	88.237	36.291	2	<0.001
		Unidimensional	44	178.924	86.884	4	<0.001
Problematic Online Pornography Use	Frequency	Bifactor	35	14.648			
		Four-factor	38	19.227	6.365	3	0.095
		Second-order factor	40	20.970	3.960	2	0.138
		Unidimensional	44	46.691	45.282	4	<0.001
	Intensity	Bifactor	–	–			
		Four-factor	38	24.261			
		Second-order factor	40	26.049	2.4603	2	0.292
		Unidimensional	44	37.535	22.4456	4	<0.001
Problematic Social Network Use	Frequency	Bifactor	–	–			
		Four-factor	38	92.437			
		Second-order factor	40	105.225	22.151	2	<0.001
		Unidimensional	44	256.809	240.135	4	<0.001
	Intensity	Bifactor	35	84.909			
		Four-factor	38	87.579	3.892	3	0.273
		Second-order factor	40	106.707	34.906	2	<0.001
		Unidimensional	44	220.128	194.659	4	<0.001
Online Gambling	Frequency	Bifactor	35	3.6504			
		Four-factor	38	3.7394	0.5552	3	0.907
		Second-order factor	40	4.5419	3.5929	2	0.166
		Unidimensional	44	10.8136	28.0524	4	<0.001
	Intensity	Bifactor	35	4.7474			
		Four-factor	38	4.9011	1.1334	3	0.769
		Second-order factor	40	5.6608	3.4310	2	0.180
		Unidimensional	44	8.2008	12.8677	4	0.012

interpretation remains speculative, if not merely suggestive, given the limited size of the subsample reporting engagement in online gambling.

Finally, we examined the correlations between ACSID-11 Intensity and Frequency total scores and well-established psychological scales assessing well-being. Across all ACSID-11 domains, positive correlations emerged with measures of depression and anxiety—mostly statistically significant—with the strongest associations observed for PSNU and Online Gambling. Regarding life satisfaction, statistically significant negative correlations were found exclusively with PSNU and Online Gambling. These results suggest that these two Internet-based behaviors are most strongly associated with psychological impairment, even within a general population sample. They should therefore be

Table 5
Descriptive statistics of the factor and overall scores of the ACSID-11 for all the specific PIUs.

	Gaming Disorder (n = 556)		Compulsive Online Shopping (n = 1137)		Problematic Online Pornography Use (n = 373)		Problematic Social Network Use (n = 1244)		Online Gambling (n = 90)	
	Min-max	*M(SD)*	*Min*-max	*M(SD)*	*Min*-max	*M(SD)*	*Min*-max	*M(SD)*	*Min*-max	*M(SD)*
Frequency										
IC	0–2.67	0.90(0.68)	0–3	0.88(0.67)	0–3	0.86(0.71)	0–3	1.61(0.79)	0–3	1.13(0.96)
IP	0–3	0.38(0.57)	0–2.67	0.22(0.43)	0–2	0.21(0.42)	0–3	0.59(0.74)	0–3	0.56(0.90)
CE	0–2.33	0.14(0.34)	0–2	0.08(0.27)	0–2	0.11(0.31)	0–3	0.24(0.47)	0–3	0.41(0.81)
FI	0–3	0.31(0.51)	0–2.50	0.25(0.46)	0–2.50	0.25(0.47)	0–3	0.60(0.71)	0–3	0.63(0.98)
Total	0–2.09	0.44(0.41)	0–1.91	0.37(0.35)	0–2.09	0.37(0.38)	0–2.73	0.77(0.54)	0–3	0.69(0.84)
Intensity										
IC	0–2.67	0.60(0.58)	0–2.67	0.53(0.55)	0–3	0.58(0.64)	0–3	1.11(0.73)	0–3	0.87(0.93)
IP	0–2.67	0.30(0.50)	0–3	0.17(0.38)	0–2	0.17(0.39)	0–3	0.45(0.62)	0–3	0.54(0.89)
CE	0–3	0.12(0.33)	0–3	0.07(0.26)	0–2.33	0.10(0.30)	0–3	0.19(0.42)	0–3	0.36(0.77)
FI	0–2.50	0.23(0.44)	0–2	0.18(0.38)	0–3	0.23(0.46)	0–3	0.44(0.63)	0–3	0.57(0.97)
Total	0–1.91	0.32(0.37)	0–1.73	0.24(0.30)	0–1.91	0.27(0.35)	0–2.45	0.56(0.48)	0–3	0.59(0.82)

Note. IC = impaired control; IP = increased priority; CE = continuation/escalation; FI = functional impairment.

considered priorities in the development of preventive interventions.

The present study offers meaningful implications for both research and clinical practice. The ACSID-11 distinguishes itself as a unified, ICD-11-based instrument, making it well suited for research aimed at screening and comparing multiple forms of PIUs within a single conceptual framework. This approach provides an advantage compared to administering multiple, separate, single-behavior scales that are often based on different conceptual frameworks. Consequently, the ACSID-11 is also particularly effective for large-scale epidemiological surveys, where time efficiency is paramount. Moreover, the ACSID-11 also proves to be a useful tool in initial clinical triage settings, as it enables practitioners to rapidly identify the co-occurrence of PIU behaviors and potential shared aetiological risk processes. Furthermore, the availability of the Italian version of the ACSID-11 is expected to promote more consistent cross-cultural investigations and substantially enhance the comparability of data between the Italian population and international cohorts. This standardisation is vital, as it offers the local healthcare system an agile and up-to-date clinical screening tool grounded in the latest international diagnostic criteria.

4.1. Limitations and future directions

Despite the undoubted interest of the present findings, several limitations should be acknowledged. First, data were collected exclusively online, which may have introduced a sampling bias by excluding individuals who do not actively use social networks. However, this procedure is widely adopted in contemporary research and has been recognized as an appropriate method for collecting large and diverse samples (Arman, 2023). Moreover, since the aim of the present study was to assess the psychometric properties of an instrument targeting online activities, such a data collection method can be considered particularly suitable. Second, the sample was unbalanced in terms of gender distribution, with women representing approximately three times the number of men (76.7 % women). Nevertheless, this pattern is frequently reported in survey-based research, as women are generally more likely than men to participate in both in-person and online studies (Keeble, Baxter, Barber, & Law, 2015; Stone et al., 2024). Moreover, a similar gender distribution was observed in studies conducted to adapt the ACSID-11 in other countries, such as for the Thai version (Yang et al., 2023; 72.6 % women) and the Malay version (Siaw et al., 2025; 69.7 % women). Despite this, future studies should seek to achieve a more balanced gender ratio to minimize potential biases. Third, the present study relied on a non-clinical sample, which implies that the results do not allow for evaluating whether the ACSID-11 can be employed as a diagnostic tool or for establishing potential cut-off scores. Future research should include clinical samples to further assess the diagnostic sensitivity and specificity of the ACSID-11, particularly among individuals diagnosed with officially recognized behavioral addictions, i.e. Gaming Disorder and Gambling Disorder. Fourth, participation in some Internet-based behaviors was relatively low, particularly for online gambling and online pornography use. Therefore, future studies should aim to include a greater number of participants engaged in these less prevalent behaviors to ensure representativeness and to address issues related to model non-identification observed in some of the more complex models tested through CFA. Moreover, as recommended by Müller et al. (2022), future research based on larger and more diverse samples should examine the measurement invariance of the ACSID-11 across different groups (e.g., gender, age) and populations. Finally, longitudinal designs are warranted to better examine the temporal stability and predictive validity of the measure.

5. Conclusions

The present study introduces the Italian adaptation of the ACSID-11 and finds further empirical support regarding its psychometric strengths. In addition to replicating the analytical procedures outlined by Müller et al. (2022), we extended the evaluation of convergent validity—limited initially to GD—by incorporating previously validated instruments for each of the five Internet-use behaviors assessed (Oelker et al., 2024). Notably, the ACSID-11 offers a unique advantage over existing validated tools by enabling a rapid and comprehensive screening of multiple patterns of problematic Internet use within a single framework.

CRediT authorship contribution statement

Simon Ghinassi: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Giulia Fioravanti:** Writing – review & editing, Supervision, Project administration. **Maria Anna Donati:** Writing – review & editing, Supervision, Methodology. **Caterina Primi:** Writing – review & editing, Methodology. **Yura Loscalzo:** Writing – original draft, Formal analysis. **Silvia Casale:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Data curation, Conceptualization.

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Table 6
Pearson's Correlations Between ACSID-11 scores and all the other self-report measures.

	α	ω	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. ACSID-11_Fr_GD	0.81	0.83	1																	
2. ACSID-11_In_GD	0.83	0.84	0.93**	1																
3. ACSID-11_Fr_COS	0.79	0.84	0.36**	0.37**	1															
4. ACSID-11_In_COS	0.80	0.83	0.40**	0.48**	0.91**	1														
5. ACSID-11_Fr_POPU	0.83	0.86	0.41**	0.39**	0.32**	0.36**	1													
6. ACSID-11_In_POPU	0.83	0.86	0.37**	0.41**	0.26**	0.38**	0.93**	1												
7. ACSID-11_Fr_PSNU	0.86	0.87	0.32**	0.35**	0.52**	0.50**	0.41**	0.39**	1											
8. ACSID-11_In_PSNU	0.87	0.88	0.28**	0.35**	0.48**	0.53**	0.37**	0.39**	0.90**	1										
9. ACSID-11_Fr_OG	0.97	0.97	−0.12	−0.08	−0.16	−0.02	0.12	0.14	0.11	0.17	1									
10. ACSID-11_In_OG	0.97	0.97	−0.10	−0.04	−0.10	0.08	0.11	0.15	0.15	0.22	0.94**	1								
11.IGDS9-SF	0.86	0.88	0.65**	0.65**	0.09	0.16**	0.38**	0.37**	0.22**	0.21**	−0.09	−0.04	1							
12. COSS	0.95	0.95	0.15**	0.17**	0.47**	0.48**	0.07	0.08	0.31**	0.35**	−0.08	−0.02	0.21**	1						
13. CYPAT	0.84	0.87	0.34**	0.32**	0.09	0.17**	0.66**	0.66**	0.23**	0.22**	0.11	0.13	0.43**	0.25**	1					
14. BSMAS	0.84	0.85	0.08	0.11*	0.25**	0.28**	0.19**	0.21**	0.63**	0.67**	0.18	0.24	0.22**	0.41**	0.23**	1				
15. CPGI	0.95	0.96	−0.07	0.01	−0.08	0.12	−0.02	0.06	0.08	0.14	0.86**	0.92**	0.05	0.03	0.13	0.17	1			
16. PHQ-9	0.87	0.88	0.15**	0.17**	0.15**	0.21**	0.10	0.14*	0.36**	0.41**	0.50**	0.60**	0.24**	0.32**	0.18**	0.51**	0.55**	1		
17. GAD-7	0.91	0.91	0.07	0.11*	0.14**	0.19**	0.11*	0.16**	0.32**	0.36**	0.48**	0.56**	0.18**	0.29**	0.19**	0.45**	0.54**	0.77**	1	
18. SWLS	0.91	0.91	−0.06	−0.07	−0.05	−0.05	−0.08	−0.06	−0.14**	−0.16**	−0.35**	−0.42**	−0.13**	−0.17**	−0.09	−0.21**	−0.34**	−0.54**	−0.43**	1

Note. fr = frequency; In = intensity; GD = Gaming Disorder; COS = Compulsive Online Shopping; POPU = Problematic Online Pornography Use; PSNU = Problematic Social Network Use; OG = Online Gambling; IGDS9-SF = Internet Gaming Disorder Scale–Short-Form; COSS = Compulsive Online Shopping Scale; CYPAT = Cyber Pornography Addiction Test; BSMAS = Bergen Social Media Addiction Scale; CPGI = Canadian Problem Gambling Index; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = General Anxiety Disorder Scale-7; SWLS = Satisfaction With Life Scale; DES-II* = $p < 0.05$; ** = $p < 0.01$; α and ω were calculated on the sub-sample (n = 999).

Declaration of competing interest

All authors declare that they have no financial or personal relationships with individuals or organizations that could inappropriately influence or bias their work.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.addbeh.2025.108580.

Data availability

Data will be made available on request.

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