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The Measurement of Internet Addiction; Tentative Observations

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ABSTRACT
The proposed paper aims to investigate the Young Internet Addiction Test (Y-IAT), the Chen Internet Addiction Scale (C-IAS), and the Compulsive Internet Use Scale (CIUS). These widely used scales have made significant contributions to identifying Internet Addiction (IA) in different social contexts. After reviewing the available literature on IA, and findings in the ongoing empirical research maintained that, the concept of 'IA' and 'IA-scales' needs to be readjusted. The available quantitative data collected through e-interview-schedule used upon the age group of 14 to 30 years revealed that, there is an increasing trend of social media (SM) use and gaming and case studies explored the subjective patterns of internet use which finally comes to the conclusion that, over internet use interwoven in needs, habits and social circumstances of an individual user.

Keywords: Internet Addiction Scales, Adaptation, Internet Usage Patterns, Western societies, Indian society

Introduction: The study investigated the term 'IA' and found that popular 'IA' scales cannot accurately identify the emerging problems resulting from the widespread and diverse use of the internet (Aziz et al., 2020). These IA scales were developed in various cultural contexts and used by researchers to identify 'IA'. However, over the last two decades, internet usage has grown exponentially around the world, encompassing diverse segments of the population based on age, gender, and geographical location. This rapid increase and inclusion of diverse demographics has led to a corresponding expansion in the nature of internet use, particularly with the proliferation of social media (SM) and gaming.

Given these considerations, the study examined several IA scales and selected three widely used scales specifically employed in Indian populations for further review. These selected scales were the Young Internet Addiction Test (Y-IAT) (Young K. , 1998), the Chen Internet Addiction Scale (C-IAS) (Chen et al., 2003), and the Compulsive Internet Use Scale (CIUS) (Dhir et al., 2015). Upon reviewing these scales, it was found that despite adaptations for use in Indian society, their reliability remains in question. Accordingly, a study was conducted using quantitative and qualitative approaches in rural parts of Murshidabad, West Bengal, India. The empirical findings further confirmed the issues previously identified in the literature. The research identified a gap that underscores the need for a more comprehensive approach (focusing on case studies) to understanding emerging patterns of internet use. Furthermore, the study indicated an increasing trend of excessive SM use and gaming among adolescents and youth.

Theoretical Framework:

The use of the internet has been steadily increasing since its inception. Currently, there are 4.66 billion active internet users globally (Sharma et al., 2022). With its integration into all aspects of life, many users are becoming addicted to emerging technology. The past two decades have seen a rising trend of various addictions in different parts of the world, especially during the COVID-19 pandemic (Meng et al., 2022). Goldberg was the one who first used the term "IA" and he connected it to substance abuse (Aziz et al., 2020). Young (1998) attempted to measure internet use, coining the term 'IA' and suggesting that over internet use can lead to a non-substance addiction similar to substance addiction. However, there is no consensus among scholars on the use of the term 'IA'. Different scholars use various terms to describe excessive internet use, such as "Internet Addiction

Disorder", "Excessive Internet Use," and "Compulsive Internet Use" (Widyanto et al., 2011). Young identified a set of criteria to differentiate between normal internet use and addiction (Young K. , 1998). Scientific research in the field suggests that behavioral addictions resemble substance addiction in many ways (Grant, 2010) (Griffiths, 2005). Various irresistible, repetitive, and harmful behaviors such as gambling (Ide-Smith & Lea, 1988), sex (Irvine, 1995), overeating (Orford, 2001), and non-professional use of the internet resemble clinical addictions and also share neurobiological underpinnings with substance addictions such as alcohol. The similarity between various drug addiction and behavioral addiction models is derived from recognized generic disturbances in the basic drives of human behavior. Both types of addictions (behavioral and drug addictions) share a common disturbance in the transformation of basic drives essential for survival (Martin & Nancy, 2005).

Identification and measuring of IA with different scales and models reveals different results that depend upon the type of recruited participants. When adapting for Indian society researches encountered several issues. These issues are anticipated in two ways; (a) increasing use of internet now reaches to different segments of populations in terms of class, age, region and profession, (b) now varied usage patterns of internet such as excessive use of SM, browsing e-shopping website and excessive gaming needs more comprehensive scales. In such varied patterns it can be argued that individual differences that interact with environmental factors lead to excessive internet use rather than described as IA (Rooij & Prause, 2014). Therefore, it is appropriate to define each addiction separately. Young (1998) was the first in the field who identified the internet addiction on the pattern of gambling and substance addiction (Young K. S., 1998). Identification and measurement of IA ignites the scholarly debates that moving around the nature of addiction. In such scenario using the term IA is not helpful for the subjective (Griffiths, 2005) understanding of the addiction. To find out emerging subjective use of internet the available literature that was focusing on the IA was needed to explore. To fulfill such needs, concept of IA and IA scales needs to be re-examined. Therefore, after discussion on the concept of IA, the popular IA scales will be explain.

There are forty-five scales (Laconi et al., 2014) assessing IA, we analyze widely discussed and popular models of IA. After reviewing four popular scales namely; (Young Internet Addiction Test (Y-IAT) (Young K. S., 1998) (Young K. , 1998) (Widyanto et al., 2011), Griffiths Component model (Griffiths, 2005) (Rooij & Prause, 2014), Pathological Internet Use Scale (Morahan-Martin & Schumacher, 2000) (Niculovic et al., 78-87), Chen Internet Addiction Scale (C-IAS) (Chen et al., 2003) and Compulsive Internet Use Scale (CIUS) (Meerkerk et al., 2009) (Alavi et al., 2011) the three widely used and comprehensive scales were selected for final review. These three scales are Y-IAT, C-IAS and CIUS discussed below.

Young IAT (Y-IAT): The Y-IAT scale was popularized through the expanded 20-item scale discussed in the book entitled *Caught in the Net: How to Recognize the Signs of Internet Addiction—and a Winning Strategy for Recovery (1998).* Since then, scholars have incorporated her concept into their studies, making revisions and modifications as needed. However, there are several questions surrounding the conceptualization of the Young model of IA. For instance, the Young (1998) investigation of IA, which is similar to the identification of pathological gambling, reveals that the majority of internet addicts are new internet users rather than non-dependents who have been using the internet for more than twelve months. Young (1998) model of IA shown high face validity but psychometric properties has not been subjected to rigorous psychometric investigation (Widyanto & McMurran, 2004). Her guidelines categorized three level of IA; average internet users, internet users facing frequent problems in daily living and those who are facing significant problems because of internet use. However, Kim, Park, Yu, and Ha (2012) argue that there is insufficient evidence to support this classification. When its psychometric properties further investigated using different sample were showing different results (Widyanto & McMurran, 2004). Young study often accuses for self-selection of the participants (Azar, 2000). There are long list of studies in different parts of the world using the Y-IAT. Korean version of Y-IAT recruited the sample of internet addicted from a hospital. Contrary to the hypothesis in the study Y-IAT has very little value for internet addicted persons admitted in the hospital. (Kim et al., 2012). In a study conducted upon pathological online gamblers which aimed to find out psychometric properties and validity of the Compulsive Internet Use Scale (CIUS) and the German version of Internet Addiction Test (GIAT). The internal consistencies of the CIUS and the GIAT were assessed with Cronbach's α scores. Which found a low Cronbach's score. The low correlation with GIAT subscale may be low reliability of this subscale (Guertler et al., 2013). In the study adaptation of Y-IAT to GIAT and different psychometric properties evident that Y-IAT is required for improvement and adaptation. A study conducted on the students of Hong Kong from grades five to nine further check the validity and reliability of Y-IAT, which concluded that adaptation is essential requirement for Y-IAT before to implement on other culture and social groups (Ngai, 2007).

There are the several studies in India using the adapted version Y-IAT. In each study Y-IAT has been adapted as per the requirement of the studied population. In a study on professionals conducted by Spoorthy et al. (2021) suitability of psychometric properties of Y-IAT has been checked on Indian population. In the study Exploratory Factor analysis was used to find out the factor structure of Y-IAT. Spoorthy et al. (2021) used two factor models; mood-interpersonal issues and duration and productivity. These two factors shows 49% overall variance and the tool also had high internal consistency upon used sample (Spoorthy et al., 2021). In a study on Indian southern city psychometric properties of Y-IAT has been analyzed. The study revealed that young adults can understand Y-IAT as having a single-factor structure. The adapted i.e., shortened form of Y-IAT is capable of detecting IA among young adults (Sharma et al., 2022). Researchers conducted a study on the Indian population in the Delhi-NCR region using Y-IAT, focusing on adolescents from the normal, mild, and severe categories of IA. The study also modified two questions as per the requirement of Indian values and culture (Sinha et al., 2020). It is evident that, Y-IAT required further adaptations for Indian populations. The suggestions and adaptations arises due to the emerging need of the internet that enters on the phase of diverse use for different populations. In that scenario, only using the Y-IAT is questionable. Therefore, Young (1998) model of IA needs to be revisited because of the emerging field researches. New field researches identified the internet usage patterns on diverse population and culture that needs adaptation of the Young model.

Chen Internet Addiction Scale (C-IAS): Among several popular scales, C-IAS has significantly contributed to the intellectual field of measuring internet use. Originally, the scale was framed to ascertain addictive behavior within Chinese cultural settings (Chen J, 2021). Several studies in China have used the original scale, and Ko et al. (2005) applied it to Taiwanese adolescents. Six countries, including China, have used the revised version of the original scale; these include Hong Kong, Japan, South Korea, Malaysia, and the Philippines (Mak K. et al., 2014). Even the revised version needs further revision if it applies outside Southeast Asia. It consists of 26 items and is rated on a four-point Likert scale (Laconi et al., 2014). Like many other scales, C-IAS derives its theoretical basis from substance dependence and pathological gambling. Targeted interviews helped frame the scale's items (Chen et al., 2003), and minor changes to the available items led to a retest. The self-reported scale is based on five dimensions, including compulsive internet use, withdrawal, tolerance, and problems managing time, relationships, and health (Ko et al., 2005). Different methods and scales in the field of measuring over-the-internet use effectively check its psychometric properties and concurrent validity. The psychiatrist interview (Ko et al., 2005) method was used to overcome the difficulties of a lack of participants' information, and Y-IAT was used to check the concurrent validity (Mak K. et al., 2014) and scientific reliability. Several studies adapted the original C-IAS for use. The revised C-IAS categorized the factors into two categories: (i) symptoms of IA and (ii) related problems of IA. The study identified tolerance, compulsive use, and withdrawal symptoms under the first category, and differently identified health-related and time-management problems under the second category. After amalgamating the first and second categories, we identified five factors in the revised C-IAS (Mak K.-K. et al., 2014). The original C-IAS was also modified as the CIAS-G (gaming version) to assess participants' online gaming experience (Ko C. H., 2019). Despite the C-IAS's popularity in several Asian countries, its use is unknown among the Indian population. After modifications, it can be used on Indian adolescents for future studies.

Compulsive Internet Use Scale (CIUS): The CIUS scale, among a series of introduced scales, aimed to examine internet use more closely than previously used scales. The creators of CIUS combined three distinct approaches, previously replicated and used separately, to identify addiction. They identified seven criteria from substance addiction, ten from pathological gambling (Meerkerk et al., 2009) and six from Griffiths biopsychosocial approach (Griffiths, 2005). Different scales such as the Online Cognition Scale (OCS) and the Y-IAT thoroughly check the concurrent validity of CIUS, confirming its authenticity. It is reliable because it has been used in different parts of the world and on diverse populations. Because it employs multiple approaches simultaneously and undergoes validation through a longitudinal study, it is nearly error-free. It is capable of measuring different aspects of addiction separately, such as gaming addiction. Despite the well-crafted nature of the scale, its application to diverse populations presents certain limitations. Its first use outside the English population was a well-defined cutoff score; the best cutoff point for Persian students was 37 (Alavi et al., 2011). Similarly, when Guertler et al. (2013) applied the CIUS to the German population, they established cut-off points that were unavailable in the original CIUS (Guertler et al., 2013). The original scale contained 14 items measured on a five-point Likert scale (Meerkerk et al., 2009). Several studies have used CIUS with other scales to check the concurrent validity, driven by the emerging need to devise measures for over-the-internet use. Similar to the original use of CIUS with the OCS (online cognition scale), the Indian population also employs it with the Y-IAT (Dhir et al., 2015). Guertler (2013) used CIUS in conjunction with the Composite Diagnostic Interview (CIDI) to assess pathological gambling (Guertler et al., 2013), while Fernandes et al. (2021) combined it with the Escapism Scale and the Rosenberg Self-Esteem Scale (Fernandes et al., 2021). Despite its versatility, scholars tried to improve the original scale with several adaptations and modifications. Recent studies recommend a relatively shorter version of CIUS (Pino et al., 2021) compared to the original CIUS. While analyzing the CIUS, they found that the shortest version (CIUS-

5) has good psychometric properties for different languages. It is found that the original scale, i.e., CIUS-14 psychometric properties, are harder to replicate (Lopez-Fernandez et al., 2019), however useful for identifying internet use among adolescents and adults of different cultures. (Fernandes et al., 2021).

The above discussion on IA scales ascertained that concept of IA and IA scales needs to be revisited which further evident with the latest developed scales. These newly developed scales are more inclusive and using comprehensive tests. Among all scales, CIUS is the most comprehensive, widely used, and popular one. The Indian population and other parts of the world most commonly use the Y-IAT scale. A review of literature and field observations helps to frame arguments in concordance with DSM-V, which specifically mentions 'Internet Gaming Disorder' (American Psychiatric Association, 2013) in Section III entitled *'Emerging Measures and Models'*. The manual emphasizes the need for more comprehensive research in the field of IA because of a lack of conceptual clarity on the concept and nature of IA.

All the discussed IA models emphasize the lack of control over internet use, experience of psychological, social, and professional conflict, and mental preoccupation (Rooij & Prause, 2014). After reviewing the scales, it was found that each scale was lacking in grasping the problematic behavior associated with the varied internet usage patterns further associated with the individual's role in social life. With such theoretical findings, a field study was conducted in 2022-2023 in Murshidabad West Bengal, it was found that many of the young users are either interested in SM or in Gaming. Many times over use of SM and Gaming are responsible for user impairments in various domains of social life.

Empirical Findings: In concordance with the available literature and field observations the study finds a steadily increasing attachment to gaming and social networking among youth and adolescents. The field research findings and accessible secondary data suggest the need for new research instruments to pinpoint the issues related to the growing use of social networking and gaming. The section below presents quantitative data tables that illustrate the behavior of SM users and the prevalence of excessive SM and gaming use. Apart from quantitative data, a few related case studies will also discuss the emerging SM and gaming behavior in the research universe.

In **Table 1**, the preferred use of SM platforms has been reflected. It is showing that use of the internet is based on the interest of the user, is very subjective,

Table 1: Preferred Social Media Use[*]

Preferred SM	Overall (N=315)	Female (N=71)	Male (N=243)
Any other	1.90%	1.41%	2.06%
Facebook	52.06%	36.62%	56.38%
Instagram	2.54%	2.82%	2.47%
Snapchat	1.27%	2.82%	0.82%
Tiktok	1.27%	1.41%	1.23%
Twitter	0.63%	0.00%	0.82%
Whatsapp	10.48%	19.72%	7.82%
Youtube	29.84%	35.21%	28.40%

and is no longer defined simply as internet addiction (IA). In the below **Table 2**, the spending hours on SM reflect the increased use of SM in day-to-day use, which is a further reflection of the specific trend of internet use.

Table 2: Spending Hours on Social Media[#]

Spending Hours on SM	Overall	Male	Female
Less than 1 hour	2.54%	2.06%	4.23%
1 hour	11.43%	8.23%	22.54%
2 hours	14.92%	15.64%	12.68%

[*] In the entire sample which includes total 315 respondents; 244 male, 71 female and 1 transgender is all inclusive and represented the five villages of different blocks of rural Murshidabad. Only one respondent is transgender and use Facebook.

[#] Only one respondent belongs to transgender category and he is spending 3 hours on Social Media.

3 hours	23.49%	23.87%	21.13%
4 hours	18.41%	17.70%	21.13%
More than 4 hours	29.21%	32.51%	18.31%

Internet Gaming Disorder Scale: **Table 3** shows that problematic gaming behavior is a reflection of the increasing trend of gaming in the studied population. We obtained the Internet Gaming Disorder after applying the IGDS9-SF tool. The IGDS9-SF is a short psychometric tool adapted from the nine core criteria that define IGD according to the DSM-5 (American Psychiatric Association, 2013). The scale comprises nine questions that were answered on a five-point Likert scale. The scale's primary goal is not to diagnose GD (Gaming Disorder) but rather to assess its severity and detrimental impact on the gamer's social life. Pontes (2014) maintained that disordered gamers are those who obtained a minimum score of 36 out of a total of 45 points[1] (Pontes, 2015). Below table is showing the summing score of the all nine questions of IGDS9-SF.

Table 3: IGDS9-SF (Obtained Score Table)

Total Increasing Gaming Score	Percentage of individual having specific Gaming Score	Count of 'grouped individuals' having specific Gaming Score
9	5.71%	18
10	0.95%	3
11	2.86%	9
12	2.86%	9
13	2.54%	8
14	2.54%	8
15	2.86%	9
16	3.81%	12
17	5.71%	18
18	26.98%	85
19	5.08%	16
20	7.30%	23
21	3.81%	12
22	3.81%	12
23	3.49%	11
24	1.90%	6
25	3.81%	12
26	1.59%	5
27	6.03%	19
28	0.95%	3
29	0.63%	2
30	1.59%	5
31	1.27%	4
32	0.32%	1
33	0.32%	1
34	0.63%	2
36	0.63%	2
Grand Total	**100.00%**	**315**

After summing up the scores from a total of nine questions, the above table revealed an increasing trend in gaming

[1] After qualitative observations of village society I reached to the argument that, in village society, it is necessary to minimize the cut-off points to achieve a suitable quantitative data representation

among young internet users. The results showed that we cannot categorize the majority of internet users as mere IA sufferer; instead, their usage of newly available applications and gaming activities on Android devices is highly subjective. After analyzing the available quantitative data through **IGDS9-SF** and tables generated through excel **Table 1 and Table 2** the qualitative data in the form of case studies will be presented to find out the subjective patterns of internet use. Two case studies discussed below, will reveal the subjective patterns of internet use. These subjective patterns of internet use revealed that internet usage patterns fluctuate in response to the shifting social circumstances in an individual's social life.

Case Study 1

Demographic Profile and SM Use: Mr. AV is a 23-year-old male who lives in Khanpur village. He recently got married and is currently looking for regular work. He lives with his parents and wife in a house the family owns, along with three shops adjacent to the house. After discontinuing his studies, he was unemployed and used to live in the house and look after the family-owned shops. He spends most of his time on SM and gaming and reported spending around 16 hours a day on these activities.Commentary: Mr. A.V. uses social media and gaming for non-professional purposes. He seems to be addicted to gaming. However, according to him, all is well and fine with his family. I also asked him about his wife's social media habits, to which he responded that she does not own a mobile phone. The other situation relating to the person's gaming and SM habits is his unemployment and available income from the shops adjacent to the house. The tenant utilized these shops, and the rental income from these establishments clearly provided financial benefits to the entire family. These two factors, which are related to unemployment, economic position, and the careful interaction between a husband and wife within a joint family system, could potentially influence his gaming and SM habits. When I discussed his SM habits with him over the phone after six months, he reported a decrease in his gaming hours due to his employment. However, he is still interested in gaming and SM. He also revealed that at the village level, there is a WhatsApp group of gamers on which they share their gaming achievements.

Case Study 2

Demographic profile and social media use*:* Mr. S.S. is a 19-year-old, unmarried male. He lives in Sheshpur village. His family is in an economically humble position. He has three siblings: two brothers and one sister. He spends most of his time on social media and gaming. His family members do not care about his behavior because of his repeated engagement in socially deviant activities.

Commentary: The village labels Mr. S.S. as socially deviant due to his involvement in substance abuse. Such labelling in rural society created a condition of social ostracism for him. This condition of social ostracism led him to engage in excessive gaming behavior, which became a permanent habit.

Above case studies are reflecting the subjective use of internet use rather than simply as 'IA'. The case study 1 is showing the changing habits of Mr A.V. in less than six months. He became less addicted as soon as he finds employment. The case study 2 is reflecting the detrimenatal impact of gaming and SM habits in the user's life. The case is revealing that, when a socially deviant user started to use gaming and SM, it further disintegrates his social life showing the external pressure on individual life rather than simply defining such habits production of internet.

Conclusion: In the present study, it is to be concluded that, initially, the measurement of IA in different societies is a reflection of the available technology that is accessible to individuals. With technology's increasing diversification, its multiple uses have become popular. Such multiple uses required the subjective interpretations of internet use that were lacking in the previous research measuring the 'IA'. In the present study, an attempt has been made to reveal the increasing trend of SM use and gaming. Through the case study methods, supported by quantitative data it was proved that the use of the internet is subjectively attached to the internet user's social life and needs rigorous subjective explanations.

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