



## Short Communication

## The evolution of Internet addiction: A global perspective

Mark D. Griffiths<sup>a,\*</sup>, Daria J. Kuss<sup>a</sup>, Joël Billieux<sup>b</sup>, Halley M. Pontes<sup>a</sup><sup>a</sup> Nottingham Trent University, UK<sup>b</sup> Université Catholique de Louvain, Belgium

## HIGHLIGHTS

- Young's (2015) paper on the evolution of Internet addiction was selective.
- Young's paper omitted important theoretical and empirical work outside the USA.
- The present paper elaborates on important omitted literature.
- The present paper rectifies some of the unsubstantiated statements made by Young.

## ARTICLE INFO

## Article history:

Received 6 October 2015

Received in revised form 30 October 2015

Accepted 1 November 2015

Available online 2 November 2015

## Keywords:

Internet addiction

Internet-related disorders

Internet Gaming Disorder

Internet Use Disorder

Online addictions

## ABSTRACT

Kimberly Young's initial work on Internet addiction (IA) was pioneering and her early writings on the topic inspired many others to carry out research in the area. Young's (2015) recent paper on the 'evolution of Internet addiction' featured very little European research, and did not consider the main international evidence that has contributed to our current knowledge about the conceptualization, epidemiology, etiology, and course of Internet-related disorders. This short commentary paper elaborates on important literature omitted by Young that the present authors believe may be of use to researchers. We also address statements made in Young's (2015) commentary that are incorrect (and therefore misleading) and not systematically substantiated by empirical evidence.

© 2015 Elsevier Ltd. All rights reserved.

Anyone that has worked in the area of Internet addiction (IA) will be aware of and respect the pioneering work of Kimberly Young. There is no doubt that her early writings on the topic inspired many others to carry out research in the area. However, her paper on the 'evolution of Internet addiction' (Young, 2015) – while admittedly personal and brief – mentioned very little of the European research, and did not consider the main international evidence that contributed to our current knowledge about the conceptualization, epidemiology, etiology, and course of Internet-related disorders. Consequently, the present authors are writing this short commentary paper to elaborate on important literature omitted by Young that we believe may be of use to researchers including theoretical and empirical work carried out in Europe, Australia, and South East Asia in the early years of research into the topic (1995–2001).

Young's first published work on IA was a case study of a 43-year old woman published in 1996 (Young, 1996). This was followed in 1998 by an influential book (Young, 1998a) and paper (Young, 1998b) on IA. In Europe, the roots of research into IA began with the publication of Griffiths (1995a) paper on 'technological addictions' that prompted publications on both IA (Griffiths, 1995b, 1996a, 1997, 1998) and specific online addictions such as Internet gambling addiction (Griffiths, 1996b). In addition to the work of Young and Griffiths, the first empirical studies started to appear, including prevalence surveys with self-selected samples, case studies, explorations of psychosocial and psychiatric correlates of IA, and psychometric validation of instruments assessing IA (e.g., Armstrong, Phillips & Saling, 2000; Black, Belsare, & Schlosser, 1999; Brenner, 1997; Chou, 2001; Egger & Rautenberg, 1996; Greenfield, 1999; Kubey, Lavin, & Barrows, 2001; Lavin, Marvin, McLarney, Nola, & Scott, 1999; Leon & Rotunda, 2000; Morahan-Martin & Schumacher, 2000; Orzack, 1999; Orzack & Orzack, 1999; Pratarelli, Browne, & Johnson, 1999; Scherer, 1997; Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000; Treuer, Fabian, & Furedi, 2001; Tsai & Lin, 2001; Xuanhui & Gonggu, 2001).

Arguably, one of the most important issues in the field at present was not addressed at all by Young's brief overview. This concerns

\* Corresponding author at: International Gaming Research Unit, Psychology Division, Nottingham Trent University, Nottingham, NG1 4BU, United Kingdom.

E-mail addresses: mark.griffiths@ntu.ac.uk (M.D. Griffiths), daria.kuss@ntu.ac.uk (D.J. Kuss), joel.billieux@uclouvain.be (J. Billieux), halley.pontes2013@my.ntu.ac.uk (H.M. Pontes).

whether IA can be considered a viable construct, which led experts in the field (i.e., Starcevic & Aboujaoude, 2015) to suggest that the concept of IA is not suitable if it refers to the use of the Internet as a medium to fuel other addictions, or that it should be replaced by addictions to specific online activities (provided that each such activity would have their behavioral addiction patterns ascertained) (Starcevic, 2013). Young (1999) attempted to make distinctions between cybersexual addictions, cyber-relationship addictions, net compulsions, information overload, and computer addiction. In response to this paper, Griffiths (1999, 2000a) argued that many of the excessive users identified by Young were not 'Internet addicts', but just used the Internet excessively as a medium to fuel their other addictions, a view that is now shared by several leading scholars in the field (e.g., Billieux, 2012; Starcevic, 2013).

The dominant view, which indirectly resulted in the APA's choice to favor the term "Internet Gaming Disorder" and reject "Internet addiction", is that a gaming addict is not addicted to the Internet *per se* but simply uses it as a medium to engage in the chosen behavior. Along the same lines, Billieux (2012) argued that Internet-related disorders have to be conceptualized within a spectrum of related and yet independent disorders. Indeed, behavioral addictions such as IGD, online social networking addiction or even online sexual addiction represent dysfunctional behaviors that have been related to both common factors (e.g., heightened impulsivity and addictive personality) and specific factors (e.g., the various motives and dysfunctional cognitions that perpetuate problematic behaviors). According to Montag et al. (2014), it is necessary to conceptually distinguish what appears to be generalized and specific IA, a view that has already been highlighted within the gaming studies field, suggesting that IGD is not the same as IA (Király et al., 2014). Put very simply, as suggested by Griffiths (1999, 2000a), there is a meaningful and conceptual difference between addictions on the Internet and addictions to the Internet.

Notwithstanding this, early case study reports appeared to identify a small number of cases who seemed to be addicted to the Internet itself (e.g., Griffiths, 1996a; Griffiths, 2000b; Leon & Rotunda, 2000; Young, 1996). These were typically individuals that used Internet chat rooms – an activity that they would not engage in anywhere except on the Internet. More recently, the same argument has been used for individuals that appear to be addicted to using social media and social networking sites (Griffiths, Kuss, & Demetrovics, 2014; Kuss & Griffiths, 2011). These individuals are to some extent engaged in social online spaces and may represent themselves differently online than in real life in order to feel good about themselves.

In these cases, the Internet provides an augmented yet limited perspective of reality to users and allows them feelings of belongingness that may be psychologically compensating for the lack of social rewards in their real lives. Such feelings (e.g., immersion in the case of online gaming) may actually lead to an altered state of consciousness that in itself may be highly psychologically and physiologically rewarding (Griffiths, 2000a). Such lines of research also inspired recent studies supporting that the discrepancy between actual versus virtual self is a predictor of excessive involvement in various types of online activities (Bessi re, Seay, & Kiesler, 2007; Billieux et al., 2015; Przybylski, Weinstein, Murayama, Lynch, & Ryan, 2012).

The present authors also note that the IA conceptual framework used in Young's commentary is limited to the very recent and neurobiological-centered model proposed by Brand, Young and Leier (2014). Although relevant and convincing regarding its purposes, this model is one attempt among others in explaining Internet-related disorders. Furthermore, Brand and colleagues' model lacks robust empirical validation (Pontes, Kuss, & Griffiths, 2015). In the present authors' view, there is currently no international consensus regarding the conceptualization and diagnosis of Internet-related disorders (e.g., Griffiths et al., 2015; King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013; Pies, 2009), and this is a key criticism of this developing research area. For example, Young (2015) made no mention of the influential cognitive-behavioral approach developed by Davis (2001), which

inspired an upsurge of psychometric cognitive-behavioral studies (e.g., Caplan, 2002).

Related to the debate about addictions on the Internet versus addictions to the Internet, Davis' model of pathological Internet use (PIU) was the first to differentiate between generalized pathological Internet use (GPIU) and specific pathological Internet use (SPIU). Davis considers SPIU as a type of IA where people pathologically engage in a specific function or application of the Internet (e.g., gambling, gaming, shopping), whereas GPIU is a more general, multi-dimensional pathological use of the Internet. Davis introduced concepts such as distal and proximal contributory causes of PIU. On the one hand, distal causes may include pre-existing psychopathology (e.g., social anxiety, depression, substance dependence) and behavioral reinforcement (i.e., provided by the Internet itself throughout the experience of new functions and situational cues that contribute to conditioned responses). On the other hand, proximal causes may involve maladaptive cognitions that are seen as a sufficient condition with the potential to lead to both GPIU and SPIU and also cause symptoms associated with PIU (Montag et al., 2014). Similarly, Young (2015) also ignored recent models that view dysfunctional Internet use as a compensatory strategy rather than a genuine addictive behavior (Kardefelt-Winther, 2014; Schimmenti & Carretti, 2010). The research highlighted in this commentary provides only a few examples to indicate that the literature on Internet-related disorders greatly flourished at the international level within the last ten years.

It should also be noted that there were also statements made in Young's (2015) commentary that are incorrect (and therefore misleading) and not systematically substantiated by empirical evidence. For instance:

- Young claimed that "by the late 2000s studies predominantly came from Asian cultures regarding this problem". This is certainly debatable (at least among papers published in the English language and depending on the definition of 'predominantly'). For instance, Kuss, Griffiths, Karila, and Billieux (2014) carried out a systematic literature review of all major epidemiological studies examining IA between 2000 and 2013. To be included in the review, studies had to (i) contain quantitative empirical data, (ii) have been published after 2000, (iii) include an analysis relating to IA, (iv) include a minimum of 1000 participants, and (v) provide a full-text article published in English. A total of 68 studies were identified, with 50 being published between 2000 and 2010. Of these 50 studies, 21 were from South East Asian countries (mostly Taiwan and China). In another paper that examined all the epidemiological studies on IA using nationally representative samples between January 2014 and February 2015 (Pontes et al., 2015), only four of the 12 studies identified were from South East Asian countries (South Korea, Taiwan and China).
- Young claimed that "in 2013, Internet Addiction Gaming disorder was singled out as the most potent problem categorized in the revised Diagnostic and Statistical Manual of Mental Disorders". Firstly, the designation given to this disorder was "Internet Gaming Disorder" (not 'Internet Addiction Gaming disorder') and nowhere in the DSM-5 did it state that IGD was the "most potent problem". In fact, if this was the case, the phenomenon would not have been included in Section 3 ("Emerging Measures and Models") of the DSM-5 but indeed within the main text as an officially recognized disorder (American Psychiatric Association, 2013).
- Young claimed that "today, the question [concerning IA] has shifted from how much time online is too much to how young is too young for children to go online". First, such a statement requires further elaboration. Indeed, since the influential work of Charlton and Danforth (2007), the question of the boundary between high involvement or passion versus problematic use or addiction received a growing interest and generated debates about, for example, the pathologization of common behaviors (Griffiths, 2010; Billieux, Schimmenti, et al., 2015). Second, looking at the all the published studies on IA over the last few years,

there are very few empirical studies that have focused on the issue of early IA onset.

- Furthermore, Young also claimed a number of times that the US should learn from what is going on in Korea regarding IA treatment and prevention. However, the present authors' view is that such assertion does not take into account the cultural discrepancies in attitudes towards Internet use in South East Asia and elsewhere. For instance, parents in South East Asia appear to pathologize any behavior that takes time away from family or educational pursuits (Griffiths, 2013). This may explain the highly inflated prevalence rates of IA in countries such as Taiwan and South Korea (Kuss et al., 2014). In short – and from a cultural perspective – in some cultures, any non-educational Internet use (not just excessive use) may appear to cause problems for the user at several levels.

The present authors would like to reiterate the respect we have for Young in helping putting IA on the academic research map. We also accept that the paper written for the special issue on technological addictions was an invitation to write about IA from a personal perspective. Nevertheless, the present commentary paper simply addresses important literature omitted by Young in her original paper and attempts to rectify some of the mistakes and misperceptions made.

## References

- Armstrong, L., Phillips, J. G., & Saling, L. L. (2000). Potential determinants of heavier internet usage. *International Journal of Human Computer Studies*, 53, 537–550.
- Bessière, K., Seay, A. F., & Kiesler, S. (2007). The ideal elf: Identity exploration in World of Warcraft. *CyberPsychology and Behavior*, 10, 530–535.
- Billieux, J. (2012). Problematic mobile phone use: A literature review and a pathways model. *Current Psychiatry Reviews*, 8, 299–307.
- Billieux, J., Schimmenti, A., Khazaal, Y., Maurage, P., & Heeren, A. (2015a). Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. *Journal of Behavioral Addictions*, 4, 142–144.
- Billieux, J., Thorens, G., Khazaal, Y., Zullino, D., Achab, S., & Van der Linden, M. (2015b). Problematic involvement in online games: A cluster analytic approach. *Computers in Human Behavior*, 43, 242–250.
- Black, D., Belsare, G., & Schlosser, S. (1999). Clinical features, psychiatric comorbidity, and health-related quality of life in persons reporting compulsive computer use behavior. *Journal of Clinical Psychiatry*, 60, 839–843.
- Brand, M., Laier, C., & Young, K. S. (2014). Internet addiction: coping styles, expectancies, and treatment implications. *Frontiers in Psychology*, 5, 1256. <http://dx.doi.org/10.3389/fpsyg.2014.01256>.
- Brenner, V. (1997). Psychology of computer use: XLVII. Parameters of internet use, abuse, and addiction: The first 90 days of the Internet Usage Survey. *Psychological Reports*, 80, 879–882.
- Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measurement instrument. *Computers in Human Behavior*, 18(5), 553–575.
- Charlton, J. P., & Danforth, I. D. (2007). Distinguishing addiction and high engagement in the context of online game playing. *Computers in Human Behavior*, 23, 1531–1548.
- Chou, C. (2001). Internet heavy use and addiction among Taiwanese college students: An online interactive study. *CyberPsychology and Behavior*, 4, 573–585.
- Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17, 187–195.
- Egger, O., & Rauterberg, M. (1996). *Internet behaviour and addiction*. Zurich: Swiss Federal Institute of Technology Available at: <http://www.idemployee.id.tue.nl/g.w.m.rauterberg/ibq/report.pdf> (last accessed September 25, 2015).
- Greenfield, D. N. (1999). Psychological characteristics of compulsive internet use: A preliminary analysis. *Cyberpsychology & Behavior*, 2, 403–412.
- Griffiths, M. D. (1995a). Technological addictions. *Clinical Psychology Forum*, 76, 14–19.
- Griffiths, M. D. (1995b). Netties anonymous: Are some people addicted to the internet? *Times Higher Education Supplement*, 17, 17 April.
- Griffiths, M. D. (1996a). Internet addiction: An issue for clinical psychology? *Clinical Psychology Forum*, 97, 32–36.
- Griffiths, M. D. (1996b). Gambling on the internet: A brief note. *Journal of Gambling Studies*, 12, 471–474.
- Griffiths, M. D. (1997). Psychology of computer use: XLIII. Some comments on 'Addictive use of the Internet' by Young. *Psychological Reports*, 80, 81–82.
- Griffiths, M. D. (1998). Internet addiction: Does it really exist? In J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, interpersonal and transpersonal applications* (pp. 61–75). New York: Academic Press.
- Griffiths, M. D. (1999). Internet addiction: Internet fuels other addictions. *Student British Medical Journal*, 7, 428–429.
- Griffiths, M. D. (2000a). Internet addiction – Time to be taken seriously? *Addiction Research*, 8, 413–418.
- Griffiths, M. D. (2000b). Does internet and computer "addiction" exist? Some case study evidence. *CyberPsychology and Behavior*, 3, 211–218.
- Griffiths, M. D. (2010). The role of context in online gaming excess and addiction: Some case study evidence. *International Journal of Mental Health and Addiction*, 8, 119–125.
- Griffiths, M. D. (2013). Internet addiction in adolescence: Challenges, prevention and intervention. In M. Kim (Ed.), *Saving children from the Internet* (pp. 19–45). Seoul: Kachi Books.
- Griffiths, M. D., Kuss, D. J., & Demetrovics, Z. (2014). Social networking addiction: An overview of preliminary findings. In K. Rosenberg, & L. Feder (Eds.), *Behavioral addictions: Criteria, evidence and treatment* (pp. 119–141). New York: Elsevier.
- Griffiths, M. D., Van Rooij, A., Kardefelt-Winther, D., Starcevic, V., Király, O., ... Demetrovics, Z. (2015). Working towards an international consensus on criteria for assessing Internet Gaming Disorder: A critical commentary on Petry et al. (2014). *Addiction*. <http://dx.doi.org/10.1111/add.13057>.
- Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior*, 31, 351–354.
- King, D. L., Haagsma, M. C., Delfabbro, P. H., Gradisar, M. S., & Griffiths, M. D. (2013). Toward a consensus definition of pathological video-gaming: A systematic review of psychometric assessment tools. *Clinical Psychology Review*, 33, 331–342.
- Király, O., Griffiths, M. D., Urbán, R., Farkas, J., Kökönyei, G., ... Demetrovics, Z. (2014). Problematic internet use and problematic online gaming are not the same: Findings from a large nationally representative adolescent sample. *Cyberpsychology, Behavior and Social Networking*, 17, 749–754.
- Kubey, R. W., Lavin, M. J., & Barrows, J. R. (2001). Internet use and collegiate academic performance decrements: Early findings. *Journal of Communication*, 51, 366–382.
- Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction: A literature review of empirical research. *International Journal of Environmental and Public Health*, 8, 3528–3552.
- Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, 20, 4026–4052.
- Lavin, M., Marvin, K., McLarney, A., Nola, V., & Scott, L. (1999). Sensation seeking and collegiate vulnerability to internet dependence. *CyberPsychology and Behavior*, 2, 425–430.
- Leon, D., & Rotunda, R. (2000). Contrasting case studies of frequent internet use: Is it pathological or adaptive? *Journal of College Student Psychotherapy*, 14, 9–17.
- Montag, C., Bey, K., Sha, P., Li, M., Chen, Y. F., Liu, W. Y., ... Keiper, J. (2014). Is it meaningful to distinguish between generalized and specific Internet addiction? Evidence from a cross-cultural study from Germany, Sweden, Taiwan and China. *Asia Pacific Psychiatry*. <http://dx.doi.org/10.1111/appy.12122>.
- Morahan-Martin, J., & Schumacher, P. (2000). Incidents and correlates of pathological internet use among college students. *Computers in Human Behavior*, 16, 13–29.
- Orzack, M. (1999). Computer addiction: Is it real or is it virtual? *Harvard Mental Health Letter*, 15(7), 8.
- Orzack, M. H., & Orzack, D. S. (1999). Treatment of computer addicts with complex comorbid psychiatric disorders. *CyberPsychology and Behavior*, 2, 465–473.
- Pies, R. (2009). Should DSM-V designate "Internet addiction" a mental disorder? *Psychiatry*, 6, 31–37.
- Pontes, H. M., Kuss, D. J., & Griffiths, M. D. (2015). Clinical psychology of Internet addiction: A review of its conceptualization, prevalence, neuronal processes, and implications for treatment. *Neuroscience and Neuroeconomics*, 4, 11–23.
- Pratarelli, M., Browne, B., & Johnson, K. (1999). The bits and bytes of computer/internet addiction: A factor analytic approach. *Behavior Research Methods, Instruments, & Computers*, 31, 305–314.
- Przybylski, A. K., Weinstein, N., Murayama, K., Lynch, M. F., & Ryan, R. M. (2012). The ideal self at play: The appeal of video games that let you be all you can be. *Psychological Science*, 23, 69–76.
- Scherer, K. (1997). College life on-line: Healthy and unhealthy internet use. *Journal of College Student Development*, 38, 655–665.
- Schimmenti, A., & Caretti, V. (2010). Psychic retreats or psychic pits? Unbearable states of mind and technological addiction. *Psychoanalytic Psychology*, 27, 115–132.
- Shapira, N., Goldsmith, T., Keck, P., Jr., Khosla, D., & McElroy, S. (2000). Psychiatric features of individuals with problematic internet use. *Journal of Affective Disorders*, 57, 267–272.
- Starcevic, V. (2013). Is internet addiction a useful concept? *Australian and New Zealand Journal of Psychiatry*, 47, 16–19.
- Starcevic, V., & Aboujaoude, E. (2015). Cyberchondria, cyberbullying, cybersuicide, cybersex: "New" psychopathologies for the 21st century. *World Psychiatry*, 14(1), 97–100.
- Treuer, T., Fabian, Z., & Furedi, J. (2001). Internet addiction associated with features of impulse control disorder: Is it a real psychiatric disorder? *Journal of Affective Disorders*, 66, 283.
- Tsai, C.-C., & Lin, S. S. J. (2001). Internet addiction of adolescents in Taiwan: An interview study. *CyberPsychology and Behavior*, 4, 649–652.
- Xuanhui, L., & Gonggu, Y. (2001). Internet addiction disorder, online behavior and personality. *Chinese Mental Health Journal*, 15, 281–283.
- Young, K. (1996). Psychology of computer use: XL. Addictive use of the Internet: A case that breaks the stereotype. *Psychological Reports*, 79, 899–902.
- Young, K. (1998a). *Caught in the net*. New York: John Wiley.
- Young, K. S. (1998b). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology and Behavior*, 1(1), 237–244.
- Young, K. (1999). Internet addiction: Evaluation and treatment. *Student British Medical Journal*, 7, 351–352.
- Young, K. (2015). The evolution of Internet addiction. *Addictive Behaviors Advance online publication*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0306460315001884>.