



The impact of Internet-based specific activities on the perceptions of Internet addiction, quality of life, and excessive usage: A cross-sectional study



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ABSTRACT

Introduction: Recent research has examined the context in which preference for specific online activities arises, leading researchers to suggest that excessive Internet users are engaged in specific activities rather than 'generalized' Internet use. The present study aimed to partially replicate and expand these findings by addressing four research questions regarding (i) participants' preferred online activities, (ii) possible expected changes in online behavior in light of hypothetical scenarios, (iii) perceived quality of life when access to Internet was not possible, and (iv) how participants with self-diagnosed Internet addiction relate to intensity and frequency of Internet use. **Methods:** A cross-sectional design was adopted using convenience and snowball sampling to recruit participants. A total of 1057 Internet users with ages ranging from 16 to 70 years ($M_{age} = 30$ years, $SD = 10.84$) were recruited online via several English-speaking online forums.

Results: Most participants indicated that their preferred activities were (i) accessing general information and news, (ii) social networking, and (iii) using e-mail and/or online chatting. Participants also reported that there would be a significant decrease of their Internet use if access to their preferred activities was restricted. The study also found that 51% of the total sample perceived themselves as being addicted to the Internet, while 14.1% reported that without the Internet their life would be improved.

Conclusions: The context in which the Internet is used appears to determine the intensity and the lengths that individuals will go to use this tool. The implications of these findings are further discussed.

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1. Introduction

According to a recent report by the [Internet Society \(2014\)](#), in the past 10 years, the number of Internet users surpassed one billion and is now close to three billion users. Also during this period, users migrated their fixed Internet access from dial-up on modems to broadband, and shifted their usage patterns from text-based to predominantly video traffic ([Internet Society, 2014](#)). While Internet adoption is growing worldwide, so is Internet traffic per connection, due to the increasing move to higher-bandwidth broadband access connections, the corresponding adoption of relatively data-heavy Internet applications (e.g., audio and video streaming), and increased adoption of portable devices that are optimized to access these applications ([Internet Society, 2014](#)). These rapid changes in technology are helping shape the way people use and rely on the Internet in their daily lives.

Despite the fact that since its mainstream introduction the Internet has been argued to possess addictive features when used in a non-controlled or pathological way (see [Griffiths, 1996](#); [O'Reilly, 1996](#); [Young, 1998b](#)), it nevertheless represents a virtual world in which several unique environments and/or activities such as gambling, browsing news and information, and social networking can be explored ([Griffiths & Szabo, 2014](#)). According to [Griffiths and Szabo \(2014\)](#) the label 'Internet addiction' (IA) fails to take into account the focus of the object of addiction (e.g., gambling, video gaming, social networking, sex, work, shopping, etc.). It has been argued since the late 1990s that most of the people who spend excessive amounts of time on the Internet are not addicted to the medium itself, but use the Internet to fuel other and specific addictions—i.e., most people have addictions on the internet rather than to it ([Griffiths, 1999, 2000](#)).

Following the latest (fifth) edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) ([American Psychiatric Association, 2013](#)), pathological gambling (which is now known as 'Gambling Disorder') was re-classified from an impulse control disorder to an addictive disorder (i.e., a behavioral addiction) ([Griffiths & Pontes, 2014](#); [Reilly & Smith, 2013](#)). As a result, one of the most fundamental

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implications of this transition is that if an activity that does not involve the use of an intoxicant can genuinely become an addiction (e.g., gambling), there are no theoretical reasons as to why other problematic and habitual behaviors (e.g., shopping, work, exercise, sex, video gaming, internet use, etc.) could not also constitute a *bona fide* addiction (Griffiths & Pontes, 2014). Additionally, the inclusion of a subtype of problematic Internet use (i.e., 'Internet Gaming Disorder', hereby IGD) in the Section 3 (i.e., 'Emerging Measures and Models') of the DSM-5, also constituted a milestone to the development of the (behavioral) addictions field on the whole.

However, the way in which IGD was conceptualized has arguably generated more confusion instead of clarifying the controversies surrounding generalized versus specific Internet use disorders (Griffiths & Pontes, 2014). Consequently, as a result of this conceptual ambiguity related to IGD, two immediate problematic issues arise. On the one hand, (i) IGD is clearly equated as IA as the DSM-5 asserts that IA and Internet use disorder are simply other names for IGD, whilst on the other hand, (ii) it is also asserted in the DSM-5 that IGD (which by definition is internet-based) also comprises offline gaming disorders (Griffiths & Pontes, 2014). In light of these issues, recent empirical research suggested that not only it is meaningful to distinguish between generalized Internet addiction and online gaming addiction (Montag et al., 2014), but it is also paramount to distinguish between them since they are two different types of behaviors conceptually distinct from each other, and therefore are two separate nosological entities (see Király et al., 2014).

Furthermore, the issues stemming from the view that IGD can include both online and/or offline gaming addiction have been discussed elsewhere (see Griffiths & Pontes, 2014; Pontes & Griffiths, 2014; Pontes & Griffiths, in press for a more detailed discussion). However, it has been argued by Griffiths (2005) that although all addictions have particular idiosyncratic characteristics, they share more commonalities than differences (i.e., salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse), and likely reflect a common etiology of addiction. This view has received extensive empirical support from different studies (e.g., Brand, Young, & Laier, 2014; Feng et al., 2013; Han et al., 2011; Ko et al., 2013) that showed how behavioral addictions are similar in nature to other substance-based addictions due to their shared neurobiological abnormalities.

A recent study by Griffiths and Szabo (2014) sought to shed light on an important theoretical aspect of research on IA by examining the context in which excessive Internet use emerges whilst also examining the context in which preference for certain activities arises. In this small study, a sample of 130 Hungarian university students was recruited and the results suggested that the time that individuals spend on the Internet was not random or generalized, but contextualized, leading the authors to conclude that in order to better understand IA, more attention should be paid to the attraction that a user has to one or more specific applications online (such as gaming or social networking).

In light of this, it is clear that identifying specific activities that people are attracted to in virtual environments is an essential task in order to understand how and what people become 'hooked' to on the Internet. In Griffiths and Szabo's (2014) study, they also examined how hypothetical changes in the way people used the Internet (by simply removing specific areas of the Internet) could affect peoples' behavior and attitudes towards their own usage. As a result, it was found that hypothetical lack of access to preferred online activities (i.e., asking participants to imagine how their lives would be if they were unable to access their preferred online activities) would decrease not only the desire to access the Internet but also their expected weekly usage. Despite these potentially fruitful insights, the study by Griffiths and Szabo (2014) had several shortcomings, such as a (i) relatively low and non-heterogeneous sample size, and (ii) lack of inclusion of variables related to IA such as self-assessment and/or other indicators of addiction.

Since the study by Griffiths and Szabo (2014) is arguably important to the way in which IA can be conceptualized and thought of as a behavioral addiction phenomenon, the present study sought to partially replicate and extend Griffiths and Szabo's (2014) study by further examining Internet-related perceptions and behaviors in a larger and more heterogeneous sample pool (i.e., not limited to young Internet users). Consequently, the aim of the present study was to investigate the following four research questions: (i) What are the three most popular online activities reported among the Internet users recruited? (RQ1); (ii) What would be the possible expected changes in these online practices if an individual's favorite online activities could not be accessed again permanently for some reason? (RQ2); (iii) How would the perceived quality of life be affected if Internet access was not possible? (RQ3); and (iv) How does the perception of being addicted to Internet relate to intensity and frequency of use and other-related sociodemographic variables? (RQ4).

2. Method

2.1. Participants and procedure

The present study adopted a cross-sectional design and a web-based recruitment strategy that involved the use of opportunity and snowball sampling methods in order to recruit participants. Several online recruitment channels were used to attract potential Internet users to participate, such as forums (e.g., Something Awful, The Student Room, etc.) and social networking websites (e.g., Facebook). Forum threads were created with prior authorization of the forum moderators and systematically checked on a daily basis for a period of four months that spanned from March to June 2014 while additional dissemination of the survey also occurred via Facebook. Throughout the entire recruitment process, personalized feedback was provided to the participants' questions and issues encountered during survey administration.

In order to take part in the study, participants had to (i) be at least 16 years of age and (ii) provide individual online written informed consent to participate in the study. After finishing the recruitment process, a total of 1,403 questionnaires were filled out. However, after an initial data screening a total of 346 (24.7%) participants were excluded from the final analyses due to either (i) not completing the survey or (ii) other types of response biases (e.g., acquiescence bias, specifying an unlikely value for age). Consequently, this yielded a final heterogeneous sample of 1,057 self-selected English-speaking Internet users, which translated in a total response rate of 75.3% (of those that began the survey). The sample was predominantly male ($n = 753$, 71.2%) and ages ranged from 16 to 70 years ($M_{age} = 30$ years, $SD = 10.84$), with no severe selective drop-out cases being observed. All participants were assured of anonymity and confidentiality, and the study was granted with approval of the research team's university Ethics Committee.

2.2. Measures

A single online questionnaire partly based on that used in the study by Griffiths and Szabo's (2014) was employed. This was then slightly modified and extended to conform to the study's aims and research questions. Consequently, the research protocol included questions that examined the participants' demographics (i.e., age, gender, and current relationship status) and Internet use habits (i.e., history, estimated weekly hours, preferred channel of Internet access [e.g., mobile phone, laptop, tablet, desktop computer, etc.]), a specific question inquiring into participants' three most preferred online activities from a list that included: (i) *games and/or gambling*, (ii) *accessing general information and news* (including sports and politics), (iii) *administration* (e.g., banking, paying bills, booking travel, etc.), (iv) *listening to music*, (v) *watching videos and movies*, (vi) *e-mailing and online chatting*, (vii) *meeting new friends*

(including romantic relationships), (viii) *shopping*, (ix) *accessing adult content*, (x) *social networking* (e.g., Facebook), and (xi) *engaging in other online activities*. Further questions asked about hypothetical situations and included: (a) If for technical reason(s), your most commonly used three online activities were not accessible, would you still switch on your computer (or other internet-enabled device) for other non-work online activities? (yes/no), (b) How much time (in hours) would you spend on the Internet per week without accessing your three most commonly used online activities? (c) If the online access was limited to only one activity, which one would you chose to access? (d) If Internet access was no longer available, the quality of your life would be (rating scale that ranged from 1 [Much Worse] to 5 [Much Better]), and (e) Choose the appropriate answer to the following statement “I am addicted to the Internet” (rating scale that ranged from 1 [Strongly Disagree] to 5 [Strongly Agree]).

2.3. Statistical analyses

Statistical analyses comprised (i) descriptive statistical analysis of the main sample's characteristics, (ii) independent and paired samples student's t-test for mean comparisons for identifying possible significant group effects of the variables involved in this study on Internet usage and behaviors, and (iii) correlational analyses of the main

variables included in the study using IBM SPSS Statistics Version 20. In addition to the aforementioned analyses, Cohen's *d* was calculated – using the Practical Meta-Analysis Effect Size Calculator developed by David B. Wilson and available at <http://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-SMD2.php> – in order to provide the effect sizes of the comparisons made whenever applicable. All statistical tests adopted a significance level of .05.

3. Results

3.1. Sociodemographics, preferred channel of Internet access, and frequency of Internet use

A detailed description of the sample's main demographic characteristics is provided in Table 1. Most of the participants reported being in a relationship (*n* = 627, 59.3%) and exhibited a higher preference for accessing the Internet from desktop computers (*n* = 469, 44.4%), followed by the laptop (*n* = 414, 39.2%), mobile phone (*n* = 114, 10.8%), tablet (*n* = 57, 5.4%), and other mobile devices to a lesser extent (*n* = 3, .3%). In terms of weekly Internet usage for leisure purposes, participants reported using the Internet for around 28 h (SD = 21.2) per week.

3.2. Effects of sociodemographic variables on Internet usage and behaviors

In terms of the gender of participants, females (M = 31 years, SD = 11.91) were significantly older than males (M = 29 years, SD = 10.33), *t*(1055) = 2.69, *p* = .007; *d* = 0.14. By contrast, males reported spending significantly more hours per week on the Internet (M = 30 h, SD = 21.74) than females (M = 26 h, SD = 19.42), *t*(623) = -2.98, *p* = .003; *d* = -0.16, and also a longer history of Internet use (M = 14 years, SD = 5.98) than females (M = 12 years, SD = 7.5), *t*[466] = -2.81, *p* = .005; *d* = -0.22.

Likewise, participants' relationship status also appeared to have significant statistical effects on the reported weekly hours of Internet use and history of Internet use. Moreover, participants who reported not being in a relationship spent more time online per week on the Internet (M = 32 h, SD = 22.83) than those that were in a relationship (M = 26 h, SD = 19.68), *t*(1055) = -4.00, *p* < .0001; *d* = -0.25. Conversely, those that were in a relationship reported a longer history of use of the Internet (M = 14 years, SD = 6.80) in comparison to those that were not in a relationship (M = 12 years, SD = 5.88), *t*(1055) = 3.25, *p* < .0001; *d* = 0.20.

3.3. Preferred Internet activities and hypothetical expected changes in online behaviors

In order to answer the first research question (i.e., *What are the three most popular online activities reported among the Internet users*

Table 1
Sociodemographics, preferred channel of Internet access, frequency of Internet use, quality of life without Internet access, and self-diagnosed Internet addiction (N = 1057).

Variable	
Gender (n, %)	
Male	753 (71.2)
Female	304 (28.8)
Age, years; mean (SD)	30 (10.84)
Relationship status (n, %)	
In a relationship	627 (59.3)
Not in a relationship	430 (40.7)
Channel of Internet access (n, %)	
Mobile phone	114 (10.8)
Tablet	57 (5.4)
Desktop computer	469 (44.4)
Laptop	414 (39.2)
Other mobile devices	3 (.3)
Type of Internet access (n, %) ^a	
Mobile	174 (16.5)
Non-mobile	883 (83.5)
Weekly Internet use, hours, mean (SD) ^b	28 (21.2)
History of Internet use, years, mean (SD)	13 (6.5)
Use of the Internet without the top three activities (n, %)	
Yes	886 (81.9)
No	191 (18.1)
Weekly Internet use, hours, mean (SD) ^c	12 (14)
Perceived quality of life without Internet access (n, %)	
Much worse	251 (23.7)
Worse	416 (39.4)
Same	241 (22.8)
Better	115 (10.9)
Much better	34 (3.2)
Perceived Internet addiction (n, %)	
Strongly disagree	66 (6.2)
Disagree	195 (18.4)
Neither agree or disagree	247 (23.4)
Agree	403 (38.1)
Strongly agree	146 (13.8)

^a Mobile Internet refers to participants that accessed the Internet via their mobile phones, tablets, and other mobile devices. Non-mobile Internet access refers to participants that accessed the Internet via their desktop computers and laptops.

^b This variable enquired into participants' estimated hours of weekly Internet use for leisure purposes only.

^c This variable enquired into participants' hypothetical estimated hours of weekly Internet use if their three most commonly preferred online activities were not accessible.

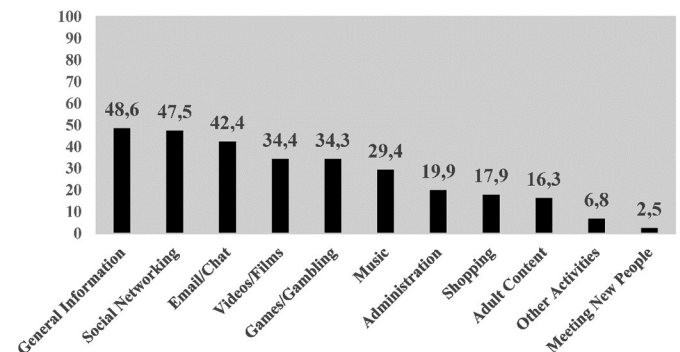


Fig. 1. Participants' three most preferred non-work online activities.

recruited?) data were collected on preferred types of online activities. Furthermore, when asked about which three non-work online activities participants displayed greater preference for, accessing general information and news (including sports and politics) was most preferred ($n = 514, 48.6\%$), closely followed by social networking ($n = 502, 47.5\%$), and e-mailing and online chatting ($n = 448, 42.4\%$) (see Fig. 1).

In order to answer the second research question (i.e., *What would be the possible expected changes in these online practices if the person's favorite online activities could not be accessed again permanently for some reason?*), participants indicated that they would choose accessing general information and news (including sports and politics) ($n = 203, 19.2\%$), followed by games and/or gambling ($n = 179, 16.9\%$), and social networking ($n = 164, 15.5\%$) (see Fig. 2).

Additionally, when asked if they would still switch on their computers (or other internet-enabled device) to use other non-work online activities (if for technical reason(s) their most commonly used online activities were not accessible), almost one out of the five participants reported “no” to this question ($n = 191, 18.1\%$), whilst the majority said that they would still go online but access other activities ($n = 886, 81.9\%$). On the other hand, participants reported that they would spend less weekly time online ($M = 12$ h, $SD = 14$) on average, if they could not access their three most preferred online activities as in comparison to the initially reported weekly time spent online without any restriction ($M = 28$ h, $SD = 21.2$), a difference that was statistically significant $t(1056) = 20.59, p < .0001; d = 1.23$.

3.4. The impact of the Internet on perceived quality of life and Internet addiction

To answer the third question (i.e., *How would the perceived quality of life be affected if Internet access was not possible?*) and fourth question (i.e., *How does the perception of being addicted to Internet relate to intensity and frequency of use and other-related socio-demographic variables?*), data were collected on perceived subjective quality of life and IA among all participants. Furthermore, as shown in Table 1, despite the fact that the vast majority of the participants ($n = 667, 63.1\%$) answered that their quality of life would be “worse” or “much worse” without Internet access, almost one in seven participants ($n = 149, 14.1\%$) reported that their quality of life would be “better” or “much better” without Internet access.

In terms of self-perceived IA, Table 1 illustrates that approximately one in four participants “disagree” or “strongly disagree” about being addicted to the Internet ($n = 261, 24.6\%$). Slightly more than half of the participants either “agree” or “strongly agree” with the same statement ($n = 549, 51.9\%$). Furthermore, a correlational analysis of the perceived IA diagnosis (see Table 2) revealed that this measure was associated with age ($r = -.10, p = .002, \text{BCa } 95\% [-.16, -.03]$), gender ($r_{pb} = -.06, p = .046, \text{BCa } 95\% [.001, .12]$), and weekly Internet use ($r = .27, p < .001, \text{BCa } 95\% [.21, .32]$).

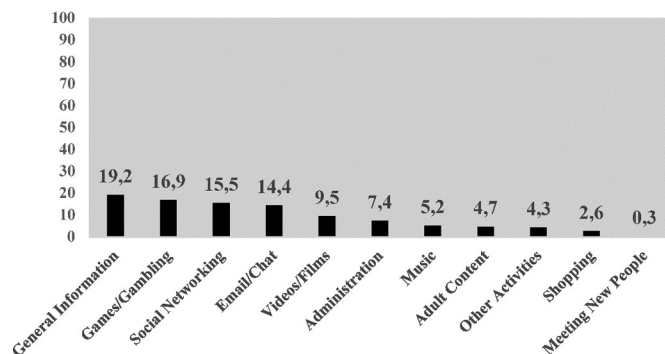


Fig. 2. Participants' single most preferred non-work online activities.

Table 2

Bootstrapped^a correlation matrix with 95% bias-corrected accelerated confidence interval between perceived Internet addiction and the study variables.

Measure	Perceived Internet addiction	BCa 95% CI
Mobile vs. non-mobile	.03	-.03, .09
Age	-.10**	-.16, -.03
Gender	.06*	.001, .12
Relationship status	.03	-.03, .09
Weekly Internet use ^b	.27**	.21, .32
History of Internet use ^c	-.02	-.10, .04
Expected Internet usage ^d	-.01	-.08, .05
Games and/or gambling	.04	-.02, .10
Accessing general information and news	-.12**	-.18, -.06
Administration	-.09**	-.15, -.03
Listening to music	<.01	-.06, .06
Watching videos and movies	.08**	.02, .14
E-mailing and online chatting	-.04	-.10, .02
Meeting new people	.06	.003, .11
Shopping	.02	-.04, .08
Accessing adult content	.09**	.02, .15
Social networking	.01	-.05, .08
Engaging in other online activities	<-.01	-.07, .06

^a Bootstrap results are based on 10,000 bootstrap samples.

^b As per estimated hours.

^c As per years.

^d This variable relates to the following question: “If for technical reason(s), the most commonly used three online activities were not accessible, would you still switch on your computer (or other internet-enabled device) for other non-work online activities? (Yes/No).”

* Correlation is significant at .05.

** Correlation is significant at .01.

In regards to the correlates of self-perceived IA and the included online activities, self-diagnosis of IA was significantly associated with accessing general information and news ($r_{pb} = -.12, p < .001, \text{BCa } 95\% [-.18, -.06]$), administration ($r_{pb} = -.09, p = .005, \text{BCa } 95\% [-.15, -.03]$), watching videos and movies ($r_{pb} = .08, p = .009, \text{BCa } 95\% [.02, .14]$), and accessing adult content ($r_{pb} = .09, p = .006, \text{BCa } 95\% [.02, .15]$).

4. Discussion

The present study sought to partially replicate and extend the findings of Griffiths and Szabo's (2014) study with a significantly larger sample pool (i.e., approximately ten times as big) whilst also including an extra set of Internet-related variables for further describing the intricacies of different online behaviors. Consequently, four research questions were examined in a sample of 1,057 English-speaking Internet users in order to investigate users' online experiences, perceptions, actual, and expected online behaviors.

As noted by Wong, Yuen, and Li (2015), the emergence of mobile technologies has broadened the functionality and utility of the Internet, thereby providing people with an easily accessible and immediate means to satisfy their needs and urges, possibly augmenting the potential for the emergence of excessive and addictive Internet use. In the present study, most participants expressed a preference for accessing the Internet on non-mobile platforms rather than purely mobile devices (see Table 1), a finding that parallels the Internet usage trends in the European Union (EU) where in most cases, mobile broadband does not substitute a fixed connection as only 8% of homes in the EU with Internet access rely purely on mobile technology as its primary source for accessing the Internet (Digital Agenda Scoreboard, 2014).

However, this trend might be reversed in the near future as mobile broadband in the EU represents the fastest growing segment of the broadband market with as much as 62 active mobile broadband SIM cards per 100 people (DAS, 2014). Moreover, in a recent study by Pontes, Griffiths, and Patrão (2014a) where IA was investigated in a sample of 131 Portuguese children and adolescents students, higher levels of IA were associated with owning a mobile device with Internet access. Hence, further attention should be paid to the issue of excessive

Internet use via mobile platforms as it may fuel Internet addictive behaviors.

In the present study, males reported using the Internet for leisure purposes for significantly more hours per week than females, a finding that is similar to those found in other studies (Durkee et al., 2012; Li & Chung, 2006). Conversely, Griffiths and Szabo (2014) found no differences between gender and weekly hours of Internet use. On the other hand, the present study found that males used the Internet for more years in comparison to females, a similar finding to Griffiths and Szabo's (2014) study.

It is worth noting that, although the amount of time spent online is a single and direct indicator of IA (Barke, Nyenhuis, & Kröner-Herwig, 2014; Siciliano et al., 2015), most people can nowadays, in theory, be connected to the internet 24 h using their mobile phones and/or tablets without a real harm to their lives (Siciliano et al., 2015). Notwithstanding this, previous research suggested that Internet-addicts usually spend more time online compared to non-addicts users (Siciliano et al., 2015; Vyjayanthi, Makharam, Afraz, & Gajrekar, 2014). Additionally, Internet-addicts display poor psychological health (i.e., depression, anxiety, and stress) and have lower satisfaction basic needs (i.e., autonomy and competence) (Wong et al., 2015).

In terms of the participants' relationship status, being single was also associated with spending more time online. Although direct comparisons may not be made, this finding is consistent with other recent studies (Pontes et al., 2014a; Pontes et al., 2014b; Quiñones-García & Korak-Kakabadse, 2014; Romano, Truzoli, Osborne, & Reed, 2014) that found that participants who are not in a relationship exhibit higher levels of IA, leading to the conclusion that this variable may well be a risk factor for the onset of IA. Furthermore, participants that reported having a longer history of Internet use were found to be in a relationship, a finding that partly concurs with the one reported by Durkee et al. (2012) where being a relationship was found to be associated with greater risk for IA. Although it is not possible to fully uncover the reasons behind this finding under the current research design, it could be speculated that both behaviors may be mutually reinforcing each other. For instance, it is plausible that in the present sample, most participants are used to forming online relationships and also flirting online since they started using the Internet, hence this may partly explain why these two variables covary. Given the speculation, the issue warrants further investigation in future studies.

To further examine participants' preferred Internet activities and hypothetical expected changes in online behaviors, two research questions were formulated. With regards to the first one (i.e., *what are the three most popular online activities reported among the Internet users recruited?*), it was found that participants exhibited greater preference to the following activities: (i) accessing general information seeking, (ii) social networking, and (iii) e-mailing and online chatting (see Fig. 1), a finding that partly mirrors those reported by Griffiths and Szabo's (2014) where it was found that participants had higher preference for (i) social networking, (ii) e-mail and online chatting, and (iii) watching videos and movies. Additionally, when asked about which online activity they would choose if online access was limited to only one activity, preferences appeared to change slightly with participants reporting higher preferences for (i) accessing general information, (ii) gaming and/or gambling, and (iii) social networking (see Fig. 2). From these findings, it is possible to conclude that the Internet may be enticing more due to its socializing and entertaining nature. This also appears to lend some validity to research showing that social networking has become the most popular form of online activity, especially among young people (Bright, Kleiser, & Grau, 2015; Griffiths & Szabo, 2014; Kuss & Griffiths, 2011).

Interestingly, when participants were asked if they would still connect to the Internet to use other non-work online activities, if for technical reason(s) their most commonly used online activities were

not accessible (i.e., *what would be the possible expected changes in these online practices if the person's favorite online activities could not be accessed again permanently for some reason?*), a significant minority of participants (i.e., 18.1%, see Table 1) reported that they would not even go online anymore, a very similar finding to that reported by Griffiths and Szabo (2014) where this value was found to be around 16%. Furthermore, another important finding was that in the case of hypothetical lack of access to their preferred online activities, a significantly lower amount of time would then be devoted to the Internet, a finding that further corroborates those by Griffiths and Szabo (2014).

These results are highly indicative that Internet users opt to go online to deliberately engage in specific activities with specific content, to an extent that in case of being prevented from accessing their favorite activities, they would then either completely stop using the Internet and/or significantly reduce their weekly time spent online. These findings lend empirical support to the notions put forth by Griffiths (1999) that the Internet fuels other addictions, further emphasizing the importance to distinguish between addictions on the Internet from addiction to the Internet (Griffiths, 2000). As noted by Shaffer, Hall, and Vander Bilt (2000) in some cases, the computer use itself may be the object of addiction, while in other cases the computer may be the mechanism for administering or gaining access to the object of addiction.

As aforementioned, data were collected on both subjective quality of life in the hypothetical scenario where Internet access was not possible and perceived IA in order to address the third research question (i.e., *how would the perceived quality of life be affected if Internet access was not possible?*) and fourth research question (i.e., *how does the perception of being addicted to Internet relate to intensity and frequency of use and other-related socio-demographic variables?*). As shown in Table 1, the results indicated that about 14.1% of the total sample reported that their life would be either "better" or "much better" without the Internet whilst 63.1% reported that it would be "much worse" or "worse" ($M = 2.30$, $SD = 1.05$), a finding that is very similar to the one found in the study by Griffiths and Szabo (2014) ($M = 5.15$, $SD = 1.9$, rated on a scale of 1 [worse] to 10 [better]), further suggesting that for some people, the engaging in online activities is fundamental for psychological wellbeing in their lives whilst for others it is not (Griffiths & Szabo, 2014).

On one hand, for those participants who indicated that their quality of life would be "worse", it may be due to the fact that for those people the beneficial effects of healthy Internet use are prominent be it due to working and/or non-working usage. In fact, it has been reported that the use of the Internet may help shaping and promoting job satisfaction of working individuals (Kim & Chung, 2014), whereas it was also found in another study (Shaw & Gant, 2002) that Internet use helps diminish loneliness and depression while also enhancing social support and self-esteem. Furthermore, for those that reported their quality of life would be "better", this might be due to possible heavy usage patterns that are accompanied by real-life detrimental effects (i.e., IA) in which case, participants may feel that not having access to the Internet would actually help them improve their quality of life (Griffiths & Szabo, 2014).

As an extension to the study by Griffiths and Szabo (2014), data on perceived IA were collected in the present study. This methodology was used instead of the inclusion of a more complete validated and standardized IA measure due to practical and pragmatic research constraints (i.e., time-limited survey) and because previous research has shown that a single diagnostic question relating to IA correlates highly with psychometrically validated IA instruments (Widyanto, Griffiths, & Brunnsden, 2011). More specifically, in a study conducted by Widyanto et al. (2011) where the authors compared the psychometric properties of the Internet Addiction Test (IAT) (Young, 1998a) and the Internet-Related Problem Scale (IRPS) (Armstrong, Phillips, & Saling, 2000), along with a self-diagnostic question asking whether participants thought they were addicted to the Internet in a sample of 225

Internet users, it was found that those that identified themselves as Internet addicts displayed more addiction levels given by higher scores on both the IAT and IRPS, and the three different IA measures were strongly correlated to each other.

Furthermore, in the present study the majority of participants (i.e., 51.9%, see Table 1) identified themselves as being addicted to the Internet (i.e., answered either “agree” or “strongly agree”). Although these percentages are unlikely to be true indicators of the existence of addiction in and of itself, these figures should not be overlooked given previous empirical findings on this issue (e.g., Widyanto et al., 2011). In light of this, it can be concluded that IA alongside its accompanying detrimental effects may well be a reality in some cases of self-diagnosed IA, especially when combined with being young and using the Internet heavily as suggested by the correlational analyses (see Table 2).

Interestingly and perhaps unsurprisingly, participants that identified themselves as addicted to the Internet displayed a tendency to prefer specific online activities such as (i) accessing general information and news, (ii) administration, (iii) watching videos and movies, and (iv) accessing adult content. It is widely reported in previous studies (see Bóthe, Tóth-Király, & Orosz, 2015; Frangos, Frangos, & Sotiropoulos, 2011; Li, Zhang, Lu, Zhang, & Wang, 2014; Maraz et al., in press; Tsitsika et al., 2014; Young, 1998b) that these activities are particularly associated with excessive usage and also IA, therefore this finding appears to lend further empirical support and consistency to the use of a self-diagnosis IA measure as in the present study.

Although the findings presented here may be insightful, they are not without limitations. Firstly, the use of self-report questionnaires may be accompanied by possible associated biases (e.g., social desirability biases, short-term recall biases, etc.). Secondly, despite the use of bootstrap with 95% bias-corrected accelerated confidence intervals to ensure the robustness of the findings, the observed correlations were not too strong, which might be indicative of spurious relationships given the large sample. Thirdly, although there is empirical evidence supporting the correlation between self-diagnosed IA and IA as measured by self-report questionnaires, self-diagnosed IA as opposed to a ‘real’ IA are not entirely the same, and therefore caution is advised when interpreting these findings. Lastly, participants were asked to report how they would behave in light of hypothetical and artificial scenarios. This might be problematic since actual behavior (e.g., estimated weekly hours on the Internet without favorite applications) may differ from those reported hypothetically. Additionally, the present findings should be not generalized to the general population due to the exploratory nature of this study and because of a non-probability sampling strategy that was used. In light of these limitations, future studies could include other research designs (e.g., longitudinal or experimental) to help testing new hypothetical scenarios in a more robust way. Additionally, it is highly recommended the use of standardized and previously validated measures of IA in future similar studies in order to confirm or negate the findings presented here using only the self-diagnostic assessment.

5. Conclusions

The present study provided convincing empirical evidence to support and replicate the findings of a recent study (i.e., Griffiths & Szabo, 2014) that used a relatively low number of young Internet users (i.e., one-tenth of the sample size in the present study). Furthermore, the findings were replicated despite the different nationalities in both studies. The findings presented here may serve to further emphasize that most Internet users, be it healthy or addicted, go online to engage in very specific activities rather than for generalized Internet use. Hence, it is important to carefully examine peoples' actual online behaviors as they are meaningful and may serve to provide a context for using the Internet. Clinical implications might also be derived from these findings as IA should be assessed in light of the individuals' actual

usage and online behaviors and not simply in a contextual vacuum by merely applying measures of generalized IA to individuals that might be addicted to a specific online activity or content (e.g., gaming, social networking).

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Conflict of interest

The authors declare no conflict of interest.

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References

- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Armstrong, L., Phillips, J.G., & Saling, L.L. (2000). Potential determinants of heavier internet usage. *International Journal of Human-Computer Studies*, 53(4), 537–550. <http://dx.doi.org/10.1006/ijhc.2000.0400>.
- Barke, A., Nyenhuis, N., & Kröner-Herwig, B. (2014). The German version of the Generalized Problematic Internet Use Scale 2 (GPIUS2): A validation study. *Cyberpsychology, Behavior and Social Networking*, 17(7), 474–482. <http://dx.doi.org/10.1089/cyber.2013.0706>.
- Bóthe, B., Tóth-Király, I., & Orosz, G. (2015). Clarifying the links among online gaming, internet use, drinking motives, and online pornography use. *Games for Health Journal*, 4(2), 1–6. <http://dx.doi.org/10.1089/g4h.2014.0054>.
- Brand, M., Young, K.S., & Laier, C. (2014). Prefrontal control and Internet addiction: A theoretical model and review of neuropsychological and neuroimaging findings. *Frontiers in Human Neuroscience*, 8(375). <http://dx.doi.org/10.3389/fnhum.2014.00375>.
- Bright, L.F., Kleiser, S.B., & Grau, S.L. (2015). Too much Facebook? An exploratory examination of social media fatigue. *Computers in Human Behavior*, 44, 148–155. <http://dx.doi.org/10.1016/j.chb.2014.11.048>.
- Durkee, T., Kaess, M., Carli, V., Parzer, P., Wasserman, C., Floderus, B., et al. (2012). Prevalence of pathological internet use among adolescents in Europe: Demographic and social factors. *Addiction*, 107(12), 2210–2222.
- Feng, Q., Chen, X., Sun, J., Zhou, Y., Sun, Y., Ding, W., et al. (2013). Voxel-level comparison of arterial spin-labeled perfusion magnetic resonance imaging in adolescents with internet gaming addiction. *Behavioral and Brain Functions*, 9(1), 33. <http://dx.doi.org/10.1186/1744-9081-9-33>.
- Frangos, C.C., Frangos, C.C., & Sotiropoulos, I. (2011). Problematic internet use among Greek university students: An ordinal logistic regression with risk factors of negative psychological beliefs, pornographic sites, and online games. *CyberPsychology, Behavior & Social Networking*, 14(1/2), 51–58. <http://dx.doi.org/10.1089/cyber.2009.0306>.
- Griffiths, M.D. (1996). Internet “addiction”: An issue for clinical psychology? *Clinical Psychology Forum*, 32–36.
- Griffiths, M.D. (1999). Internet addiction: Internet fuels other addictions. *Student British Medical Journal*, 7, 428–429.
- Griffiths, M.D. (2000). Internet addiction-time to be taken seriously? *Addiction Research and Theory*, 8(5), 413–418. <http://dx.doi.org/10.3109/16066350009005587>.
- Griffiths, M.D. (2005). A ‘components’ model of addiction within a biopsychosocial framework. *Journal of Substance Use*, 10(4), 191–197. <http://dx.doi.org/10.1080/14659890500114359>.
- Griffiths, M.D., & Pontes, H.M. (2014). Internet addiction disorder and internet gaming disorder are not the same. *Journal of Addiction Research & Therapy*, 5(4), e124. <http://dx.doi.org/10.4172/2155-6105.1000e124>.
- Griffiths, M.D., & Szabo, A. (2014). Is excessive online usage a function of medium or activity? An empirical pilot study. *Journal of Behavioral Addictions*, 3(1), 74–77. <http://dx.doi.org/10.1556/JBA.2.2013.016>.
- Han, D.H., Bolo, N., Daniels, M.A., Arenella, L., Lyoo, I.K., & Renshaw, P.F. (2011). Brain activity and desire for Internet video game play. *Comprehensive Psychiatry*, 52(1), 88–95. <http://dx.doi.org/10.1016/j.comppsy.2010.04.004>.
- Internet Society (2014). Global Internet Report. Reston, VA. Retrieved from http://www.internetsociety.org/sites/default/files/Global_Internet_Report_2014_0.pdf
- Kim, H., & Chung, Y.W. (2014). The Use of social networking services and their relationship with the big five personality model and job satisfaction in Korea. *Cyberpsychology, Behavior and Social Networking*, 17(10), 658–663. <http://dx.doi.org/10.1089/cyber.2014.0109>.
- Király, O., Griffiths, M.D., Urbán, R., Farkas, J., Kökönyei, G., Elekes, Z., et al. (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(12), 749–754. <http://dx.doi.org/10.1089/cyber.2014.0475>.

- Ko, C. -H., Liu, G. -C., Yen, J. -Y., Yen, C. -F., Chen, C. -S., & Lin, W. -C. (2013). The brain activations for both cue-induced gaming urge and smoking craving among subjects comorbid with Internet gaming addiction and nicotine dependence. *Journal of Psychiatric Research*, 47(4), 486–493. <http://dx.doi.org/10.1016/j.jpsychires.2012.11.008>.
- Kuss, D.J., & Griffiths, M.D. (2011). Online social networking and addiction—A review of the psychological literature. *International Journal of Environmental Research and Public Health*, 8(9), 3528–3552. <http://dx.doi.org/10.3390/ijerph8093528>.
- Li, S. -M., & Chung, T. -M. (2006). Internet function and Internet addictive behavior. *Computers in Human Behavior*, 22(6), 1067–1071. <http://dx.doi.org/10.1016/j.chb.2004.03.030>.
- Li, Y., Zhang, X., Lu, F., Zhang, Q., & Wang, Y. (2014). Internet addiction among elementary and middle school students in China: A nationally representative sample study. *Cyberpsychology, Behavior and Social Networking*, 17(2), 111–116. <http://dx.doi.org/10.1089/cyber.2012.0482>.
- Maraz, A., Eisinger, A., Hende, B., Urbán, R., Paksi, B., Kun, B., et al. (2015). Measuring compulsive buying behaviour: Psychometric validity of three different scales and prevalence in the general population and in shopping centres. *Psychiatry Research*. <http://dx.doi.org/10.1016/j.psychres.2014.11.080> (in press).
- Montag, C., Bey, K., Sha, P., Li, M., Chen, Y.F., Liu, W.Y., et al. (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>.
- O'Reilly, M. (1996). Internet addiction: A new disorder enters the medical lexicon. *Canadian Medical Association Journal*, 154(12), 1882.
- Pontes, H.M., & Griffiths, M.D. (2014). Assessment of internet gaming disorder in clinical research: Past and present perspectives. *Clinical Research and Regulatory Affairs*, 31(2–4), 35–48. <http://dx.doi.org/10.3109/10601333.2014.962748>.
- Pontes, H.M., & Griffiths, M.D. (2015). New concepts, old known issues—The DSM-5 and internet gaming disorder and its assessment. In J. Bishop (Ed.), *Psychological and social implications surrounding internet and gaming addiction*. Hershey, PA: IGI Global (in press).
- Pontes, H.M., Griffiths, M.D., & Patrão, I.M. (2014a). Internet addiction and loneliness among children and adolescents in the education setting: An empirical pilot study. *Aloma: Revista de Psicologia, Ciències de l'Educació i de l'Esport*, 32(1), 91–98.
- Pontes, H.M., Patrão, I.M., & Griffiths, M.D. (2014b). Portuguese validation of the internet addiction test: An empirical study. *Journal of Behavioral Addictions*, 3(2), 107–114. <http://dx.doi.org/10.1556/JBA.3.2014.2.4>.
- Quiñones-García, C., & Korak-Kakabadse, N. (2014). Compulsive internet use in adults: A study of prevalence and drivers within the current economic climate in the UK. *Computers in Human Behavior*, 30, 171–180. <http://dx.doi.org/10.1016/j.chb.2013.08.004>.
- Reilly, C., & Smith, N. (2013). The evolving definition of pathological gambling in the DSM-5. *National center for responsible gaming*, 1–6.
- Romano, M., Truzoli, R., Osborne, L.A., & Reed, P. (2014). The relationship between autism quotient, anxiety, and internet addiction. *Research in Autism Spectrum Disorders*, 8(11), 1521–1526. <http://dx.doi.org/10.1016/j.rasd.2014.08.002>.
- Shaffer, H.J., Hall, M.N., & Vander Bilt, J. (2000). "Computer addiction": A critical consideration. *American Journal of Orthopsychiatry*, 70(2), 162–168. <http://dx.doi.org/10.1037/h0087741>.
- Shaw, L.H., & Gant, L.M. (2002). In defense of the internet: The relationship between internet communication and depression, loneliness, self-esteem, and perceived social support. *CyberPsychology & Behavior*, 5(2), 157–171. <http://dx.doi.org/10.1089/109493102753770552>.
- Siciliano, V., Bastiani, L., Mezzasalma, L., Thanki, D., Curzio, O., & Molinaro, S. (2015). Validation of a new short problematic internet use test in a nationally representative sample of adolescents. *Computers in Human Behavior*, 45, 177–184. <http://dx.doi.org/10.1016/j.chb.2014.11.097>.
- Tsitsika, A., Janikian, M., Schoenmakers, T.M., Tzavela, E.C., Ólafsson, K., Wójcik, S., et al. (2014). Internet addictive behavior in adolescence: A cross-sectional study in seven European countries. *Cyberpsychology, Behavior and Social Networking*, 17(8), 528–535. <http://dx.doi.org/10.1089/cyber.2013.0382>.
- Vijayanthi, S., Makharam, S., Afraz, M., & Gajrekar, S. (2014). Gender differences in the prevalence and features of internet addiction among Indian college students. *Medica Innovatica*, 3(2), 65–70.
- Widyanto, L., Griffiths, M.D., & Brunsden, V. (2011). A psychometric comparison of the internet addiction test, the internet-related problem scale, and self-diagnosis. *Cyberpsychology, Behavior and Social Networking*, 14(3), 141–149. <http://dx.doi.org/10.1089/cyber.2010.0151>.
- Wong, T.Y., Yuen, K.S.L., & Li, W.O. (2015). A basic need theory approach to problematic Internet use and the mediating effect of psychological distress. *Frontiers in Psychology*, 5, 1562. <http://dx.doi.org/10.3389/fpsyg.2014.01562>.
- Young, K.S. (1998a). *Caught in the net: How to recognize the signs of Internet addiction - and a winning strategy for recovering*. New York: John Wiley & Sons, Inc.
- Young, K.S. (1998b). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology & Behavior*, 1(3), 237–244. <http://dx.doi.org/10.1089/cpb.1998.1.237>.